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ENHANCING PATENT DIVERSITY FOR AMERICA'S INNOVATORS

HEARING

BEFORE THE

COMMITTEE ON SMALL BUSINESS
UNITED STATES
HOUSE OF REPRESENTATIVES

ONE HUNDRED SIXTEENTH CONGRESS

SECOND SESSION

HEARING HELD
JANUARY 15, 2020



Small Business Committee Document Number 116–067
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ENHANCING PATENT DIVERSITY FOR AMERICA'S INNOVATORS

WEDNESDAY, JANUARY 15, 2020

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SMALL BUSINESS,
Washington, DC.

The Committee met, pursuant to call, at 11:31 a.m., in Room 2360, Rayburn House Office Building. Hon. Nydia Velázquez [chairwoman of the Committee] presiding.

Present: Representatives Velázquez, Finkenauer, Golden, Kim, Davids, Chu, Evans, Schneider, Delgado, Houlahan, Craig, Chabot, Balderson, Hagedorn, Stauber, Burchett, and Joyce.

Chairwoman VELAZQUEZ. Good morning. The Committee will come to order.

I would like to start by thanking all of our witnesses for coming today to participate in this important hearing.

As the Chair of the House Small Business Committee, I see every day how innovation and invention drive entrepreneurship. An important part of how we support American inventors is through our patent system. Applying for and obtaining a patent allows small firms to gain access to capital, find licensing deals, and level the playing field with larger competitors—all of which lead to jobs and economic growth.

However, women, minorities, and low-income individuals from urban and rural America are significantly underrepresented in the innovation ecosystem. The Institute for Women's Policy Research reported that in 2016, less than 20 percent of U.S. patents listed one or more women as inventors, and under 8 percent listed a woman as the primary inventor. Research also reveals that only six patents per million were attributed to African American inventors. Additionally, children who are born to high-income families are 10 times more likely to obtain a patent than children from below-median income families.

This severe underrepresentation not only hurts these groups, but the economy as a whole. Reports show the U.S. GDP would grow by 4.6 percent if more women and minority inventors were included in the patent system. This is particularly troubling for low-income communities and rural America that are already suffering from being on the wrong side of the digital divide. That is why this Committee held a staff briefing on rural innovation to educate Members and staff on the obstacles inventors and tech founders face in building innovation hubs in rural America.

As the Chairwoman of this Committee, I am dedicated to ensuring that every corner of America has equal access to the patent sys-

tem. Doing so is not only the right thing to do; it makes economic sense to harness the potential of all Americans to fully support innovation and competitiveness.

During today's hearing we will hear from experts on barriers to entry in the patent system, how we can craft public policy to increase diversity, and other challenges facing women and minorities in STEM-heavy industries.

One way to improve the intellectual property system is gathering better information on who is applying for patents. Thanks to the leadership of the Ranking Member, Mr. Chabot, his legislation, the SUCCESS Act, required the USPTO to look at the participation of women, minorities, and veterans in the patent system. That bill and its report were a great first step. However, a key finding was that there is a limited amount of publicly available data regarding the participation rates of women, minorities, and veterans.

If you cannot measure it, you cannot improve it. This lack of research and reporting on patent applicant demographic data makes it difficult for policymakers to advance legislation that will foster inclusive innovation.

I have mentioned many times that nearly 85 percent of SBA loan applicants voluntarily fill out the demographic data that is collected by SBA. This provides the Committee with valuable insight regarding the small businesses utilizing the SBA for access to capital.

The IDEA Act, which I introduced earlier this Congress, builds on the SUCCESS Act by collecting patent applicant demographic data on a voluntary basis at the application stage and directing the USPTO to produce reports. Collecting and reporting this valuable information will drive better policy and help close the patent gap faced by women, minorities, and others. It will also provide insight so that we can make smart, targeted investments to increase the pool of inventors and entrepreneurs.

At the same time, we must also address some of the barriers many Americans have obtaining patents in the current system, including increased diversity in venture capital and the tech industry, robust support for women and minorities in STEM education, and congressional support of the SBIR program.

Today, women received just 2.2 percent of venture capital and under 3 percent of venture-backed founders were Black or Latino. Further, women hold less than 20 percent of U.S. tech jobs and only 5 percent are in positions of leadership at technology companies. Similarly, African Americans hold less than 15 percent of tech positions and Latinos 14 percent. Clearly, more must be done to increase diversity.

Supporting STEM education and the SBA's SBIR program are two other important ways to address the lack of diversity in the technology sector. Studies show that 75 percent of girls who have participated in hands-on STEM activities are empowered to seek careers in technology, while government programs like SBIR have made strides to foster participation by women and minorities through their national road show.

I look forward to hearing from today's witnesses and working with my colleagues on both sides of the aisle to create meaningful policies that foster more opportunities for all Americans to inno-

vate, seek patent protection for their inventions, and reap the benefits of entrepreneurship.

I now would like to yield to the Ranking Member, Mr. Chabot, for his opening statement.

Mr. CHABOT. Thank you, Madam Chair, and thank you for holding this important meeting today.

Today, as you indicated, the Committee will address the need for increased diversity in U.S. patents. Intellectual property (IP) plays a vital role in protecting creative and innovative products and ideas. Our Nation's small businesses represent about 96 percent of employer firms in manufacturing industries with a high number of patents. Studies show that small business owners with IP protections can earn over 30 percent more in revenue compared to their counterparts who have none. Firms with IP rights also pay on average 20 percent more in wages.

The process for obtaining these protections can be challenging. Some small business owners are not even aware that they should protect their innovative products and ideas with intellectual property protections.

In the last Congress, I was involved in helping to get the SUCCESS Act passed. This law became the starting point for this hearing and gave the U.S. Patent and Trademark Office the opportunity to collaborate with the SBA in order to study and reach recommendations for how to better include women and minorities in entrepreneurship and patent activities.

Today, we will hear from a panel of very distinguished witnesses who will help us think about what the next steps should be in ensuring that there is patent diversity. I look forward to hearing what we can do to foster America's creative small businesses moving forward.

Again, we want to thank all our panel members for being here this morning. We look forward to their testimony and asking questions, and I yield back.

Chairwoman VELAZQUEZ. Thank you, Mr. Chabot. The gentleman yields back.

If Committee Members have an opening statement, we would ask that they be submitted for the record.

I would like to take a minute to explain the timing rules. Each witness gets 5 minutes to testify and Members get 5 minutes for questioning. There is a lighting system to assist you. The green light comes on when you begin, and the yellow light means there is 1 minute remaining. The red light comes on when you are out of time, and we ask that you stay within that timeframe to the best of your ability.

I would now like to introduce our witnesses on today's first panel.

Our first witness today is Ms. Andrea Ippolito. Ms. Ippolito currently serves as Executive Director of Engineering Management Program and creator of W.E. Cornell at Cornell University, which works to increase the number of women in Cornell's STEM-based entrepreneurship programs. Prior to joining Cornell, she served as the Director of the Department of Veterans Affairs Innovators Network within the VA Center for Innovation. In this capacity, Ms. Ippolito designed and oversaw the creation of a $10.5 million pro-

gram that provides tools and resources to VA employees to develop innovations that improve the experience of our veterans. Ms. Ippolito pursued doctoral studies in the Engineering Systems Division at MIT and also completed her M.S. in Engineering and Management at MIT. Welcome, Ms. Ippolito.

Our second witness is Dr. Rayshawn Ray. Dr. Ray, a David M. Rubenstein Fellow in Governance Studies at The Brookings Institution, is Associate Professor of Sociology and Executive Director of the Lab for Applied Social Science Research at the University of Maryland, College Park. Dr. Ray's research addresses the mechanisms that manufactures and maintains racial and social inequality. Dr. Ray has published over 50 books, articles, and book chapters, and nearly 20 op-eds on the intersection of race, gender, and work. Welcome, Dr. Ray.

Our third witness is Ms. Janeya Griffin. Ms. Griffin is founder and CEO of The Commercializer, a strategic consulting firm that collaborates with entrepreneurs and institutions to bring ideas and talents to fruition and increase economic growth opportunities. Focusing on technology, entrepreneurship, and inclusive innovation, Ms. Griffin is an experienced business development strategist assisting a range of client—from small business owners to historically black colleges and universities, to underserved community organizations. Welcome.

Now I yield to the Ranking Member to introduce our final witness.

Mr. CHABOT. Thank you, Madam Chair.

Our final witness will be Rick Wade, who is the vice president of Strategic Alliances and Outreach at the U.S. Chamber of Commerce. Previously, he worked with the Department of Commerce Economic Development Administration and the Minority Business Development Agency. Before joining the Chamber he was the deputy chief of staff to former Secretary of Commerce, Gary Locke, and a member of the White House Interagency Task Force on Federal contracting opportunities for small businesses. He received his B.S. from the University of South Carolina, an MPA from Harvard University, and was awarded honorary doctorates from Benedict College and from South Carolina State University. We welcome you here this morning, Mr. Wade. Thank you.

Chairwoman VELÁZQUEZ. Thank you, Mr. Chabot.

Ms. Ippolito, you are now recognized for 5 minutes.

STATEMENTS OF ANDREA IPPOLITO, PROGRAM DIRECTOR OF W.E. CORNELL, CORNELL UNIVERSITY; DR. RASHAWN RAY, DAVID M. RUBENSTEIN FELLOW, THE BROOKINGS INSTITUTION; JANEYA GRIFFIN, MANAGING MEMBER AND PRINCIPAL CONSULTANT, THE COMMERCIALIZER, LLC; RICK C. WADE, VICE PRESIDENT, STRATEGIC ALLIANCES AND OUTREACH, U.S. CHAMBER OF COMMERCE

STATEMENT OF ANDREA IPPOLITO

Ms. IPPOLITO. Thank you, Chairwoman Velázquez, Ranking Member Chabot and members of the Committee for inviting me to speak here today. I am incredibly honored to be here as a citizen,

biomedical engineer, entrepreneur, and faculty member at Cornell University.

At Cornell, I focus my teaching efforts on cultivating women entrepreneurs in the sciences, where I serve as a lecturer in the College of Engineering and SC Johnson College of Business. I also direct a program called Women Entrepreneurs Cornell (W.E. Cornell) at the Center for Regional Economic Advancement, a hub at Cornell for several entrepreneurship programs.

In my testimony, I will focus on the challenges facing women in obtaining patents. However, the challenges I will talk about today also apply to other minority groups and are often felt even more acutely by men and women of color.

Today, women make up just 12 percent of all patent inventors. If we continue business as usual, it will take an estimated 116 years to reach gender parity in patenting. This is not an acceptable status quo.

Innovation is the cornerstone of our economy. We need to be bringing more and diverse people into the innovation ecosystem to remain competitive on the global stage. The USPTO says if women, minorities and low-income individuals were to invent patent technology at the same rate as white men from high-income households, the rate of innovation in American would quadruple.

Now, let's take a look at the barriers. It is important to note up front that many of the barriers facing women in the patenting process are the same obstacles that women battle in the workplace at large—systemic gender discrimination and lack of access to institutional resources and mentoring in the right fields.

Women are actually making significant gain in STEM fields and entrepreneurship, participating in these fields at greater rates than ever before. At Cornell University, 50 percent of all undergraduate engineering students are women. However, the growing number of women in STEM fields has not translated to increases in female patent inventors.

But getting more women into STEM fields is not enough. The real gap comes from the rate of women involved in patent-intensive fields, such as electrical and mechanical engineering. We also see far fewer women seeking patents in private industry than in the academic sector. Given that 85 percent of patents go to private industry, this presents a challenge to gender parity.

So why this gap? The existing research suggests that a lack of exposure to women in patent-producing fields is a key cause of sluggish growth in female innovation. Basically, it is a vicious cycle. A lack of women in these fields mean a lack of mentors, role models, and sponsors for aspiring women inventors seeking guidance and resources to innovate.

Speaking from personal experience, my mother was an electrical engineer and constantly exposed me to STEM fields growing up. Her example created a pathway for me, which I hope to pass on to my daughter who is here with me today. If we are serious about raising the rates of women filing for and obtaining patents, we need to focus more resources on creating pathways to innovation and patenting for individuals in the academic sector and by bringing more women into patent-intensive fields.

Part of creating that pathway is addressing the high cost of patenting. The cost of patenting can range from $5,000 to $20,000 depending on the complexity of the technology. For individuals, the cost almost always falls directly on the inventor. The cost is often a heavier burden for women inventors due to continued gender-wage disparity and lack of access to venture capital or seed stage investment. Note that just 2 percent of venture capital in the U.S. goes to women-only founders.

Women also bear a disproportionate share of the responsibilities for child rearing and they point to child care costs as a key barrier to pursuing patents. A 2011 study found that patenting rates for women academics with children are lower than men and women faculty without children. And many academics actually increase patent activity with parenthood.

Now, there are a few ways we can start to address the barriers facing women in the patenting process. First, the Federal Government should consider directing resources to establishing programs that provide onramps dedicated to increasing women's and minority group exposure to the patent and commercialization process. These resources should be directed to sectors in which women are currently pursuing patents, such as the academic sector, as well as for bringing women into patent-intensive fields. Specifically, we recommend that the SBA and USPTO consider a joint initiative which would create funds for onramp programs that focus on women and minorities.

Second, these on-ramp programs should be feeders to existing entrepreneurship initiatives in the university, community, or region, such as the NSF I-Corps program among others.

And third, we need to address the cost of applying for a patent. Tailored programs and entrepreneurship initiatives should consider specific funding for patent support to cover the cost of applying for parents and hiring the appropriate legal counsel.

In conclusion, let's tackle this together to bring untapped talent into the innovation sphere, and support more equitable and just economic prosperity across our Nation. I would be happy to answer any questions that you have.

Chairwoman VELAZQUEZ. Thank you, Ms. Ippolito.

Dr. Ray, now you are recognized for 5 minutes.

STATEMENT OF RASHAWN RAY

Dr. RAY. Chairwoman Velázquez, Ranking Member Chabot, and distinguished members of the Committee on Small Business, thank you for inviting me to testify on Enhancing Patent Diversity for America's Innovators. I am currently a David M. Rubenstein Fellow at The Brookings Institution and an associate professor of Sociology at the University of Maryland. I am also the executive director of the Lab for Applied Social Science Research (LASSR). At LASSR, what we do regularly partner with government agencies, organizations, and corporations to conduct objective research evaluations and develop innovative research products, such as our virtual reality work with law enforcement and incarcerated people.

My comments will primarily focus on the importance of collecting data. What are public attitudes, how do people behave, and why is it important to collect demographic data?

A majority of Americans want to be in control of who collects data on them, what is collected, for how long that data are stored, and what the data will be used for. However, context matters. For example, 90 percent of Americans view their social security number as very sensitive, whereas, only 8 percent view their purchasing habits as being very sensitive. About 80 percent of Americans report having awareness that the government collects information about verbal, written, and online communication. And people seem to be quite comfortable with credit card companies collecting and storing data on them, followed closely by the government. They are much less likely, however, to be comfortable with websites they visit online, as well as cable and cellphone companies. Over 50 percent of Americans think that the government should be able to store data for a few years or as long as they need to. At the same time, however, slightly less than one-third of Americans perceive the government will keep their data safe and private. This is comparable to views about cellphone companies and cable companies. Partly, this simply has to do with a decline in public trust and social institutions. However, the public is much more likely to trust science and medicine than other social institutions.

So, do people actually voluntarily provide demographic information on a survey when asked? In short, yes. My experience collecting data is that people overwhelmingly answer demographic questions on surveys. I have conducted surveys and interviews with the general public; police officers; students; families; parents; employees of companies; members of religious organizations; protestors and march attendees, people who have lost large amounts of weight; people living in urban, suburban, and rural areas; people on the west coast, the south, east coast, as well as the mid-west; and other high-risk groups. I have conducted these surveys and interviews in-person, online, on paper, and on tablets and other smart devices. I have asked demographic questions verbally, too, and the response rate is similar.

Generally, I have asked respondents an assortment of questions ranging from questions about police-civilian relationships to sexual assault on campus, to issues with family and relationships. And overwhelmingly, people still voluntarily provide demographic information. I typically ask an assortment of questions about demographics—gender, age, race, ethnicity, national origin, sexual orientation, education level, household income, military or veteran status, and disability. I have also asked people who live in their household, what their relationship is to these people as well as people's political and religious beliefs.

In this regard, demographic data encompasses a host of factors well beyond race or gender. By collecting other factors, it gives researchers the ability to conduct statistical analyses to determine what other factors matter in a survey.

In a typical survey, less than 5 percent of respondents refuse to answer demographic questions. I am also the co-editor of an academic publication, Contexts Magazine: Sociology for the Public, and no matter how obscure the topic, rarely do researchers report having difficulty getting respondents to answer demographic questions.

I want to end with three points about why it is important to collect demographic data. First, more data are normally better be-

cause they help to eliminate false positives. For example, the lack of demographic data may inflate the likelihood of certain groups catching a daily disease, having an early onset of dementia, or even whether or not they receive a patent or not, how many times they had to apply to receive a patent, and then what impact that patent might actually have on their economic growth.

Oh, and the other thing, these false positives may inadvertently funnel resources to the wrong areas. So, by not including demographic factors, we might be misplacing resources and efficiencies.

Second, the collection of demographic data allows for the determination of whether or not a sample is representative. Representation is extremely, extremely key, whether or not we are talking about people living in urban, or rural areas; whether or not we are talking about across different demographic groups, veteran status, disability status, et-cetera.

So, if a researcher is conducting a study on vaccines, for example, a representative sample is paramount. And I think everyone knows that there is kind of a history of this legacy here of what happens when you do not have a representative sample.

If there is an over or underrepresentation of certain groups, the analysis will then likely over or underestimate the impact of say, in this case, vaccines and other sorts of outcomes. I also study algorithms and we have seen that recently as well, the impact that can have in the medical sphere.

Third, what most Americans desire more than anything is transparency, inclusion, and equity. Demographic data help to provide this. A lack of demographic data often leads to bad science, does a disservice to Americans, and inhibits the United States' ability in continuing to be innovative and comprehensive.

Chairwoman VELAZQUEZ. Thank you, Dr. Ray.

Ms. Griffin, you are now recognized for 5 minutes.

STATEMENT OF JANEYA GRIFFIN

Ms. GRIFFIN. Chairwoman Velázquez, Ranking Member Chabot, and members of the Committee, good morning. Thank you for this opportunity to discuss increasing diversity within our patent and commercialization system. I am honored to be here with you today.

My name is Janeya Griffin, The Commercializer. I am an advocate for intellectual property. The first time that I truly learned about the value of patents was not in grade school or even college. Not in history books that were part of any common core curriculum that I was taught. It was only after college when I met professors who had patents who looked like me did I believed that it was possible to obtain one.

Before becoming an advocate for IP, I was a STEM graduate from Grambling State University. The dean of my college recognized the entrepreneur in me and encouraged me to apply for a fellowship program called the Integrated Technology Transfer Network. Funded by the Department of Navy through earmarks, it took STEM students from HBCUs and taught us the business side of things so we could speak and understand the technical language, then translate that into a value proposition that business people could understand. Unfortunately, that program was defunded in 2011.

By receiving certification in entrepreneurial technology commercialization, I was able to learn the true value and functionality of IP and work on tech transfer projects from several Federal labs where I evaluated patents to determine their commercial potential. Today, I manage and sell NASA's IP.

Having said that, I am a black woman with a very unique skillset and only have the knowledge about the patent and commercialization system because I went through a very specialized program that targeted STEM students from HBCUs. This program has created inventors, small business owners, and even directors of SBA-funded programs. The advocacy work I do for innovators of color allows me to speak to what I see may be the issues that the country's patent and commercialization process is facing.

My story about patents is not unique. I have surveyed my colleagues, clients, and professionals within this space and the sentiments are mostly the same. Many of them, even those who are patent attorneys, only learned about the value of IP when they reached grad school or as they were assigning their ownership rights to their IP over to their soon-to-be employer.

Research shows black inventors receive six patents per million people compared to 235 of their white counterparts. So if you combine 13 of the Nation's NFL stadiums, only six of those seats were for black people.

It is clear that even with the invention of the Internet, there are still huge exposure gaps in education when it comes to people of color seeing the contributions of people that look like them in the history books we are learning from. We should be highlighting and elevating inventors such as Marian Croak, a black woman with almost 200 patents who has a proven track record of success in this field to serve as a nationwide ambassador for patent attainment.

The diversity gap in patents is not just an inclusion issue. It is also an exposure to generational wealth through patent commercialization, an access issue. And if exposure to generational wealth can be passed down through generations, then so can exposure to generational trauma. Before we begin to think we can solve the diversity gap, we must first understand how it came to be. For decades, our country's laws have placed minorities in positions where they have had to choose their life over their IP, even at one point being considered property themselves.

Economist Dr. Lisa Cook discusses the correlation of declining minority patents during the Jim Crow and race riot era, having lost over 1,000 patents. More than 100 years prior, in 1710, the same holds true. The Meritorious Manumission Act of Virginia gave slave owners the rights to grant their slaves freedom in exchange for their inventions. Hence, the systemic issues faced by minorities in the patent commercialization systems for decades has not only created the diversity gap but has continued to sustain it. How can we expect to increase diversity in patenting and commercialization if historically the system has not been built for minorities to participate or succeed in general? Only collecting vanity metrics such as demographics of the inventor is not going to close the diversity gap. In fact, we should be asking how many of those six patents per million people are actually small business owners as ownership of a patent by a small business generates 16 new

jobs. That is 16 more opportunities for minorities and returning citizens.

The success of this great Nation is not only dependent on our ability to invest in programs, pathways, and institutions which make room for a greater number of inventors, but also on how we tell the true story of the contributions of women and minorities in almost every sector of the American economy. Why not fund more certificate programs like the one I went through? If we are truly focused on increasing the diversity of patents, we must invest in education, access, and equity at the highest level in the most marginalized communities which will ensure this great Nation retains it's economic vitality.

My name is Janeya Griffin, an HBCU graduate, IP advocate, and a proud black woman. Thank you for your time.

Chairwoman VELAZQUEZ. Thank you.

Mr. Wade?

STATEMENT OF RICK C. WADE

Mr. WADE. Good morning, Chairwoman and members. I am Rick Wade, the U.S. Chamber of Commerce's vice present for Strategic Alliances and Outreach. I am leading our efforts to create and expand opportunities for diverse-owned businesses and enterprises across America. I appreciate the opportunity to testify before you this morning.

The Chamber commends the Committee for its leadership on issues central to increasing access to our innovation economy, particularly among women, minorities, veterans, and other underserved communities. Through my experience both in the public and private sectors, I have come to understand and appreciate that diverse-owned enterprises are key contributors to and drivers of America's economy. The Minority Business Development Agency (MBDA) of the U.S. Department of Commerce, estimates that there are currently 11 million minority business enterprises nationwide which employ over 6 million people and generate nearly $1.8 trillion in revenue. Enhanced access to tools like the Patent System will only strengthen these enterprises and ensure their competitiveness in years to come. We especially appreciate the Committee's work on the Study of Underrepresented Classes Chasing Engineering and Science Success Act of 2018, also known as the SUCCESS Act.

Too often, underserved communities and diverse business owners lack the information and/or resources to take advantage of the many forms of intellectual property protections available to them, including our U.S. Patent System. As you well know, the SUCCESS Act directed the U.S. Patent and Trademark Office, in consultation with the Small Business Administration, to identify publicly available data on the number of patents applied for and obtained from women, minorities, and veterans, and benefits of increasing these numbers. The act also asked for legislative recommendations on how to encourage and increase engagement among diverse innovators and entrepreneurs. We recognize the leadership of USPTO director Andrei Iancu for the report and programs that his agency has implemented to encourage more diverse participation in our innovation economy. The USPTO report re-

vealed that there is a limited amount of public available data regarding the level of participation by women, minority, and veterans. Only approximately 12 percent of investors named on U.S. patents are women. Clearly, this represents a serious issue of concern but also an opportunity as minority communities have higher shares of women-owned enterprises. The USPTO has resources in almost every state to help new entrants navigate the patent process, including local partnerships with pro bono attorneys, law school clinic programs, local libraries where inventors can get help searching USPTO databases for previously filed patents and trademarks and other programs. The USPTO also recently updated its homepage to include a link to these local resources. Now with just one click, new inventors can access a map of the United States and then click on their state and find in one place numerous resources to assist them in their local areas.

This year, the USPTO will launch a Council for Innovation and Inclusiveness to develop a national strategy for promoting and increasing the participation of underrepresented groups and will expand its work with other Federal agencies to develop training materials to help elementary, middle, and high school teachers incorporate the concepts of invention and IP creation and protection into classroom instruction.

The report also provides legislative recommendations. Congress could authorize a streamlined mechanism for USPTO to undertake a voluntary, confidential biennial survey of individuals named in patent applications that have been filed. Congress could expand the authorized uses of grants and funds in appropriate Federal programs to include activities that promote innovation and entrepreneurship among underrepresented groups.

Finally, please know that the U.S. Chamber of Commerce, the largest business organization in the world, has stepped up its efforts to expand opportunities for diverse-owned enterprises. Our partnership with the Minority Partnership Development Agency in which we are working together to address issues such as innovation, automation, access to capital and connectivity to the global marketplace. We are convening the heads of the Nation's diverse chambers and other business organizations to collectively advocate for a common business agenda to include entrepreneurship. Our NextGen partnership with Historically Black Colleges and Universities seeks to inspire and develop the next generation of innovators, entrepreneurs, and business leaders. Through a grant from the W.K. Kellogg Foundation, we are advancing a dialogue across the business community on Kellogg's major research port, the Business Case for Racial Equity, assessing best practices and policies that could help close the entrepreneurial divide. From Thomas Jennings, the first black patent recipient in 1821 for a dry cleaning process, to current day Dr. Lonnie Johnson, who is literally a rocket scientist, our goal must be to continue to inspire and develop new generations of innovators and entrepreneurs.

We look forward to working with you and walking with you on this very important journey.

Chairwoman VELAZQUEZ. Thank you very much. Quite an impressive group of witnesses. We really thank you for providing such insightful information.

I am going to start by recognizing myself for 5 minutes.

Dr. Ray, in the SUCCESS Act report we found that there was no available data concerning the number of women and minority inventors who have applied for or received patents from the USPTO. We also know that we need to improve patent opportunities for all underserved entrepreneurs, including those in rural communities. How does this lack of data impact Congress's ability to propose legislation that will improve opportunity for underrepresented groups?

Dr. RAY. Yeah, well, a lack of data might actually lead to a misallocation of funds or misplacement of funds. And it might also be about an intersection between say race, gender, and geography. So, what you might find as we know is that there is an underrepresentation for women and minorities, but it might be that individuals are living in particular areas. And if we do not capture these variety of demographic questions, we will not be able to answer these important questions.

Chairwoman VELAZQUEZ. Do you think it is important that we collect information to track regional patterns of innovation?

Dr. RAY. Yes, I do. I mean, geography becomes a key metric by which to look at. In fact, in a lot of research studies, zip code is oftentimes used as a proxy for income, wealth, and race. If we are collecting that information, we want to make sure that we collect an assortment of these demographic variables because a proxy can be just as detrimental as not collecting information.

Chairwoman VELAZQUEZ. Thank you.

Ms. Ippolito, you mentioned that more women are participating in science and engineering occupations and entrepreneurship, but yet, this has not translated into more female patent holders. I heard when you said the high cost of patents might be a factor, but do you believe that there are any other efforts needed to ensure that a more robust pipeline of women in STEM leads to equality in the innovation economy?

Ms. IPPOLITO. Absolutely. So we recommend that the USPTO and SBA ignite new programs to create onramp programs taking STEM women and other minorities, to introduce them to the patent and commercialization processes. And in these programs they will get exposed to role models and mentors.

There was a recent study that was done by Dr. Delgado and Dr. Murray that shows that patents from top inventors have higher percentages of including first-time female inventors on their patents. What is interesting about this work is that these top inventors are both male and female. But in particular, female top inventors tend to include more women. So how do we include these top inventors as part of these onramp programs as role models, as mentors to help facilitate this process? And what is great about these onramp programs, W.E. Cornell being one of them——

Chairwoman VELAZQUEZ. At what level should that happen?

Ms. IPPOLITO. So they should be based in universities and in communities. Universities are the places where STEM women and minorities are being educated, so this is a great opportunity to expose them at that level so that they can continue innovating beyond the university setting.

Chairwoman VELÁZQUEZ. Ms. Griffin, would you like to comment?

Ms. GRIFFIN. Yes, I do agree with Ms. Ippolito's sentiments. Specifically, minority institutions and HBCUs graduate the most minorities that we know today. So by working directly with them I think that would be the best bet.

Chairwoman VELÁZQUEZ. What would you say is one of the biggest reasons why many minority entrepreneurs fail to receive patents?

Ms. GRIFFIN. So, I will give you three: Education. Lack of education in terms of the patenting and commercialization process, lack of resources, and then also the lack of access. If we are looking in terms of representation on how many inventors we are looking at through our history books, which is kind of what I talked about before, we do not really see too many of them. And it is not something that is widely known. And so we need that representation. There are so many people that I talked to that actually did not know anything about the patent process until they reached graduate school. So if you think about the many patents, especially Dr. Croak. She has 200 patents. So any time before then, if she would have been educated as a child in her early childhood years, 200 patents from her graduate school years until now, we have lost so much economic opportunity from that position.

Also we need more culturally competent qualified counsel, and so by working with them they would allow us to be able to educate our minorities in marginalized communities.

Chairwoman VELÁZQUEZ. Thank you. My time has expired.

Now I recognize the Ranking Member, Mr. Chabot.

Mr. CHABOT. Thank you very much, Madam Chair.

Ms. Ippolito, in your view, what is the biggest barrier for women who are trying to enter the patent process, and what can we do to help?

Ms. IPPOLITO. So the two biggest barriers are exposure and also the high cost of patenting. So we know that there is a growing number of STEM women that are entering this field and they are going on to the private sector. By the way, there is an overwhelming number of patents coming from the private sector, particularly in patent-intensive fields like electrical engineering and mechanical engineering. So the biggest barrier is getting exposure to these STEM women who we know are getting this education but we are not efficiently using that talent pool. And so if we can direct resources, programs like the ones the panelists have talked about to educate them and expose them, show them role models. You cannot be what you cannot see. And so we need to bring this exposure to K-12 programs and university settings. And then we need to address the high cost of patenting itself with pro bono lawyers that are qualified in those fields and we need to give them access to these networks of lawyers to help them facilitate this process.

Mr. CHABOT. Okay. Thank you very much.

Let me go back to Dr. Wade, if I could. Or Mr. Wade; sorry.

In your written statement you had discussed the Chamber's annual International IP Index. Are there any trends that the Chamber sees that could either be beneficial or nonbeneficial for the U.S. in coming years?

Mr. WADE. Well, the IP Index, you know, the Intellectual Property Index which measures economies across some 50 countries, I mean, what it does, it shows a correlation between intellectual property protections, patents, job creation, and success and growth of business. That has been a consistent trend and probably the most important trend that I think should be the basis of even this conversation. How do we increase entrepreneurs and innovators across diverse communities so as to create more jobs and create the positive forces of our economy?

Mr. CHABOT. Okay, thank you very much.

Dr. Ray, in your opinion, why do Americans give so much, you know, the demographic data so easily to surveyors? Are there any risks that come with that? And anything that you would suggest along those lines? Because, obviously, you are legitimate. How should people make sure that they are not being tricked into something?

Dr. RAY. Yeah, that is a great question. I think when people know why they are giving their information they are much more likely to give it. I think when it comes to the Federal Government, when it becomes clear why that information is being provided. For all of the slew of publications that I have had, I tell people. In fact, it is required at universities to do research that we tell people why we are collecting data on them and what we are going to use it for. And typically, people will do that.

I think one of the other things that is extremely important is to capture the most people at the most time. In this particular case, at the application phase is when you are going to get them because, I mean, if people do not get the patent, they are going to be less likely to fill out a survey later. They are not as incentivized. But if you get that demographic information from the beginning, then people are much more likely to provide it. And I think it is common place. I think in many regards if we are talking about gender, age, even household income, geography, race, typically people can pinpoint what a person looks like. And even if people's age is slightly off by 10 years or so, people kind of have an idea of what those demographics are and people are willing to provide them.

Mr. CHABOT. Thank you very much.

And Ms. Griffin, could you tell us something about, you talked about the various patents that you have been involved in. Is there any one in particular that you have that was particularly, you think might be helpful or help other people out there who might have a great idea and want to get a patent for themselves to either support their family or their business down the line or whatever?

Ms. GRIFFIN. You are asking me if I have an actual patent?

Mr. CHABOT. Yes, I mean——

Ms. GRIFFIN. No, I did not.

Mr. CHABOT. Okay. You have not yourself. Okay. Was there anything that you were engaged in or work with that you think are particularly interesting or that give some information to folks that might have a good idea out there?

Ms. GRIFFIN. Patents in particular?

Mr. CHABOT. Yes.

Ms. GRIFFIN. So there are, oh, wow, a lot of different technologies, specifically ones that are focused on actually solving the

problems within their communities. Most times what I see when I am working with people is that they are solving a problem that has been specifically affected by them and most people that they know. People solve problems that affect themselves. And so I think that specifically when we are talking about women, issues that women face, there are many times where there should be issues where marginalized communities are really being focused on. So if we are talking about artificial intelligence, if we are talking about different ways that we can use technologies to be incorporated into businesses that may not actually have patents or may not have a technical person there, they should be able to use Federal labs or institutions that actually have repositories of patents in order to become either tech enabled or tech based.

We are now currently in our fourth industrial revolution, and so technology is at the core of that. And so if entrepreneurs and small business owners are not putting technologies into their business, owning their own patents, we are losing out on jobs lost. We are losing out on being able to be a part of the economy that is now being created today.

Mr. CHABOT. Thank you very much.

My time is expired, Madam Chair.

Chairwoman VELAZQUEZ. The gentleman's time has expired.

The gentlelady from Kansas, Ms. Davids, is recognized for 5 minutes.

Ms. DAVIDS. Thank you, Chairwoman. To the Chairwoman and Ranking Member, thank you for holding this hearing today.

I say this all the time, small business is the backbone of our country, and I think what we are talking about now is seeing small business being impacted by innovation and being able to own the intellectual property when you are the creator.

This past October, the House passed the Women's Business Center Improvement Act and Rep. Hagedorn and I put that bill forward because women's business centers we think can have a really strong impact on entrepreneurship and supporting women entrepreneurs.

I have at least one more question so hopefully we will get through this quickly.

Ms. Ippolito, I wanted to see if you could talk a little bit, because you mentioned WBCs in your testimony. If you could talk a little bit about how programs like yours or other programs can help either feed into women's business centers or maybe how women's business centers can improve to maybe partner with the types of programs that you have.

Ms. IPPOLITO. Absolutely. So at Cornell, we created Women Entrepreneurs of Cornell, or W.E. Cornell to act as a feeder into our existing entrepreneurship initiatives. And the reason we did that is because we did not want to cannibalize the number of women in our entrepreneurship programs. We wanted to increase the number of women and minorities in our programs.

So programs like W.E. Cornell that we see at other universities as well, but we hope programs like W.E. Cornell can scale across the country and university-based settings, in particular in areas outside of our technology bubbles that we often see on the coast.

But programs like W.E. Cornell can partner with the women business centers to increase exposure of STEM women to these services. If you build it you cannot just assume they will come. Women need to be invited, encouraged, inspired, frankly, to be part of this movement so that we can have a better economy. So programs like W.E. Cornell can partner with women business centers and we can have directed outreach to STEM women and minorities in these programs.

Ms. DAVIDS. So that actually, so Ms. Griffin, in your written and verbal testimony you mentioned the program, the Integrated Technology Transfer Network Program that you participated in and that you did not really see this type of opportunity until much later. And I am curious how we can talk about getting folks more knowledgeable, interested, excited about these kinds of, about STEM, about patents, earlier on. And not just when folks get to that college level.

And then secondarily, if you would not mind talking a little bit about—I do not know if you are familiar with the women's business centers or some of the other SBA programs, but how those might partner with like HBCUs. I would be curious to hear that as well.

Ms. GRIFFIN. Yes. Thank you.

We have to meet them where they are. And most times when we are talking about marginalized communities, they know nothing about what is going on outside of where they live. Right? And so if we are to educate them on who they could be, we have to show them people that look like them that are actually doing it, which is why I talked about Dr. Croak. I keep bringing her up again because we need to actually see people that look like us to actually put it in place where we actually believe that it can happen because it is a tangible thing.

The Integrated Technology Transfer Network Program was a really great program and it opened up my eyes to a lot of different things. I did not know anything about Technology Transfer offices. I did not know that many HBCUs do not necessarily have them or know what to do about technology transfer. After I graduated I went back to my HBCU and I said, hey, where is our tech transfer office? I am thinking that this is something that is common because we were at Cal State University San Bernardino and they did not know what I was talking about. And so for me, I think the education around technology commercialization and technology transfer, because you are looking at it from a standpoint of having either corporations or institutions that are actually licensing these technologies that are resulting from Federal funds versus small business owners who are actually spending their hard-earned money and investments into patenting, prosecution, fees, and things of that nature.

So I think those are two very different things. And when we want to talk about licensing for small business owners, they are actually being able to exploit and reap most of those benefits by getting residual income from that.

Chairwoman VELAZQUEZ. Time has expired.

Ms. DAVIDS. Thank you.

Chairwoman VELAZQUEZ. Now, we recognize the gentleman from Tennessee, Mr. Burchett.

Mr. BURCHETT. Thank you, Chairlady, Ranking Member. Thank you all for putting this meeting together as was stated earlier.

I have always been an inventor at heart. I still make bamboo skateboards, actually. Bamboo and hemp, actually. Completely biodegradable. Everybody thinks I am going to break my neck on them but I still ride them, much to the chagrin of my neighbors and my wife. But anyway. And I appreciate you all being here.

Ma'am, I appreciate you bringing your daughter her. I had a very cool momma and she actually flew an airplane during the Second World War. She was quite a lady, and I miss her daily. And while Daddy was off fighting the Japanese in the Pacific, my momma did her part for the war effort and so I was blessed.

And ma'am, when you mentioned historically black colleges, my momma taught for 10 years at Knoxville College and was in their hall of fame, actually. So that is cool.

And you, men, I have nothing for you all today. I dig you all being here but I especially appreciate the ladies. And I thank you again for bringing your daughter here with you. I have a wonderful little girl who I got when she was five. And started dating her momma then and I adopted her since then. Never made more money, never been broker, never been happier in my entire life. So thank you all.

This really does not have anything to do with what you all have said but a fellow was in my office this week that I met earlier oddly enough and we had talked about inventions. And he invented something that was really cool and it got stolen from him. Went to court, got it back. But I am wondering if any of you all have ever heard of anybody that has an approved patent but they have not been able to maintain it because a larger company stole their idea. I hear a lot of that from China. Thank you, ma'am. But I was wondering if any of you all could name any specifics real fast.

Sir, we will start with you on the end and just come this way.

Mr. WADE. I apologize. I cannot cite any specific examples. I would be happy to follow up.

Mr. BURCHETT. Okay. I would like that.

Ma'am?

Ms. GRIFFIN. So I will not get into specifics because I do not know what is public information, but I have spoken with a few people who have those same sentiments that they do feel like corporations are, you know, once they have presented that information to them they basically say that they are not interested and then they see something, whether it is in the marketing that they shared or something that is not in their claims, right, so they begin to use the funds that they do have access to develop around the claims that are in those patents. And then when you are looking at an independent patent inventor, they do not necessarily have those funds to actually fight in litigation and to go up against big corporations. And so there is nothing that they can do, I mean, outside of just coming to legislation, talking to the congressmen and congresswomen.

Mr. BURCHETT. Right.

Ms. GRIFFIN. But, yes.

Mr. BURCHETT. Thank you.

Sir?

Dr. RAY. Yeah, I will quickly say, I mean, Lonnie Johnson, who we mentioned before, who pretty much every kid has played with a Nerf Gun or a Super Soaker. I mean, he actually had to litigate and go to court. And, the patents actually helped to preserve that for him. I think that is what is key is that it is a long, torrid history of particularly individuals who are under resourced, women and minorities, having their inventions stolen from them. I mean, historically, Jack Daniels is one of those examples with Uncle Nearest. And they tried to amend from that.

I am from Murfreesboro, Tennessee, by the way.

Mr. BURCHETT. Thank you. I appreciate the fact that you and I are the only people in this daggum room that do not have an accent. So thank you.

Dr. RAY. I could go along with that.

Mr. BURCHETT. Thank you.

Dr. RAY. But I mean, I think that there are several individuals, and I think to this point, that impacts the application process. And that is why it is important to collect data on the front end because you have a lot of individuals who simply will opt out of that process because of the money and because they are worried about getting scooped from larger companies.

Mr. BURCHETT. Thank you.

Ma'am?

Ms. IPPOLITO. So I do not have any specifics from personal experience, but in speaking with folks that have gone through the patent process and that are repeat offenders, and I use that in a positive way of those that are applying for more than one patent, they hear these stories. And to Dr. Ray's point, if they learn and hear of their colleagues and peers that have to go to court and litigate which sometimes it can cost up to a couple hundred thousand dollars if not more, then this deters them from submitting more patents. So I think we need to fix this. I believe there is a group of inventors that have the Inventors Right Act and there is a lot of talk in this arena from inventors who I have spoken with.

Mr. BURCHETT. I feel like we are the daggum Congress. We ought to do better by working folks that come up with these innovative ideas because I hear about them getting stolen. I know this lady back here, I appreciate that. I have heard it many times. So thank you all.

One quick question. I have got 17 seconds.

Ms. Griffin, where would you suggest folks go to obtain funding for their patents? Banks?

Ms. GRIFFIN. Independent inventors, I think we are here. They should come here. Well, no, so if we are looking at funding that has already been allocated to help small business owners, why are we not looking at allocating more funding to actually help them within the patent ownership process? Data shows that small business owners who actually own their patents generate 16 jobs. Their sales go up 51 percent over 5 years. And so if we are wanting to help small business owners, then we need to help them in the ownership of their patents and be able to help them exploit those as well.

Mr. BURCHETT. Thank you, ma'am.

Thank you, Chairlady. I appreciate your indulgence.

Chairwoman VELAZQUEZ. Thank you.

Mr. BURCHETT. Thank you, ma'am.

Chairwoman VELAZQUEZ. Now we recognize the gentlelady from California, Ms. Chu, Chairwoman of the Subcommittee on Investigation, Oversight, and Regulations.

Ms. CHU. Thank you.

I was certainly alarmed to see that women, especially African Americans and Hispanics, obtain patents at lower rates than men; that people of color obtain patents at much lower rates than whites; that individuals from lower income backgrounds are much less likely to obtain a patent than children of wealthier families. And yet I know as Co-Chair of the Congressional Creative Rights Caucus how important intellectual property and IP protections impact our economy. These protections are especially important for my district in southern California which is home to countless of these small business owners and innovators who hold IP in a wide variety of fields from technology to art, music and movies. And so I really feel strongly that as members of Congress we have a responsibility to foster their innovation and ensure that the U.S. is an environment where ingenuity and inventiveness can thrive and prosper.

We need to make sure that we have robust and thorough demographic data to understand how we can ensure the patent system is working for traditionally underserved communities like minorities, women, and veterans, and it means that we need more data and better cooperation between Federal agencies, including the U.S. Patent and Trademark Office.

Ms. Griffin, you have such a powerful story about how patents changed your life. You testified to how patents can unlock generational wealth. Can you expand on that statement and explain why patents are a powerful tool in reducing economic inequality and why it is so important that historically disadvantaged Americans can fully benefit from patent protections for their intellectual property?

Ms. GRIFFIN. Absolutely. So when we talk about patents, we talk about generational wealth, right, and how intellectual property is equitable to ownership which is also equitable to generational wealth. And so if we are to own patents, then what does that do for our economy, for our marginalized communities, for our historically black college universities if they are to actually start playing in the tech transfer spaces. And having return on investments from R&D funding by producing patents and then being able to exploit those by licensing those patents, creating spinoff companies specifically around those communities, utilizing the entrepreneurs within those universities who are also minorities, to utilize those technologies, to improve on those technologies, it becomes this ecosystem in the cycle of event where you are now creating generational wealth across generations. Specifically, when we start talking about Federal Government, how can we actually be using HBCUs as a conduit to do this? And so even with SBIR funding, STTR funding, looking at nontraditional principal investigators who are in our marginalized communities, they may be small business owners who do not have a technical background, but what we

see is in the startup space you can actually be a nontechnical CEO and then find a CTO to actually help you push your company forward. And so if we are to do that, then we could take small business owners with nontechnical backgrounds, pair them with principal investigators at historically black colleges and universities or minority-serving institutions and then create generational wealth through that way.

Ms. CHU. Thank you for that.

Ms. Ippolito, my district in southern California is home to 744 independent small business inventors and they have told me personal stories about the prohibitive costs associated not only with applying for a patent but also defending their intellectual property rights from sometimes frivolous legal challenges. In fact, they said that large companies are able to exploit the USPTO system to overwhelm independent inventors and small businesses with litigation and legal fees by endlessly challenging the validity of their patent.

But I was struck about your case study of a female entrepreneur expecting to pay between $4,000 to $8,000 in filing and fees, and also, of course, she has childcare costs that limit her financial resources. So how can the expectation of high filing legal fees dissuade some innovators from engaging in the patent process and how could this disproportionately affect minority and female entrepreneurs?

Ms. IPPOLITO. Yeah, thank you for that question.

So the example that you mentioned is Dr. Sarah Reyes. She recently obtained her doctoral degree at Cornell and she has a countertop breast milk pasteurizer that she is currently going through the filing process right now. She is about to be a post-doc where you do not make a lot of money, and thankfully, she is in programs like entrepreneurship lab or eLab at Cornell and W.E. Cornell that provide her with a small stipend of money, $5,000 to help cover those costs.

But if you do not provide those funds to cover those legal fees and the patent fees itself, then folks like Dr. Reyes will be limited even pursuing those patents. So providing these small stipends as part of onramp programs like W.E. Cornell can help increase the number of women and minorities that are applying for patents. Or else it is just cost prohibitive and we are not going to see this increase.

Ms. CHU. Thank you.

I yield back.

Chairwoman VELÁZQUEZ. Time has expired.

Mr. Evans from Pennsylvania, Vice Chairman of the Committee is recognized for 5 minutes.

Mr. EVANS. Thank you, Madam Chair. And as usual, I thank you, Madam Chair, and the Ranking Member for your leadership on these issues. This is really very important.

Women and minorities are less likely to receive venture capital. In 2018, women entrepreneurs in tech brought in just 22 percent in U.S. venture capital investment. Just 1 percent of venture backed founders were African Americans and 1.8 were Hispanic. Further, nearly three-fourths of venture capital firms have no female investors. Minorities represent just 3 to 4 percent of venture capital.

Now, this is a question to all of you so you will have your chance since I only have 4 minutes and 16 seconds. To any of the witnesses, can you explain the disparity in venture capital expenditures and make suggestions on how we can increase the chances of women and minority in tech of receiving venture capital?

So I will go down the line and start with Mr. Wade.

Mr. WADE. Thanks. That is a very important issue, capital. And one of the things we must understand is that investors are attracted to patents.

Mr. EVANS. Yes.

Mr. WADE. And that is a very important variable in this conversation of access to capital. I also believe that mentor-protege programs, how do we build the kinds of relationships between venture capitalists and other funders with innovators and entrepreneurs from minority communities are very important. That is one of the initiatives actually that we are developing through the U.S. Chamber.

Mr. EVANS. Ms. Griffin?

Ms. GRIFFIN. So I would also like to comment on what he said. I have the same sentiments. But as I was doing my research it says the first patent granted increases the probability of securing VC funding by 53 percent. So it is very, very important that we get small business owners, specifically black women, to start actually monetizing their IP and actually patenting that intellectual property. We are the most educated, the most entrepreneurial, and with that we need to also have the most patents as well. So, yes.

Dr. RAY. I will just quickly say that the collection of data becomes important by understanding what happened before the application, during the application, and after the application. So, what the SUCCESS Act is aiming to do is commendable in a sense that essentially is doing the longitudinal survey to ask people over time. That becomes extremely, extremely key to figure out: where are the gaps in the pipeline? Where are the leaks in the pipeline? Right now, we simply only have data kind of on who is applying and who is not and whether or not they are awarded that. But the pipeline extends well beyond that and a collection of data will help better address these questions so that resources can then be allocated specifically to deal with social networks, to deal with a lack of capital. I mean, we already know from minority and women-owned businesses they are simply less likely to get loans from banks and a lot of that is systemic. These are things that can be prevented. This prevents them from bringing their work to scale and that becomes extremely important for individuals who are low income in urban and rural areas because research shows that they are more likely to return to where they are from. This means they are helping to generate jobs in rural areas, urban areas, and low-income areas that previously did not have any.

Ms. IPPOLITO. I want to agree with everything that has been said so far. So we know that venture capitalists are overwhelmingly white males, and if you talk to any venture capitalist they say how they get to know entrepreneurs is through introductions. So if you are not embedded in these networks then you cannot get an introduction to venture capitalists and then you cannot raise

funding. And we know that getting a patent helps get venture funding. So that is one point.

Secondly, a lot of the process of pitching and getting investment from venture capitalists frankly has been optimized for men. An example of this is a study by Dr. Murray where she looked at both male and female entrepreneurs and she recorded their voice with the exact same content. And it was found that men were seen as a more attractive investment. They even added video and, of course, they saw the same thing. But as you can see that it has been optimized for men to receive this funding overall.

Mr. EVANS. I thank you.

Madam Chair, I hope with the question that I just asked, yes, protecting patents are important and what we need to do, but at the end of the day, if you are going to move these patents to be commercialized to the marketplace and try to address the problems in communities, the basis is they need capital. They need access. So you, I know, have been conducting sessions with tech-fins and other entities but that really needs to be a discussion as a follow-up. So I only suggest that in your thinking about that.

Thank you. I yield back.

Chairwoman VELAZQUEZ. The gentleman yields back.

Now we recognize the gentleman from Maine, Mr. Golden, Chairman of the Subcommittee on Subcontracting and Infrastructure for 5 minutes.

Mr. GOLDEN. Thank you, Madam Chair.

I am going to ask a question that I do not know the answer to already so it is, you know, hopefully, one out of curiosity but it is specific to some of my constituents in Maine.

Maine is I think per capital one of the least diverse, whitest states that we have in the country, very large, very rural. But in the last couple of decades we have had a sizeable group of Somali Americans move in to the community as well as a fair number of asylum seekers. And I found that because of language barriers, for the first generation, anyway, what we often see is a lot of people that become small business owners. They bring a lot of skills with them. The language barrier kind of stands in the way though. And as a result, it is hard for them to get into whatever industries we have in that area. And so they are very creative in how they find a way to make things work and make a living, become entrepreneurs themselves. But something we often see, particularly with, or technical issues or having to deal with the bureaucracy of agencies like SBA is that language barrier can be very frustrating and/or prevent them from accessing the kind of assistance that they need to really maximize their skills and become successful.

So I was just curious, particularly with patent at USPTO, is there good resources there to help people overcome language barriers or is that lacking? And if it is lacking, any recommendations on where people can go to get help with that kind of a challenge?

Ms. IPPOLITO. Not to my knowledge. I do not know of any resources off the top of my head.

Mr. WADE. I do not as well but I would like to just make one observation of the advantage of that language also. What we do know is that minority firms, owned enterprises are more likely to export, to do business in countries abroad. And so how we also view

language barriers could also be a language opportunity in not just the patent process but as we seek to grow more entrepreneurs, particularly who are exporting their products abroad.

Dr. RAY. I just want to make one quick point that speaks to this. When I did my analysis of patents over time with the data that we have available, one big thing we know is that U.S. patent recipients has decreased over time and foreign recipients have increased. And a large percentage is coming from Asia, particularly Japan. But one of the things that I was thinking about in relation to demographic information as a university professor, we have a lot of individuals, a lot of international students who come to the U.S. But they might actually return or a lot of them might actually want to stay and they are being innovative while they are here. However, we are not collecting information to know whether or not they are even educated in the United States to begin with. So, when we look at the demographic information currently, we see that they are listed under a foreign inventor when, in fact, they might have invented that at a U.S. university and then they might actually need ways to think about scaling it to help the U.S. economy grow. I think that is something that is missing. It speak to language in a sense that a lot of international students come over. There is a language barrier. They are learning English in a lot of ways. But they are being innovative. And we need to actually capture information on them to figure out how they are contributing to the U.S. economy as well.

Mr. GOLDEN. I appreciate that. And I agree wholeheartedly. It is a huge potential asset in our community where we can increase economic relations that we would not have had without our Somali Americans.

I am not surprised that maybe you do not have an answer or that you do not think that there are any resources like that out there but something to point out, Madam Chair, I mean, I have had meetings with SBA where it was a point of frustration for people that there is no one to help translate, no one that can help deal with some of the language barrier. And I am, of course, thinking more specifically about that first generation of immigrants who often have a lot of great ideas and are running businesses. And when they come to the Federal Government for help it is tough if there is no resources out there to help with translation.

Chairwoman VELAZQUEZ. With that, let me thank all the witnesses. I would like to make a closing statement.

The U.S. patent system provides inventors and small businesses the ability to monetize life-changing ideas and incentivizes advancement in technology. Because of its vital role in protecting valuable intellectual property, a strong and inclusive patent system is necessary to advance America's economic growth and global competitiveness.

However, we have far to go in this journey. Women, minorities, and low-income communities in urban and rural America are still underrepresented in the patent, trademark, and innovation ecosystem. Gathering information about patent applicant demographics will drive better policy that ultimately helps more women, people of color, moderate and low-income communities, and other traditionally disadvantaged groups obtain patents for their innova-

tions. Closing the patent gap will also drive economic growth and advance America's global lead in innovation.

I look forward to working with my colleagues in Congress to advance policies that foster an inclusive innovation ecosystem.

I will ask unanimous consent that members have 5 legislative days to submit statements and supporting materials for the record.

Without objection, so ordered.

If there is no further business to come before the Committee, we are adjourned. Thank you.

[Whereupon, at 12:45 p.m., the Committee was adjourned.]

APPENDIX

Cornell University

Small Business Committee Hearing: "Enhancing Patent Diversity for America's Innovators"

Testimony before the U.S. House of Representatives Committee on Small Business

January 15, 2020

Submitted by:
Andrea Ippolito
Program Director, Women Entrepreneurs Cornell (W.E. Cornell), Center for Regional Economic Advancement
Lecturer, Engineering Management Program, College of Engineering
Visiting Lecturer, SC Johnson College of Business
Cornell University
Ithaca, NY

Introduction

Thank you, Chairwoman Velázquez, Ranking Member Chabot and members of the Committee for inviting me to speak on this important topic: increasing diversity in innovation, entrepreneurship and patenting. I am incredibly honored to be here as a citizen, biomedical engineer, entrepreneur, and faculty member at Cornell University.

At Cornell, I focus my teaching efforts on cultivating women entrepreneurs in the sciences, where I serve as a Lecturer in the College of Engineering and SC Johnson College of Business, and direct a program called Women Entrepreneurs Cornell (W.E. Cornell) at Cornell's Center for Regional Economic Advancement. The program is in its second year, and I work with women entrepreneurs in STEM disciplines who are at all stages of their entrepreneurial journey, including several who are pursuing patents for their innovations. I am also an entrepreneur myself, and one of the few female faculty members teaching classes at the intersection of science, technology and entrepreneurship. I highlight this fact to emphasize the dearth of women that persists in STEM and entrepreneurship in both academia and private industry. In my testimony, I will focus primarily on the challenges facing women in becoming inventors and obtaining patents, and the existing research on these barriers as they apply to women. However, I want to acknowledge that gender diversity is just one facet of the diversity we seek in patenting. The challenges facing women also apply to other minority groups and are often felt even more acutely by men and women of color.

The women I mentor who pursue patents are in the minority at Cornell, as they are nationwide. Today, women make up just 12 percent of all patent inventors. That rate is higher at Cornell, where 23 percent of all patent disclosures come from female faculty, but still significantly below where we can and want to be.

Further, women hold only 5.5 percent of all commercialized patents or patents that make it to market. The Institute for Women's Policy Research estimated that on our current trajectory it will take until the year 2092 for women to reach parity with men in patenting rates.[1] Another group, comprised of top economists, estimates it will take until the year 2136 (116 years from now) to reach gender parity.[2] This is neither an acceptable status quo nor an acceptable rate of change.

The Decline in American Innovation

Why is it important to focus on increasing the number of women patent inventors in the United States? The answer is economic growth, including job creation.

Young firms have historically accounted for a disproportionate level of job creation in the U.S.[3] More recently, however, top economists and other scholars have pointed to the decline in high-

[1] Institute for Women's Policy Research. "At the Current Rate, Women Inventors Will Not Reach Parity in Patenting Until 2092." July 21, 2016. Available online: https://iwpr.org/at-the-current-rate-women-inventors-will-not-reach-parity-in-patenting-until-2092/.

[2] The Equality of Opportunity Project. "Who Becomes an Inventor in America? The Importance of Exposure to Innovation." By Alex Bell, Raj Chetty, Xavier Jaravel, Enviana Petkova, and John Van Reenen. Available: http://www.equality-of-opportunity.org/assets/documents/inventors_summary.pdf

[3] NBER Working Paper No. 21776. "Where has all the skewness gone? The decline in High-Growth (Young) Firms in the U.S." February 2016. Available online: https://www.nber.org/digest/feb16/w21776.html.

growth startup rates in the post-2000 period, a trend described as "pervasive" by observers.[4] Researchers at the Brookings Institute and the Kauffmann Foundation found, based on an analysis of U.S. Census data, that the number of new companies as a share of all U.S. businesses has dropped by 44 percent since 1978.[5]

There is a way to help reverse this trend: increase the number of women and other underrepresented groups obtaining patents and starting valuable businesses. The U.S. Patent and Trademark Office (USPTO) stated in its 2019 report: "If women, minorities and low-income children were to invent patented technology at the same rate as white men from high-income (top 20 percent) households, the rate of innovation in America would quadruple."[6] Studies have also found that even though women patent less than men, the quality and impact of their patents are equal to or exceed those of men.[7]

The number of women obtaining patents has improved, albeit slowly, over the past 40 years. The share of patents with at least one female inventor has increased from five percent in 1976 to 21 percent in 2016. However, it is important to note that the rate of increase in that trend has slowed since 1998, and that there has not been a comparable increase in patents granted to female-only teams.

Research shows that obtaining a patent is also tied to promotion and salary increases, so increasing the patent rate among women is critical to women moving into leadership roles across the board. For perspective, just 6.6 percent of Fortune 500 companies currently have a female CEO. Along with patents, diversity within an organization or team, including gender diversity, is associated with improved productivity, creativity, and increased profits.[8][9][10] One of the best ways we can have diverse, higher performing innovation teams is to have more diverse innovators.

Further, patents are the foundation that help drive innovation in the United States. Recent research at MIT found that entrepreneurs who acquire patents and trademark protection were

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[4] Brookings Institute. "What's Driving the Decline in the Firm Formation Rate? A Partial Explanation." November 2014. By Ian Hathaway and Robert E. Litan. Available online: https://www.brookings.edu/wp-content/uploads/2016/06/driving_decline_firm_formation_rate_hathaway_litan.pdf

[5] Inc. "American Entrepreneurship is Actually Vanishing. Here's Why." By Leigh Buchanan. May 2015. Available online: https://www.inc.com/magazine/201505/leigh-buchanan/the-vanishing-startups-in-decline.html

[6] United States Patent and Trademark Office. Office of the Chief Economist. "Progress and Potential: A profile of women inventors on U.S. patents." February 2019. Available online: https://www.uspto.gov/sites/default/files/documents/Progress-and-Potential.pdf.

[7] McMillan, G., Gender Differences in Patenting Activity: An Examination of US Biotechnology Industry, Scientometrics, 80, 683-691 (2009).

[8] McKinsey & Company. "Why Diversity Matters." By Vivian Hunt, Dennis Layton, Sara Prince. January 2015. Available online: https://www.mckinsey.com/business-functions/organization/our-insights/why-diversity-matters. Harvard Business Review. "Why Diverse Teams Are Smarter." By David Rock and Heidi Grant. November 04, 2015. Available online: https://hbr.org/2016/11/why-diverse-teams-are-smarter.

[9] Forbes "New Research: Diversity + Inclusion = Better Decision Making At Work", Erik Larson, September 21, 2017, available online: https://www.forbes.com/sites/eriklarson/2017/09/21/new-research-diversity-inclusion-better-decision-making-at-work/#532612474cbf

[10] Journal of Innovation: Organization & Management, 2013, "Gender diversity within R&D teams: Its impact on radicalness of innovation", Cristina Díaz-García, Angela González-Moreno, Francisco Jose Sáez-Martínez, available online: https://www.tandfonline.com/doi/abs/10.5172/impp.2013.15.2.149

significantly more likely to achieve equity growth,[11] because patents are an important factor in an entrepreneur's ability to seek venture capital. Founders who seek and acquire patents indicate strongly that they aim to create a high-growth, high-value company. In fact, high-growth ventures are responsible for 50 percent of job creation in the U.S.[12] Thus, if we agree that patenting is a strong indicator of high-growth business creation, and that high-growth, young firms create the most jobs in this country, then we necessarily must agree that patenting is critical to job creation, and ultimately economic growth.

The Patent Process: Barriers to Entry for Women

There are a few key reasons why women have struggled to gain ground in patenting, including systemic gender bias, an educational gap between women and men in patent-intensive fields, and a lack of access to mentoring and institutional resources, particularly in patent-intensive fields.

Starting with systemic gender bias, Jessica Milli, Study Director at the Institute for Women's Policy Research in DC, says, "The reasons why women are so woefully underrepresented amongst patent inventors are complicated, but they likely mirror the challenges women face advancing in the workplace and – more specifically – in science, engineering and technology fields. Gender bias, societal expectations and challenging workplace environments have made it difficult for women to break into male-dominated STEM fields, many of which also happen to be the most patent-intensive."[13]

We know from the USPTO report that women-only teams are less likely to apply for patents, more likely to be rejected in the patenting process, and are less likely to appeal when rejected.[14] Gains in female participation in science, engineering, and entrepreneurship are not leading to broad increases in female patent inventors. This is despite the fact that women in the U.S. earn more than half of all academic degrees, from bachelors to doctoral degrees.[15] Women are also racing to gender parity in STEM and entrepreneurship participation. For example, 39 percent of new entrepreneurs in 2016 were women; while in 2015, nearly half of all biological and life scientists were women. Overall, women made up 28 percent of the STEM workforce in 2015, and 40 percent of workers whose highest degree was in a science or engineering field.[16]

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[11] NBER Working Paper No. 26073. "Passive Versus Active Growth: Evidence from Founder Choices and Venture Capital Investment. Christian Catalini, Jorge Guzman, Scott Stern. July 2019. Available online: https://www.nber.org/papers/w26073?utm_campaign=ntwh&utm_medium=email&utm_source=ntwg18

[12] Journal of Economic Perspectives, Vol. 28, No. 3, Summer 2014, pgs. 3-24. Decker, Ryan; Haltiwanger, John; Jarmin, Ron; Miranda, Javier. "The Role of Entrepreneurship in U.S. Job Creation and Economic Dynamism." Available online: https://pubs.aeaweb.org/doi/pdfplus/10.1257/jep.28.3.3.

[13] Marketwatch "Why are just 12 percent of inventors with a U.S. patent women?", March 8, 2019, available online: https://www.marketwatch.com/story/just-12-of-american-inventors-with-a-us-patent-are-women-2019-02-15.

[14] Nature Biotechnology. Jensen, Kyle; Kovzeacs, Balázs; Sorenson, Olav. 05 April 2018. "Gender differences in obtaining and maintaining patent rights." Summary available online: https://insights.som.yale.edu/insights/why-do-women-inventors-win-fewer-patents

[15] National Center for Education Statistics. Table 318.10. Degrees conferred by post-secondary institutions, by level of degree and sex of student: Selected years, 1869-70 through 2027-28. Available online: https://nces.ed.gov/programs/digest/d17/tables/dt17_318.10.asp?current=yes

[16] National Science Board Science and Engineering Indicators 2018. Available online: https://www.nsf.gov/statistics/2018/nsb20181/report/sections/science-and-engineering-labor-force/highlights.

Second, despite the growing number of women in STEM fields, the largest attainment gap between women and men is the number of women filing patents in patent-intensive fields, such as mechanical and electrical engineering. At Cornell University, where I teach, 50 percent of all undergraduate engineering students are women. But getting more women into STEM fields is not enough. Jennifer Hunt and team found that only seven percent of the gender gap in commercialized patents may be attributed to women's lower probability of having a STEM degree. The real gap comes from the rate of women involved in patent-intensive fields, such as electrical and mechanical engineering.

Further, the USPTO report suggests that women are pursuing patents at higher rates in academia and public research institutions than they are within private industry.[17] Given that the vast majority of patents go to business and private industry, this presents a challenge to gender parity.[18] According to a National Science Foundation (NSF) report, private sector companies received 85 percent of all patents granted to U.S. patent holders, individuals received nine percent of patents granted, and the academic sector received just four percent of patents.[19] The evidence suggests, including at Cornell, that women are pursuing innovation and patents within academia—at public research institutions and as individuals—at higher rates than in private industry, therefore more attention should be focused on supporting potential women inventors and entrepreneurs outside of private industry.

The high cost of patenting is likely a reason why private industry is dominant in filing for and obtaining patents. While not representative of all companies, *Inc* magazine said, "IBM spends more than $6 billion a year on R&D and has an in-house staff of more than 370 patent lawyers…and many large companies have recently spent billions buying up patent portfolios to protect them from lawsuits by other corporations."[20] The cost of filing for and obtaining a patent (and defending one in some cases) is highly variable, but for individuals the costs can range from $5,000 to more than $20,000 depending on the complexity of the technology to be patented. For individuals, the cost almost always falls directly on the inventor. This presents an added burden for women inventors seeking patents in several systemic ways, including the wage disparity among genders, meaning they are less financially able to bear the costs of patenting. Further, fewer women receive venture capital or seed stage investment from any source – a challenge that acts as a barrier at all stages of the entrepreneurial journey. Women also bear a disproportionate share of the responsibility for child-rearing and in some cases the costs of childcare, further stressing their finances and ability to pursue the patenting process.

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[17] United States Patent and Trademark Office. Office of the Chief Economist. "Progress and Potential: A profile of women inventors on U.S. patents." February 2019. Available online: https://www.uspto.gov/sites/default/files/documents/Progress-and-Potential.pdf.

[18] National Science Board: Science and Engineering Indicators 2018. Chapter 8: Invention, Knowledge Transfer, and Innovation. Appendix Table 8-1. Available online: https://www.nsf.gov/statistics/2018/nsb20181/report/sections/invention-knowledge-transfer-and-innovation/invention-united-states-and-comparative-global-trends.

[19] National Science Board: Science and Engineering Indicators 2018. Appendix Table 8-1.

[20] Inc. "How the Current Patent System Actually Hurts Inventors." Nick Skillicorn. Aug. 31, 2016. Available online: https://www.inc.com/nick-skillicorn/how-the-current-patent-system-actually-hurts-inventors.html.

A 2019 brief published by economists at Moody's Analytics calls childcare a "serious financial burden" for American families, and noted that childcare "crimps the ability of parents to work," a fact that "weighs on the economy," wrote the authors.[21] Women inventors participating in entrepreneurship programs at Cornell have pointed to childcare costs as a key barrier to pursuing patenting, from the cost of childcare prohibiting them from devoting more time to developing their prototypes and technology, to the financial constraints posed by the balancing high cost of both patenting and childcare.

Third, existing research suggests that a lack of exposure to female patent inventor role models and mentors, particularly in fields that are more patent-producing intensive, is inhibiting the growth of female innovation, including limiting women's ability to go after seed funding and venture capital.[22] Exposure to innovation begets innovation – and research by leading economists has found that gender matters in that exposure.

Speaking from personal experience, my mother was an electrical engineer and constantly exposed me to STEM fields growing up. Her example created a pathway for me, which I hope to pass on to my daughter, who is here with me today. Active and engaged role models are critical to illuminating the path for women to engage in innovation, patenting, and entrepreneurship. According to one report "Who Becomes an Inventor in America? The Importance of Exposure to Innovation", "women are more likely to invent in a given technology class if they grew up in an area with many female inventors in that technology class. Growing up around male inventors has no impact on women's propensity to innovate."[23]

This is consistent with the USPTO finding that women inventors are increasingly concentrated in specific technologies and types of patenting organizations, suggesting that women are specializing where female predecessors have patented rather than entering into male-dominated fields or firms.[24] Lack of exposure to a network of inventors means that applying for a patent can be a daunting, seemingly insurmountable process. As a practical example, access to a network of investors is critical to securing venture funding, just as it is for applying for and obtaining patents. Lack of access to mentors, resources and a network similarly presents steep barriers to entry for women and minorities attempting to apply for and obtain patents.

Case Study: Sarah Reyes

To highlight some of the ways we can better support women applying for patents, the experience of one of our recent Ph.D. STEM graduates provides a good example.

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[21] Moody's Analytics. "Universal Child Care and Early Learning Act: Helping Families and the Economy." February 2019. By Mark Zandi, Chief Economist and Sophia Koropeckyj, Managing Director. Available online: https://www.economy.com/mark-zandi/documents/2019-02-18-Child-Care-Act.pdf.

[22] United States Patent and Trademark Office. Office of the Chief Economist. "Progress and Potential: A profile of women inventors on U.S. patents." February 2019. Available online: https://www.uspto.gov/sites/default/files/documents/Progress-and-Potential.pdf.

[23] The Equality of Opportunity Project. "Who Becomes an Inventor in America? The Importance of Exposure to Innovation." By Alex Bell, Raj Chetty, Xavier Jaravel, Enviana Petkova, and John Van Reenen. Available: http://www.equality-of-opportunity.org/assets/documents/inventors_summary.pdf

[24] United States Patent and Trademark Office. Office of the Chief Economist. "Progress and Potential: A profile of women inventors on U.S. patents." February 2019.

Dr. Sarah Reyes developed a countertop breast milk pasteurizer and is in the process of filing for a utility patent. Dr. Reyes participated in a number of our programs at Cornell University and in Ithaca's community, including W.E. Cornell, and two other accelerator programs supported by funds from the National Science Foundation's I-Corps Site program—Cornell's eLab business accelerator, and Rev: Ithaca Summer Hardware Accelerator, whose founding was funded by the US EDA's i6 program. Through these programs, she was introduced to one of Cornell's Entrepreneurs-In-Residence who helped connect her to a patent attorney.

Dr. Reyes is currently in the patent application process, which will cost between $4,000 and $8,000 for the utility patent filing fee, a prior art search with attorney opinion, the legal fees surrounding preparing and submitting the utility patent application by a licensed patent attorney knowledgeable about the technology used in her product, and the USPTO fees. Dr. Reyes was awarded $5,000 through the Cornell eLab accelerator which she will use to apply for her patent and cover the costs mentioned above. Without this, she said it would have been unlikely she would be able to cover the full cost of applying for her patent. She will be responsible for covering the balance of the patent cost beyond the $5,000 in eLab funding she received.

Dr. Reyes has a 17-month old and two children in elementary school. Her childcare costs average $2,000 a month, leaving her with few financial resources to pursue a patent. In speaking with her about her patent journey, she said, "Quite honestly, one of the biggest barriers I have as a woman in trying to get my invention off the ground is the burden of childcare, and the cost of childcare."

Dr. Reyes told us she was lucky because she was embedded in an ecosystem that helped facilitate connections, provided a network to patent attorneys, and gave her access to funds to file her patent. While this is an example of what success looks like, it also sheds light on a number of issues faced by women applying for patents. In general, the cost of filing a patent is highly variable, but is almost always too expensive for an individual to shoulder.

While the cost of childcare is not the only reason women face difficulties or are deterred from pursuing entrepreneurship and applying for patents, it is an example of hurdles adding to the real costs of pursuing entrepreneurship, innovation and patents. Many entrepreneurs, but parents in particular, have to make tradeoffs with both their time and their savings, producing seemingly insurmountable barriers to the patenting process. The high cost of patenting can act as a serious deterrent without the right connections to patent attorneys and resource support. This is further validated by a 2011 study which found that patenting rates for women academics with children are lower than men and women faculty without children, while male academics increase patenting activity with parenthood.[25]

Policy Recommendations

1. Develop on-ramp programs dedicated to increasing women's and minority's exposure to the patent and commercialization process.

[25] Whittington, K.B., 2011. Mothers of invention? Gender, motherhood, and new dimensions of productivity in the science profession. Work and Occupations, 38(3), pp. 417-456.

2. Direct resources to sectors in which women are currently pursuing patents, as well as high volume patent-producing fields such as electrical and mechanical engineering.
3. Connect on-ramp program participants with resources at the university, community and federal level, including NSF, SBA, and EDA commercialization initiatives.
4. Integrate women and minority role models into programming.
5. Create structures and support for deliberately recruiting women and minorities into on-ramp and federal commercialization programs.
6. Expand existing cost reduction policies to include women and minority entrepreneurs.

First, we need to develop tailored on-ramp programs that are dedicated to increasing women's and minorities' exposure to the patent and commercialization process. At Cornell University, we developed W.E. Cornell, which is a cohort-based commercialization program to increase exposure and form a community of STEM-based women who are looking to learn the process for patenting and commercializing their innovations. We recruit women to join and we provide them with a series of workshops, programming and networking opportunities that improve their ability to navigate the commercialization process.

Programs like W.E. Cornell help increase the number of women and minorities pursuing patents and commercialization. In these tailored on-ramp programs, participants get exposed to the process of applying for patents along with other components of the commercialization process, and the programs provide direct access to funding, resources, and a network to support them. Similar to Dr. Reyes' example above, these newly proposed on-ramp programs can connect cohort members to trusted, vetted patent attorneys to help apply for patents and get through the process. I recommend the Small Business Administration (SBA) and USPTO consider a joint program which would create funds for these on-ramp programs specifically focusing on women and minorities. This program can be an outgrowth of the existing SBA Growth Accelerator or EDA i6 program, which provides funding for the nation's most innovative and promising small business accelerators and incubators.

Programs that focus specifically on increasing female and minority involvement in entrepreneurship and innovation are critical to increasing diversity in patenting. We also need to focus on building these programs in ecosystems that already have the foundation and resources to help inventors innovate, including but not limited to: academic R&D spending, supportive faculty, labs, and other infrastructure available at universities, and to fund programs in a diverse set of communities beyond the technology bubbles we see in the coastal United States. Federal dollars should be directed to communities outside of these technology bubbles to increase rates of commercialization and job creation more evenly across the United States.

Second, we need to focus on recruiting women and minorities to these on-ramp programs in academic sectors where we know women are pursuing patents – such as the life sciences – and increase exposure to patent-intensive fields, such as electrical and mechanical engineering, where women are currently in less numbers and find it more difficult to enter.

Third, these on-ramp programs should be feeders to existing entrepreneurship initiatives in the university, community or region. The entrepreneurship initiatives in the Upstate and Southern Tier regions of New York are based mainly at academic institutions and in community-based

business accelerators or incubators; they are largely supported by state funds and direct contributions from universities, as well as federal incubator and accelerator programs like the US Economic Development Administration's i6 program or the Small Business Administration's Growth Accelerator program. NSF also provides significant support through its I-Corps program for the commercialization of technology and cultivation of entrepreneurs in the academic space. By pairing these feeder programs with existing entrepreneurship initiatives, this does not cannibalize the number of women and minorities in the current programs, but, instead, helps existing programs further diversify, faster.

Pairing on-ramp programs with federal NSF Innovation or I-Corps programs – which are working to translate academic R&D from federally funded labs to the marketplace – has been successful at Cornell in supporting entrepreneurs in STEM to connect to Small Business Innovation Research (SBIR) grants. SBIR grants provide research and development funds to some of the best early-stage innovation concepts in small businesses, which are promising but too high risk for private investors. SBIR funds help bridge this funding gap to allow small businesses to reach technical and customer milestones, thus helping them to realize impact and obtain further follow-on investment. NSF has pointed to the I-Corps program as a significant contributing factor to successful SBIR applications, increasing the amount of seed-stage funding going to inventors and entrepreneurs in STEM. In 2019, entrepreneurs at Cornell supported by the Upstate New York I-Corps Node, won $1.45 million in SBIR grants. As a result of the on-ramp program from NSF to SBIR pipeline, more women and minority entrepreneurs are gaining access to federal commercialization support.

Fourth, these targeted programs should contain role models who have recently obtained a patent to help guide aspiring entrepreneurs and inventors through the system. Ideally, peer role models have a similar background to the on-ramp cohort members and can help entrepreneurs overcome challenges of specific industries or domain areas. As noted earlier, gender and race-specific exposure to role models is necessary, and research supports its efficacy.

Fifth, there needs to be deliberate recruitment of women and other underrepresented entrepreneurs to these targeted on-ramp programs. Based on past initiatives and speaking with people leading entrepreneurship efforts in several locations across the country, I know from personal experience that we need to dedicate the time and resources to proactively and personally invite, meet, and encourage women to apply. Success of these on-ramp programs require dedicated program administrators actively seeking individuals by participating in research labs, attending faculty and lab meetings, and being a member of the community to invite women into supportive on-ramp programs. "If you build it, they will come" does not work – achieving the desired increase in diversity requires paid support for dedicated personnel to actively attract and recruit program participants. In addition, Congress should dedicate resources for on-ramp program administrators to study metrics and outcomes of these programs to inform and scale best practices and future policy recommendations.

Finally, the cost of applying for a patent is a significant deterrent for many women and minorities. Tailored programs and entrepreneurship initiatives should consider specific funding for patent support to cover the costs of applying for patents and hire the appropriate patent legal counsel. The USPTO currently has a graduated and reduced fee schedule for small entities and

micro-entities to defray the costs of patenting, which should be extended to women and minorities.

In conclusion, thank you again for the invitation to testify. I am deeply honored to be part of this conversation. Let's tackle this together to bring untapped talent into the innovation sphere, and ultimately bring more equitable and just economic prosperity across our nation. I would be happy to answer any questions you may have.

THE IMPORTANCE OF COLLECTING DEMOGRAPHIC DATA

Dr. Rashawn Ray
David M. Rubenstein Fellow, The Brookings Institution

Chairwoman Velázquez, Ranking Member Chabot, and distinguished members of the Committee on Small Business, thank you for inviting me to testify on "Enhancing Patent Diversity for America's Innovators." I am a David M. Rubenstein Fellow at The Brookings Institution. I am also an Associate Professor of Sociology at the University of Maryland and the Executive Director of the Lab for Applied Social Science Research (LASSR). LASSR is a research center that regularly partners with government agencies, organizations, and corporations to conduct objective research evaluations and develop innovative research products such as our virtual reality work with law enforcement and incarcerated people.

My comments will center on the voluntary collection of demographic data. My written testimony will primarily focus on three specific questions: 1) What are public attitudes and behaviors regarding the collection of demographic data? 2) Is the collection of demographic data important? and 3) What do we know about United States Patent and Trademark Office (USPTO) patent assignees?

What are the Public Attitudes and Behaviors regarding Demographic Data?
A majority of Americans want to be in control of who collects data on them, what is collected, and for how long the data are stored.[1] However, context matters. For example, 90% of Americans view their social security number as very sensitive whereas only eight percent view their purchasing habits as very sensitive.[2] People are also willing to provide information about their political and religious views. At the same time, Americans are becoming accustomed to limited control over their information. About 80% of Americans report having awareness about the government collecting information about verbal, written, and online communication. Roughly 50% of people in a Pew survey reported having little to no control over that information. Overall, what most Americans desire is more transparency about what data is collected, how long it will be stored, and what those data will be used for.

People seem to be quite comfortable with credit card companies collecting and storing data on them, followed closely by the government. They are much less likely to be comfortable with websites they visit online as well as cable and cell phone companies collecting and storing information on them. In fact, over 50% of Americans think that the government should be able to store data for a few years or as long as they need to. Still, people are not confident about the

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[1] Madden, Mary and Lee Raine. 2015. "America's Views about Data Collection and Security." Pew Research Center. < https://www.pewresearch.org/internet/2015/05/20/americans-views-about-data-collection-and-security/> (accessed on January 13, 2020).

[2] Madden, Mary. 2014. "Public Perceptions of Privacy and Security in the Post-Snowden Era." Pew Research Center." < https://www.pewresearch.org/internet/2014/11/12/public-privacy-perceptions/> (accessed on January 13, 2020).

privacy and security of their data from any source. Slightly less than one-third of Americans perceive the government will keep their data safe and private. This is comparable to views about cell phone and cable companies.

Over 50% of Americans say they have very little or no understanding about data protection laws,[3] and 75% say there should be more regulation. People disapprove of the government collecting their phone and email records. Part of this simply has to do with a decline in public trust in social institutions.[4] However, the public is much more likely to trust science and medicine than other social institutions.

Despite people's attitudes about data collection, how do people actually behave? Do people actually voluntary provide demographic information on a survey when asked? In short, yes. My experience collecting data is that people overwhelmingly answer demographic questions on surveys. I have conducted surveys and interviews with the general public, police officers, families, parents, employees of companies, members of religious organizations, government employees, protesters and march attendees, people who have lost large amounts of weight, people living in urban, suburban, and rural areas, people living in the Midwest, on the west coast, in the south, and in the northeast, and high risk groups. I have conducted these surveys and interviews in-person, online, on paper, and on tablets and other smart devices. I have asked demographic questions verbally too and the response rate is similar.

Generally, I have asked respondents about an assortment of topics ranging from discussions about police-community relations to marital and relationship issues to sexual assault on college campuses. No matter the topic, people still overwhelmingly volunteer their demographic information. I typically ask respondents their gender, age, race/ethnicity, national origin, sexual orientation, education level, household income, military or veteran status, and disability. I have also asked people about who lives in their household as well as their political and religious beliefs. In a typical survey, less than 5% of respondents refuse to answer demographic questions. I am also the co-editor of an academic publication, *Contexts Magazine: Sociology for the Public*, and have authors who publish on a range of topics. No matter how obscure, rarely do the researchers report having difficulty getting respondents to answer demographic questions.

Additionally, there are large datasets that social scientists commonly utilize such as the General Social Surveys, which has been asked since the 1970s. People regularly provide answers to demographic questions on these surveys. A government survey, such as the U.S Census, that

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[3] Auzier, Brooke And Lee Rainie. 2019. "Key Takeaways on Americans' Views about Privacy, Surveillance and Data-sharing." Pew Research Center. < https://www.pewresearch.org/fact-tank/2019/11/15/key-takeaways-on-americans-views-about-privacy-surveillance-and-data-sharing/> (accessed on January 13, 2020).

[4] McGeeney, Kyley, Brian Kriz, Shawnna Mullenax, Laura Kail, Gina Walejko, Monica Vines, Nancy Bates, and Yazmín García Trejo. 2019. "2020 Census Barriers, Attitudes, and Motivators Study Survey Report." United States Census Bureau. < https://www2.census.gov/programs-surveys/decennial/2020/program-management/final-analysis-reports/2020-report-cbams-study-survey.pdf> (accessed January 13, 2020).

collects a series of demographic data is also useful to note.[5] Ninety percent of Americans view the Census as very or somewhat important. And, over 80% of Americans say they definitely or probably will participate in it. Interestingly, I had to fill out a demographic data form to be here today. I did not think twice about filling it out, similar to most Americans. I think it is safe to say that Americans are more than willing to provide their demographic data.

Why is it Important to Collect Demographic Data?

Collecting demographic data is important for a few central reasons. First, more data is normally better because they help to eliminate false positives. For example, the lack of demographic data may inflate the likelihood of certain groups catching a deadly disease, having an early onset of dementia, or having a child with autism. These false positive may inadvertently funnel resources to the wrong areas. Second, the collection of demographic data allows for the determination of whether a sample is representative. If researchers are conducting a study on vaccines, for example, a representative sample is paramount. If there is under- or over-representation of certain groups, the analysis will likely over or underestimate the impact of those vaccines. Third, there is a long and torrid history of the consequences of not collecting demographic data on real life outcomes that have shifted public opinion. Certain groups have historically and systematically been left out of the data collection process. What many Americans desire more than anything is transparency, inclusion, and equity. Demographic data help to provide this. A lack of demographic data often leads to bad science, does a disservice to Americans, and inhibits the United States' ability in continuing to be innovative and comprehensive.

In the case of patents, demographic data could show us whether certain groups are more or less likely to apply and receive patents. Demographic data may show that the percentage of women and racial minorities who apply for patents are lower than their percentage in the U.S. population. But, demographic data may show that the percentage of women and racial minorities who apply for patents is on par with their percentage in certain STEM fields. Demographic data may show that people with lower levels of education are applying for patents but less likely to receive them. This may suggest that people with higher levels of education may have more knowledge and expertise about the patent process that leads to a higher level of success. We do have some information about inventors that is important to share that may help shed light on some of these propositions.

What do we know about who is Awarded Patents?

The National Science Foundation provides some data on patent assignees (inventors and owner of patents) from 2000-2016 from USPTO.[6] I provide graphs for ease of use. Figure 1 shows the number of patents by U.S. versus foreign owners during this period. Though the number of assignees suggest parity between U.S. and foreign inventors, the percentages in Figure 2 suggest a different story. The percentage of U.S. inventors has decreased over time, while the percentage

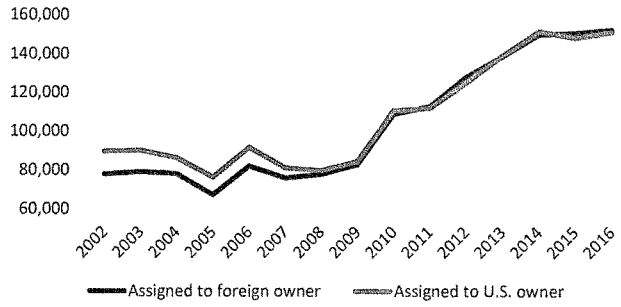
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[5] Pew Research Center. 2010. "Most View Census Positively, But Some Have Doubts." < https://www.people-press.org/2010/01/20/most-view-census-positively-but-some-have-doubts/> (accessed on January 13, 2020).

[6] National Science Foundation. 2018. "Invention, Knowledge Transfer, and Innovation." < https://www.nsf.gov/statistics/2018/nsb20181/report/sections/invention-knowledge-transfer-and-innovation/invention-united-states-and-comparative-global-trends> (accessed on January 13, 2020).

of foreign inventors has increased. With additional demographic data, policymakers may want to know whether the proportion of U.S. versus foreign applicants shows a similar pattern.

Figure 1: Number of USPTO Patents Granted by Owner, 2002-2016



Source: National Science Foundation, National Center for Science and Engineering Statistics; SRI International; Science-Metrix; PatentsView and USPTO patent data, Science and Engineering Indicators 2018; Accessed January 2020.

Figure 2: Percentage of USPTO Patents Granted by Owner, 2002-2016



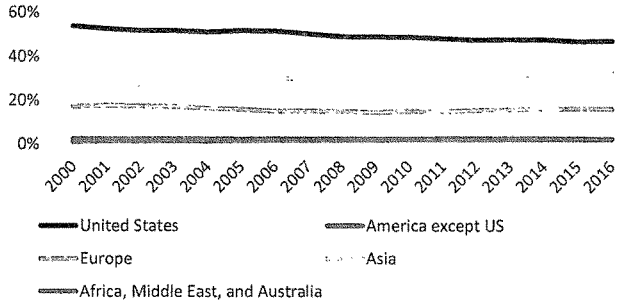
Source: National Science Foundation, National Center for Science and Engineering Statistics; SRI International; Science-Metrix; PatentsView and USPTO patent data, Science and Engineering Indicators 2018; Accessed January 2020.

Figure 3 shows the percentage of USPTO patents granted by world region from 2000-2016. As noted above, the percentage of U.S. assignees has decreased over time. The rest of Northern, Southern, and Central America has stayed relatively stable at less than three percent. Besides the

U.S., most of the patent assignees from the Americas come from Canada. Africa, Middle East, and Australia has increased slightly from over one percent to over 2 percent. Israel is the main representative from this region. Europe has decreased slightly from 17.2% in 2000, dipping to 14.4% in 2009, and then increasing to 16.2% in 2016. Germany followed by the United Kingdom are the main assignees from Europe. Asia, primarily represented by inventors from Japan, have encompassed at least 25% of assignees each year. Asian inventors have represented nearly one-third of assignees every year since 2008. With additional demographic data, policymakers may want to know the educational trajectories (university affiliations) of assignees. That piece of demographic information may provide useful insights about inventors from other regions of the world.

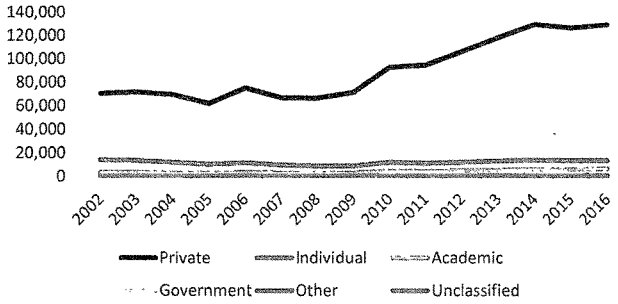
Figure 4 shows the number of USPTO patent assignees for U.S. owners. It shows a substantial increase in the number of patents assigned to people in the private sector. The number of inventors classified as individuals has decreased over time. The number of patent assignees from the government remains low. The number of patents to U.S. universities has increased over the past 15 years. In 2016, slightly over one-third of patents to U.S. universities were for pharmaceuticals, biotechnology, and medical technology.

Figure 3: USPTO Patents Granted by World Region, 2000-2016



Source: National Science Foundation, National Center for Science and Engineering Statistics; SRI International; Science-Metrix; PatentsView and USPTO patent data, Science and Engineering Indicators 2018; Accessed January 2020.

Figure 4: Number of USPTO Patents Granted by Sector for U.S. Owners, 2002-2016



Source: National Science Foundation, National Center for Science and Engineering Statistics; SRI International; Science-Metrix; PatentsView and USPTO patent data, Science and Engineering Indicators 2018; Accessed January 2020.

In addition to government records about national origin and sector of inventors, some researchers and organizations have aimed to gain information about gender and race by examining the names of inventors. More recent research has aimed to estimate women's patent activity and impact by estimating their proportional representation on a patent based on the number of inventors listed. The Institute for Women's Policy Research has done extensive research in this area.

Results show some notable trends as they pertain to gender.[7] First, the number of women listed on patents still remains significantly low, despite increasing from less than 2,000 in the 1970s to over 20,000 by 2010. Second, the number of patents with no women listed also increased from the late 1970s to 2010. In 2010, nearly 100,000 patents had no women listed as inventors. Third, women inventors are more likely to be in the sectors of apparel and jewelry rather than technology and pharmaceuticals. Fourth, men are more likely to apply for patents relative to women.

However, the gender gap seems to not solely be about who applies for a patent. There is a gender gap in patent acceptance rates. While 73% of men had their patents accepted from 2002-2016, only 67% of women did. This means that women are nearly 10% less likely to have a patent accepted. When a woman is the primary assignee, the patent is rejected roughly 30% of the time, compared to slightly less than 20% when the main patent assignee is a man. These results are

[7] Milli, Jessica Milli, Emma Williams-Baron, Meika Berlan, Jenny Xia, and Barbara Gault. 2016. "Equity in Innovation: Women Inventors and Patents." Institute for Women's Policy Research. < https://iwpr.org/publications/equity-in-innovation-women-inventors-and-patents/> (accessed January 13, 2020).

troubling considering that women-owned firms have increased four times that of men over the past 20 years but still represent roughly one-fifth of employer firms.[8]

An examination of race showed that less than 1,000 inventors of over 1 million were Black.[9] Black and Hispanic college graduates are less than half as likely to hold a patent relative to their White counterparts.[10] Children born in poverty are 10 times less likely than children born to the most affluent families to receive a patent. Still, Black and Hispanic men, compared to White and Asian men, are less likely to have their patents accepted. But, Black men are more likely than Black women to apply for patents. The intersection of race and gender matters in this context considering that minority women firms are mostly driving the increase in women-owned firms.

College degrees do play a role in patent applications and gender disparities. While the number of women obtaining degrees in biology and engineering increased from the late 1970s-2010, the number of women obtaining computer science degrees decreased. However, degree is not the only issue. There are leaks in the pipeline that cannot be adequately identified because the U.S government does not currently collect demographic data. It is clear that disparities extend from who applies to who is ultimately awarded a patent.

Collecting demographic data can help fill these important gaps, create more understanding and equity in the process,[11] and better streamline resources for trainings and funding so all Americans can assist the United States in continuing to be a major world innovator for new products that can help drive the economy and create jobs.

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[8] Williams-Baron, Emma, Jessica Milli, and Barbara Gault. 2018. "Innovation and Intellectual Property among Women Entrepreneurs." Institute for Women's Policy Research. < https://iwpr.org/publications/innovation-intellectual-property-women-entrepreneurs/> (accessed January 13, 2020).

[9] Cook, Lisa D. and Chaleampong Kongcharoen. 2010. *The Idea Gap in Pink and Black*. Michigan State University. <https://www.msu.edu/~lisacook/pink_black_0810.pdf> (accessed January 13, 2020).

[10] Fechner, Holly and Matthew S. Shapanka. 2018. Closing Diversity Gaps in Innovation: Gender, Race, and Income Disparities in Patenting and Commercialization of Inventions." *Technology and Innovation,* 19: 727-734.

[11] Shaw, Elyse Shaw and Cynthia Hess. 2018. "Closing the Gender Gap in Patenting, Innovation, and Commercialization: Programs Promoting Equity and Inclusion." Institute for Women's Policy Research. < https://iwpr.org/publications/gender-diversity-patenting-program-scan/> (accessed January 13, 2020).

STATEMENT OF

JANEYA GRIFFIN

Managing Member and Principal Consultant

The Commercializer, LLC

BEFORE THE

COMMITTEE ON SMALL BUSINESS

U.S. HOUSE OF REPRESENTATIVES

"Enhancing Patent Diversity for America's Innovators"

January 15, 2020

I. Introduction

Chairwoman Velázquez, Ranking Member Chabot, and Members of the Committee:

Good morning. Thank you for this opportunity to discuss initiatives pertaining to ways we should be focusing on increasing diversity within our patent and commercialization system. I am honored to be here with you today.

My name is Janeya Griffin - The Commercializer. I am a HBCU STEM graduate, serial entrepreneur, daughter of two inventors, advocate for ownership, intellectual property and generational wealth amongst underrepresented populations. Throughout my 32 years of living, the first time that I truly learned about the value of patents was not as I was introduced to inventors who contributed through history books, no, it was only after I graduated college and knew professors who had patents, did I believe that people that looked like me and that I knew could obtain them. Before becoming this advocate for intellectual property that I am today and owning my own consulting firm that helps independent inventors commercialize their IP, I was a Forensic Chemistry and Criminal Justice major at Grambling State University, who did not know what she wanted to do with her two degrees. The Dean of my college told me that I could not have a boss and therefore I needed to be an entrepreneur and encouraged me to apply for a fellowship program, called the Integrated Technology Transfer Network. This program took STEM students from HBCUs moved them to California and taught them the business side of things, so they could speak and understand the technical language, but then also translate that into a value proposition that business people could understand. I was 1 out of 14 students selected out of more than 100 students who applied across the country. Coincidentally enough, this program was funded by the Department of the Navy through Earmarks facilitated at and by California State University San Bernardino's inland empire center for entrepreneurship and the Army Research Lab Aberdeen. Unfortunately, due to budget cuts the program was defunded in 2011. Through that program I was able to learn the true value and functionality of intellectual property and once I graduated, I received a certification in Entrepreneurial Technology Commercialization. I was able to work on active technology transfer projects with the U.S. Food and Drug Administration, National Institutes of Health, and Naval Surface Warfare Center, all before I truly started my career and became a business owner. On these projects I evaluated patents, worked directly with inventors and researchers to determine the commercial potential of their innovations, developed marketing strategies, performed primary and secondary market research and identified and spoke with potential partners and licensing targets. In fact, some of those organizations used that information that I provided as a fellow to advance their projects.

I say all of this to say, I am a minority with a very unique set of skills and only have the knowledge about the patent and commercialization system, because I went through a very specialized program that targeted STEM students from a Historically Black College. Out of the Alumni from the program, there have been multiple inventors and many have become tech founders, small business owners or have received jobs running SBIR/STTR programs, and even small business development centers. Furthermore, due to that education and experience, I was initially recruited to work in the technology transfer space, and ultimately ended up taking a contracting job at NASA Armstrong Flight Research Center. Where for the last 8 years I have managed and sold their intellectual property amongst other things, such as taking several technologies through the process from disclosure to commercialization, vetting hundreds of technologies for their commercial potential and assisting in the patenting process as well. This education afforded me the opportunity to start my own small business, which I am here representing today, and the advocacy work I do surrounding innovators of color, allows me to speak to what I see may be the issues that the country's patent and commercialization process is facing.

My story in regards to learning about patents and commercialization is not unique to only me. I have surveyed my colleagues, clients, and professionals in this space and the sentiments are mostly the same. Many of them, even those who are patent attorneys, only learned about the value of intellectual property, specifically patents, when they reached graduate school or as they were assigning their ownership rights to their intellectual property over to their soon to be employer.

Although some minority inventors in industry, startups and nonprofits get exposure to patenting and commercialization after research and scientific training in academia others are left behind with the lack of knowledge, skills, and training on the patenting and commercialization process. In 1970 to 2006, black American inventors received six patents per million people, compared to 235 patents per million for all U.S. inventors.[1] Which means that if you combined 13 of the nations NFL stadiums, only 6 of those seats would be given to african americans. In fact, African Americans actually only apply for patents at nearly half the rate of white Americans not because they do not want to but due to the lack of access, education, and resources.[2]

Currently, there is a disparity in under-represented populations engaging in patenting as well as commercializing their technology. The research around the disparity of minority and women inventors goes back decades. For 70 years during the late 1800's and early 1900's, African Americans comprised between only 1% and 7% of the inventor-patentees. [7] Cook's African American data set discloses that participation of blacks in patenting activity even today remains dismal. [9]

With the exception of individuals held in slavery, the U.S Patent system has always been open to all inventors, regardless of race, gender, or economic status As we know, enslaved people were not considered American citizens1, and the rights and provisions of the Constitution did not extend to them as well as state enacted laws that prevented enslaved people from owning any kind of property, presumably including patents as they were considered property themselves.

Although there were laws such as the Meritorious Manumission Act of 1710 [10,20], that were put in place, giving slave owners the opportunity to grant their slaves freedom in exchange for their inventions, many did not do so, and instead took ownership of their slaves patents. The issue still with this law is that in order for them to gain their freedom they would need to forfeit their intellectual property, therefore forfeiting their economic opportunity to participate in ownership, inventorship, and also commercialization. Being asked to choose between your freedom or your intellectual property, makes handing it over an easy decision as this was the only way they could essentially profit from their IP.

According to Johnson (2019), "as the years went by, the U.S. Supreme Court's 1857 *Dred Scott* opinion held that black Americans could not be citizens of the United States. Arguably, free blacks were precluded from patenting their inventions after *Dred Scott* because they did not have a country of citizenship and presumably could not swear to the Patent Oath. Even after the *Dred Scott* opinion was superseded by the Thirteenth and Fourteenth Amendments after the Civil War, "the economic and educational conditions that many free blacks faced . . . simply were not conducive to pursuing whatever incentives and opportunities U.S. patent law provided." [3]

How can we expect to increase diversity in patenting and commercialization if historically the system has not been built for minorities to participate or succeed in general. Social/institutional norms, educational norms, and resource availability are all primary areas whereby women and minorities have faced social and/or legal difficulties to patenting and the commercialization process.

This is not my personal opinion, the Success ACT reports on segregation laws and hate-related violence on patenting, invention activity, and tangible capital that reduced patenting among African Americans.[8] From a psyche standpoint due to systemic challenges people have opted out of being innovators because historically they could have lost either their life or had to decide to trade their freedom for it, and According to Lisa D. Cooks work, an american economist, there are over 1,000 missing patents due to hate-related violence during that era.[4,5,6]

Hence, the systemic issues faced by minorities in the patent and commercialization systems for decades has not only created the diversity gap, but has continued to sustain it.

Therefore, it is imperative that minorities gain the knowledge, skills, and training needed to patent and commercialize technology. Not only for innovation, but also for increasing the value of minority owned small businesses. Because the statistics have not changed and minorities and women continue to be underrepresented in owning and disclosing their inventions, patenting their work, and commercializing their technologies, research will continue to show a huge gap in minority engagement in patents and commercialization and in how underrepresented minorities approach patenting and commercialization in general.

II. Impact and Effect on Minority Inventors and the Economy

According to Fechner and Shapanka, "The under-representation of women, people of color, and lower-income individuals in the patent system presents both a social and an economic challenge. Patents help start-ups grow by encouraging capital investment, creating jobs, and generating follow-on innovations that create more useful and accessible products for consumers. The connection between patents and start-ups is important for the broader economy: Start-ups generate 10 percent of all new jobs in the U.S. each year. Allowing more people access to the patent system will only increase these economic benefits. Greater inclusion in the innovation ecosystem means more perspectives and more ideas in the innovation pipeline and helps deter the U.S. from foregoing the opportunity for substantial economic growth and job creation." [1,11]

The research of Cook finds that including more women and African Americans in the "initial stage of the process of innovation" would increase GDP somewhere between 0.64 percent and 3.3 percent per capita. [4] The U.S. GDP potential, shows a need to close the diversity gap in patents because there is a severely lowering of new business creation opportunity, job growth, and innovation. The structural barriers that continue to perpetuate the lack of diversity in patenting and commercialization by segments of the U.S. population create other structural barriers to establish business ownership and entrepreneurship for minority inventors. [13]

Limited access to financial capital for minority entrepreneurs as well as cost barriers in the patent prosecution and patent preparation process are also major issues. Minority inventors cannot afford high priced attorney fees to prepare and prosecute patent applications. In addition, for minority owned businesses, paying the increasing patent maintenance fees as the years go by often causes extreme difficulties, especially if the small business is not receiving a return on investment from the commercialization of their technology. Although there are special programs like the United States Patent and Trademark Office's (USPTO) patent pro-bono program that

exist, small business owners still have to meet the income requirements and for minority inventors that don't meet the requirements they still cannot afford to pay for qualified counsel. This is why access to capital for small businesses is so imperative.

In the Success Act report, authors have argued that financial institutions are less likely to lend to new businesses because of the high failure rate of all new businesses. The report also found that African Americans were more likely to secure financing through non-bank sources than White business owners and that Black or African American men were also more likely to be turned down for loans than their white counterparts. [8] It also suggest that minorities have access to fewer resources leading to adverse outcomes in the patent and commercialization process for minority inventors. [8]

Economic justifications for intellectual property concentrate on the incentive to produce technology in the form of stimulating the economy with the creation and the promotion of innovation via patents. Minority inventors are more willing to patent and commercialize technology if minority inventors are able to recoup their investment (specifically, the investment in the research and development of the innovation). It is crucial that minority inventors participate in the patenting and commercialization process because a patent will give minority inventors an incentive to further innovate. They will eventually receive some revenue on account of the commercialization of their invention and, at the same time, enable disclosure of the patented invention so that others can build on the technology. This approach benefits minority inventors by allowing them the right to efficiently, exclude others from using the intellectual property and the incentive to generate innovations that will in turn represent added value to society.

Minority Inventors have been subjected to the hardest challenges within the patent process and commercialization due to the absence of property rights that caused disruption of financial and social capital in marginalized communities yet have contributed greatly to our society through innovation.

III. Generational wealth

Cook and Kongcharoen (2010) find that African Americans are less likely to commercialize their patented inventions than all U.S. inventor patentee (77% of inventions commercialized compared to 80% for all U.S. inventor-patentees) which impacts stimulating the U.S. economy and continues to sustain a systemic culture of the lack of minority participation. [4]

Small business ownership and the commercialization of technologies from small business is key in order for a small business to sustain their companies. The entire purpose for minority inventors is to start small businesses to obtain a patent ultimately to monetize their intellectual property, license their technology, and receive a return on their investments. The benefit of

small business ownership for the economy is to create job opportunities for taxpayers as well as redirect the funds from the return on investment to create more technologies and create generational wealth within marginalized communities.

As we move through the 21st century, we want to boost the economy by increasing the tax-base and better positioning minority communities for economic viability and workforce development. If the small business owns intellectual property, not only will they be able to commercialize it, but jobs will be created, thereby increasing the tax-base and also, giving small business owners the opportunity to hire within their own communities, essentially increasing wealth generation.

"For example, economists have studied the impact of the award of a patent to small businesses, concluding that the award of the first patent to a start up, on average, leads to 16 additional employees after five years, and $10.6 million in additional sales over five years. " [21] In addition, when minority small business owners begin to generate more jobs, there becomes an opportunity for them to hire people within their own communities, which could in turn also create opportunities to hire returning citizens, and potentially decrease the rate of recidivism, as according to the NAACP, African Americans in this country are imprisoned at more than five times the rate of whites. When we are argue better wealth generation in minority communities and better vehicles of getting there one cannot make the argument without making the link between patents and licensing, because licensing is a wealth generating vehicle.

Spulber 2015 finds that applying for and obtaining a patent helps companies to gain access to financial capital, find licensees, stimulate innovation, and facilitate firm growth, which are all potential benefits to companies (Spulber (2015)). Minority inventor participation in the patenting and commercialization process can provide incentives for efficient investment as well as promoting finance and innovation. [19]

Patent and commercialization activities are a key metric for venture capital funding, so minority disparity in patent application filings may correlate to minority disparity in financial support of entrepreneurial activities. Increasing the number of women and minority inventors filing patent applications may help increase the funding for minority entrepreneurial activity.

Despite the disparity, the reasons we see gaps in the lack of minority in engagement in patent and commercialization as well as the lack of generation wealth is due to several factors:

- Education and Outreach - addressing the knowledge gap in underrepresented populations around patenting and entrepreneurship;

- Connecting - aiding underrepresented populations to establish meaningful networks that enable their penetrance into patenting and other commercialization areas like venture funding or sourcing accelerator and incubator opportunities, for example;
- Representation - providing examples of successful individuals who identify in these underrepresented populations; and,
- Inviting - finally making a very clear invitation to underrepresented populations to participate in patenting and commercializing their discoveries and ideas. [16]

These factors will help community resources in marginalized communities as well as provide guidance around educational campaigns that promote innovation in those marginalized communities.

IV. Programs that attempt to close the gap

There was and continues to be a consistently wide gap between non-minority inventors and minority inventors (especially African American inventors) in the colorblind U.S. Patent System. It is important to understand the benefits of fostering greater diversity in inventorship and commercialization.

For federal government agencies that have tech-transfer programs, it's time to take a step back and consider creating targeted programs that may help facilitate minority institutions and minority communities gain access to resources (facilities, expertise and know-how) intended to propel minority innovators forward in their research. Such efforts may also include assistance with commercialization of their innovations.

Efforts to foster greater diversity of inventors and entrepreneurs are not as effective as they could be. There are a limited number of industry and academic institutions that are prioritizing such efforts. There are also efforts that support minority inventors through government funded programs such as the Small Business Administration's (SBA) Small Business Innovative Research Program(SBIR/STTR) and supplemental Technical and Business Assistance funding (TABA). The USPTO's Patent Pro Bono program provides patent assistance to under-represented populations. In limited instances, non-profits and universities have created curricula and support structures around educating and training under-represented populations in innovation and entrepreneurship as well as patenting and commercialization.

Funding for minority serving institutions (MSI) and HBCUs to start tech-transfer programs will address some of the barriers to reducing the minority inventor gap. In addition, showcasing minorities who have commercialized their innovations through start-up companies or direct licensing to existing companies, can provide incentive and opportunities for minority innovators to grow their network with individuals who can assist with strategic direction and capitalization.

Increase the representation of minority inventors by increasing the funding provided to MSIs and HBCUs to help them develop tech-transfer offices and also educate them on the value of intellectual property. There are programs currently funded by the federal government that provide these resources. The National Science Foundations i-corps program is one that focuses on providing curriculum around the commercialization of intellectual property.

Patents are powerful tools for building up a University's reputation, securing ongoing funding, and enticing new prospective students. While HBCUs have also jumped on the patent bandwagon, their numbers remain extremely low. A look at data from the US Patent and Trade Office show that between 1969 and 2012, HBCUs have only been granted a total of 101 patents. More than half of those patents were awarded between 2010 and 2012. Howard University, Morehouse School of Medicine, and Florida Agricultural and Mechanical University account for the most patents granted to an HBCU between 1969 and 2012, with 18, 17 and 16 patents, awarded respectively.[18]

According to the Association of Public and Land-Grant Universities, "the lack of R&D funding for HBCUs is directly correlated to the number of patents obtained by HBCUs. In addition, each of the Top 10 US Colleges and Universities by Total R&D Expenditures alone receives more funding than all R&D funding to HBCUs combined ``.[22]

In order to significantly impact the funding for minorities and women faculty members to have the ability to access the resources for a start-up company vs. signing their rights away in an agreement process, there needs to be substantial support in outreach to increase the knowledge regarding the USPTO programs and initiatives.

V. Solutions to Increase Diversity in Patenting and Commercialization

Collaborations with the USPTO and SBA could help close the gap by making a concerted effort to partner with MSI's and HBCUs to help these institutions better engage under-represented populations. The USPTO and SBA could create a model to strengthen partnerships with MSI's and HBCUs, marginalized communities, small businesses, and principal investigators to bridge the diversity gap in patenting and commercialization. Minority Institutions can be a conduit between the federal government and minority inventors as well as small business owners. This connection between the federal government and MSI/HBCUs will promote innovation and help increase resources and workforce development in marginalized communities.

Outreach efforts from the USPTO and SBA to partner with MSI/HBCUs could enable opportunities for under-represented populations to find and build networks with individuals or companies that can support their efforts in the patent and commercialization process. There should be a continuous concerted effort to track data in the USPTO system on small entity, micro-entities, and pro-se applicants. Other federal agencies should also track data relevant to their outreach efforts and collaborations with minority innovators. Such data tracking may assist in a more targeted outreach effort to under-represented populations.

While certain data regarding individual inventors may be sensitive, collecting this data and maintaining it's confidentiality within the USPTO system would give assurances to inventors that their personal information is protected. Such data may enable a more robust data-set for future benchmarking against progress.

VI. Small Business Ownership

Since businesses account for the majority of patenting in the United States, there should be a push to engage with minority small businesses as this will in turn assist in increasing, not only the value of the business, but also the economic output.

Black owned businesses in the United States increased 34.5% between 2007 and 2012 totaling 2.6 million Black firms. More than 95% of these businesses are mostly sole proprietorship or partnerships which have no paid employees. About 4 in 10 black-owned businesses (1.1 Million) in 2012 operated in the health care, social assistance; and other services such as repair, maintenance, personal and laundry services sectors. There should be funding and programs that utilize this data to build targeted campaigns that would allow businesses such as these to become educated about not only participating in the patenting and commercialization process, but also the benefits they seek to gain by doing so.[23]

A new study from Harvard Business School and NYU, "The Bright Side of Patents," spotlights the value that patents bring to startup businesses. Among its key findings:

- A first patent issued raises employment growth an average of 36% over 5 years.
- A first patent issued grows sales an average of 51%.
- A first patent grant increases the probability of securing VC funding by 53%. [14]

Leaving innovations unpatented equates to lost economic value. Hence, patents help companies obtain venture capital funding and secure loans.

VII. Conclusion

Equal opportunity to invent, patent, and commercialize innovative ideas will drive the U.S. innovation economy ever forward, creating countless new products and cures that will create jobs, stimulate economic growth, and improve the quality of life for millions of people.

Critical to the equal opportunity to invent, patent and commercialize is an informed knowledge of one's rights and of the patent system, access to the patent system and the resources to exploit their inventions and discoveries. Far too often minority inventors fall short on all counts. Thus, empowering minority or under-represented populations with competent qualified counsel will facilitate knowledge and access to invent and patent. This may be achieved via minority serving institutions and HBCUs who operate a well funded tech-transfer program and federal government agencies who are well positioned to provide education and outreach assistance to these under-represented groups. The Minority Serving Institutions and HBCUs in collaboration with the federal government can also facilitate commercialization of inventions and discoveries created by under-represented groups. The MSI/HBCU-federal government collaboration can make significant progress in closing the invention gap between minorities (African Americans) and non-minorities when these under-represented groups are provided with education, access and resources that will enable a fair and equal opportunity to invent, patent and commercialize.

Only collecting vanity metrics, such as the demographics of the inventor, is not going to close the diversity gap in patenting and commercialization, other factors should be considered. In fact, the real question should be how many of those 6 patents per million people of African American inventors are actually small business owners.

If we're only concerned with the patents being commercialized in order to boost the economy, without factoring in small business owners that could be minority inventors then we are not truly, addressing the diversity gap.

In addition, as a country we must approach this issue with solutions that are both proactive and reactive. The education of the younger generation is imperative in creating not just more minority inventors, but also, in developing their problem solving skills and teaching them to tap into their creativity. Representation is extremely important and it is unfortunate that minorities are not afforded the same opportunities to see people that look like them represented in the history books we grow up learning from through our elementary educational system. For example, growing up I learned about the grand contribution Thomas Edison made to this country, but not the same one that Granville T. Woods did, or even Lewis Latimer. Both being prime contributors to the electricity and connectivity systems we use today and even competitors to Thomas Edison himself.

There should be a push for more organizations like The NextGen IP foundation who works to ensure minority K-12 students are properly prepared to participate in an economy which develops through innovation and intellectual property by providing financial and networking opportunities to students, educators, and other non-profit organizations. Funding should be set aside, for foundations that have a commitment in ensuring minority K-12 students are not only exposed to the patenting and commercialization process but have the opportunity to make a global impact by helping them bring their ideas to market. By combining both intellectual property and innovation, students will not only benefit, but society will benefit from the solutions and the economic benefits which are associated with intellectual property.

When it comes to being reactive, educating our educators and also marginalized communities where information about the patenting and commercialization system would not be common, is important.

As I closeout it is significant that we continue to fund programs like the graduate, Integrated Technology Transfer Network that enabled equal opportunity in learning about the patent, technology transfer and commercialization process. It also provided opportunities for its participants to take advantage of the networks it created as well as developed future minority inventors, who are now innovation/commercialization ambassadors continuing to increase the awareness and importance of education, access, and resources with respect to patenting and commercializing inventions among their communities.

Chairwoman Velázquez, Ranking Member Chabot, and Members of the Committee of the Small Business House Committee, we appreciate your continued support of increasing minority inventors in the patenting and commercialization process.

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U.S. Chamber of Commerce

STATEMENT OF THE U.S. CHAMBER OF COMMERCE

ON: Enhancing Patent Diversity for America's Innovators

TO: The House Committee on Small Business

BY: Rick C. Wade, Vice President of Strategic Alliances and Outreach, at the U.S. Chamber of Commerce

DATE: January 15, 2020

I am Rick Wade, and I am the Chamber's Vice President for Strategic Alliances and Outreach. I appreciate the opportunity to testify before the committee today.

The Chamber commends the committee for its leadership on issues central to increasing access to our "innovation economy" among women, minorities, veterans, and other underserved communities.

Through my experience in both the public and private sectors, I have come to understand and appreciate the important role that diverse-owned businesses play in our economy and society. Consider the following:

- The Minority Business Development Agency (MBDA) of the U.S. Department of Commerce estimates that there are currently 11 million minority business enterprises nationwide, which employ over 6 million people and generate nearly $1.8 trillion in revenue.

- The U.S. Census Bureau and other statistical data show that minority-owned businesses are twice as likely to export as non-minority companies, three times as likely to have international operations, and six times as likely to transact business in a language other than English.

- *Fortune and Forbes* report that Black and Hispanic buying power now exceeds $2.9 trillion.

All in all, diverse-owned enterprises are key contributors to and drivers of America's economy. Enhanced access to tools like the patent system will only strengthen these enterprises and ensure their competitiveness in years to come.

The patent system serves as the foundation of our innovation ecosystem. We especially appreciate the Committee's work on the **Study of Underrepresented Classes Chasing Engineering and Science Success Act of 2018**, also known as the "***Success Act***". I want to thank the Chairwoman and Ranking Member, and all Members of the Committee for their hard work and commitment to this legislation.

The United States has long led the world in innovation and creativity, and to maintain this lead we must ensure that all Americans have the education, skills, opportunity, knowledge, and tools to innovate, invent, and succeed. Too often, underserved communities, minorities, women, veterans, individual inventors, and small business owners lack the information and/or resources to take advantage of the many forms of intellectual property protections available to them, including our U.S. patent system.

As you well know, the ***Success Act*** directed the United States Patent and Trademark Office (USPTO), in consultation with the Small Business Administration (SBA), to identify publicly available data on the number of patents applied for and obtained by women, minorities, and veterans, and the benefits of increasing these numbers. We appreciate that the Act also asked for legislative recommendations on how to encourage and increase engagement among diverse entrepreneurs.

In addition to the Committee's excellent work on these issues, we want to also recognize the leadership of USPTO Director Andrei Iancu for the report and many programs he and his team at USPTO have implemented to encourage more participation in our innovation economy by women, minorities, veterans, and other underserved communities – some of which I will discuss in more detail later in my testimony.

The USPTO report mandated by the ***Success Act*** revealed there is a limited amount of publicly available data regarding the level of participation by women, minorities, and veterans in our patent system. But according to a recent USPTO study, only approximately twelve percent (12%) of inventors named on U.S. patents are women. Clearly, this represents both a serious issue of concern and a tremendous untapped resource for innovation.

Much of our domestic innovation is driven by individual inventors and entrepreneurs who start small businesses and create jobs. And it is important to note that minority communities have higher shares of women-owned businesses. According to the Small Business Administration (SBA), almost all (99.9%) of women-owned businesses are considered a small business (less than 500 employees). Of those, 59 percent are black/African American and 44 percent are Hispanic.

According to the Department of Commerce and other sources, small businesses make up 99.7 percent of U.S. employer firms, 64 percent of new private-sector jobs, 49.2 percent of private-sector employment, 42.9 percent of private-sector payroll, 46 percent of private-sector output, 43 percent of high-tech employment, 98 percent of firms exporting goods, and 33 percent of exporting value.

Small Business Administration (SBA) data also shows that of high patenting firms, those with fifteen (15) or more patents in a four-year period, small businesses produced sixteen (16) times more patents per employee than large patenting firms. Small businesses have an average of ten employees per firm. In contrast, small firms in the "super-heavy" patent intensity industries – or those which receive over eight percent of all patents issued to corporations – employ 24 employees per firms. In the

"heavy-intensity" industries – those receiving two (2) and six (6) percent of all corporate patents – small businesses employ almost double the average number of people per firm. And this trend continues in the "light-intensity" industries as well.

The Chamber's annual International IP Index, which analyzes the intellectual property (IP) environment in over fifty (50) economies, clearly shows the correlation between economic growth, innovation, creativity, and global competitiveness and a strong domestic IP system. A critical component of such a system is a strong domestic patent system that can be accessed by inventors and creators to bring innovative new products to market.

However, more needs to be done to ensure that first-time inventors, start-ups, minority, and women-owned businesses have a fuller understanding of, and access to, our domestic patent system. As I previously stated, USPTO, under Director Iancu's leadership, continues to initiate and implement a number of programs specifically designed to address this need.

Here are a few of these programs:

The USPTO has resources in almost every state to help new entrants to patenting navigate the patent process, including local partnerships with bro bono attorneys, law school clinic programs, local libraries where inventors can get help searching USPTO databases for previously filed patents and trademarks, and many other programs.

The USPTO also recently updated its home page to include a link to these local resources. Now, with one click, new inventors can access a map of the U.S. and then click on their states and find – in one place – numerous resources to assist them in their local areas.

The USPTO has also indicated in its SUCCESS Act report the following new initiatives to enhance its efforts to reach and serve underrepresented and first-time inventors:

- **Council for innovation inclusiveness**: This year, the USPTO will launch a council to develop a national strategy for promoting and increasing the participation of underrepresented groups as inventor-patentees, entrepreneurs, and innovation leaders.

- **Workforce development**: The USPTO will work with other government agencies to help develop workforce training materials that include information

on how to obtain a patent, and the importance of invention and IP protections.

- **Increased development of IP training for educators**: The USPTO will continue and expand its work with other federal agencies to develop training materials to help elementary, middle, and high school teachers incorporate the concepts of invention and IP creation and protection into classroom instruction.

The USPTO report also includes a number of legislative recommendations for Congress, such as:

- **Enhance USPTO authority to gather information**: Congress could authorize a streamlined mechanism for the USPTO to undertake a voluntary, confidential, biennial survey of individuals named in patent applications that have been filed with the USPTO.

- **Expand the purposes/scopes of relevant federal grant programs**: Congress could expand the authorized uses of grants and funds in appropriate federal programs to include activities that promote invention and entrepreneurship, as well as the protection of inventions and innovations using intellectual property among underrepresented groups.

Finally, please know that the Chamber is stepping up its efforts to expand opportunities for diverse-owned companies. Some of our exciting initiatives include:

- Our Partnership with the Minority Business Development Agency, in which we are working together on research and seeking to address key issues such as automation, access to capital, and connectivity to the global marketplace.

- The Diverse Business Leadership Group convenes the heads of the nation's diverse chambers and other business organizations to develop a common business agenda.

- Our Next-Gen Business Partnership with Historically Black Colleges & Universities and other minority-serving institutions, which inspires and develops the next generation of innovators, entrepreneurs and business leaders.

- Through a grant from the W. K. Kellogg Foundation, we are advancing a dialogue across the business community on Kellogg's major research report *The*

Business Case for Racial Equity and assessing best practices and policies that can help close the economic inequality gap.

While these programs are important and effective ways to try and increase participation by women, minorities, veterans, and other underserved communities in our patent system, more still needs to be done.

From Thomas Jennings, the first black patent recipient in 1821— for a dry-cleaning process — to Elijah McCoy, who obtained 57 patents over his lifetime, our collective goal must be to continue to inspire and develop new generations of innovators and entrepreneurs.

We need to ensure that tomorrow's inventors have the opportunities that helped propel Dr. Lonnie Johnson to a successful and celebrated career. Dr. Johnson is literally a "rocket-scientist" whose mission is to ensure the world has enough energy for a prosperous future. Although he has devoted his life to solving some of the world's most complex technological problems, he is perhaps best known for his wildly successful invention, the Super-Soaker water gun. He holds more than 100 patents and earned a Master's Degree in Nuclear Engineering and an honorary Doctorate in Science from Tuskegee University. Dr. Johnson has worked on the Galileo mission to Jupiter, the Mars Observer Project, and the Cassini mission to Saturn. Dr. Johnson exemplifies the spirit of American invention and entrepreneurship, and a clear reminder of how important it is we get this right.

The Chamber looks forward to continuing to work with this Committee, the Administration, academia, business leaders, and others in the private sector, to ensure that every American has access to our patent system and the opportunity to bring new inventions and products to market.

The stakes could not be higher. Our position as the leader of the world's innovation economy can only be sustained if we devote the resources and energy needed to ensure that tomorrow's inventors, innovators, and creators succeed.



Statement of

Holly Fechner
Covington & Burling LLP

On Behalf of
Innovation Alliance

Before the
House Committee on Small Business

Hearings on
Enhancing Patent Diversity for America's Innovators

January 15, 2020

Chairwoman Velázquez, Ranking Member Chabot, and Members of the Committee:

My name is Holly Fechner, and I am submitting this statement on behalf of the Innovation Alliance. We appreciate the Committee on Small Business holding this hearing on the important issue of ensuring full participation in our innovation ecosystem, and thank you for allowing us to share our views.

The Innovation Alliance is a coalition of research and development-based technology companies that believe that maintaining a strong patent system is critical to supporting innovative enterprises of all sizes.[1] Innovation Alliance companies innovate across industries, from audio compression (Dolby Laboratories, Inc.), to wireless communications (Qualcomm, Inc.), currency counting and counterfeit detection equipment (Cummins Allison Corp.), touch feedback or "haptic" technology (Immersion), and vehicle transmissions and drive train technology (Fallbrook Technologies).

The constitutionally-protected U.S. patent system has been open to virtually all inventors since its inception. The original Patent Act of 1790 provided that "upon the petition of *any person or persons* . . . setting forth that he, she, or they hath or have invented or discovered any useful art, manufacture, engine, machine, or device, or any improvement therein not be for

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[1] Strong patent rights allow Innovation Alliance inventions to be freely bought, sold, or licensed, which allows our members to invest licensing revenue in innovative R&D, while ensuring that manufacturers better positioned to commercialize these inventions can implement our technology for public or industry use.

known or used," the inventor is entitled to a patent. The ability to patent has given rise to innovators like Jessica Matthews, the CEO of Uncharted Play, who invented a soccer ball that can harness energy and power lamps. Matthews's invention was inspired by a power outage during a family wedding in Nigeria. Today, Uncharted Play holds 15 patents for technology that can be installed in any device that "can harness kinetic energy," such as baby strollers, floor panels, and furniture.

By granting inventors—whether individual inventors or companies—property rights in their inventions, allowing them to control who makes, uses, sells, or imports their patented ideas or products for a limited period of time, patent rights incentivize inventors to engage in risky, resource-intensive R&D by ensuring that future licensing fees will allow the inventor to recoup the investment they made in their R&D enterprise. Patent rights also facilitate commercialization, collaboration, and follow-on innovation, especially for small inventors, by ensuring that an invention can be freely bought, sold, or licensed. This allows patents owners to reap the benefit of their invention, while transferring their invention directly to the party best positioned to commercialize it for use.

Intellectual property protections thereby unlock a vast innovation economy in the United States that, according to the USPTO, accounts for more than $8 trillion in economic activity, or more than one-third of U.S. GDP. Research from the Federal Reserve Bank of Cleveland has shown that an increase in a state's patent stock leads to a significant increase in that state's per capita personal income levels. In addition to strengthening the U.S. economy, individuals directly benefit from patent ownership. Patent owners benefit from increased income, opportunities for promotion, new job opportunities, and heightened prestige.

The extraordinary benefits of patent ownership, however, are not shared equally among the U.S. population. In 2018, Congress passed the Study of Underrepresented Classes Chasing Engineering and Science Success (SUCCESS) Act, which directed the USPTO, for the first time, to study the disparity in patenting for women, people of color, and low-income individuals and to propose legislative recommendations to encourage patenting among these groups.

The SUCCESS Act report, released this past October, relies on the limited amount of available data to confirm much of what other researchers have already found: America's innovation economy is hamstrung by the lack of diversity among inventors. Women, people of color, and lower-income individuals patent inventions at significantly lower rates than their male, white, and wealthier counterparts. Only 20 percent of all U.S. patents today list a woman as an inventor. Even more troubling, only 12 percent of all inventors listed on U.S. patents were women. In a survey of inventors who filed valuable patent applications between 2011 and 2015, African Americans and Hispanics represented only 0.3% and 1.4% of respondents despite comprising 11.3% and 11.5% of the U.S. population respectively. In addition to being disproportionately represented as individual inventor-patentees, women-owned businesses were reported as less likely than businesses owned by men to hold intellectual property rights.

Yet, as the SUCCESS Act report suggests, more diverse patent teams lead to higher quality patents. Inventors, entrepreneurs, and small businesses benefit from patent ownership, and the benefits they gain allow them to more meaningfully contribute to the U.S. economy.

Thus, these disparities in patenting not only hurt individual inventors and would-be-inventors, it hurts our economy, and it holds back our collective technological progress by leaving a massive amount of talent on the sidelines, and a tremendous amount of economic potential untapped. As USPTO Director Andrei Iancu told the Senate Judiciary Committee last year, "Broadening the innovation ecosphere to include women—and other underrepresented groups—is critical to inspiring novel inventions, driving economic growth, and maintaining America's global competitiveness."

Some scholars have published research quantifying the lost economic potential of these patent gaps. Professor Lisa Cook at Michigan State University, for example, found that U.S. GDP per capita would be higher by between 0.6 and 4.4 percent "if more women and African Americans received STEM training and worked in related jobs." Other studies have found that increasing women's participation in patent intensive industries would increase U.S. GDP per capita by 2.7 percent. For example, the SUCCESS Act report states that women-owned business that have intellectual property out-earn women-owned business that do not hold intellectual property.

These findings underscore that closing the race and gender gaps in patenting rates will generate real economic results. Moreover, greater inclusion in the innovation ecosystem means more perspectives and more ideas in the innovation pipeline. Without broader perspectives and experiences, innovative ideas to solve significant problems might not emerge. Equal opportunity to invent, patent, and commercialize innovative ideas will drive the U.S. innovation economy ever forward, creating countless new products and cures that will create jobs, stimulate economic growth, and improve the quality of life for millions of people.

We appreciate that Congress has taken such an interest in narrowing the gaps in patenting for underrepresented groups. The House and the Senate Judiciary Committees both held hearings last year to discuss the lack of diversity in patenting. And at the direction of Congress, the USPTO set forth a number of policy solutions in the SUCCESS Act report designed to increase the number of diverse inventor-patentees. For instance, the report suggests that Congress should empower and direct the USPTO to collect demographic data on applicants and recipients to better understand the gaps and to study efforts to reduce them. In addition, Congress could remove statutory and regulatory barriers that prevent federal agencies from sharing demographic data among agencies.

Moreover, the USPTO recommends that Congress expand the authorized uses of grants and funds in certain federal programs to include activities that promote innovation and entrepreneurship to close the gender, race, and income gaps in patenting. For example, Government agencies, including the USPTO, Small Business Administration, National Science Foundation, the National Institutes of Health, and the Office of Science and Technology Policy, should promote diversity in patenting and entrepreneurship across industries through policies, grants, education, and mentorship programs. Government programs should also promote science and engineering education in early childhood to increase youth exposure to innovative fields. Congress should also authorize government grants to be used to fund the cost of obtaining a patent, and the USPTO should expand programs that offer inventors volunteer legal assistance to lower the costs associated with patenting. We commend the USPTO for providing these thoughtful policy recommendations and fully support their enactment into law.

Thank you again for holding these hearings on this critical topic for our innovation economy, and we appreciate your recognition there is more work to be done in this area. The Innovation Alliance especially supports the Inventor Diversity for Economic Advancement (IDEA) Act (H.R. 4075/S. 2281) sponsored by Chairwoman Velázquez, Representative Stivers, and Senators Hirono and Tillis. This legislation will provide researchers and government agencies with additional data tools necessary to address the patenting gap by allowing the USPTO to collect demographic data from patent applicants on a voluntary basis. The Innovation Alliance stands ready to work with Congress, the USPTO, the Small Business Administration, and other policymakers to ensure that our innovation ecosystem works for all inventors.

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Testimony of

Incubate

to the

United States House of Representatives

Committee on Small Business

Enhancing Patent Diversity for America's Innovators

January 15, 2020

Testimony of Incubate: *Enhancing Patent Diversity for America's Innovators*

On behalf of the early-stage life science community, we appreciate the opportunity to share our views on this critical topic. Incubate is a coalition of venture capitalists and thought leaders from the early-stage investment, corporate, and philanthropic communities that are committed to educating policymakers on venture capital's role in bringing promising ideas to patients.

We were formed to ensure unrelenting patient-centered innovation by raising awareness of the positive impact of venture capital in the life sciences industry, and to advance the quest for tomorrow's cures by preserving the American system of intellectual property (IP).

We appreciate the Committee's interest in this important topic. While there are several initiatives underway across the venture capital community to ensure diversity, we are taking this opportunity to spotlight one of our partner organization's Springboard Enterprises. As such, much of our commentary focuses on increasing women in the life science early stage ecosystem. We would gladly discuss further with the Committee ways this work can be furthered, as well as initiatives that improve racial diversity in our community.

The Critical Role of the U.S. Patent System

As investors in extremely high-risk companies, one of our first questions for entrepreneurs is: "what is the reassurance to validate our financial risk?" In many cases there are few assets behind the very nascent science in biotechnology and biopharmaceutical companies.

Often, that risk is justified by a now forty-year old system of protecting innovation through patents—though the fundamental value of IP dates all the way back to the Constitution.

Without IP protecting the innovations we fund our capital would disappear. Our limited partners (LPs), those that invest in our funds, which in turn are invested in companies, would be more likely to shift their money away from the life sciences and toward industries with quicker returns. As recently reported, these LPs are key institutions including pension funds and university endowments.[1] Sustained investment in the life sciences is important; these funds allow entrepreneurs to discover drug breakthroughs that save patients' lives.

Simply put, without patents, there would be effectively no investment in companies that could be home to the next breakthrough in medicine, health technology, or devices.

Diversity of Patent Holders in Life Sciences

Given the clear link between IP and investment, it is critical that securing that protection through patents is available to all. Innovation is colorblind and does not know the gender of a scientist, where they grew up, or the capital they have access to. That is why this Committee's interest in this topic is vital and laudable.

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The current statistics for the life science industry bear mentioning. While women currently earn more than half of new PhDs, only 15% of life science inventors listed on patents are women.[2] We believe this can and will change given the growing role of women in leadership of biotech companies. In 2010, $432 million of capital was invested in female co-founded companies and 71 deals took place involving these companies. Last year alone, female co-founded companies received $4.3 billion in capital and were involved in 201 deals.[3]

Organizations Can Level the Playing Field

Some of the growth in women-owned and led life science companies is directly attributable to one of Incubate's partner organizations, Springboard Enterprises. Their efforts should be championed by Congress and ways to expand their impact considered.

Springboard Enterprises focuses on the success of entrepreneurial women leaders in life science and technology-driven companies and reaches a network of entrepreneurs, investors and advisors in the industry.[4] This network of investors, innovators, and influencers has built a platform that has catalyzed the development of the infrastructure that invests in women's entrepreneurship. Springboard's network spans 777 portfolio companies whom have created $20.3 billion in value and had over $10 billion in M&A transactions, including five unicorns valued at over $1 billion. With 197 exits to strategic acquirers, 20 IPOs, and 463 contributing 'alumnae' of the network, Springboard is an effective example of a sustainable model of women helping women.

A constant theme in their "pitch" events across the country is the discussion of IP. Whether licensing technology or science from a university or securing a patent outright, Springboard businesses are leveraging IP to fund their innovation.

Other organizations are building similar programs. For example, Women's Business Centers, a public private partnership with the Small Business Administration are playing a key role in making sure women are leveraging IP for business success.

A good example is Mi Casa WBC in Denver, Colorado. Recognizing the limited number of women filing for patents – despite great innovations and creativity – Mi Casa partnered with the USPTO to streamline and simplify the patent process. The relationship has been a tremendous success and has contributed to the thriving economy of the area. Specifically,

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[2]Jensen, K., Kovács, B., & Sorenson, O. (2018). Gender differences in obtaining and maintaining patent rights. Nature Biotechnology, 36(4), 307–309. Retrieved from https://www.nyipla.org/images/nyipla/Programs/Gender differences in obtaining and maintaining patent rights.pdf

[3] The VC Female Founders Dashboard. (2020, January 27). Retrieved January 27, 2020, from https://pitchbook.com/news/articles/the-vc-female-founders-dashboard

[4] Portfolio Statistics. (2019). Retrieved January 26, 2020, from https://sb.co/statistics

> The ProBoPat program connects low-income inventors with patent practitioners for patent preparation and prosecution legal services on a pro bono (free) basis as well as provides access to business consulting and training for bringing new ideas to market.[5]

For minority and low-income communities, Incubate hopes to partner with similar organizations and applauds the committee's efforts to raise awareness and foster such collaboration.

Congress Should Value our Intellectual Property System

At the core of this conversation is a fundamental principle: America's world-class IP system drives the early stage life science ecosystem. The World Intellectual Property Organization (WIPO), a sister institution to the United Nations, put the importance of IP in clear terms (emphasis added):

> While technology has been seen as one of the engines for the dramatic economic growth and productivity the United States has experienced over the last several decades an underlying factor has been the strength of the intellectual property developed during that period. Intellectual property provided the basis for investors to place their resources at risk. Intellectual property is an integral part of value creation in a technology-based enterprise and as such is a critical element in obtaining venture capital for SMEs. The appropriate use of the intellectual property system is a powerful tool for competition, stability and mitigation of risks on capital investments.[6]

While this Committee's efforts to advance patent adoption by disadvantaged communities move forward, we must also ensure policymakers do not fundamentally undermine the IP at the heart of this ecosystem. This hearing shows the commitment of policymakers to a strong patent system. We strongly urge this Committee to continue its work in ensuring securing patent protections are available to all.

After all, the link between intellectual property and investment cannot be overstated. We look forward to working with the Committee to develop policies that can strengthen America's IP system, incentivize further breakthrough research ultimately benefiting patients and maintaining our global biopharmaceutical leadership.

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[5] Mi Casa Resource Center: What We Do. (2020). Retrieved from https://micasaresourcecenter.org/what-we-do/business-pathways/pro-bono-patent/

[6] Cardullo, M. W. (2020). World Intellectual Property Organization: Intellectual Property – The Basis for Venture Capital Investments. Retrieved from https://www.wipo.int/sme/en/documents/venture_capital_investments_fulltext.html

Statement of

SUSIE M. ARMSTRONG
Senior Vice President, Engineering
QUALCOMM, Inc.

Before the
House Committee on Small Business

Hearings on
Enhancing Patent Diversity for America's Innovators

January 15, 2020

Chairwoman Velázquez, Ranking Member Chabot, and Members of the Committee:

My name is Susie Armstrong, and I am a Senior Vice President, Engineering at Qualcomm, Incorporated. Thank you for holding this hearing on diversity in patenting for American inventors. I appreciate the opportunity to submit this statement to the Small Business Committee on this topic of critical importance to our innovation economy.

Since its founding in 1985, Qualcomm has been at the forefront of wireless R&D, and its technology has driven each generation of cellular wireless standards. The company was the first to recognize and realize the potential of the wireless Internet and mobile broadband, and has helped pioneer other transformative smartphone technologies, including GPS, digital camera and video streaming, and mobile graphics. Qualcomm is a large company now, but it started as a small, seven-person company propelled forward by great ideas and initial funding from the Small Business Innovation Research (SBIR) Program.

Research and development essential to every generation of "G" takes close to a decade, beginning long before the new standard is developed and commercialized. In order to ensure that Qualcomm can continue to fund research in wireless R&D, we patent our inventions, and license them to device makers that incorporate those inventions into their products. Today, Qualcomm holds over 130,000 patents on its technology, and its patent portfolio is the most widely and extensively licensed in the wireless industry, with over 300 licensees.

I joined Qualcomm in 1994 as an engineer working on Globalstar satellite communications. I then worked on the team that developed and commercialized packet data technology—which permits transmission of data over the Internet over cellular links—in the late 1990s. This resulted in the first web surfing on a cellular phone in 1997.

Since then I have held various positions at Qualcomm, including responsibility for the development and commercialization of all of the software that drives Qualcomm's chipsets. I served as the head of worldwide Customer Engineering, the group that integrates and commercializes the company's products in phones and other wireless devices. My responsibilities included engaging extensively with base station makers, carriers, and phone and other device makers in the United States, Asia, and Europe to bring those technologies to market.

Although I have held multiple roles within the company, I first and foremost consider myself an engineer and inventor. Sometimes people think that inventors and patent holders are brilliant people working in their garage on their own, coming up with "light bulb" ideas. But more often, invention is a team effort that requires "out of the box" and creative thinking to recognize a technical need or opportunity and solve it. For example, my invention in the late 1990s of "simple packet data"—the technology that allows cellular phones to connect to the Internet—was the result of working on a team where I was able to come up with a new idea based on my background in computer communications. I was able to bring a unique perspective, and this demonstrates what can happen when someone with a different background is included as part of a diverse team.

As a Qualcomm engineer during that late 1990s period, my team was working on digital fax while code division multiple access (CDMA) was contemporaneously being promoted for high quality, high capacity voice calls. However, my background prior to working at Qualcomm was in the computer communications industry (*i.e.* Ethernet and the internet data protocols TCP/IP). So to me, the digital CDMA voice link looked like just another Ethernet, or dial-up modem link, well suited for carrying Internet packet data wirelessly. So I invented a way to get a base station to set up a packet data call—essentially a wireless phone call for connecting to the Internet—leveraging the work we were already doing for "digital fax." My invention involved minimal changes to the then-existing base stations and other infrastructure, further simplifying the process of connecting mobile devices to the Internet.

That insight resulted in the first wireless Internet surfing, on a Qualcomm mobile phone, at the February 1997 Cellular Telecommunications Industry (CTIA) show. The download speed was 14.4 kbps, which, by comparison, is over 20,000 times slower than the 300 Mbps download speeds of today's 4G networks. And 5G networks will be significantly faster delivering up to 20 Gigabits-per second peak data rates and 100+ Megabits-per-second average data rates.

Within one year of our successful mobile web connection, infrastructure manufacturers adopted the technology and had commercialized it in multiple markets. Qualcomm and others in the industry then began focusing on research in "airlinks" that were optimized to carry packet data rather than just voice, and mechanisms for internet connections in a moving phone. Twenty years later, mobile Internet has revolutionized the way we communicate; expanding capabilities from simple web surfing to mobile email, to high-speed browsing, media streaming, and navigation; creating whole new industries, from on-demand services to online content creation, and paving the way for 5G and the wireless economy of the future.

The Diversity Gaps in Patenting

Despite the economic benefits of patents, not all inventors have equal access to the innovation pipeline. Multiple studies have shown that women inventors, inventors of color, and inventors from lower-income families patent their inventions at lower rates than male, white, and wealthier inventors.[1] In 2018, Congress passed the Study of Underrepresented Classes Chasing Engineering and Science Success (SUCCESS) Act, which directed the USPTO to study these representational disparities in patenting. The SUCCESS Act report offered additional insight to the patent gaps among women, inventors of color, and low-income inventors, and proposed recommendations from USPTO, in consultation with the Small Business Administration, for how to facilitate participation in inventing and commercialization among these underrepresented groups.

The SUCCESS Act report notes that the bulk of publicly available information is limited to women inventors and comprised of imperfect information gathered through software algorithms and other studies. For example, in 2016, the Institute for Women's Policy Research (IWPR) found that just 18.8 percent of U.S. patents, as of 2010, listed one or more women as an

[1] *See generally*, Holly Fechner and Matthew S. Shapanka, Closing Diversity Gaps in Innovation: Gender, Race, and Income Disparities in Patenting and Commercialization of Inventions, *Technology & Innovation* 19:727 (2018).

inventor.[2] A prior USPTO study made similar findings, reporting that only 20 percent of U.S. patents list a woman inventor.[3] In the SUCCESS Act report, the USPTO reported the alarming finding that in 2016, only 12 percent of U.S. inventors who were awarded a patent were women.[4] The report also suggests that women are underrepresented as independent patent owners—women inventors are more often listed on patents as part of teams with male inventors.[5]

Even though data is limited for other demographic groups, the USPTO found that racial and ethnic minority groups also patent at lower rates than do their white counterparts. Blacks or African Americans represent 11.3% of U.S.-born Americans, but they represent only 0.3% of surveyed patent applicants between 2011 and 2015.[6] According to IWPR, among college graduates, African Americans and Hispanics hold nearly half as many patents as whites—about one percent. African Americans and Hispanics also apply for patents at nearly half the rate of whites as compared with Asian American and Pacific Islanders, who seek patents at nearly double the rate of white men.[7] African Americans, Hispanics, and white women apply for patents at comparable, and much lower, rates (0.3, 0.3, and 0.5 percent of women college graduates within each racial/ethnic group).[8] Other studies, including research by Dr. Lisa Cook at Michigan State University, have found that African American inventors are awarded patents at a much lower rate than the general population: from 1970 to 2006, African American inventors received just six patents per million people, compared to over 40 patents per million for women, and 235 patents per million for all U.S. inventors [9]

Inventors from low-income families also experience a wide gap in inventing: for every 10,000 children born to families with incomes below the U.S. median, just 2.2 will receive a patent in their lifetime, compared with over 22.5 children born to families in the top one percent of income.[10]

The disparity in representation for women, people of color, and low-income individuals in the patent system is concerning for both these inventors and the U.S. economy. The ability to patent drives personal and professional growth for inventors. Inventor-patentees benefit from heightened prestige, increased income, more job opportunities, and broader professional networks. Patent ownership also enables access to venture capital, loans, and other investment funding for small businesses and entrepreneurs.

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[2] Institute for Women's Policy Research, *Equity in Innovation: Women Inventors and Patents* (2016), https://iwpr.org/wp-content/uploads/wpallimport/files/iwpr-export/publications/C448%20Equity%20in%20Innovation.pdf.
[3] Office of the Chief Economist, U.S. Patent & Trademark Office, *Progress and Potential: A Profile of Women Inventors on U.S. Patents* (2019), https://www.uspto.gov/sites/default/files/documents/Progress-and-Potential.pdf.
[4] U.S. Patent & Trademark Office, *Report to Congress Pursuant to P.L. 115-273, the SUCCESS Act* (2019).
[5] *Id.*
[6] *Id.*
[7] Institute for Women's Policy Research, *Equity in Innovation: Women Inventors and Patents* (2016),
[8] *Id.*
[9] Lisa D. Cook, The Idea Gap in Pink and Black: A Framework for Research and Policy, Presentation at Inventing America Conference, July 12, 2017 (Washington, D.C.).
[10] Alex Bell et al, Who Becomes an Inventor in the United States? The Importance of Exposure to Innovation, *The Quarterly Journal of Economics* (2019), 1–67, https://doi.org/10.1093/qje/qjy028.

We appreciate the careful attention Congress has paid to these disparities. In addition to the SUCCESS Act, both the House and Senate Judiciary Committees have held hearings on the race, gender, and income gaps in patenting, and today's hearing in the House Small Business Committee offers another important chance to highlight the importance of closing these gaps. But there is more work to do. Despite the important steps taken by Congress, the USPTO, and several scholars, however, it remains extremely difficult to study gender, race, and income gaps in patenting and commercialization. The USPTO and other agencies do not currently collect any demographic information on inventors or patent applicants, leaving scholars to estimate the size and scope of the demographic disparities in patenting.

The Inventor Diversity for Economic Advancement (IDEA) Act (H.R. 4075/S. 2281), sponsored by Chairwoman Velázquez, Representative Stivers, and Senators Hirono and Tillis, would address this critical data shortcoming. This legislation directs the USPTO to collect, on a voluntary basis, demographic data from inventors who apply for patents. Access to information on gender, race, ethnicity, income, and other characteristics from patent applicants would facilitate efforts by government agencies, academia, and private sector companies to monitor their progress in closing the patent gaps and inform ways for these entities to pursue policies that encourage full participation in innovation and entrepreneurship. Qualcomm strongly supports the IDEA Act, and applauds Chairwoman Velázquez and the other sponsors of the bill for this important step in understanding the diversity gaps in patenting.

Diversity Initiatives at Qualcomm

Inclusion and diversity form core corporate values at Qualcomm and act as major forces that drive our technological innovation, including in 5G. The development and deployment of 5G in particular requires a wide variety of perspectives to solve previously unimagined technological problems. In his keynote at the 2017 Consumer Electronics Show (CES), Qualcomm CEO Steve Mollenkopf said "With 5G, new and previously unsolvable problems will be solved, new generations of innovations and innovators will be born. And we need more great technology minds, and that means getting the next generation, in particular women and under-represented communities, excited and prepared for the world to come."[11]

In other words, diversity and inclusion are not just core values, they are economic and innovation imperatives. If Qualcomm, and its customers, hope to build and commercialize transformational technology that solves new problems in new ways, we need engineers from all walks of life who can dream up new solutions, and we also need people to be inventing new ways to use these technology advances. We promote a corporate ethos that values diversity, and that encourages all of our engineers and employees to participate fully in our innovation, patenting, and commercialization processes.

STEM Pipeline and Talent Recruitment

[11]Steve Mollenkopf, *CES 2017: Steve Mollenkopf and Qualcomm are not just talking about 5G – they're making it happen*, OnQ Blog (Jan. 5, 2017), https://www.qualcomm.com/news/onq/2017/01/05/ces-2017-steve-mollenkopf-keynote.

Qualcomm is proud of our already diverse workforce. Our engineer employees represent 116 different nationalities and speak 74 different languages, and are involved in both internal and external programs to increase that diversity.

But there is more work to do. As countless scholars, including Dr. Cook and Barbara Gault and Jessica Milli at the IWPR, have identified, there is a diversity challenge in the Science, Technology, Engineering, and Mathematics (STEM) pipeline. It is imperative that we continue to encourage STEM education for women and girls, children of color, and low-income children, both in formal and informal programs that expose them to careers in science and engineering.

However, in Qualcomm's experience, STEM is only one factor in the equation. Over the past 25 years, we have seen the number of women employed in science and engineering occupations rise to nearly 30 percent in 2015 (and higher in some STEM fields) while the women inventor rate—the percentage of inventors awarded a patent in any given year who are women—hovers just above 10 percent.[12] Additionally, at Qualcomm, we're finding that a lower share of women and people of color with STEM degrees are engaging in semiconductor R&D, which typically attracts electrical engineers and computer scientists, those same fields applicable to such visible fields as machine learning, artificial intelligence, and financial technology.

In order to attract more qualified applicants to our workforce, we have examined our hiring process, especially on-campus recruiting at colleges and universities. We want to make sure that we send teams of engineers and employees that reflect the existing diversity within our company, and the diversity we hope to achieve.

Employee Training and Networking: Engineering the Bias Out of Corporate Processes

Once we have recruited a diverse workforce, our focus is on preserving a diverse and inclusive environment. As an engineering company, our goal is always to engineer the potential bias out of our process to build diverse and inclusive teams that can most effectively attack some of the biggest engineering problems inherent to bleeding edge wireless R&D. As our former Executive Chairman and CEO Paul Jacobs has said, "Inclusion and diversity are at the very heart of innovation," because "[i]t requires different perspectives to take an idea, perfect it, and turn it into world-changing technology."[13] We strongly believe, as the SUCCESS Act report suggests, that diverse, mixed-gender teams are more successful and more innovative, and produce higher quality patents. We constantly strive to create a culture that encourages and rewards teams that embody these values.

Part of this process involves training senior management company-wide about the value of diversity and inclusion, and supporting the development of employee-led networks to promote professional development and collaboration among different employee groups. Qualcomm currently has employee networks for women, Africans and African Americans, Latinos and Latinas, military veterans, millennials, lesbian, gay, bisexual and transgender employees, and differently-abled employees and caregivers for individuals with special needs. We are working

[12] *See* USPTO, *Progress and Potential* at 5.
[13] DMBA New Team, Qualcomm Inc. – 2013 50 Out Front for Diversity Leadership, *Diversity MBA* Magazine, July 20, 2013, https://diversitymbamagazine.com/50-out-front/qualcomm-inc-2013-50-out-front-for-diversity-leadership/.

to continually and strategically expand these networks and ensure employees worldwide have access to them.

A key component of our training and networking program is ensuring that employees who identify with underrepresented groups have access to leadership, mentorship, and career development opportunities within the company and their functional group.

Qualcomm STEM Initiatives

As a company of inventors, Qualcomm purposefully takes a long-term look at invention and diversity. One of our key programs is the Qualcomm Thinkabit Lab. The Thinkabit Lab is a tangible hands-on career engagement program, whose byline is "inspiring the next generation of inventors." Thinkabit Lab was born four years ago after we observed that students, regardless of age, are not likely to pursue a STEM career without exposure and inspiration. Moreover, students from underrepresented populations struggle to see themselves in science and technology careers that often generate inventors.

The Thinkabit Lab initiative brings a hands-on approach to engage students with cutting edge technologies. For example, in our program, students learn about 5G, the Internet of Things, and careers in technology, and then program a simple circuit board to act as the core of their own IoT invention. The program is not prescriptive, nor is it a competition, but a tool to expose young people to invention and technology.

Over the past three years, we have created Thinkabit Labs in libraries, school districts, and university hubs in underserved parts of the nation to both expand our reach, and to leverage these organizations expertise to promote STEM education. We have created public/private partnerships to create "hub" Labs with Virginia Tech in the National Capitol Region, in downtown Detroit with University of Michigan, with the Chula Vista Public Library in California, and with the Porterville Unified School District in the rural, agricultural central valley of California.

Since the launch of the "Inspired by Qualcomm Thinkabit Lab Toolkit" in May of 2017, we have created over 25 "Inspired by Thinkabit Lab" sites in schools throughout the nation. These districts, universities, and libraries have integrated our Thinkabit Lab activities, reaching numbers of students far beyond what we could impact at our cornerstone facility in San Diego. For example, the Innovation Station at the Chula Vista Public Library has served every sixth grader in the Chula Vista Elementary School District for the past two and a half school years.

The teachers, librarians, and administrators implementing these activities have added both their expertise in education and know-how in implementing STEM education programs to further improve and inform our program. Each of the Inspired by Thinkabit Lab sites have implemented the program to be responsive to the educational needs of students in their area and their local workforce, and to showcase the breadth of possibilities in the IoT area for new applications and inventions in such areas. There is a large demand by these Inspired by Thinkabit Lab sites for additional activities, teacher professional development, and best practices/lessons learned from the San Diego-based Qualcomm Thinkabit Lab.

Thinkabit Labs have focused on middle school students, though the program can be easily scaled down in age to fifth graders and up into high school. In conjunction with the San Diego Work Force Partnership, we have been discussing ways to use the successful program to engage adults in retraining programs – again, our observation is that some adults to not engage in STEM retraining because they have not been shown that these could be careers for them. As we "age" the program up, we are planning to introduce more specific invention and patent content. We are currently piloting a program at a community college for adults from 18 to 42, and will use this program this summer in Porterville, where we are partnering with ag tech companies to get students to both engage in STEM careers, and to create IoT inventions.

Qualcomm's Invention and IP Culture

While building the STEM pipeline and attracting diverse talent is a key component of Qualcomm's innovation culture, so too is encouraging patents for our inventions. These values work in tandem to ensure that every member of team, whatever their background, is participating fully in the innovation process. By working hard to attract a diverse and inclusive workforce, then integrating every engineer fully into our inventing and patenting work, we help to ensure that underrepresented groups fully contribute to Qualcomm innovations.

Patenting can be a complex and intimidating process, especially to engineers who have different skills and training, even in a larger company. Our inventor development program includes both online and in-person classes that cover both the basics of patenting and advanced team building. Given the importance of patents to funding and encouraging invention across the wireless technology ecosystem, we also host invention sessions with engineers from multiple technology areas to encourage cross-functional information sharing.

Because patenting and licensing is a core feature of Qualcomm's business model, we highly value the contributions of our engineers and staff to the invention innovation process. We encourage and celebrate all our inventors, ensuring that they are adequately trained on how to obtain patents, and that they are recognized for their contributions to patented inventions. We also facilitate the submission of inventions to our internal database with a centralized web page that allows inventors and employees to search for Qualcomm innovations and submit new invention ideas to the repository.

It is particularly important to our invention culture to recognize contributions to Qualcomm's innovations. We are leading the world to 5G, and want our engineers to be a part of a team—both within their individual working group and within the broader company—that is focused and united around working together to invent the best technology that changes the world.

To that end, we celebrate all of our inventors. Engineers who contribute to inventions or who are awarded patents are given special "IP cards" to recognize their contributions, and are entitled to a notation in the company directory and on their business cards as patent holders. Monetary awards are also available to incentivize and recognize invention activity. Senior executives also send a congratulatory letter to each inventor who obtains a patent. For the most significant contributions to Qualcomm's patenting, we recognize "Master Inventors," an achievement awarded just 15 times since 2011.

In addition to internal recognitions, we publicize our inventions publicly. Our "Qronicles"[14] page offers an interactive visual display of over 30 years of Qualcomm patenting, allowing visitors to learn about all of the innovations Qualcomm has contributed to wireless and mobile communications throughout its history.

About Qualcomm, Inc.

Qualcomm was founded in San Diego, California by Dr. Irwin Jacobs and Andrew Viterbi, two University of California at San Diego professors, along with five other leaders in the emerging field of wireless communications. It is the quintessential American success story of a highly innovative startup, whose deep commitment to R&D have positioned mobile as the largest and most transformative communications platform in history. In his 2011 testimony before Congress, Dr. Jacobs explained that Qualcomm "started small . . . but with the determination to innovate in digital wireless communications."[15] Indeed, early funding from the SBIR program, provided Qualcomm with its first funding —a $1.5 million grant to hire new engineers and begin developing its patented chips. R&D from that grant became critical to development of code-division multiple access (CDMA), a core wireless communications standards. With SBIR support, Qualcomm grew from a seven-person operation in Dr. Jacobs's living room to one of the largest chipmakers in the world and the leading U.S. company in global wireless R&D.[16]

Efforts to promote commercial adoption of the CDMA standard, however, were not easy. Even after Qualcomm had successfully built and demonstrated a small CDMA system in the 1980s, a Stanford University professor decried the technology, stating that it "defied the laws of physics." Yet the company persisted, by relentlessly anticipating the future of technology and investing in bringing it to fruition. For example, Dr. Jacobs was among the very first to envision that every person would eventually have their own phone number and communicate wirelessly. One of Qualcomm's earliest products was a satellite-based vehicle tracking and communications system—an early precursor to GPS technology usage that millions of mobile phone users rely on daily to hail a ride or track their deliveries. Qualcomm recognized early on the ability of the digital cellular link to carry data as well as voice, leading to their development of communications optimized for data, and the first "smart phone." Qualcomm also invented one of the early mobile "app stores," a mechanism for safely downloading and running third party software on a phone.

In the three decades since Qualcomm's founding, the mobile phone first used for simple voice communication has become an extraordinarily powerful mobile computer, thanks to Qualcomm's innovative CDMA technology—the foundational cellular technology that has enabled every "G" of wireless technology and that continues to underlay the 5G revolution.

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[14] Qronicles of Invention, https://www.qualcomm.com/invention/qronicles0finvention/index.html (last visited Jan. 23, 2020).

[15] *Hearing on Reauthorization of the SBIR and STTR Programs Before S. Comm. on Small Business & Entrepreneurship*, 112 Cong. 4 (2011) (statement of Irwin Mark Jacobs, Co-Founder of Qualcomm) https://www.sbc.senate.gov/public/_cache/files/4/8/4878f6aa-114e-495a-9fea-03ab2a21cf9c/78A77C01862D1DAD0B9A5CDCF5DEB9B4.testimony-jacobs.pdf.

[16] Qualcomm Inducted into SBIR Hall of Fame, SBIR·STTR (Mar. 15, 2011), https://www.sbir.gov/success-story/qualcomm-inducted-sbir-hall-fame.

Today, the majority of Qualcomm's employees are engineers whose focus includes long-term R&D on core wireless capabilities. Most of the research work is done at the company's San Diego headquarters, and in New Jersey, North Carolina, and Texas. Qualcomm's significant R&D projects require considerable investments of time and resources and may not be commercialized for up to a decade, if ever. Qualcomm's dedication to R&D results in transformative inventions, including most recently with respect to 5G.

Broad licensing of Qualcomm technology has given rise to a healthy ecosystem consisting of smart devices, networks, and applications. The patenting of innovative technology ensures that this basic technology is publicly disclosed, allowing others to incorporate the technology into their own devices and innovations, and also to improve upon it. Qualcomm participates in and contributes substantially to standards-setting organizations, international bodies of engineers who contribute technology to standards that allow devices and products from different manufacturers and different countries to interact with one another, further encouraging innovation and collaboration.

No other company in the U.S. or Europe has made the same long-term commitment to 5G R&D. Revenue from Qualcomm's licensing business is invested back into R&D to continue the cycle of innovation. For the past several years, the company has invested over 20 percent of its total annual revenue in R&D, bringing the company's total R&D expenditures to over $53 billion.

This level of private sector investment in wireless R&D—which is now being applied to the development of 5G wireless—is unparalleled anywhere in the world. No other U.S. company or government has made a commitment to developing 5G that rivals Qualcomm's investments. This unique role in the development of 5G means that Qualcomm's technology has critical importance to U.S. economic and national security interests.

* * *

Qualcomm's leadership in long-term R&D in foundational technologies like CDMA, 3G, 4G, and 5G is only possible because of our talented engineering workforce and a strong patent system that protects the intellectual property of our company. As our competitors overseas strengthen their own intellectual property rights, it is an economic and technological imperative for Qualcomm in particular, and the United States at large, to ensure that inventors from all background and perspectives can participate fully in our innovation ecosystem. Qualcomm is committed to ensuring that women, people of color, low-income individuals, and other inventors from other underrepresented groups can bring their talents to our innovation economy. We appreciate the opportunity to share our experience and best practices with the USPTO and other policymakers to support and develop policies that engineer the biases out of innovation, so the United States can continue to lead the world into the future.

From: Pete Antros
To: successact
Subject: Success Act Study
Date: Wednesday, May 1, 2019 12:24:00 PM

Dear Ms. Laura Pope,

My name is Peter Antros. As a Veteran of the US Army Reserves, having volunteered during the eve of Operation Desert Storm, serving during wartime, as well as a USPTO Patent applicant (U.S. Application No. 14/865,814, filed September 25, 2015), I am writing today add public testimony regarding the Study of Underrepresented Classes Chasing Engineering and Science Success Act (SUCCESS Act).

1. The USPTO must stop taking patents back from inventors.
2. Inventors must have full ownership over their inventions, including the right to decide who can use it and how it is used.
3. There must be stiff penalties for those who steal inventions.

Having obtained training in the Army Reserves for the military occupational specialty (M.O.S.) 91Victor, Respiratory Specialist (now 68V) completing the program in February 1992, I have been and continue to be active in the field of Respiratory Care for the last 27 years.

The invention for which I applied for patent protection, Pulmonary Expansion Device, is so simple that it makes people say "Why didn't I think of that?'

In essence, PXT is a hand-held suction device that allows the User to grab hold of the chest wall in order to manually lift and expand the underlying targeted lung field. PXT is a miniaturized version of the Iron Lung, localizing negative pressure (utilized by the Iron Lung applied to the entire body) directly to specific affected lung fields.

The public benefit of PXT is enormous. PXT has the potential to change the field of Respiratory Medicine, specifically in the neonatal population, where the rates of Broncho-Pulmonary Dysplasia have remained unacceptably high for decades due the exclusive use of positive pressure ventilation in NICUs throughout the world. Healthcare providers need another option to treat premature infants with Respiratory Distress syndrome besides PPV, which causes BPD.

The intellectual property rights of inventors that had caused America to lead the world in innovation have now been lessened to such a degree that it is virtually impossible for an inventor of something truly valuable to 1) stop the theft of it, 2) stop the invalidation of his or her patent(s), or 3) stop him or herself from being rendered penniless and summarily defeated in legitimate efforts to stop the theft of the invention. -Randy Landreneau of US Inventor

PXT demonstrates all the qualities required to be a market disruptor, cost-effectiveness, efficiency, patient comfort, risk/benefit ratio, etc.,, over any other airway

clearance device currently on the market. The field of Respiratory Medicine is littered with devices that cannot meet FDA standards enacted with ObamaCare requiring devices on the market to demonstrate both "safety and effectiveness" for Medicare/Medicaid reimbursement. If a new device is able to demonstrate both safety and effectiveness, would the FDA allow others that cannot continue to be marketed?

So, if I do happen to be able to pay all associated USPTO and lawyer's fees required to obtain a patent granting me "Property Rights" to PXT, how much money would Device Manufacturers with products currently being sold that cannot demonstrate their product is either safe or effective be willing to pay to tie me up with PTAB?

#PTAB makes me wonder why I am asking my family to sacrifice in order to pay for a patent with "Property Rights" that don't have any tangible value.

Thank You,

Peter Antros

29Apr19

To: Director Iancu

Thank You for your time. My name is Brian Aumiller, I served 10.5 years, in the National Guard. I served multiple deployments from 2001 and got out in 2008. I deployed to Germany, I was activated to do Base Security at Ft. Riley- Kansas and I volunteered to serve on what at that time became the longest Military Deployment of OIF.

I didn't grow up with a lot of fancy toys or vacation experiences; I got a push mower. My stepfather believed in hard work, keeping busy and there's always work to be done. This later brought me to join the military after High School. My parents couldn't pay for my college so I joined the military.

After my Iraq deployment, Congress passed the Post 9/11 GI Bill leading into the summer of 2008-09. My civilian job had cut my hours and I made the decision to go back to school. I applied and ended up getting accepted into a Watchmaking Program in Oklahoma. After 2 years in school I graduated in 2013, my wife and I moved to Florida for a Job. It was my first start as a professional.

Fast forward 5 years, I come up with an idea and have no clue what to do. I found it hard to find help, or even talk with some about Patents. Because the last thing you want is someone taking your idea. The VA didn't have any resources, but did recommend the SBA. They help vets, I was told. The SBA didn't help that much before I was even able to ask about Patents, they asked for a business plan. I didn't have one let alone have an idea how to do one.

Moving forward, I unknowingly did what every inventor does, I went out get a lawyer and start my patent for my new idea. I did the Track One Option and it was issued within 7 months, it felt great, it's an unexplainable feeling getting that Letter from the USPTO. I'm excited because I now have something that is mine, I paid for it, and the Government gives me control of it for 20 years. Its mine! I think to myself, this is what it feels like to live in America and the process of getting ahead. I can play by all the rules set in front of me and have this feeling, this is what I fought for in the Military, and this is why I served. For the American Dream. This is becoming my dream ...and seems it has changed. My patent was issued and I have yet to discuss it publicly, even to the majority of my family. In front of you is my first time doing so. I don't know what success my Product brings, but I would like to know there is a level playing field.

After getting my patent issued and going through the process, I learned right away, a Patent is only valuable if you can defend it. When I got back from Iraq, there were Home Improvements shows that would go in and fix up a house and turn it over to usually a Disabled Vet. I've then heard a story about a Veteran that had lost the house because he couldn't keep up with the newer taxes assessed on his property. It just made me think why wouldn't of anyone thought about this? I feel that's where we are here, helping us get a patent is a good start, but helping enforce or make it easier on the Small Business owner protecting it easier would be the second part. Getting the patent is the easiest part, protecting it is the hard part. It could cost hundreds to thousands dollars and years to complete. I've

read stories about Products on Kickstarter being knocked off in China, and being sold before the Kickstarter project has even finished regardless if they had IP or not. If that don't kill a business I don't know what will. I feel larger companies don't honor this and label us the "Patent Trolls" for defending our patents.

I do feel the SBA is the best place for the USPTO to work with on helping the underrepresented get that education on Patents and give us a level playing field on defending it. I also feel there needs to be more accountability with the Invention Help Type Companies that do prey on people as well. I would also like to add that securing a Patent helps with getting Investment or other types of funding.

I'll keep moving forward as I can with this process and I'll keep hoping changes are coming, either from the USPTO or Congress.

Thank you for your time.

Brian Aumiller
Veteran/Independent Inventor-Patent Holder

My name is Arnold Beal and I am a 69-year-old independent inventor and owner of four patents, all related to a unique new engine design. I am concerned about protecting my patent rights as intended by our forefathers and granted by the U.S. Patent & Trademark Office. For independent patent holders like myself, it is crucial that a generation of laws, regulations, and court decisions that have discouraged innovation by failing to secure to inventors the exclusive rights to their discoveries are reversed. Women, minorities, and veterans who attain patents as a result of the SUCCESS Act and following legislation will be harmed if the patent system remains in its current state.

We must increase the enforceability of issued patents, especially those issued to the independent inventors as they are most often attempting to start and build a business around their innovation without large company funding. Thanks to the PTAB and lack of strong enforcement in court, patents cost inventors far more than is ever returned. Patents are just liabilities. If the recommended legislation does not include increased protection of patents, we will end up destroying the businesses and lives of the very individuals and employees we intend to help. I also support increasing the number of women, minorities, and veterans who hold patents.

Because of other inventors' experience with the PTAB with exorbitantly high costs and ultimately resulting patent infringement, I am reluctant to invest further in additional patents on my engine development and my business development, especially if my patent rights can suddenly belong to another entity not having the original rights to the innovation. These outcomes obviously affect my decision to/not to innovate and invest. Brief examples of this damaging decision making are summarized below.

A. Josh Malone, Bunch O Balloons – Josh's invention was copied by Telebrands who flooded the market with knock-offs. The effort to enforce his patents resulted in 4 district court cases, 8 PTAB cases, and 13 appeals, costing over $20 million.
B. Alex Sevrinsky, Paice – Alex invented a torque drive system for hybrid vehicles. The technology was successfully license to Toyota, but Ford, Volkswagon, and Hyundai opted to eliminate his primary patent by filing 26 IPR petitions. The dispute led to 4 district court cases, 44 PTAB cases, and 34 appeals and millions of dollars in legal expense.
C. Roman Chistyakov, Zond – Roman invented a plasma metal thin film deposition technology used for semiconductors and razor blades. Intel, Toshiba, Fujitsu, GlobalFoundries, Gillette and others gang-tackled Zond with 125 IPR petitions costing them millions of dollars. The PTAB construed Roman's invention of a plasma "without arcing" to cover prior art plasmas with "a little arcing" and cancelled 10 patents with 371 claims. Zond was growing with over 20 employees at the start. All are now gone.

If an idea is successful, big companies will want to use it. They are happy to go to court. Most inventors can't afford the legal fees, so the big company immediately gets to "win" the trial and take the patented product for free. On the small chance that the inventor can afford to go to court, there is an even smaller chance that the big company would ever lose. And even if they lose, there is no punishment more than being forced to pay a reasonable royalty. If the company takes the inventor to the PTAB, their likelihood of success goes through the roof. The very worst-case scenario for an infringing company is that they have to pay a royalty, so of course they choose to infringe. The patent system has been turned backwards and protects infringers far better than inventors. If these problems are not addressed, the women, minorities, and veterans who invest their lives and livelihood in patents, at the encouragement of the USPTO and Congress, will be utterly destroyed like the examples above.

Patents are the foundation for innovative companies. Due to extremely high PTAB invalidation rates, investors are not funding innovative companies built on patented ideas. It is incomprehensible that the Patent Office is attacking inventors in these proceedings – the complete opposite of promoting innovation! According to the 2017 AIPLA Report of the Economic Survey, the estimated mean cost of a post-grant proceeding through appeal runs at $450,000.00. The underrepresented classes being discussed would be ruined by a single IPR. In order to provide patents of value women, minorities, and veterans, the USPTO must stop taking back patents from inventors.

Additionally, the "exclusive right" promised on the patent as granted by the U.S. PTO must be enforced. The 2006 eBay decision revoked the inventor's ability to decide how her invention is produced and by whom. The inventor cannot determine the price, quality, brand, included features, materials, factory location, working conditions, environmental sustainability, or any other concern. The legislative recommendation should include bolstered access to injunctions for individual inventors.

Finally, infringers must not profit by using an invention without permission. Current law limits most inventors who win in court to only a "reasonable royalty", which in many cases does not cover legal fees and is too little to serve as a deterrent against large corporations with deep pockets. Few inventors, particularly the underrepresented classes being discussed through the SUCCESS Act, can afford the millions of dollars and years required to enforce their patents in court. Even after winning, the inventor gets a small percentage of the profits while the infringer keeps the rest. Infringement is a good business decision under current law. The legislative recommendation must include more severe penalties for willingly infringing on patents.

I appreciate the USPTO's willingness to hear from real inventors. We support the intention behind the SUCCESS Act, but after watching the lives of many of our own be utterly destroyed because they believed in the patent system, we know that this legislation will not achieve its goal – the goal of bringing success to women, minorities, and veterans through patents – unless the patents actually provide the protection promised.

Sincerely,
Arnold J. Beal

From: Shelly Conrad
To: successact; eyebandzllc@gmail.com
Subject: Patent rights
Date: Saturday, June 22, 2019 12:39:08 PM

6/22/19

Dear USPTO officials,

I am a patent holder. I value my patent and the monetary and time my family and I have devoted to it. I'm writing to request that changes to current process respect the patent holder. These are life quests and effects many more individuals than the patent holder. Certainly if a family member of yours had their patent revoked or copied without recourse, you would care. Our country was built on many things and the ability to feel safe with a patent you have issued is one of them. It's time to change the usual and customary practices which have a blatant disregard for the United States patent holder.

Surely, someone on your panels are brave enough to take that first step towards securing and respecting patent holders. What a legacy that will be.

Hoping You Hear Us,

Valerie Carbone
Patent holder

SUCCESS Act Public Comment

My name is Deja S. Castro and I am the inventor of the Tear and Toss Trash System and founder of RDC Systems, LLC. As a female patent holder, the SUCCESS Act is very important to me. I have three granted patents in the United States with an additional one pending. I also have 27 patents in three other countries, the United States patents represent the highest potential and value for me and my business.

I support increasing the number of women, minorities, and veterans who hold patents, but it is crucial that we concurrently increase the enforceability of those patents. Patents have become liabilities for independent inventors thanks to the PTAB and lack of strong enforcement in court. If the recommended legislation does not include increased protection of patents, the USPTO and Congress will end up destroying the lives women, minorities, and veterans who attain patents.

I am a full time working nurse and have left all behind and cashed out all savings and even my children's college money in order to invest in the patents I hold. The future of my family and I depend on the licensing of these patents. A fortune 500 who is currently reviewing my idea required, just like most large companies, that I have patents in order to have the idea considered seriously. I have seen cases from fellow inventors such as Josh Malone, Bunch O Balloons and Alex Sevrinsky, Paice, Roman Chistyakov, Zond – Roman who invented a plasma metal thin film deposition technology used for semiconductors and razor go through terrible heartache and stress financially, mentally, and emotionally while companies use the legal system to undo all their hard work and steal their babies. I would have sacrificed nearly a decade of my life to invent, prototype, draft patent applications, and go round after round with the patent office just to have all my work and my family's future torn apart? I would likely not only be very hurt and bitter, but also have to admit to everyone I know personally and publicly that the patents in the United States aren't worth anything and just to keep your day job. People need to know that making the world better is safe, and they will be compensated for all the passion and tears they invested, on top of all the money they scrapped together. I am a micro entity and it has been hell trying to keep up with all the costs in order to not have my future stolen. My kids believe I am protected by these beautiful patents that came to us in the mail. Let's not ruin their trust and belief in that.

Question 4: What social and private benefits to small businesses owned by women, minorities, and veterans would you identify as resulting from increasing the number of patents applied for and obtained by those businesses?

Imagine the United States without our invention shows like Shark Tank. Our society is full of dreamers and they believe anything can happen in the United States, the land of opportunity. In the past when inventors, especially women, were able to secure patents for their businesses it allowed them to secure money and deals and with that comes an extraordinary social opportunity in the public eye to share the story, not only the product. We all know that people are

driven by how they feel. If one minority or woman sees another living the "dream" and they made it, then many more will be brave enough to follow and thus a society shift occurs. Unfortunately, like my story, without valid patents this dream of inventing and reaching the masses via distribution of a large company just doesn't happen and then the story never reaches others because success is cut short due to no protection. Or worse, if patents can't be enforced, the idea is stolen and makes it out there without the public ever knowing it was a woman who invented it! I have an unusual name, Deja, and it is interesting in almost every email from around the world I am addressed as Sir, everyone assumes the inventor, the owner is a male! I hope to assign my patents to mega companies to help protect them because as of now the social and private benefits to small businesses from increasing the number of patents obtained are zero, if not in the negative, due to the current state of the patent system. Due to extremely high PTAB invalidation rates, investors are not funding innovative companies built on patented ideas. It is incomprehensible that the Patent Office is attacking inventors in these proceedings – the complete opposite of promoting innovation! A lack of trust in the patent system means that socioeconomically disadvantaged individuals have no chance of success. According to the 2017 AIPLA Report of the Economic Survey, the estimated mean cost of a post-grant proceeding through appeal runs at $450,000.00. The underrepresented classes being discussed would be ruined by a single IPR. In order to provide patents of value women, minorities, and veterans, the USPTO must stop taking back patents from inventors.

Signature
Deja S. Castro

From: shelly conte
To: successact
Subject: Help me my life is over!
Date: Thursday, June 20, 2019 2:28:07 PM

All I wanted was to be an inventor and to make money with our invention and maybe more inventions. I have lost everything! It's not fair! Why is this happening! I am one step to being homeless. I am applying for well fare this week. I am balling right now. I thought I had a great future ahead of me . I gave up all my retirement assets to do this! Now I have nothing! How is this ok. It's wrong! I thought patents were my insurance plan to protect me. My invention was stolen and they made millions and our product is still selling. My husband kicked me out and I have no security. Let me talk or say something. I may as well be dead because I have lost everything. We have proof they stole it but our lawyer got bought off to end both lawsuits. Please please help me. I will make a big impact.

Sent from my iPhone
Shelly Conte

From: Travis Creighton
To: successact
Subject: SUCCESS Act Study
Date: Monday, June 24, 2019 10:51:38 AM

Hello USPTO,

Below are my thoughts to your SUCCESS Act Study inquiry for which I felt I could respond. Additionally, I have included my current plans for future applications given the current state of US patent law and policies.

(3) What social and private benefits would you identify as resulting from increasing the number of patents applied for and obtained by women, minorities, and veterans?

The social benefit of increased patents for these groups would be to provide hope of betterment for themselves, their families, potential employees and their families, and America in general. Beyond the groups for which this is focused, patents in general should be publicized as a means for obtaining the American Dream. Patents have no inventor age limitations and the financial limitations have been greatly reduced with Micro Entity and the Pro Bono program, of which I am utilizing. However, the PTAB can completely destroy any value of increased patent endeavors at any time for 20 years. A business based on its IP as its kingpin would be hard pressed to find investors given the current law and the PTAB.

(4) What social and private benefits to small businesses owned by women, minorities, and veterans would you identify as resulting from increasing the number of patents applied for and obtained by those businesses?

It would stand to reason that having an issued patent would give a such an entity, not only a potential asset in hand, but also, perhaps, some stronger than casual internal drive to do something great with the asset. This could lead to more Americans being employed and further innovation. However, the PTAB can completely destroy this asset and, in fact, put the inventor in great financial harm.

(5) Should the USPTO collect demographic information on patent inventors at the time of patent application, and why?

No. Demographics should not matter to the filing and awarding of a patent. Unless you will be changing the order of prosecution based on demographics; but then, is that fair? Otherwise, it is just more erroneous data and more expense.

(6) To what extent, if at all, do educational and professional circumstances affect the ability of women, minorities, and veterans to apply for and obtain patents or to pursue entrepreneurial

activities?

Everyone can think and this does not require education; only experiences. In fact, some institutions might condition people to think 'their way' and not in a unique manner and thus inhibit creative thought. Sometimes, not knowing why something cannot be done, leads to a different perspective than those taught it cannot be done. Conversely, having an idea but not the means to pursue it due to financial issues is a problem, one I personally am having to navigate. Fortunately, the USPTO has the Micro Entity designation and Pro Bono program. I personally feel this area would be an excellent area to expand in order to acquire patent applications for the groups in question. Concerning the business aspect of monetizing an issued patent, the Small Business Administration (SBA) and the Service Corps of Retired Executives (SCORE) would be good resources.

(7) To what extent, if at all, do socioeconomic factors facilitate or hinder the ability of women, minorities, and veterans to apply for and obtain patents or to pursue entrepreneurial activities?

I don't believe socioeconomic factors technically hinder the pursuit of patents. A lack of knowledge of the existing programs that are available could be the problem. That being said, a simple Google search reveals the programs' existence. This is how I discovered the Micro Entity designation and Pro Bono program. As for being able to perform an internet search, public libraries have computers for use and there are programs that offer free phones to the poor.

(8) What entities or institutions, if any, should or should not play an active role in promoting the participation of women, minorities, and veterans in the patent system and entrepreneurial activities?

I feel an outreach to the following organizations to make them aware of programs for these groups would be of benefit: Small Business Administration, legal associations, inventor user groups (mine is Tampa Bay Inventors Council), Veteran's Administration if they provide any 'general Q&A Helpdesk' resources, "Maker" community groups, 9^{th}-12^{th} grade schools, 2 year and 4 year colleges and vocational schools, and the military for when soldiers think of exiting service. Patents need to be seen as a means of success and this needs to be taught.

(9) What public policies, if any, should the Federal Government explore in order to promote the participation of women, minorities, and veterans in the patent system and entrepreneurial activities? Are there any public policies that the Federal Government should not explore?

I think engaging the various local inventor groups with resources in hand (Pro Bono attorney/agent, engineer/CAD drawer, prototyping business, Pro Bono patent graphics drawer, etc.) would return great and rapid results. This is because if inventors have already searched for and found inventor groups, they are 'idea in hand' and eager to make progress.

(10) What action could USPTO take to address the participation of women, minorities, and veterans in the patent system and entrepreneurial activities?

Do away with the PTAB or fix the reasons it is needed. It scares me, and probably the groups for which you seek more applications, that the PTAB exists because it creates never ending uncertainty. And the ONLY reason it does exist is because of the failure of USPTO prior art searches and the claims. Think about that – it is true. Most all of the money and time spent in litigation is because of the prior art search and the interpretation of claims. More people will file, and have or find backers, if there were assurances that a US Patent was not in jeopardy of being invalidated at any moment.

(11) Are there policies, programs, or other targeted activities shown to be effective at recruiting and retaining women, minorities, and veterans in innovative and entrepreneurial activities? Are there policies, programs, or other targeted activities that have proved ineffective?

I don't know of any policies or programs that would help with obtaining these groups people. Conversely though, I do know that if the USPTO takes $5,000 to issue a patent and then makes the female, veteran go through one or more PTAB trials and ultimately invalidates their patent, you will be working against yourself and America.

My current views of the USPTO and patent acquisition:

To seek more patent applications from anyone, let alone the groups this survey targets to help, without addressing the problem surrounding the PTAB is nothing more than, dare I say, [redacted]. It sounds harsh; but, let me explain. The USPTO takes their filing and, hopefully, issuing fee, along with full public disclosure, from the inventor and in doing so, after the USPTO performs what is to advertized be an exhaustive prior art search, promises 20 years of protection from the filing date. However, at the same time, the USPTO takes money from an inventor's competitor, or even infringing adversary, and, quite often, find grounds to invalidate the inventor's patent. These grounds only exist because the USPTO did not do their job well enough. Who has profited from this exchange? The USPTO, the competitor/infringing adversary, and the world. Who loses? The inventor. Fix the prior art search, claim interpretations, and grandfathering of patents and the need for the PTAB greatly diminishes.

When I go to file my PCT, I'll name the US as my Receiving Office (RO), but, at this time, my preferred International Search Authority (ISA), will be the European Patent Organization (EPO). If my finances are still an issue, my ISA will be the Korean Intellectual Property Office (KIPO). I feel these ISAs will produce a better search and thus a better PCT patent.

Best Regards,

Travis Creighton

☎ 🕒 hours: M – F 9:00am – 4pm EST

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From: Elizabeth Crouch
To: successact
Subject: Patent US8708166B1
Date: Wednesday, May 15, 2019 5:23:13 PM

To Whom it May Concern,

My name is Elizabeth Crouch and my patent is US8708166, known currently as The Cupcake Rack.

In 2014, I was very excited when my patent was approved...actually, I was on top of the world.

And in December 2018, I was a bit flattered when I found out that my invention had been knocked-off by an American DRTV company. After all, I had a patent, therefore I should expect to roll in the big bucks from their sales.
All that excitement came to a sudden halt when I found out that my patent would not hold up in court - it was weak and I didn't have a leg to stand on. Anybody could copy my invention and sell it, and there is not a thing I could do about it.

(My story is the featured cover story in Inventors Digest March 2019)

As a first time inventor, I did not know the ropes when my patent application was submitted. Actually, I signed it, but really didn't understand it at all.
Now, I get it. My patent application could have been challenged a bit more by my examiner, verifying and questioning some of the claims in it. That would have helped me take a better look at the information included in the application. Perhaps, then my patent would be strong enough to fight for. As for now, it's not worth paying a lawyer for a letter to the company making the replica. Even if my patent could stand up in court, there is no way I could afford to fight for it. Seriously, I don't see any way that I could win in this situation unless some changes are made at the USPTO.

The individual inventor needs to be represented by the USPTO, they need to be protected by them. I am so leery of sharing my ideas with anyone at this point. I don't even think I should apply for patents on my new ideas because it doesn't seem to matter anyway.

Solutions? Have help available for the independent inventors. We don't want to lose them, they make the world a better place!

Thank you,
Elizabeth Crouch

[redacted]

Sent from Mail for Windows 10

From: johndag@ymail.com
To: successact
Subject: SUCCESS Act Study
Date: Tuesday, June 25, 2019 3:03:52 PM

Dear Director Iancu:

As the USPTO creates a legislative recommendation in relation to women, minorities, and veterans obtaining patents, there are a number of crucial issues to consider, outside of the simple number of patents granted to the aforementioned underrepresented classes. Success is highly unlikely under the current system. Filing for a patent has become a death wish for independent inventors. Any legislative recommendation put forth by the USPTO must include reforms to the patent system that protect independent inventors, or else the lives and livelihood of the very individuals you are seeking to help will be utterly destroyed.

These comments are submitted in support of legislative and rule changes to bring some semblance of reason back to the examination of patents in view of the manner in which the USPTO destroys an alarmingly high number of the patents it grants. Corporate infringers now routinely use procedures such as IPRs and CBM reviews as methods to create confusion regarding the validity of issued patents so that they can take advantage of their huge legal and lobbying budgets to infringe patents, and particularly those held by individual inventors and small companies, with impunity. The system the corporate infringers have created has, as a practical matter, made obtaining patents a worthless endeavor to anyone without the vast resources needed to fight the endless challenges to their validity that are sure to be made by these infringers using these new procedures. The result is simple; large corporate interests can now infringe patents held by individuals and small companies with almost complete impunity-and that is exactly what they do.

1. Patent claim construction should be standardized and uniform.

Simply stated, it is inherently ridiculous to give a patent claim two different meanings depending on who is reading it. A patent claim either does or does not mean the same thing as a prior art disclosure. A patent claim either does or does not cover a product or process. It should not make any difference what venue is analyzing it. This is self-evident and is simple common sense that anyone can easily understand. The two different standards currently being used for construing claims should be standardized and uniform. The Phillips standard of using the patent description (specification) as the key guide for understanding what the claims mean is the most logical approach. Who is better suited to explain the meaning of the invention than the inventor? Just because it is theoretically possible for a claim term to have a broader meaning than "the ordinary meaning in view of the specifications", does not make such a presumption reasonable. Infringers frequently use the broader standard as an excuse to proffer far fetched claim construction theories which may be theoretically possible in a vacuum, but make little sense in view of the actual invention as

described in the patent. This is one of their favorite tricks, and it often works.That's why infringers love the broader standard. It is a great way to create confusion and they know this and capitalize on it routinely. They are always trying to confuse what is possible with what is reasonable. The broader standard helps them do this.

2. The Patent Office should not change its own Pre-Grant or Post-Grant claim construction in subsequent post-grant procedures, or consider the same prior art again after giving it special consideration and dismissing it.

Claim construction used in prior office procedures should obviously be given strong consideration in any subsequent proceeding. Furthermore, disregarding the prosecution history makes a mockery of the entire process. Why should a patent owner need to re-argue the very same issues that were successfully addressed to obtain the patent in the first place? **The current state of affairs makes double jeopardy seem like a stroke of good luck.** Where else but in the USPTO can someone have the same rights challenged and upheld two, three, four, or even 5 times, and still be at risk of having the very same deep-pocketed corporate infringer use the Patent Office as a tool to make the same challenge, based on the same prior art, yet again?

In my case, I was forced to file a second CAFC appeal (having won the first one) of yet another Patent Office ruling of invalidity based on **the very same prior art** which was:

a) pointed out twice for special consideration prior to my patents being granted,

b) denied as a basis for a reexamination because it could not meet even the low standard of raising a "substantial new question of patentability",

c) completely overcome in a total validity victory in a reexamination which resulted after the corporate challenger circumvented the denial decision (which is supposedly not appealable) by lobbying the unit director to reconsider the denial,

d) denied as a basis for a CBM review, and

e) later used by the Patent Office as the basis of invalidity in an IPR,

only to have the bizarre new claim construction they used tossed by the CAFC as being completely unreasonable. Yes, that is exactly what happened. If it sounds too ridiculous to believe, that's because it is! So how did the same IPR panel respond upon remand? They resurrected an equally ridiculous claim construction that had been rejected by the Patent Office in every procedure described above, including their own IPR, and decided that is suddenly made sense. It didn't. This time the giant corporate attack machine succeeded in resurrecting the very same issues, which had long since been resolved in my favor, resulting in my patents being invalidated using the same old prior art and discredited claim construction **which had previously been rejected by the Patent Office multiple times**. This is simply ludicrous! **Prior art which has already been given special consideration by the Patent Office should not be allowed to be used later to attack the same patents which were already**

determined to be valid over that prior art. The Patent office might just as well put up a giant sign saying "WE DON'T KNOW WHAT WE'RE DOING".

3. The Patent Office should stand behind its issued patents and not allow itself to be used as a tool for Patent owner harassment by infringers

IPRs and CBM reviews are tools created for and and used by large corporate infringers under the false flag of "Patent Reform" to make it prohibitively expensive for inventors and small companies to defend their patents against those corporate infringers. These procedures have served their corporate authors magnificently! IPRs and CBM reviews have become a "killing field" for patents, just as their creators intended. In fact, CBM reviews came into existence, under intense pressure from the bank lobby, to help the banks kill one particular group of patents that they could not defeat in court. They couldn't win under the rules, so they simply pressured Congress to change them; and that is exactly what Congress did.

The infringer lobby has made a mockery of post-grant proceedings and has made the Patent Office look ridiculous. It seems as though the Office spends more time overturning its own patent grants than it does granting patents. What other organization could operate with such inefficiency? **This is wasteful government at its worst!** When should an office determination of validity be final? The answer today is a resounding "never". How many times should the office change its own claim construction? How many times should the same giant corporation be allowed to attack the same patent with the same prior art? The answer for me has been that there is no limit. The present system is an embarrassment.

The present system affords no benefit, and no likelihood of success to women, minorities, veterans, or other independent inventors who attain patents. I strongly support legislative and rule changes to address the gross inequities in the present system which are the product of well-funded lobbyists who get the laws and rules they want regardless of how unfair and unreasonable they are. Make no mistake, the current IPR and CBM laws were not written by Congressmen, they were written by lobbyists for corporate infringers. It is high time to remedy these stunning examples of corporate excesses.

Respectfully submitted,

John D'Agostino

Sarasota, FL

SUCCESS Act Public Comment

My Name is Kip Azzoni Doyle. I am the founder and inventor of the CardShark WalletSkin®. (www.cardsharskin.com) A simple solution to a problem we never knew we had. Credit cards, ID, cash on the back of your phone in the protection of a phone case. As a female patent holder, the SUCCESS Act is not only imperative in the defense of IP protection for any of us independent inventors, but it is also equally essential in restoring the just and right patent system that the United States once held the prestigious reputation as the very best country in all the world for patent protection. This fact is because our Founding Fathers had the prescience to write THE CONSTITUTION based upon the most important rights for inventors in an effort to grow business and create jobs and wealth. With strong patent system came a willingness to share knowledge and ideas versus what has happened as a result of corrupt practices that force independent inventors to fear the fallout to their INTELLECTUAL PROPERTY, yes, PROPERTY, if they go after the wrong infringer who can pay to destroy the patent holder with deeper pockets and a system rigged in the infringers favor.

Though I support increasing the number of women, minorities, and veterans who hold patents, I consider all independent inventors to be considered a minority in their own class and right. We are a small few whether we are female, male, or any other minority. INVENTORS ARE MINORITY CLASS and it is crucial that we concurrently increase the enforceability of those patents held by minorities of women, veterans or any other class, but mostly the patents held by this minority of people called independent inventors. Patents have become liabilities for independent inventors thanks to the PTAB and lack of strong enforcement in court. If the recommended legislation does not include increased protection of patents, we will end up destroying the lives of the very individuals we intend to help.

My story: I invented a phone case that holds credit cards on the back of the case. A simple solution to everyday problem. It was back when everyone would peel down the corner of their phone case and slide their credit cards behind their phone. I did my first iteration with duct tape and a male billfold taped to the back of the phone case. Then I set about getting a utility patent. I have three patents and fight every day to protect my IP from infringers. I rarely win and must always be careful they don't IPR me. Years of battling infringers and trying to convert them into licensees has been fruitless and certainly not been worth all the money spent to get the patents in the first place. I can't live off the proceeds from my own invention, but the infringers are huge companies and their sales are very lucrative. I don't see a penny. They know they have the money to IPR me and that 96% of the time those IPRs go in the favor of the infringers who bring the cases to the PTAB. We all know it and hate the system. Woman, or minority, the independent inventors are all minority class and we get called unjust names like patent "trolls". Here are the three things that make this work impossible to monetize and unsustainable for the independent inventor:

1. Independent inventors do not often have the means to compete with big businesses. They often spend all the money they have trying to get the protection of their IP by patenting it because they feel the patent should protect their invention. Big money

that they don't have. Getting investors today is a joke, read this article PLEASE This is the report that shows venture capital running from groundbreaking ventures. https://www.usij.org/research/2018/7/9/us-startup-company-formation-and-venture-capital-funding-trends-2004-to-2017

2. Inventors do not have the money to go after infringers and sue them for infringement either willful or any other.
3. Inventors don't have the money to also at the same time, manufacture their own version of their invention BECAUSE THEY HAVE SPENT ALL THEIR MONEY CHASING POINT 1 & 2.

Given the onus is on the inventor to a) come up with invention, b) patent invention, c) defend invention , oh and d) also manufacture invention, it is inconceivable that when the inventor cannot fund all these paths at the same time, they then try to call out an infringer who turns around and calls the inventor a patent troll!!!!! ON THEIR VERY OWN IDEA. I have been called a patent troll, when I explained and then all but screamed at the big infringing company, I am NOT A PATENT TROLL, I wish I could be a practicing entity of MY VERY OWN IP, but due to deep pocked infringers like them I can't afford all avenues to pursue. I am forced into being a non-practicing entity due to the financial constraints. In another instance where a company based their entire product line ON MY IP, I sent them a cease and desist letter, and they replied by suing me back claiming the letter I sent to their jurisdiction explaining their infringement was cause for damages to their company in their jurisdiction. So I, the inventor, cannot send a cease and desist letter to a company that bases their entire product line on my patented IP and instead sues me???? The cost to defend was exorbitant. I got no relief and the case of course should have been thrown out for improper jurisdiction as a frivolous lawsuit which should have been dismissed. No such luck.

The independent inventor is a pariah of society today. We were once heralded. My last story is one that addresses the woman owned inventor plea. I was bullied by a big tough CEO of one of the largest film companies in the world. Turns out his wife's company infringes fully on my **UTILITY** Patent. I set a meeting with her for *a hashtag me too* #metoo moment. The husband barges in, slams his fist on the desk and rips up a copy of my patent in front of me, for effect, I guess. Yells at me I would rather spend all the money I have on IPR'ing you than ever paying you a dime. The wife meekly sits and tells me she thought she had done research on her design patent so it was all ok. Her design patent was a joke versus my UTILITY patent. (You are aware of the immense cost difference between one design patent versus 3 Utility patents? Did they do me a shred of good? Not a shred. And, the husband used his clout at his movie firm's $2,000 an hour law firm to threaten me. I had to walk away or be IPR'd by the bully of a man who clearly didn't let his wife do any of the negotiating or in this case pummeling of me, female, indie inventor. I will tell you how much that one alone cost me when I was forced to walk away from that losing battle: 1 million dollars! I would be IPR'd and the threat of losing all my patents because the system is corrupt was too great so I walked away.

Last point: I was a single mother living in a small one bedroom apartment in NYC and I raised my four children alone. I invented the CardShark and spent my only money I had to protect it so I could make money on a great, simple universal need. I was going to put my kids through college on this company. I haven't even made enough money off this to keep me from having to embark on several other jobs to support myself and my family. It's wrong and unfair.

Yes, we sound like victims, because we are. All of us have been forced into the victim mentality of negativity and fear for our hard-earned IP. If we had a strong patent system where the words IPR and PTAB didn't immediately mean death to all our dreams, then we could prosper and grow the economy through jobs and positive and productivity. This is completely backwards and I am sure the Founding Fathers are rolling in their graves at the state of their once beloved and world-renown regaled patent system.

Bottom Line: Trying to be a woman patent owner is also a joke. I read on some website, 9% patent holders are women. It asked me to join some forum and participate and gain traction with my patents. The banner was some click through. When they responded there was no forum. There was no support for women inventors. It was completely consistent with how I feel about the patent system for all of us minority of indie inventors. Useless and bogus. WOSB filings have done me zero good. ZERO. The USPTO is no different. As a patent holder, I consider myself in the minority of people willing to chance it all in society and take the risk all for an invention worthy to patent. So to further my minority status as a subset in this minority, that is to say that I am an inventor, and a FEMALE INVENTOR, the SUCCESS ACT is very important to me.

In answer to the 4th question posed by the USPTO, the social and private benefits to small businesses as a result of a higher number of patents obtained is nonexistent. As I and many other inventors have learned, holding a patent means nothing to large companies. The promise of a brighter future where you are able to attract investment, build a business, and support your family through patent ownerships is a lie. With such high PTAB invalidation rates, investors would be very unwise to invest in a brilliant, patented idea, so the inventor is forced to pour their own savings into the project. The USPTO's actions are directly preventing success for independent inventors. Then, if the inventor has a profitable idea, a large company will want to use it and it will be cheaper and easier for them to challenge the validity of the patent than to work out a licensing agreement. According to the 2017 AIPLA Report of the Economic Survey, the estimated mean cost of a post-grant proceeding through appeal is $450,000.00. What independent woman, minority, veteran, or member of any other unrepresented class has that kind of money? The USPTO must stop taking patents back from inventors.

On question seven, the real impact of socioeconomic disadvantage is seen when an independent inventor attempts to enforce his or her patent. Current law limits most inventors who win in court to only a "reasonable royalty", which in many cases does not cover legal fees and is too little to serve as a deterrent against large corporations with deep pockets. Few inventors, particularly the underrepresented classes being discussed through the SUCCESS Act, can afford the millions of dollars and years required to enforce their patents in court. Since taking a patent infringement case on contingency is impossible, inventors cannot get their day in court. Even after winning, the inventor gets a small percentage of the profits while the infringer keeps the rest. Infringement is a good business decision under current law. The legislative recommendation must include more severe penalties for willingly infringing on patents.

Sincerely,
Kip Azzoni

SUCCESS Act Public Comment

I am Dr Keir Finlow-Bates, founder of the blockchain startup Chainfrog Oy, which produces a product called Blockbinder. I am an independent inventor and hold 6 US patents with about another 24 applications pending, which I finance and prosecute myself.

As an independent inventor I see the SUCCESS Act as an important milestone in patent legislation in the US, mainly by drawing attention to greater underlying issues with the US patent system as a whole.

Although the focus of the SUCCESS Act is on improving the obtaining of patents by underrepresented classes, as an independent inventor I strongly believe that any action that benefits any subgroup of "small players" in the patent space will have a knock-on effect for other lone inventors. In particular, it is my hope that the SUCCESS Act will lead to a reduction in the powers of the PTAB, which has frequently been described as a "death squad for patents owned by small entities".

I have yet to face an attempt by a large company to invalidate any of my patents, but I believe this is just a matter of time – the technology area that I innovate in, blockchain, is still new, but when larger technology companies start profiting from blockchain and infringing my granted patents, I expect that their first response will quite possibly be to file IPR petitions. Quite frankly, I am dreading the day that the first PTAB IPR petition arrives on my doorstep.

The Request for Comments poses the following interesting question: "*What social and private benefits to small businesses owned by women, minorities, and veterans would you identify as resulting from increasing the number of patents applied for and obtained by those businesses?*"

None. It would be a liability to them.

Encouraging women, minorities and veterans to obtain patents under the current system is to encourage them to take great financial risks with a low chance of any reward. The patent granting process is already fraught with cost and risk, however this risk is understandable and quantifiable – patents should be granted on genuine innovation.

However the subsequent risk of, after having paid and worked to obtain a patent reviewed by a qualified patent examiner, only to have struck down arbitrarily by the PTAB at the whim of a large financially rich corporate entity unwilling to pay the lawful royalties that the patent is supposed to award the inventor, is too great.

The PTAB IPR system needs to be overhauled to redress the balance in favor of the individual inventor. That was the whole point of the "patent deal" between inventor and state, and this crucial aspect has been lost.

As an independent inventor I sometimes wonder why I have put myself through the process – however, inventing is in my blood. True inventors have to invent, just as true writers have to

write. Writers are lucky – the PTAB doesn't take their novels off them, or demand they hand the copyright over to the big players.

Sincerely,

/Keir Finlow-Bates/
Keir Finlow-Bates, MA (Cantab), PhD (LSBU)
25 June, 2019
Urjala, Finland

From: Curt Flowers
To: successact
Subject: Patents
Date: Thursday, June 20, 2019 3:42:38 PM

I truly believe that we are slowing down progress by making easier for big companies to monopolize on someone else's invention by simply outspending and exhausting the small inventors resources in court litigation. This country was build on many one persons idea, which transformed this nation to what it is today. If we don't bring back protections for the little guy I'm afraid so many people will sit on their dreams and not make it a reality, which in turn will tear down one of the many foundation blocks that use to make this country great.

Sent from my iPhone

Written Testimony of
JEFF HARDIN & PATRICIA DURAN

Before the
UNITED STATES PATENT & TRADEMARK OFFICE
(USPTO)

Pursuant to the
Study of Underrepresented Classes
Chasing Engineering and Science Success
(SUCCESS) Act of 2018

Submitted on
June 30, 2019

Coupling Equal Opportunity with Equal Outcome:

The Necessary Two-Pronged Approach for Promoting the Participation of Underrepresented Classes both in Entrepreneurship and in the Pursuit of the U.S. Patent Bargain

by

Jeff Hardin
Pro Se Inventor, Business Owner & Entrepreneur
Affiliations:
Houston Inventors Association
Young Inventors Showcase

Patricia Duran
MBA, AMLCA, Inventor & Entrepreneur

"The SUCCESS Act instructed the USPTO to ... report to Congress on recommendations for promoting the participation of women, minorities, and veterans both in entrepreneurship and in applying and obtaining patents. ***I look forward to receiving that report and its recommendations.****"*

— U.S. Representative Martha Roby
March 27, 2019, House Judiciary Committee Hearing,
Lost Einsteins: Lack of Diversity in Patent Inventorship and the Impact of America's Innovation Economy

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Prologue

On May 8, 2019, I, Jeff Hardin, and my wife, Patricia Duran, provided oral testimony at the USPTO in one of three hearings for public comments pursuant to the SUCCESS Act.[1,2]

My wife began her testimony noting her status as a minority, while providing her testimony in Spanish with me translating.[3] Her speech questioned the benefit of a patent if one is not able to defend it, and she provided rationale to expand the definition of the underrepresented class as defined by the SUCCESS Act to additionally include the class of independent inventors and small businesses owned by those inventors. Note that it is this expanded definition I will use for "underrepresented" in this written testimony throughout. She then shared her personal story of battling cancer and misdiagnosis, showing the need for continued innovation in the field of diagnosis methods.

I followed my wife's lead, providing legislative recommendations for the USPTO to provide Congress pursuant to the SUCCESS Act. The first legislative recommendation addressed diagnosis methods via Section 101 reform that would also serve to augment the number of women who apply for patents. In the second legislative recommendation, I first identified the problem of the underrepresented class of patent holders that was created by the America Invents Act (AIA)[4] and recent Supreme Court cases. I posed a key question at the heart of the issue that both the USPTO and Congress must realize:

How do we provide equal outcome so that equal opportunity even presents an incentive worth pursuing?

I then provided a legislative solution to address that problem, restoring patent rights for the underrepresented class of inventors.

My oral testimony I provided on May 8 served to provide only one part of what I consider a two-pronged approach to the task the USPTO has before it in lieu of providing legislative recommendations to Congress pursuant to the Act. In this written testimony, I summarize my oral testimony while completing the two-pronged approach: coupling equal opportunity with equal outcome.

Furthermore, following the oral testimony on May 8, I have met with various members of Congress, including those of the House Judiciary Subcommittee on Courts, IP, and the Internet, discussing legislation strategies in pursuit of this two-pronged approach: providing equal opportunity to underrepresented classes as well as equal outcome to the underrepresented patent holder.

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[1] https://www.uspto.gov/about-us/events/provide-comments-first-public-hearing-success-act
[2] https://www.youtube.com/watch?v=2fF7d9i0Km4
[3] See Attachment 2.
[4] 35 U.S.C. § 100 (2012) (Leahy-Smith America Invents Act (AIA) of 2011).

Executive Summary

One thing at stake in the pursuit to increase entrepreneurship and patenting among underrepresented classes is providing a system of equal opportunity for the future innovators of America. By working to address the gap in the number of patents applied for and obtained by underrepresented classes, the United States seeks to maximum the innovative potential of the American people, promoting the United States leadership in the global economy.

The primary advantage of patenting is that it is rooted in meritocracy. The U.S. Patent System was designed at the outset to be the true anti-monopoly and equal opportunity engine, as innovation, effort, and achievement supersede any demographic or financial factors possessed by an inventor. For this reason, today there is still no requirement for the USPTO to collect information regarding race, gender, age, or any financial information from an inventor so that an examiner can proceed with examination on the merits of an inventor's application for a patent grant.

This meritocracy makes the patent system available and open to anyone. Thus, by emphasizing programs that provide education on and exposure to inventing and entrepreneurship for all peoples, while encouraging healthy competition and the sharing of ideas, the United States can foster innovation amongst its citizens and even to those beyond her borders with no limit on its potential.

Most importantly, however, is that the pursuit of equal opportunity must coincide with the pursuit of equal outcome. Therefore, additionally at stake in this pursuit is providing a system of protection for patent holders, particularly those inventors in the underrepresented class. It goes without saying that without one's ability to utilize or enforce a U.S.-granted patent once received, regardless of the patent holders' financial state, the incentive to pursue even entering the patent bargain with the United States government becomes lost.

Unfortunately, as a result of the AIA of 2011 and various court decisions over the past two decades, the ability for a patent holder to utilize or enforce a granted patent issued by the United States government today has plummeted. The result to the American economy is that the "reliability" of an issued patent that once existed now has become a meaningless asset for investment. Only until after a patent undergoes the gauntlet of post grant review proceedings can a patent be said to have any value for investment, and yet, even if this patent is fortunate enough to survive a post grant review, the "reliability" is never fully settled due to being subject to gang tackling, serial attacks, and business models such as those that use surrogates to challenge patents without having time bar limitations. Moreover, the exorbitant costs in defending patent challenges at the Patent Office are at the expense of the patent holder, serving as a major deterrent in why one should pursue a patent. In fact, for the inventor who holds a patent of value in the market but who cannot afford representation for a post grant review proceeding challenge, ironically possessing such a patent today has become a risk, as anyone can challenge the patent, despite that it has already been vetted by expert examiners in the field, and can drag the inventor into a costly proceeding. This ironically defeats the intent of Patent Clause to promote and encourage innovation.

Thus, the pursuit of equal opportunity for the underrepresented inventor must coincide with correcting equal outcome in the inventor's ability to enforce and utilize a granted patent on issuance, regardless of the inventor's financial state. Accordingly, the AIA "second look experiment" that was created by Congress to address a patent trolling narrative preached by entities who would prefer to infringe an issued patent rather than license it must be revisited. The Honorable Andrei Iancu, Under Secretary of Commerce for Intellectual Property and Director of the United States Patent and Trademark Office, warned in a speech in 2018 that "we have over-corrected and risk throwing out the baby with the bathwater. This must now end, and we must restore balance to our system."[5] We submit that this baby is the underrepresented inventor and show that it has already been thrown out. Fortunately, our laws are by the People, and our elected Congress itself is seeking solutions. Today, they are asking the Patent Office for legislative recommendations. This written testimony includes legislative proposals for the Patent Office to recommend to Congress.

The testimonies provided by my wife and me serve to provide solutions to both prongs—equal opportunity and equal outcome—in the required two-pronged approach to adequately promote the participation of underrepresented classes both in entrepreneurship and in the pursuit of the U.S. patent bargain.

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[5] https://www.ipwatchdog.com/2018/10/19/iancu-risk-takers-patent-troll-narrative-orwellian-doublespeak/id=102474/

Written Statement

I. Introduction

By way of introduction, I am a self-made entrepreneur, software developer, and inventor. I currently oversee an information technology consulting firm I co-founded in 2002, and, over the course of the last decade, I have developed and pursued patents for inventions related to software, cloud, and mobile device platform technologies on a *Pro Se* basis, resulting in 7 patent grants with others pending. I am an active member of the Houston Inventors Association, have advised judges at the Young Inventors Showcase of Houston, and sit on the advisory board for the Inventor Rights Coalition. Additionally, I have been invited to Washington, D.C. multiple times to meet with members of Congress and IP subcommittee counsel as a result of my recent efforts supporting independent inventors and patent rights.

My wife, Patricia Duran, has over ten years of experience in the areas of compliance, operational risk management, and anti-money laundering, having vast work experience throughout Latin America. Prior to moving to the United States, Patricia served as independent advisor to the vice presidency of the 2nd largest bank in the Dominican Republic, while additionally serving in the capacities of anti-money laundering department lead, compliance analyst, and spokeswoman for the institution. Patricia has elected to keep her innovations, particularly those related to payment systems, as trade secrets due to the state of the U.S. Patent System, which goes against the American spirit of promoting the Useful Arts by public disclosure.

Patricia and I first met when I served as an ambassador to the Dominican Republic as part of Rotary International's Group Study Exchange program. We married 15 months later and will celebrate 10 years of marriage this year. We have two children, ages three and four years.

A major turning point occurred in our lives between the months of February to May in 2016, as each of these events happened in sequence: Patricia underwent a C-section; my father received a lung transplant and was under recovery; my mother became bedridden with a crushed vertebrae, pelvis, and hand from a falling accident; Patricia's mother suffered a heart attack and contracted sepsis while in the hospital; and Patricia was then diagnosed with breast cancer, requiring mastectomy, chemotherapy, and radiation. Trying to manage this with an 18-month old and infant was when our plans came to a complete halt; the only thing that mattered was survival.

Adding insult to injury, Patricia suffered misdiagnosis during her treatment, resulting in irrecoverable surgical failures. To me, this demands innovation, yet all the while, I watched at a distance while my existing patent rights began to fade away due to Supreme Court decisions and the effects of Congressional policy. This was when I decided to take an active stance as a citizen and patent holder, addressing and speaking with U.S. government leaders regarding patent rights.

Ms. Duran and I do not speak for any other company or entity or colleague. Our views are strictly independent of others' opinions on policy, and we have not discussed our testimony with any companies or entities before submission, except that between ourselves.

II. Underrepresentation in Outcome

> "Thanks to the passage of the SUCCESS Act, the USPTO is following up on this report with further research on underrepresentation... *Fully understanding the contours of underrepresentation is an important step in designing policy* that can ensure that as a nation we are not leaving potential inventors behind and groundbreaking innovations undiscovered."
>
> — U.S. Representative Hank Johnson, Chair of the U.S. House Subcommittee on Courts, Intellectual Property, and the Internet[6,7]

On May 9, 2019, the day after I provided oral testimony at the USPTO, I attended the Oversight of the U.S. Patent and Trademark Office hearing by the U.S. House Subcommittee on Courts, Intellectual Property, and the Internet, where I heard Representative Hank Johnson speak those very words above. My comments here seek to provide the USPTO a fuller understanding how there is underrepresentation in outcome among independent inventors who hold patents.

The Honorable Andrei Iancu, Director of the USPTO, sat as witness to the USPTO Oversight hearing. Laura Peter, Deputy Under Secretary of Commerce for Intellectual Property and Deputy Director of the USPTO, was present with Director Iancu. Ms. Peter spoke the previous day at the first of three hearings for public comments pursuant to the USPTO's study on SUCCESS Act, where my family was also present, and my wife and I spoke. So, following the USPTO Oversight hearing, I found it appropriate to introduce myself to Ms. Peter, where I thanked her for allowing my wife and me the opportunity to provide our testimonies. In this conversation with Ms. Peter, I expressed my concerns with post grant review proceedings and my preference towards an Article III court, to which Ms. Peter asked: "What can you *not* get at the PTAB that you *can* get in an Article III court?"

It's a simple question, really, and in fact, I was asked this question earlier in the week in a meeting with a staff member of the House Judiciary Subcommittee on Courts, IP, and the Internet, and he indeed saw my point. As such, I elected to address this question and make it part of my oral testimony I provided to the USPTO on May 8. Simply put, using this question as justification for post grant review proceedings alone incorrectly focuses on the ends and not the means, falling victim to the fallacy of expediency,

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[6] https://judiciary.house.gov/legislation/hearings/oversight-us-patent-and-trademark-office
[7] https://www.youtube.com/watch?v=Y-XyuoRZ_Fs

defined as "ignoring every aspect of a means other than its capacity to achieve a desired end." In other words, it doesn't matter how we get there; just as long as we got there.

In fact, in his dissent in *Oil States Energy Services, LLC v. Greene's Energy Group, LLC*[8], Supreme Court Justice Gorsuch emphasized the problem of expediency in the AIA:

> Today, the government invites us to retreat from the promise of judicial independence. Until recently, most everyone considered an issued patent a personal right—no less than a home or farm—that the federal government could revoke only with the concurrence of independent judges. But in the statute before us Congress has tapped an executive agency, the Patent Trial and Appeal Board, for the job. Supporters say this is a good thing because the Patent Office issues too many low quality patents; allowing a subdivision of that office to clean up problems after the fact, they assure us, promises an efficient solution. And, no doubt, dispensing with constitutionally prescribed procedures is often expedient. Whether it is the guarantee of a warrant before a search, a jury trial before a conviction—or, yes, a judicial hearing before a property interest is stripped away—the Constitution's constraints can slow things down. ... No doubt this efficient scheme is well intended. But can there be any doubt that it also represents a retreat from the promise of judicial independence? Or that when an independent Judiciary gives ground to bureaucrats in the adjudication of cases, the losers will often prove the unpopular and vulnerable? Powerful interests are capable of amassing armies of lobbyists and lawyers to influence (and even capture) politically accountable bureaucracies. But what about everyone else?

In answering the very question in my May 8 speech that was subsequently posed by Ms. Peter, I identified but ignored addressing the many differences impacting all stakeholders facing a validity challenge, some of those being the very things Justice Gorsuch expressed as concerning: not having a stacked panel, the benefits of having an impartial judge, a jury, full discovery, a presumption of validity, etc. Rather, I focused on the single difference that matters most to the underrepresented class, and I summarized it in one word: *Representation*. In fact, the very word "representation" is at the root of "underrepresented", which is very thing Congress is trying to address in their Study of *Underrepresented* Classes Chasing Engineering and Science Success (SUCCESS) Act.

I provided how this very thing—representation—is where the imbalance lies between the represented and underrepresented classes that Congress unintentionally created with the AIA. Without it, no underrepresented inventor can even make it on the field to play the sport, and none of the other concerns even matter.

I emphasized that no patent practitioner or attorney will take a PTAB challenge on a contingency arrangement, as there are no monetary damages on the prospect of success at the PTAB. This cost is on the inventor's dime. As a result of the AIA, just trying to reach the same state of reliance that previously

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[8] 138 S. Ct. 1365 (2018).

existed on the day a patent was granted before the AIA went into effect is now the financial burden of the patent holder, and these extra costs are post grant and after issuance—costs that are not anticipated by an inventor, as the patent has already been vigorously vetted by expert examiners at the USPTO.

As an aside, what I did not mention in my speech due to time constraints is the fact that no inventor holding a patent having a priority date *before* the AIA went into effect ever agreed to this new AIA-created patent bargain with the government when she disclosed her invention to the government and the public. As such, earlier this year in March, I drove to Austin, Texas so I could witness a fireside chat with USPTO Director Iancu as guest at SxSW[9], hoping for an opportunity to arise during a potential Q&A so that I could ask the Director if he found it fair that no inventor who entered into the patent bargain and disclosed her invention to the public prior to the AIA subscribed to the substantial rule changes that were retroactively applied by the AIA to patents having priority dates that predated the law. I did in fact get that opportunity and asked that question, and I reminded Director Iancu that he has the power to deny institution of an IPR, and I asked whether he would consider first his oath to defend and support the Constitution— in which the Takings, Due Process, and Ex Post Facto Clauses are immediately present—as a way to protect the patent grant on which the inventors who never entered into the AIA "patent bargain" so dearly rely.

Director Iancu's response was that a) *Oil States* did not address the issue of retroactivity, b) this issue was currently being litigated so he could not speak on it, and c) that as an agency, the USPTO must execute the law that is on the books. I did meet Director Iancu afterwards and thanked him for taking my question. However, others in the crowd told me he didn't answer it, and given that the power to deny institution of an IPR does indeed reside with the Director, and under 35 U.S.C. § 326(b), "in prescribing regulations under this section, the Director shall consider the effect of any such regulation on the economy [and] the integrity of the patent system," perhaps they were correct. Does changing the patent bargain during the term of the social contract provide reliance to the economy? Does changing the patent bargain during the term of the social contract exhibit or uphold integrity in the patent system?

Now, regarding these newly introduced costs to patent holders, I provided in my May 8 oral testimony that, per the *2017 AIPLA Report of the Economic Survey*[10], the estimated mean cost of a post-grant proceeding through appeal runs at $450,000.00. I showed that this is how much it costs a patent holder for a single post grant proceeding, let alone the problems of gang tackling, parties of interest and privies, conflicts of interest with APJs, serial attacks, and a surrogate-type business model to skirt time bar limitations. Add to that the institution and kill rate statistics on patents challenged at the PTAB, and an underrepresented patent holder has a bleak picture if she desires to utilize her patents and ends up in that tribunal.

So, in other words, if an underrepresented inventor holding a granted patent doesn't have just shy of half a million dollars to spare for a single patent challenge at the USPTO, she will not find

[9] https://www.ipwatchdog.com/2019/03/20/cta-preaches-patent-troll-fairy-tale-chat-iancu-sxsw/id=107539/
[10] https://www.aipla.org/detail/journal-issue/economic-survey-2017

representation if she ever wants to license her patent and someone does the math and challenges it, or if she wants to protect her patent when someone else steals her invention. Is this a fair shake?

This very reality makes the case that a patent does not give underrepresented inventors any reliable benefit, but rather, it gives them an increased risk of receiving a costly validity challenge. Hence, with today's U.S. patent system, the question that arises if the government were to encourage underrepresented groups to get more patents is not "What are you doing for them?", but "What are you getting them into?" It goes without saying that as a result, organizations such as US Inventor now resort to advising their members to keep their inventions trade secrets and not to disclose them to the U.S. government and the public in pursuit of a U.S. patent, lest their inventions easily be disclosed to, and stolen by, the public. The very statute Congress created ironically goes *against* the intent behind the Patent Clause of the Constitution.

This alone is not the only threat to innovation for those hoping that a granted patent will give their invention the protection it needs so they can climb the ladder of success. Recent Supreme Court decisions have also damaged the underrepresented inventor in their pursuit of innovation and entrepreneurship.

The previously mentioned *Oil States*[11] case re-emphasized that a patent is no longer a private property right, but a public franchise. The Court majority did conclude that it is the prerogative of Congress to create such a patent system in the name of "efficiency", but this does not mean that this provides the best patent system for the underrepresented, nor did the Court put their stamp of approval on that as the best system. In fact, it is evident Congress is aware of this, as in this very SUCCESS Act, Congress is seeking legislative recommendations to help serve underrepresented classes. Evidence of the Supreme Court's disapproval is seen throughout the *Oil States* oral argument[12], as many justices expressed their concerns that the same branch of government who gives can also take away, and that the process and rules changed dramatically. As further evidence of their discomfort in what the AIA created, Supreme Court Justice Sotomayor said later in the oral argument of *Return Mail, Inc. v. Postal Service*[13] (2019):

> It does seem like the deck is stacked against a private citizen who is dragged into these proceedings. They've got an executive agency acting as judge, with an executive director who can pick the judges, who can substitute judges, can reexamine what those judges say, and change the ruling...

What is important to note is that Justice Sotomayor did *not* say that the deck is stacked against a woman or a minority or a veteran. She said, "private citizen", reinforcing the concept that the patent system is designed as a meritocracy, as previously explained.

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[11] 138 S. Ct. 1365 (2018).
[12] https://www.supremecourt.gov/oral_arguments/argument_transcripts/2017/16-712_7kh7.pdf
[13] https://www.supremecourt.gov/oral_arguments/argument_transcripts/2018/17-1594_1an2.pdf

Another Supreme Court case to the detriment of inventors is *TC Heartland LLC v. Kraft Foods Group Brands LLC*[14], where residency was defined as the state of incorporation for a company. This means that inventors wishing to enforce their rights against an infringer must halt their inventing, leave their labs, and traverse the United States to district courts in states where infringers are incorporated or where they performed acts of infringement. Not only does this present another financial burden toward the underrepresented inventor, but this yanks her out of her lab and garage where she is performing her best innovative work and forces her to travel to distant courts across the United States in an effort to enforce her granted patent rights.

Furthermore, the Supreme Court in *eBay Inc. v. MercExchange, L.L.C.*[15] makes the very text on the face of every printed patent a false promise, as the "person(s) having title to [a] patent" does *not* have "the right to exclude others from making, using, offering for sale, or selling the invention throughout the United States of America or importing the invention in to the United States of America" against larger companies. So, for example, if an inventor invents a better way to ship products and obtains a patent for it, and suppose a company like Amazon decides it wants to take the patented invention and use it, it can do exactly that, and the inventor is compelled to license the patent at a price determined by a court, nevermind, if she wants to be the exclusive entity to utilize the patent and bring competition to the market.

Each of these issues—the *America Invents Act* and how it created the underrepresented inventor; *TC Heartland* and the loss of a convenient venue for the underrepresented inventor; *eBay* and the loss of the exclusive right, stripping the ability for inventors to compete—represent real challenges in the plight of today's inventor. Consequently, independent inventors and small businesses owned by those inventors can no longer expect a granted United States patent will protect their innovations and allow them to compete in the marketplace against larger, financially-abled entities. This is because an independent inventor becomes underrepresented the very minute she receives her patent grant. There is no equal outcome.

III. The Golden Standard Program Without a Diversity Gap

Notwithstanding the difficulties in equal outcome for the underrepresented inventor, we must recognize research received by the U.S. House Subcommittee on Courts, Intellectual Property, and the Internet. As Chair of the Subcommittee and U.S. Representative Hank Johnson stated on May 9 at the aforementioned USPTO Oversight hearing, "[W]e are falling behind in [creating and encouraging the next

[14] 137 S. Ct. 1514 (2017).
[15] 126 S. Ct. 1837 (2006).

generation of innovators] because our patent system demonstrates a lack of diversity in who is getting patents."[16,17]

Turning to Chair of the Judiciary Committee and U.S. Representative Jerrold Nadler's statement in the hearing "Lost Einsteins: Lack of Diversity in Patent Inventorship and the Impact of America's Innovation Economy", held on March 27, 2019, we learn:

> With so much of our economy dependent on IP-related industries, it is critical that everyone share the economic opportunities these industries offer. Promoting greater inclusion in the innovation ecosystem is good for our economy, good for underserved communities, and good for all Americans. Unfortunately, research shows that many segments of our society continue to be underrepresented as inventors on patents.
>
> The USPTO's recent report on gender diversity finds that women are very much underrepresented as patent holders. Analyzing data on U.S. patents granted between 1976 and 2016, the report shows that women comprised only 12% of the named inventors on patents in 2016, representing an increase of only 2% over the last 16 years. Clearly, whatever progress is being made is happening far too slowly, and much needs to be done to promote greater gender diversity among inventors. Moreover, the USPTO's research shows that the underrepresentation in patenting is not solely a function of women entering science and engineering fields at lower rates than men, although that continues to be a problem. In 2015, women comprise nearly 28% of the total science and engineering workforce, but only 12% of inventors'-granted patents. Even where women are in the fields most associated with patenting, they are not patenting at the same rate as their male colleagues. This shows that the gender gap in patenting is likely to be caused by many factors, not just because there are fewer women scientists and engineers.
>
> Unfortunately, because the USPTO does not collect demographic data on inventors, it has been more challenging to study racial and ethnic diversity among U.S. inventors. Nonetheless, the studies that have been done also show significant disparities in patenting rates along racial and ethnic lines.
>
> I hope to learn more from the witnesses about how we can improve data collection on this issue, and learn more about the causes of these disparities, since *the first step towards solving the problem is understanding its scope and root causes*. For example, *one study found that exposure to innovation during childhood has a major impact on an individual's desire to become an inventor*, and a child's likelihood to becoming an inventor increases if he or she grows up in one of our country's technology hubs. I am proud that New York City,

[16] https://judiciary.house.gov/legislation/hearings/oversight-us-patent-and-trademark-office
[17] https://www.youtube.com/watch?v=Y-XyuoRZ_Fs

> where my District is located, counts as one of these hubs, and *I hope we can figure out how to replicate this sort of inventive environment elsewhere throughout the United States*.[18,19]

In fact, this study—"Who Becomes an Inventor in America? The Importance of Exposure to Innovation"—presents new evidence on the factors that determine who becomes an inventor. It states:

> Most previous work on innovation has focused on factors such as financial incentives, barriers to entry, and STEM education. *Our results point to a different channel – exposure to innovation during childhood – as a critical factor that determines who becomes an inventor*. A lack of exposure to innovation can help explain why talented children in low-income families, minorities, and women are significantly less likely to become inventors. Importantly, such lack of exposure may screen out not just marginal inventors but the "Einsteins" who produce innovations that have the greatest impacts on society. Policies that increase exposure therefore have the capacity to greatly increase quality-weighted aggregate innovation.[20]

Accordingly, and in line with the sentiments of Representative Nadler, I find it prudent to identify and focus on a program that a) showcases this type of exposure to innovation during childhood, b) is successful in encouraging inventing and entrepreneurship, c) has evidence of lacking a gap in diversity, and d) has replicative power. In fact, I have personal experience with such a program. Accordingly, I would like to introduce the USPTO to the *Young Inventors Showcase*, a project and competition of which I was asked to be a judge this year. I personally know the founder of the showcase, Greg Micek, and I strongly advocate *this program as the very program that should be replicated throughout the United States*.

Interestingly, the Young Inventors Showcase actually spawned indirectly from USPTO activities in Houston, Texas, where the concept for an inventors' association originated. In 1983, the USPTO, pursuant to the Small Business Innovation Development Act of 1982, co-sponsored the University of Houston's Hilton Hotel conference, where more than four hundred attendees were present. The Patent Office specifically requested that an inventors program be started in Houston, and Houston businessman and attorney Greg Micek accepted the mandate. During the next two years, Mr. Micek helped maintain a productive relationship with the USPTO and the University, volunteering the use of his offices for dozens of monthly meetings for local inventors, resulting in the formation of the Houston Inventors Association (HIA)—a Texas non-profit organization. The HIA's mission is to provide education, technical assistance, and support to creative thinkers in the greater Houston area and across the nation. From the beginning, the founders acknowledged the need for high quality educational information for members and the public at large, as well as a priority for outreach to children.

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[18] https://judiciary.house.gov/legislation/hearings/lost-einsteins-lack-diversity-patent-inventorship-and-impact-america-s

[19] https://www.youtube.com/watch?v=CCOeRO2NBCw

[20] Bell, A.M., R. Chetty, X. Jaravel, N. Petkova, and J.V. Reenen, 2017. "Who Becomes an Inventor in America? The Importance of Exposure to Innovation". National Bureau of Economic Research Working Paper No. 24062. https://doi.org/10.3386/w24062

Shortly thereafter, the Young Inventors Club was started as a subordinate project that reported to the HIA Board and operated under the HIA's 501(c)(3) sanction, and in 2002, the non-profit project grew into its own organization—the Young Inventors Association of America (YIAA).

The Young Inventors Showcase is an annual competition held by the YIAA, and it excels in encouraging and fostering innovation among today's youth and their families. The competition requires that participants identify a problem to solve, solve it, describe and/or demonstrate the solution, and name the invention. Participants learn valuable problem-solving, expression, and presentation skills that they will carry for a lifetime. Meanwhile, while the participants are presenting their skills to the judges, the families of the participants attend sessions in a separate meeting space on entrepreneurship and how to start a family business, including seeking protection via copyrights, trademarks, and patents.

Furthermore, the competition features two categories for winners that tie directly into USPTO activities—"The Most Patentable Invention" and "The Best Trademarkable Name". Also, unique to the Young Inventors Showcase this year, a volunteer patent attorney judged and researched the USPTO database for these categories live during the competition, and the elected winners for these categories receive prosecution and filing fees with the attorney pro bono as part of their prize. I asked this attorney what his motivation was in doing this, and what he told me was astonishing. He shared a story of how when he was in elementary school as a child, his teacher took him into the hallway and told him that he was incredibly gifted, and that he scored at genius levels. He said, "Whether this was true or not, it didn't matter. From that point on, I knew I was intelligent and different, and my life as a result shot upward in a magnificent trajectory that wouldn't have happened otherwise. Look at these kids here. Just the fact that these kids made it here to the finals. They invented something, and they are told they are inventors and they are intelligent. And someone believed in them. Because of that, they have already won in life. It is for this reason I do what I do."

Moreover, the competition clearly demonstrates how innovation is the natural diversity engine. This past competition, over 700 participants entered the competition, and of the seven elected winners, three were female, and three of the four male winners were minorities. As I took a photo of these winners with my smartphone, I was literally in tears as an inner voice deep inside whispered, "And this why you do what *you* do. This is who you are fighting for."

If exposure to innovation during childhood is indeed a critical factor that determines who becomes an inventor, and, given that the Young Inventors Showcase is clearly a program where there is no diversity gap and also sets the next generation of winners on a trajectory of success, the government getting behind programs such as this should be paramount.

As such, I would be happy to meet with the USPTO and Congressional leaders to discuss this program in more detail and how it may be expanded throughout the United States. Furthermore, I have recently spoken with Mr. Micek, and he has also expressed a willingness to meet as well. The Young Inventors Showcase presents the golden standard model of which the USPTO can report to Congress, and with proper government backing and nationwide replication, this very program and policy could close the diversity gap with underrepresented classes when it comes to equal opportunity in the pursuit

of entrepreneurship and the U.S. patent bargain. As the cited study states: "If women, minorities, and children from low-income families were to invent at the same rate as white men from high-income families, there would be four times as many inventors in America as there are today."[21]

IV. Congress & Simultaneous Pursuit: Equal Opportunity + Equal Outcome

At the May 9 USPTO Oversight Hearing, Representative Doug Collins, expressed concern regarding outcome via the USPTO's implementation of IPR proceedings:

> Another area of the patent system that requires our attention is the USPTO's implementation of the [] IPR proceedings. ... [Many] argue that the PTO has implemented countless rules skewed against patent owners that result in good patents being struck down in bad IPR decisions. I have heard numerous reports that defendants in litigation are filing multiple similar attacks on the same patent or are using surrogates to skirt prohibitions to repeat attacks. I've also learned that since, in instance, where small businesses sought to assert their patents in federal court to stop the theft of their valuable IP from those thieves, are instead forced to defend themselves their patents before the PTAB, which issued a questionable decision invalidating the patents. Fortunately, some of these small innovative companies could afford to appeal the PTAB's final decision and have their patents restored by the Federal Circuit. But this demonstrates the PTAB proceedings may be used by well-funded companies to harass small businesses in submission. The cost for appealing a bad PTAB decision may be too much for small businesses to bear, resulting in their loss of their patents, innovations, and business at the hands of an unscrupulous copycat. Again, the very thing that we're trying to avoid, we're actually seemingly incentivizing. That's something that we need to look at.[22,23]

Recognizing these matters within the state of the U.S. Patent System, my wife Patricia Duran stated the following in her oral testimony on May 8 at the USPTO:

> [A]lthough pursuing equal opportunity with women, minorities, and veterans in obtaining a patent is a valuable effort, *if it does not coincide with equal outcome in one's ability to utilize the patent once received*, regardless of the person's financial state, telling women,

[21] *Id.* at 34.
[22] https://judiciary.house.gov/legislation/hearings/oversight-us-patent-and-trademark-office
[23] https://www.youtube.com/watch?v=Y-XyuoRZ_Fs

> minorities, and veterans that they stand to benefit from a patent will simply be false doctrine.[24]

Indeed, our current system does not provide equal outcome for an underrepresented inventor once she receives the patent grant. Therefore, if the government wants to encourage the pursuit of more patents among the underrepresented, there needs to exist a worthy incentive in terms of outcome. However, the imbalance in outcome between the underrepresented inventor and the financially-represented business today negates that incentive. So, there must be a simultaneous pursuit towards creating both equal opportunity and creating equal outcome in one's ability to defend a patent once it is issued.

As previously stated, Congress has expressed that they desire to *fully* understand underrepresentation in the U.S. patent system, in terms of equal opportunity as well as equal outcome. In fact, immediately following Representative Johnson statement at the May 9 USPTO Oversight Hearing on this desire, he immediately then directed his concern to the reliability in the resulting patent grant:

> A strong patent system requires clear rules, which lead to *reliable patent grants* that attract the investment needed to turn a patentable invention or innovation into a marketable product or service.[25]

Additionally, Congresswoman Sheila Jackson Lee has expressed explicit interest in the stakeholder feedback that the Patent Office has received from the public as part of its SUCCESS Act study. Recall, in my oral testimony on May 8, I quoted Congresswoman Jackson Lee by looking back to the 2011 Congressional Record where she added her sense of Congress amendment during the debate on the floor. Even then, she expressed great concern on how changes to patent law would affect inventors and small business and their patent rights:

> My amendment speaks ... to the vast population of startups and small businesses that are impacted by this legislation. ... This sense of Congress will put us on notice that we need to be careful that we allow at least the opportunity for [] investors, and that we continue to look at the bill to ensure that it responds to this opportunity. ... [M]y amendment also reinforces that we do not wish to engage in any undue taking of property... Small businesses should be as comfortable with going to the Patent Office as our large businesses. ... We must always be mindful of the importance of ensuring that small companies have the same opportunities to innovate and have their inventions patented and that the laws will continue to protect their valuable intellectual property. ... [W]ithout strong patent protection, businesses will lack the incentive to attract customers and contribute to economic growth.[26]

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[24] https://www.youtube.com/watch?v=2fF7d9i0Km4 (See also Attachment 2.)
[25] https://judiciary.house.gov/legislation/hearings/oversight-us-patent-and-trademark-office
[26] https://www.congress.gov/congressional-record/2011/06/23/house-section/article/H4480-1

In my testimony on May 8, I asked, "What happened to those investors the Congresswoman mentioned?" I then explained that according to a report from the Alliance for U.S. Startups & Inventors for Jobs (USIJ), in strategic sectors where patent protections are key, venture capital funding has dropped from being 20.95% of total VC funding in 2004 to a mere 3.22% in 2017.[27] "The VC money is gone," I said. I then declared that "now is the time to look at that bill and its consequences—not to lawyers, not to big business, but to the true stakeholders: the American Inventors".[28] So, very fittingly, Congresswoman Jackson Lee today still maintains her interest in looking at the AIA's consequences and its affect to the underrepresented, as she submitted Questions for the Record[29] for the USPTO following the May 9 USPTO Oversight Hearing – questions inquiring about stakeholder feedback, such as:

- Have stakeholders who have provided testimony pursuant to the SUCCESS Act identified any other people(s) as being underrepresented?
- Has the USPTO received stakeholder feedback expressing concern on an underrepresented inventor's ability to financially enforce her patent rights?
- What legislative recommendations has the USPTO received from stakeholders that would increase the incentive for underrepresented classes to apply for and obtain more patents, and does equal outcome with respect to a patent holder's financial ability to enforce their rights against well-funded companies play a part?
- Given that contingency law firms rely on damages to recoup their investment, and in the case of the PTAB, there is no monetary compensation for prevailing patent holders, have stakeholders expressed concern whether the underrepresented classes have the financial means to receive legal representation?
- What legislative recommendations has the USPTO received from stakeholders that would help the underrepresented classes avoid such a financial burden while still achieving the end result of determining patent validity/eligibility?

It goes without saying, clearly Congress is concerned with stakeholder burdens and solutions, both in the pursuit of equal opportunity and in the pursuit of equal outcome. As such, a desire to fully understand the contours of underrepresentation to aid in designing policy, as Representative Hank Johnson put it, is evident.

Now, to aid the USPTO with Congresswoman Jackson Lee's questions, by way of the oral testimony provided by my wife and me, and of this very written testimony, the Patent Office has indeed received stakeholder feedback clarifying that the underrepresented class includes not only women, minorities, and veterans, but additionally includes independent inventors and small businesses owned by those inventors. The Patent Office has also received stakeholder feedback expressing concern on an independent inventor's ability to financially enforce her patent rights, that feedback also expressing concerns on the lack of contingency representation at the PTAB. In lieu of legislative recommendations that would increase the incentive for the underrepresented inventor to apply for and obtain more patents, and legislative

[27] https://www.usij.org/research/2018/7/9/us-startup-company-formation-and-venture-capital-funding-trends-2004-to-2017
[28] https://www.youtube.com/watch?v=2fF7d9i0Km4
[29] See Attachment 1.

recommendations to help the underrepresented inventor avoid the financial burden of the PTAB while still achieving the end result in determining a patent's validity/eligibility, I have provided legislative recommendations that address these questions and more in the following section below.

V. Legislative Recommendations

Pursuant to the SUCCESS Act, the Director of the USPTO is to conduct a study that provides legislative recommendations for how to a) promote the participation of women, minorities, and veterans in entrepreneurship activities, and b) increase the number of women, minorities, and veterans who apply for and obtain patents.

Legislation that would help in the pursuit of **equal opportunity** for underrepresented classes would include:

1. **Women, Minorities & Youth.** Establishing and providing funding from Small Business Innovation Research (SBIR) grants or otherwise to be used to build educational programs that expose our young generation to inventing, programs such as the Young Inventors Showcase, including funds to replicate this model throughout the United States. This falls in line with the study showing that exposure to innovation during childhood leads to higher inventor rates, helping close the diversity gap by focusing on education in and exposure to inventing. Reach could be maximized to all demographics by placing inventing into the public-school system curriculum.

2. **Veterans.** In return for their service to the United States, allowing veterans to enjoy reduced filing fees, and perhaps, fees reduced to an even greater extent than that of a micro entity. This would encourage veterans to partake in innovation with a lower barrier to entry, as well as show our appreciation for their service to our country.

3. **Minorities & Immigrants.** For the purpose of bringing the best minds and the best ideas to the United States, rather than exporting them overseas, upon issuance of a U.S. patent, allowing immigrants who a) are named inventors on the patent, b) have applied for U.S. residency and/or U.S. citizenship status, and c) have satisfied the requirements and do not pose a security risk, to enjoy the benefit of no waiting time to receive their residency/citizenship appointment at USCIS, similar to the benefit received by a spouse of a U.S. citizen seeking the same. Given that the majority of immigrants are minorities by nature, this would help address any diversity issues with regard to those minorities, while encouraging the world's best innovators to contribute in and to American society and commerce. This would also help satisfy the current

concerns of U.S. valuable IP being sought outside the U.S. and in Europe and China, particularly in areas such as 5G, artificial intelligence, and medicine.

It has been shown here that a patent is only valuable if it can be trusted to be reliable and if an underrepresented patent holder enjoys the means to defend it. Recall that *the government must simultaneously provide equal outcome in the resulting patent grant so that equal opportunity in the pursuit of the grant even presents an incentive worth pursuing*. Accordingly, **simultaneous legislation** that would help provide **equal outcome** for underrepresented inventors who hold patents would include:

4. **Venue Reform**. As a result of *TC Heartland*, an underrepresented inventor who wishes to enforce her patent rights against an infringer does not have a convenient venue to do so. She did nothing wrong, yet now her work on innovation must halt while she spends the additional time and cost to traverse the United States to infringer-friendly district courts to enforce her rights against theft. The solution to this can be found in the proposed Section 1400(b)(4) of S.2733 of the 114th Congress—the Venue Equity and Non-Uniformity Elimination (VENUE) Act of 2016[30], legislation that was tabled given that *TC Heartland* was underway. Now the pendulum in full swing in favor of an infringer due to *TC Heartland*, this bill seeks amends Section 1400(b) and contains a provision allowing an infringement action to be brought in judicial districts "where an inventor named on the patent in suit conducted research or development that led to the application for the patent in suit". This bill would allow an underrepresented patent holder to more conveniently enforce her patent rights in the judicial district where she conducted her research; moreover, this language of this bill does not allow bad actors to participate in forum shopping.

5. **Defining Inventor-Owned Patents and PTAB / Declaratory Judgement Venue Consent**. Underrepresented inventors likely retain ownership of their patents, or assign their patents to a small business they own. Accordingly, Section 100 of 35 U.S.C. shall be amended with the following new subsection: "The term 'inventor-owned patent' means a patent held entirely by the inventor(s), or held entirely by a business owned solely by the inventor(s), of the claimed invention." Once that is established, patent validity challenges petitioned on inventor-owned patents at the USPTO must first be agreed to by the inventor(s); otherwise, said challenges will occur in traditional district court. This provision would allow an underrepresented inventor maintaining possession of her patent to receive contingency fee representation, while still achieving the end result of determining patent validity. This also serves to protect against the threat of bad actors who are said to buy up patents and file frivolous lawsuits, as these supposed bad actors are not the original inventors listed on the face of the patents they potentially might buy. Furthermore, in accordance with the proposed venue reform regarding where research was conducted, claims for declaratory judgement

[30] https://www.congress.gov/bill/114th-congress/senate-bill/2733/

relating to an inventor-owned patent should also be limited to the district where the inventor is domiciled or has consented to jurisdiction.

6. **Restore Constitutional Exclusivity**. Article I, Section 8, Clause 8 of the U.S. Constitution gives Congress the sole power to "promote the Progress of Science and the Useful Arts, by securing for limited times to Authors and Inventors *the exclusive Right* to their respective Writings and Discoveries."[31] However, in *eBay*, the Supreme Court elected that it could decide what promotes the progress of science and the useful arts, and in doing so, it fundamentally changed the constitutional exclusive right bestowed upon an inventor by the grant of a letters patent to where a patent holder can be forced to license her invention, which is equivalent to her losing the right to exclude others. This represents a real challenge for the underrepresented inventor if she wants to compete in the market. If Congress wants to provide equal outcome for underrepresented inventors in the competitive market with more financially-abled businesses, Congress must enact a provision that includes the right to injunctive relief for patent holders upon a finding of infringement, providing underrepresented inventors true ownership and exclusive rights over their disclosed inventions.

7. **Abolish Retroactive Application of the AIA**. The Supreme Court in Oil States opted not to address retroactive application of IPRs on patents having priority dates that predate the AIA; nevertheless, the AIA provides that the USPTO can unconstitutionally take a patent away from a patent holder by instituting an IPR on said patent. Moreover, such a taking by the Patent Office from inventors who disclosed their inventions prior to the AIA and who did not subject themselves to the provisions of its title is unjust, violates due process, and destroys any confidence in the social compact between inventors and the government, because, at any time, the government can change a legal contract *ex post facto*. Congress must restore integrity and confidence in the U.S. patent system. Abolishing retroactive application of the AIA on patents having priority dates that predate the law would restore confidence held by the underrepresented inventor in her government and in the social compact patent bargain with the people, without fear that the government can unfairly change the rules in the middle of the game on a patent bargain already entered.

The legislative recommendations above will restore reliability for the underrepresented inventor in seeking a U.S. patent grant. These recommendations will provide her both a new and restored incentive to seek patent protection for her inventions, thus receiving the protection she needs to engage in entrepreneurship and the American and global innovative economy.

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[31] U.S. CONST. art. I, § 8, cl. 8 (emphasis added).

VI. Federal Register Notice Questions

As part of the Federal Register Notice[32], the Director provided questions as a preliminary guide to aid the USPTO in collecting relevant information and to evaluate possible administrative or legislative recommendations that may be provided to Congress. The Federal Register notice stated that comments from the public on any issues that they believe are relevant to the scope of the study are welcome, but the USPTO was particularly interested in answers to the questions in the Notice. I have provided my answers to selected questions in Attachment 3.

VII. Conclusion

This testimony has shown that in order to provide equal opportunity to underrepresented classes in entrepreneurship and invention, the government stands to benefit in this quest by supporting and replicating educational programs such as the Young Inventors Showcase nationwide, fostering innovation among today's youth and their families; allowing veterans to participate in the patent system with reduced fees; and encouraging those seeking U.S. residency and/or citizenship to bring their ideas to be protected in the United States and be rewarded with waiting time advantages. Furthermore, in order to provide an incentive to those underrepresented classes pursuing equal opportunity when filing for and obtaining patents, Congress must ensure there is equal outcome in lieu of the ability for the underrepresented patent holder to be able to rely upon and defend her granted patent rights. Policy that will restore representation to inventors, reliability in their patent grants, a convenient venue for enforcement by inventors, and exclusive rights as stated in the Constitution, will bring the necessary incentive and encourage those underrepresented groups seeking to protect their intellectual property. Only by coupling equal outcome with equal opportunity in such a two-pronged approach can the United States fully harness the maximum innovative potential of its people and continue to promote U.S.-based leadership in the global innovation economy.

Both the USPTO and Congress should be commended on their dedicated attention to this issue of underrepresentation, and the USPTO especially should be commended for involving the public as stakeholders in their required study pursuant to the SUCCESS Act. Concurring with Representative Martha Roby's statement made during the March 27, 2019 House Judiciary Committee "Lost Einsteins" Hearing,

[32] 84 FR 17809 (2019).

I too look forward to viewing the USPTO's report on the results of the study conducted by the USPTO pursuant to this SUCCESS Act.

It is my hope that the USPTO finds this testimony useful in its report to Congress. Given that it is the sense of Congress that the United States has the responsibility to work with the private sector to close the gap in the number of patents applied for and obtained by women and minorities, I look forward to continuing the conversation and/or engaging with the USPTO to that end.

ATTACHMENT 1
TO

Written Testimony of
JEFF HARDIN & PATRICIA DURAN

Before the
UNITED STATES PATENT & TRADEMARK OFFICE
(USPTO)

Pursuant to the
Study of Underrepresented Classes
Chasing Engineering and Science Success
(SUCCESS) Act of 2018

Submitted on
June 30, 2019

SHEILA JACKSON LEE
18TH DISTRICT, TEXAS

WASHINGTON OFFICE:
2160 Rayburn House Office Building
Washington, DC 20515
(202) 225-3816

DISTRICT OFFICE:
1919 SMITH STREET, SUITE 1180
THE GEORGE "MICKEY" LELAND FEDERAL BUILDING
HOUSTON, TX 77002
(713) 655-0050

ACRES HOME OFFICE:
6719 WEST MONTGOMERY, SUITE 204
HOUSTON, TX 77019
(713) 691-4882

HEIGHTS OFFICE
420 WEST 19TH STREET
HOUSTON, TX 77008
(713) 861-4070

FIFTH WARD OFFICE
4300 LYONS AVENUE, SUITE 200
HOUSTON, TX 77020
(713) 227-7740

Congress of the United States
House of Representatives
Washington, DC 20515

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SENIOR WHIP
DEMOCRATIC CAUCUS

CONGRESSWOMAN SHEILA JACKSON LEE OF TEXAS QUESTIONS FOR THE RECORD FOLLOWING HOUSE JUDICIARY SUBCOMMITTEE ON IP: OVERSIGHT OF THE U.S.P.T.O MEETING HELD: MAY 9, 2016 QUESTIONS SUBMITTED: MAY 16, 2019

As required by the 2018 Study of Underrepresented Classes Chasing Engineering and Science (SUCCESS) Act, the USPTO is to prepare a study on the participation of women, minorities, and veterans in entrepreneurship activities and the patent system. Section 3 of the SUCCESS Act requires the study to provide legislative recommendations for how to increase the number of women, minorities, and veterans who apply for and obtain patents. To assist in gathering information prior to compiling the report, the USPTO has invited the public to provide written comments and also oral testimony at one of three hearings.

1. Have stakeholders who have provided testimony believe that the underrepresented classes only consist of those who are considered women, minorities, or veterans, or have any of the stakeholders identified any other people(s) as being underrepresented? In the case of the latter, who else, or what other group(s) of people, have the stakeholders identified as being underrepresented?

2. Have stakeholders expressed concern regarding the underrepresented classes' financial ability to enforce their rights once they do obtain patents? What legislative recommendations has the USPTO received from

stakeholders that would increase the incentive for underrepresented classes to apply for and obtain more patents, and does equal outcome with respect to a patent holder's financial ability to enforce their rights against well-funded companies play a part?

3. The PTAB/IPRs are purported to being a cheaper and faster alternative than district court litigation in achieving the end result of determining patent validity/eligibility. Given that contingency law firms rely on damages to recoup their investment, and in the case of the PTAB, there is no monetary compensation for prevailing patent holders, have stakeholders expressed concern whether the underrepresented classes have the financial means to receive legal representation? What legislative recommendations has the USPTO received from stakeholders that would help the underrepresented classes avoid such a financial burden while still achieving the end result of determining patent validity/eligibility?

4. What legislative recommendations has the USPTO received from stakeholders that would help underrepresented classes apply for and obtain more patents in lieu of patent eligibility?

ATTACHMENT 2
TO

Written Testimony of
JEFF HARDIN & PATRICIA DURAN

Before the
UNITED STATES PATENT & TRADEMARK OFFICE
(USPTO)

Pursuant to the
Study of Underrepresented Classes
Chasing Engineering and Science Success
(SUCCESS) Act of 2018

Submitted on
June 30, 2019

SUCCESS Act: Oral Public Testimony at First Public Hearing
Patricia Duran
"The True Underrepresented Class"

(This testimony below was delivered by Patricia Duran in Spanish, with Jeff Hardin providing the English translation.)

My name is Patricia Duran. Thank you for the opportunity to allow me to comment with you here today.

I am a woman, and I am considered a minority in this country. I appreciate the intent behind the SUCCESS Act for Congress to ask for legislative recommendations for how to increase the number of women, minorities, and veterans who apply for and obtain patents, but I must start with this question:

What good is a patent if one cannot feasibly defend it?

Regarding this SUCCESS Act, I am certain you will hear this theme from all independent inventors, who are the true stakeholders in the patent system and the true source of American innovation. The theme is this:

> Women, minorities, and veterans all reside in the same category with all the other independent inventors, and this class – the *independent inventors – this is the true underrepresented class*.

And here's why. Women, minorities, and veterans, once they receive a patent, are actually in the same predicament as all independent inventors and small businesses. With the current state of patent law in the United States, independent inventors and small businesses cannot adequately license the patents they receive with larger, financially-abled entities – the "represented" class – nor can they enforce their patents against this class when their patents are stolen. This is because this represented class can simply bleed the underrepresented class dry legally and financially by taking advantage of today's current patent laws.

So, although pursuing equal opportunity with women, minorities, and veterans in obtaining a patent is a valuable effort, if it does not coincide with equal outcome in one's ability to utilize the patent once received, regardless of the person's financial state, telling women, minorities, and veterans that they stand to benefit from a patent will simply be false doctrine.

Now that I have provided the above clarification, I will tell you a chapter in the story of my life.

I am a cancer survivor. I was diagnosed with breast cancer three months after my daughter was born. I am almost three years into my fight. After being diagnosed, I received a double mastectomy, and because the biopsy taken prior to my surgery of the suspicious lymph node adjacent to my tumor turned out to be negative, I was to receive simultaneous reconstruction during the mastectomy. Two birds with one stone. But as it turned out, my diagnosis was incorrect. A second biopsy of my lymph nodes was performed during the surgery, and it revealed that my lymph nodes in fact had been compromised.

The result was irreversible torture, and I had to relive this multiple times. During this double surgery attempt, my mastectomy had already been completed, and my plastic surgeon was already midway into his reconstructive procedure, using fatty tissue from my abdomen to reconstruct my breasts. Because my lymph nodes were discovered as compromised, he had to suspend his work, leaving me with a diamond-shaped incision going from hip to hip and plastic silicon sheets were to remain in my abdomen until I had undergone and

SUCCESS Act: Oral Public Testimony at First Public Hearing
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recovered from full chemotherapy and radiation therapy. Then I would have to come back and undergo surgery again to complete the rest of the procedure.

What was the end result in that follow up procedure one year later? I had complications and my reconstruction failed 3 times. I have not only endured and continue to suffer physical pain as a result of these surgeries, but I also endure psychological pain every day when I look in the mirror as a reminder. My scars remind me of the battle I fight, but every day I have is a gift. My blessing is that I am alive, and I have two beautiful children and a loving husband.

So how does my story relate to patents? Well, given that I endured misdiagnosis, the fact that medical diagnosis methods can be considered patent ineligible is concerning. The cure of cancer today is merely playing a game of statistics – crossing my fingers hoping that I fall within the percentage of people who survive in studied patient populations and clinical trials. The chemotherapies I received were a result of a strong patent system, but is there something better? For example, can more work be done in immunotherapies and other discoveries? Or, as Sherry Knowles, who is also a breast cancer survivor, has questioned: are discoveries now being thrown out? The Constitution includes discoveries, and so does the Patent Statute. Jeff will speak more on these, but this is my testimony, and I thank you for giving me the opportunity to share my comments with you here today.

SUCCESS Act: Oral Public Testimony at First Public Hearing
Patricia Duran
"The True Underrepresented Class"

(This Spanish testimony below was delivered by Patricia Duran, with Jeff Hardin reciting the English translation.)

Mi nombre es Patricia Duran. Gracias por la oportunidad de permitirme estar aquí hoy con ustedes y escucharme.

Soy mujer y soy considera una minoría en este país. Y quiero agradecer la intención de THE SUCCESS ACT que emite el Congreso en solicitar recomendaciones legislativas que contribuyan la fomentación del número de mujeres, minorías y veteranos que solicitan y obtienen patentes, pero debo empezar con esta pregunta:

¿De qué sirve tener una patente si no la puedes defender?

Con respecto a esta ley de THE SUCCESS ACT, estoy seguro de que escucharemos este tema de todos los inventores independientes quienes son los verdaderos interesados en el sistema de patentes y quienes son el verdadero origen de la innovación norteamericana. El tema es este:

> Las mujeres, las minorías y los veteranos están dentro de la misma categoría con todos los demás inventores independientes, y esta clase - los inventores independientes - *es la verdadera clase subrepresentada*.

La razón es porque las mujeres, la minoría y los veteranos, una vez que reciben una patente están realmente en el mismo aprieto económico que todos los inventores independientes y las pequeñas empresas. Con el estado actual de la legislación en materia de patentes en los Estados Unidos, los inventores independientes y las pequeñas empresas se ven en la incapacidad de licenciar adecuadamente las patentes que reciben, con entidades grandes y de mayores capacidades financieras – que representan la clase "representada" - ni pueden hacer valer sus patentes contra Esta clase cuando se roban sus patentes. Esto se debe a que la clase representada puede simplemente abusar gradualmente de todos los recursos legales y financieros sobre la clase subrepresentada y así con conllevándole a la extinción utilizando a las leyes actuales de patentes de hoy en día.

Por lo tanto, aunque perseguir la igualdad de oportunidades que las mujeres, la minoría y los veteranos en la obtención de una patente es un esfuerzo valioso, si no coincide con el mismo resultado en la capacidad de utilizar la patente una vez recibida, independientemente del estado financiero de la persona, decir que las mujeres, las minorías y los veteranos que pueden beneficiarse de una patente simplemente será una doctrina falsa.

Después de haberles aportados la aclaración anterior; deseo contarles un capítulo de la historia de mi vida.

Soy sobreviviente de Cáncer. Fui diagnosticada con cáncer de mama 3 meses después de nacer mi hija. Estoy casi tres años en mi lucha. A causa de este diagnóstico tuve que realizar una mastectomía doble lo cual fue planeada con una reconstrucción simultanea debido a que previa a la cirugía el ganglio linfático que presentaba características sospechosas adyacente al tumor fue biopsia y su resultado fue negativo. El plan fue matar 2 pájaros con un solo tiro. Pero ese diagnóstico fue incorrecto, una segunda biopsia de los ganglios linfáticos durante la cirugía revelo que estos estaban comprometidos.

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El resultado fue una pura tortura irreversible y que luego tendría que volver a repetir. Durante este intento de doble cirugía, mi mastectomía ya se había completado, y mi cirujano plástico ya había avanzado su trabajo en su procedimiento reconstructivo usando tejido graso de mi abdomen para reconstruir mis senos. Pero el hallazgo de que algunos ganglios linfáticos sí estaban comprometidos conllevo a que la reconstrucción se suspendiera dejándome con una incisión en forma de diamante en la cadera cruzando de un extremo a otro, y dejando dentro unas hojas de silicona de plástico que permanecieran en mi abdomen hasta que el tratamiento de quimioterapias y radioterapias se completara para luego proceder con la reconstrucción nuevamente.

Entonces el resultado final al procedimiento reconstructivo de seguimiento fue que tuve ciertas complicaciones y la reconstrucción falló 3 veces. Batallo con el sufrimiento de tener diferentes dolores físicos como resultado de estas cirugías, pero también sufro dolor psicológico todos los días cuando me miro en el espejo. Sin embargo, estas marcas son de luchas ganadas en la batalla que estoy peleando, donde cada día no es un día más, es un regalo como las bendiciones de que Estoy viva, tengo dos hermosos hijos y un esposo amoroso.

Entonces como mi experiencia se relaciona con el tema de las patentes, dado que he sido afectada por un diagnóstico erróneo, el hecho de que los métodos de diagnóstico médico puedan considerarse inadmisibles en materia de patentes es preocupante. Y la cura del cáncer es un sorteo que En la que las estadísticas nos dan un numero de probabilidades donde yo cruzo mis dedos con la esperanza de quedarme dentro del porcentaje de personas que sobreviven en las poblaciones de pacientes estudiados y ensayos clínicos. Las quimioterapias que recibí fueron el resultado de un fuerte sistema de patentes, pero ¿hay algo mejor? Por ejemplo, ¿se puede hacer más trabajo en inmunoterapias y otros descubrimientos? O, como Sherry Knowles, que también es sobreviviente del cáncer de mama, ha cuestionado: ¿ahora se están desechando los descubrimientos? La Constitución incluye los descubrimientos, y también lo hace el estatuto de la patente. Jeff hablará más sobre estos, pero este es mi testimonio, y les agradezco por haberme dado la oportunidad de compartir mis comentarios con ustedes aquí hoy.

ATTACHMENT 3
TO

Written Testimony of
JEFF HARDIN & PATRICIA DURAN

Before the
UNITED STATES PATENT & TRADEMARK OFFICE
(USPTO)

Pursuant to the
Study of Underrepresented Classes
Chasing Engineering and Science Success
(SUCCESS) Act of 2018

Submitted on
June 30, 2019

Federal Register Notice Questions

(1) What public data are available to identify the number of patents applied for and obtained by women, minorities and veterans?

Regarding the number of women, the USPTO used particular methodology to reach conclusions as described in Appendix II in the February 2019 report "Progress and Potential: A profile of women inventors on U.S. patents". Although not definitive, the methodology did exhibit a level of confidence in its analysis. An analysis is minorities and veterans might be harder to identify. Moreover, what is the definition of a "minority", and how is it relevant? My wife is considered a minority. Does that mean my children are?

(2) What public data are available to assess the social and private benefits that result from increasing the number of patents applied for and obtained by women, minorities, and veterans, as well as small businesses owned by these groups?

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(3) What social and private benefits would you identify as resulting from increasing the number of patents applied for and obtained by women, minorities, and veterans?

Unfortunately, because of the current state of the U.S. patent system, I honestly find it difficult to recommend that women, minorities, and veterans—or any independent inventor or small business for that matter—seek to apply for and obtain a U.S. patent. The benefit of protection that a patent once provided to an inventor has lost its reliance. This in part is because larger, financially-abled companies can partake in the strategy of efficient infringement on an underrepresented inventor's disclosed invention and bleed her dry legally and financially until she doesn't the resources to continue to try to defend her patent.

(4) What social and private benefits to small businesses owned by women, minorities, and veterans would you identify as resulting from increasing the number of patents applied for and obtained by those businesses?

Unfortunately, because of the current state of the U.S. patent system, I honestly find it difficult to recommend that any small business—whether owned by women, minorities, veterans, or any independent inventor for that matter—seek to apply for and obtain a U.S. patent. The benefit of protection that a patent once provided to a small business has lost its reliance. This in part is because larger, financially-abled companies can partake in the strategy of efficient infringement on a small business's disclosed invention and bleed it dry legally and financially until it doesn't have the resources to continue to try to defend its patent.

(5) Should the USPTO collect demographic information on patent inventors at the time of patent application, and why?

No. The patent system is a meritocracy. It goes without saying, an examiner of a patent application cares *not* of the gender, age, race, or otherwise of the applicant or inventor when examining the merits, as a patent is based solely on the merits of the claims, and nothing more.

If the USPTO desires to collect demographic information, providing this information should be voluntary for inventors, and should only be collected *after* the application has either been granted or abandoned, but definitely not before or during the application process, lest the application or the examination process run the risk of becoming tainted. E.g., what if someone at the Patent Office decides to use the demographic information to discriminate?

I elect for not allowing any form of bias to creep into an otherwise blind yet meritorious process.

Federal Register Notice Questions

(6) To what extent, if at all, do educational and professional circumstances affect the ability of women, minorities, and veterans to apply for and obtain patents or to pursue entrepreneurial activities?

See answer in (7) below.

(7) To what extent, if at all, do socioeconomic factors facilitate or hinder the ability of women, minorities, and veterans to apply for and obtain patents or to pursue entrepreneurial activities?

Educational, professional, and socioeconomic factors do affect the ability to apply for and obtain a patent, not just women, minorities, and veterans, but for anyone applying. This comes from understanding Maslow's Hierarchy of Needs, which entails a pyramid for the different levels of personal development. This explains that only when one reaches the highest level in the pyramid will one's genius begin to flourish. Now, do realize that this does *not* solve the problem that today's system does not have equal outcome, but this will at least help solve the problem of equal opportunity.

Maslow's Hierarchy of Needs explains a personal development pyramid containing five levels. Starting from the bottom and going up, there's

- physiological (food, water, shelter)
- safety needs (personal, emotional, and financial security)
- social and moral belonging (intimate relationships, friends, family, church, sports)
- self-esteem (feeling of accomplishment, confidence in one's abilities)
- self-actualization (utilizing abilities and talents. understanding and pursuing goals: creating or even inventing)

Each lower level must be satisfied within an individual in order for one to be motivated to pursue the next level. Because if one doesn't have food to eat, then one is not going to engage in becoming an entrepreneur or pursuing a patent. That's just not on their mind.

Only until someone has all lower levels satisfied can they begin freely pursuing goals, creating, and inventing, so only then will you begin to see the genius flourish. Unfortunately, once those who reach this level will become educated on the state of today's patent system, and they will understand today's patent landscape is largely defined by unequal outcome, which might tend to discourage their participation on patenting as they look for other methods of receiving protection, such as trade secrets.

(8) What entities or institutions, if any, should or should not play an active role in promoting the participation of women, minorities, and veterans in the patent system and entrepreneurial activities?

For me, I had the privilege of having an established network – the third prong "social and moral belonging" in Maslow's hierarchy. That did not occur because of my gender or my race. That was because I knew a friend. When I had an idea for my first invention, I reached out to a friend who was in law school. He connected me with a patent attorney who had gone out on his own and would likely file my patent application at a deep discount, which he did. Again, I am in the underrepresented class, and this is what worked for me.

In my written testimony, I describe the Young Inventors Showcase, and it plays an active role in promoting the participation of all youth and their families in the patent system and entrepreneurial activities. I do believe programs like this should continue to play an active role, and this type of program creates a natural diversity engine.

Federal Register Notice Questions

(9) What public policies, if any, should the Federal Government explore in order to promote the participation of women, minorities, and veterans in the patent system and entrepreneurial activities? Are there any public policies that the Federal Government should not explore?

The government (Congress) needs to correct the imbalance in equal outcome for the patent holder. The value of a patent should not depend on the financial resources of the entity who possesses ownership of the patent.

In my written testimony, I outline seven legislative recommendations that the Federal Government should explore that would promote the participation of the underrepresented in the patent system and entrepreneurial activities.

Public policies that the Federal Government should *not* explore include policies that focus on the post grant review proceedings. Post grant review is an experiment that Congress should end. Rather, any focus on bringing additional reliance to issued patents should be during the initial examination phase, *prior to* when a patent is issued. Bringing into question the patent grant that is issued by the USPTO only serves as a detriment to investment, and thus serves as a risk, rather than an asset, for a patent holder. An underrepresented inventor's biggest fear today is being dragged into a post grant review proceeding, where the cost to defend a patent cannot be arranged on a contingency basis. This cost is on the inventor's dime, and being dragged into this proceeding is not due to any fault by the inventor. The patent has already been vetted by experts in the field, so the inventor should receive quiet title, or at least the same level of reliance that existed for a patent prior to when the America Invents Act went into effect, where patent validity challenges occurred in district court, and an underrepresented inventor could be assured of contingency fee representation.

(10) What action could USPTO take to address the participation of women, minorities, and veterans in the patent system and entrepreneurial activities?

In my written testimony, I outline seven legislative recommendations that the Federal Government should explore that would promote the participation of the underrepresented in the patent system and entrepreneurial activities. The USPTO should share these recommendations with Congress. Furthermore, the USPTO should learn more about programs like the Young Inventors Showcase, while working strategically with, and sponsoring, such programs, so they may be rolled out nationwide.

(11) Are there policies, programs, or other targeted activities shown to be effective at recruiting and retaining women, minorities, and veterans in innovative and entrepreneurial activities? Are there policies, programs, or other targeted activities that have proved ineffective?

In my written testimony, I explain the Young Inventors Showcase. This is such a program shown to be effective at recruiting and retaining all peoples in innovative and entrepreneurial activities. I provide a demographic sampling of this year's elected winners as proof of its effectiveness.

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Submitted on
June 30, 2019

Coupling Equal Opportunity with Equal Outcome:

The Necessary Two-Pronged Approach for Promoting the Participation of Underrepresented Classes both in Entrepreneurship and in the Pursuit of the U.S. Patent Bargain

by

Jeff Hardin
Pro Se Inventor, Business Owner & Entrepreneur
Affiliations:
Houston Inventors Association
Young Inventors Showcase

Patricia Duran
MBA, AMLCA, Inventor & Entrepreneur

"The SUCCESS Act instructed the USPTO to ... report to Congress on recommendations for promoting the participation of women, minorities, and veterans both in entrepreneurship and in applying and obtaining patents. ***I look forward to receiving that report and its recommendations.****"*

— U.S. Representative Martha Roby
March 27, 2019, House Judiciary Committee Hearing,
Lost Einsteins: Lack of Diversity in Patent Inventorship and the Impact of America's Innovation Economy

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Prologue

On May 8, 2019, I, Jeff Hardin, and my wife, Patricia Duran, provided oral testimony at the USPTO in one of three hearings for public comments pursuant to the SUCCESS Act.[1,2]

My wife began her testimony noting her status as a minority, while providing her testimony in Spanish with me translating.[3] Her speech questioned the benefit of a patent if one is not able to defend it, and she provided rationale to expand the definition of the underrepresented class as defined by the SUCCESS Act to additionally include the class of independent inventors and small businesses owned by those inventors. Note that it is this expanded definition I will use for "underrepresented" in this written testimony throughout. She then shared her personal story of battling cancer and misdiagnosis, showing the need for continued innovation in the field of diagnosis methods.

I followed my wife's lead, providing legislative recommendations for the USPTO to provide Congress pursuant to the SUCCESS Act. The first legislative recommendation addressed diagnosis methods via Section 101 reform that would also serve to augment the number of women who apply for patents. In the second legislative recommendation, I first identified the problem of the underrepresented class of patent holders that was created by the America Invents Act (AIA)[4] and recent Supreme Court cases. I posed a key question at the heart of the issue that both the USPTO and Congress must realize:

How do we provide equal outcome so that equal opportunity even presents an incentive worth pursuing?

I then provided a legislative solution to address that problem, restoring patent rights for the underrepresented class of inventors.

My oral testimony I provided on May 8 served to provide only one part of what I consider a two-pronged approach to the task the USPTO has before it in lieu of providing legislative recommendations to Congress pursuant to the Act. In this written testimony, I summarize my oral testimony while completing the two-pronged approach: coupling equal opportunity with equal outcome.

Furthermore, following the oral testimony on May 8, I have met with various members of Congress, including those of the House Judiciary Subcommittee on Courts, IP, and the Internet, discussing legislation strategies in pursuit of this two-pronged approach: providing equal opportunity to underrepresented classes as well as equal outcome to the underrepresented patent holder.

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[1] https://www.uspto.gov/about-us/events/provide-comments-first-public-hearing-success-act
[2] https://www.youtube.com/watch?v=2fF7d9i0Km4
[3] See Attachment 2.
[4] 35 U.S.C. § 100 (2012) (Leahy-Smith America Invents Act (AIA) of 2011).

Executive Summary

One thing at stake in the pursuit to increase entrepreneurship and patenting among underrepresented classes is providing a system of equal opportunity for the future innovators of America. By working to address the gap in the number of patents applied for and obtained by underrepresented classes, the United States seeks to maximum the innovative potential of the American people, promoting the United States leadership in the global economy.

The primary advantage of patenting is that it is rooted in meritocracy. The U.S. Patent System was designed at the outset to be the true anti-monopoly and equal opportunity engine, as innovation, effort, and achievement supersede any demographic or financial factors possessed by an inventor. For this reason, today there is still no requirement for the USPTO to collect information regarding race, gender, age, or any financial information from an inventor so that an examiner can proceed with examination on the merits of an inventor's application for a patent grant.

This meritocracy makes the patent system available and open to anyone. Thus, by emphasizing programs that provide education on and exposure to inventing and entrepreneurship for all peoples, while encouraging healthy competition and the sharing of ideas, the United States can foster innovation amongst its citizens and even to those beyond her borders with no limit on its potential.

Most importantly, however, is that the pursuit of equal opportunity must coincide with the pursuit of equal outcome. Therefore, additionally at stake in this pursuit is providing a system of protection for patent holders, particularly those inventors in the underrepresented class. It goes without saying that without one's ability to utilize or enforce a U.S.-granted patent once received, regardless of the patent holders' financial state, the incentive to pursue even entering the patent bargain with the United States government becomes lost.

Unfortunately, as a result of the AIA of 2011 and various court decisions over the past two decades, the ability for a patent holder to utilize or enforce a granted patent issued by the United States government today has plummeted. The result to the American economy is that the "reliability" of an issued patent that once existed now has become a meaningless asset for investment. Only until after a patent undergoes the gauntlet of post grant review proceedings can a patent be said to have any value for investment, and yet, even if this patent is fortunate enough to survive a post grant review, the "reliability" is never fully settled due to being subject to gang tackling, serial attacks, and business models such as those that use surrogates to challenge patents without having time bar limitations. Moreover, the exorbitant costs in defending patent challenges at the Patent Office are at the expense of the patent holder, serving as a major deterrent in why one should pursue a patent. In fact, for the inventor who holds a patent of value in the market but who cannot afford representation for a post grant review proceeding challenge, ironically possessing such a patent today has become a risk, as anyone can challenge the patent, despite that it has already been vetted by expert examiners in the field, and can drag the inventor into a costly proceeding. This ironically defeats the intent of Patent Clause to promote and encourage innovation.

Thus, the pursuit of equal opportunity for the underrepresented inventor must coincide with correcting equal outcome in the inventor's ability to enforce and utilize a granted patent on issuance, regardless of the inventor's financial state. Accordingly, the AIA "second look experiment" that was created by Congress to address a patent trolling narrative preached by entities who would prefer to infringe an issued patent rather than license it must be revisited. The Honorable Andrei Iancu, Under Secretary of Commerce for Intellectual Property and Director of the United States Patent and Trademark Office, warned in a speech in 2018 that "we have over-corrected and risk throwing out the baby with the bathwater. This must now end, and we must restore balance to our system."[5] We submit that this baby is the underrepresented inventor and show that it has already been thrown out. Fortunately, our laws are by the People, and our elected Congress itself is seeking solutions. Today, they are asking the Patent Office for legislative recommendations. This written testimony includes legislative proposals for the Patent Office to recommend to Congress.

The testimonies provided by my wife and me serve to provide solutions to both prongs—equal opportunity and equal outcome—in the required two-pronged approach to adequately promote the participation of underrepresented classes both in entrepreneurship and in the pursuit of the U.S. patent bargain.

[5] https://www.ipwatchdog.com/2018/10/19/iancu-risk-takers-patent-troll-narrative-orwellian-doublespeak/id=102474/

Written Statement

I. Introduction

By way of introduction, I am a self-made entrepreneur, software developer, and inventor. I currently oversee an information technology consulting firm I co-founded in 2002, and, over the course of the last decade, I have developed and pursued patents for inventions related to software, cloud, and mobile device platform technologies on a *Pro Se* basis, resulting in 7 patent grants with others pending. I am an active member of the Houston Inventors Association, have advised judges at the Young Inventors Showcase of Houston, and sit on the advisory board for the Inventor Rights Coalition. Additionally, I have been invited to Washington, D.C. multiple times to meet with members of Congress and IP subcommittee counsel as a result of my recent efforts supporting independent inventors and patent rights.

My wife, Patricia Duran, has over ten years of experience in the areas of compliance, operational risk management, and anti-money laundering, having vast work experience throughout Latin America. Prior to moving to the United States, Patricia served as independent advisor to the vice presidency of the 2nd largest bank in the Dominican Republic, while additionally serving in the capacities of anti-money laundering department lead, compliance analyst, and spokeswoman for the institution. Patricia has elected to keep her innovations, particularly those related to payment systems, as trade secrets due to the state of the U.S. Patent System, which goes against the American spirit of promoting the Useful Arts by public disclosure.

Patricia and I first met when I served as an ambassador to the Dominican Republic as part of Rotary International's Group Study Exchange program. We married 15 months later and will celebrate 10 years of marriage this year. We have two children, ages three and four years.

A major turning point occurred in our lives between the months of February to May in 2016, as each of these events happened in sequence: Patricia underwent a C-section; my father received a lung transplant and was under recovery; my mother became bedridden with a crushed vertebrae, pelvis, and hand from a falling accident; Patricia's mother suffered a heart attack and contracted sepsis while in the hospital; and Patricia was then diagnosed with breast cancer, requiring mastectomy, chemotherapy, and radiation. Trying to manage this with an 18-month old and infant was when our plans came to a complete halt; the only thing that mattered was survival.

Adding insult to injury, Patricia suffered misdiagnosis during her treatment, resulting in irrecoverable surgical failures. To me, this demands innovation, yet all the while, I watched at a distance while my existing patent rights began to fade away due to Supreme Court decisions and the effects of Congressional policy. This was when I decided to take an active stance as a citizen and patent holder, addressing and speaking with U.S. government leaders regarding patent rights.

Ms. Duran and I do not speak for any other company or entity or colleague. Our views are strictly independent of others' opinions on policy, and we have not discussed our testimony with any companies or entities before submission, except that between ourselves.

II. Underrepresentation in Outcome

> "Thanks to the passage of the SUCCESS Act, the USPTO is following up on this report with further research on underrepresentation... *Fully understanding the contours of underrepresentation is an important step in designing policy* that can ensure that as a nation we are not leaving potential inventors behind and groundbreaking innovations undiscovered."
>
> — U.S. Representative Hank Johnson, Chair of the U.S. House Subcommittee on Courts, Intellectual Property, and the Internet[6,7]

On May 9, 2019, the day after I provided oral testimony at the USPTO, I attended the Oversight of the U.S. Patent and Trademark Office hearing by the U.S. House Subcommittee on Courts, Intellectual Property, and the Internet, where I heard Representative Hank Johnson speak those very words above. My comments here seek to provide the USPTO a fuller understanding how there is underrepresentation in outcome among independent inventors who hold patents.

The Honorable Andrei Iancu, Director of the USPTO, sat as witness to the USPTO Oversight hearing. Laura Peter, Deputy Under Secretary of Commerce for Intellectual Property and Deputy Director of the USPTO, was present with Director Iancu. Ms. Peter spoke the previous day at the first of three hearings for public comments pursuant to the USPTO's study on SUCCESS Act, where my family was also present, and my wife and I spoke. So, following the USPTO Oversight hearing, I found it appropriate to introduce myself to Ms. Peter, where I thanked her for allowing my wife and me the opportunity to provide our testimonies. In this conversation with Ms. Peter, I expressed my concerns with post grant review proceedings and my preference towards an Article III court, to which Ms. Peter asked: "What can you *not* get at the PTAB that you *can* get in an Article III court?"

It's a simple question, really, and in fact, I was asked this question earlier in the week in a meeting with a staff member of the House Judiciary Subcommittee on Courts, IP, and the Internet, and he indeed saw my point. As such, I elected to address this question and make it part of my oral testimony I provided to the USPTO on May 8. Simply put, using this question as justification for post grant review proceedings alone incorrectly focuses on the ends and not the means, falling victim to the fallacy of expediency,

[6] https://judiciary.house.gov/legislation/hearings/oversight-us-patent-and-trademark-office
[7] https://www.youtube.com/watch?v=Y-XyuoRZ_Fs

defined as "ignoring every aspect of a means other than its capacity to achieve a desired end." In other words, it doesn't matter how we get there; just as long as we got there.

In fact, in his dissent in *Oil States Energy Services, LLC v. Greene's Energy Group, LLC*[8], Supreme Court Justice Gorsuch emphasized the problem of expediency in the AIA:

> Today, the government invites us to retreat from the promise of judicial independence. Until recently, most everyone considered an issued patent a personal right—no less than a home or farm—that the federal government could revoke only with the concurrence of independent judges. But in the statute before us Congress has tapped an executive agency, the Patent Trial and Appeal Board, for the job. Supporters say this is a good thing because the Patent Office issues too many low quality patents; allowing a subdivision of that office to clean up problems after the fact, they assure us, promises an efficient solution. And, no doubt, dispensing with constitutionally prescribed procedures is often expedient. Whether it is the guarantee of a warrant before a search, a jury trial before a conviction—or, yes, a judicial hearing before a property interest is stripped away—the Constitution's constraints can slow things down. ... No doubt this efficient scheme is well intended. But can there be any doubt that it also represents a retreat from the promise of judicial independence? Or that when an independent Judiciary gives ground to bureaucrats in the adjudication of cases, the losers will often prove the unpopular and vulnerable? Powerful interests are capable of amassing armies of lobbyists and lawyers to influence (and even capture) politically accountable bureaucracies. But what about everyone else?

In answering the very question in my May 8 speech that was subsequently posed by Ms. Peter, I identified but ignored addressing the many differences impacting all stakeholders facing a validity challenge, some of those being the very things Justice Gorsuch expressed as concerning: not having a stacked panel, the benefits of having an impartial judge, a jury, full discovery, a presumption of validity, etc. Rather, I focused on the single difference that matters most to the underrepresented class, and I summarized it in one word: *Representation*. In fact, the very word "representation" is at the root of "underrepresented", which is very thing Congress is trying to address in their Study of *Underrepresented* Classes Chasing Engineering and Science Success (SUCCESS) Act.

I provided how this very thing—representation—is where the imbalance lies between the represented and underrepresented classes that Congress unintentionally created with the AIA. Without it, no underrepresented inventor can even make it on the field to play the sport, and none of the other concerns even matter.

I emphasized that no patent practitioner or attorney will take a PTAB challenge on a contingency arrangement, as there are no monetary damages on the prospect of success at the PTAB. This cost is on the inventor's dime. As a result of the AIA, just trying to reach the same state of reliance that previously

[8] 138 S. Ct. 1365 (2018).

existed on the day a patent was granted before the AIA went into effect is now the financial burden of the patent holder, and these extra costs are post grant and after issuance—costs that are not anticipated by an inventor, as the patent has already been vigorously vetted by expert examiners at the USPTO.

As an aside, what I did not mention in my speech due to time constraints is the fact that no inventor holding a patent having a priority date *before* the AIA went into effect ever agreed to this new AIA-created patent bargain with the government when she disclosed her invention to the government and the public. As such, earlier this year in March, I drove to Austin, Texas so I could witness a fireside chat with USPTO Director Iancu as guest at SxSW[9], hoping for an opportunity to arise during a potential Q&A so that I could ask the Director if he found it fair that no inventor who entered into the patent bargain and disclosed her invention to the public prior to the AIA subscribed to the substantial rule changes that were retroactively applied by the AIA to patents having priority dates that predated the law. I did in fact get that opportunity and asked that question, and I reminded Director Iancu that he has the power to deny institution of an IPR, and I asked whether he would consider first his oath to defend and support the Constitution— in which the Takings, Due Process, and Ex Post Facto Clauses are immediately present—as a way to protect the patent grant on which the inventors who never entered into the AIA "patent bargain" so dearly rely.

Director Iancu's response was that a) *Oil States* did not address the issue of retroactivity, b) this issue was currently being litigated so he could not speak on it, and c) that as an agency, the USPTO must execute the law that is on the books. I did meet Director Iancu afterwards and thanked him for taking my question. However, others in the crowd told me he didn't answer it, and given that the power to deny institution of an IPR does indeed reside with the Director, and under 35 U.S.C. § 326(b), "in prescribing regulations under this section, the Director shall consider the effect of any such regulation on the economy [and] the integrity of the patent system," perhaps they were correct. Does changing the patent bargain during the term of the social contract provide reliance to the economy? Does changing the patent bargain during the term of the social contract exhibit or uphold integrity in the patent system?

Now, regarding these newly introduced costs to patent holders, I provided in my May 8 oral testimony that, per the *2017 AIPLA Report of the Economic Survey*[10], the estimated mean cost of a post-grant proceeding through appeal runs at $450,000.00. I showed that this is how much it costs a patent holder for a single post grant proceeding, let alone the problems of gang tackling, parties of interest and privies, conflicts of interest with APJs, serial attacks, and a surrogate-type business model to skirt time bar limitations. Add to that the institution and kill rate statistics on patents challenged at the PTAB, and an underrepresented patent holder has a bleak picture if she desires to utilize her patents and ends up in that tribunal.

So, in other words, if an underrepresented inventor holding a granted patent doesn't have just shy of half a million dollars to spare for a single patent challenge at the USPTO, she will not find

[9] https://www.ipwatchdog.com/2019/03/20/cta-preaches-patent-troll-fairy-tale-chat-iancu-sxsw/id=107539/
[10] https://www.aipla.org/detail/journal-issue/economic-survey-2017

representation if she ever wants to license her patent and someone does the math and challenges it, or if she wants to protect her patent when someone else steals her invention. Is this a fair shake?

This very reality makes the case that a patent does not give underrepresented inventors any reliable benefit, but rather, it gives them an increased risk of receiving a costly validity challenge. Hence, with today's U.S. patent system, the question that arises if the government were to encourage underrepresented groups to get more patents is not "What are you doing for them?", but "What are you getting them into?" It goes without saying that as a result, organizations such as US Inventor now resort to advising their members to keep their inventions trade secrets and not to disclose them to the U.S. government and the public in pursuit of a U.S. patent, lest their inventions easily be disclosed to, and stolen by, the public. The very statute Congress created ironically goes *against* the intent behind the Patent Clause of the Constitution.

This alone is not the only threat to innovation for those hoping that a granted patent will give their invention the protection it needs so they can climb the ladder of success. Recent Supreme Court decisions have also damaged the underrepresented inventor in their pursuit of innovation and entrepreneurship.

The previously mentioned *Oil States*[11] case re-emphasized that a patent is no longer a private property right, but a public franchise. The Court majority did conclude that it is the prerogative of Congress to create such a patent system in the name of "efficiency", but this does not mean that this provides the best patent system for the underrepresented, nor did the Court put their stamp of approval on that as the best system. In fact, it is evident Congress is aware of this, as in this very SUCCESS Act, Congress is seeking legislative recommendations to help serve underrepresented classes. Evidence of the Supreme Court's disapproval is seen throughout the *Oil States* oral argument[12], as many justices expressed their concerns that the same branch of government who gives can also take away, and that the process and rules changed dramatically. As further evidence of their discomfort in what the AIA created, Supreme Court Justice Sotomayor said later in the oral argument of *Return Mail, Inc. v. Postal Service*[13] (2019):

> It does seem like the deck is stacked against a private citizen who is dragged into these proceedings. They've got an executive agency acting as judge, with an executive director who can pick the judges, who can substitute judges, can reexamine what those judges say, and change the ruling...

What is important to note is that Justice Sotomayor did *not* say that the deck is stacked against a woman or a minority or a veteran. She said, "private citizen", reinforcing the concept that the patent system is designed as a meritocracy, as previously explained.

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[11] 138 S. Ct. 1365 (2018).
[12] https://www.supremecourt.gov/oral_arguments/argument_transcripts/2017/16-712_7kh7.pdf
[13] https://www.supremecourt.gov/oral_arguments/argument_transcripts/2018/17-1594_1an2.pdf

Another Supreme Court case to the detriment of inventors is *TC Heartland LLC v. Kraft Foods Group Brands LLC*[14], where residency was defined as the state of incorporation for a company. This means that inventors wishing to enforce their rights against an infringer must halt their inventing, leave their labs, and traverse the United States to district courts in states where infringers are incorporated or where they performed acts of infringement. Not only does this present another financial burden toward the underrepresented inventor, but this yanks her out of her lab and garage where she is performing her best innovative work and forces her to travel to distant courts across the United States in an effort to enforce her granted patent rights.

Furthermore, the Supreme Court in *eBay Inc. v. MercExchange, L.L.C.*[15] makes the very text on the face of every printed patent a false promise, as the "person(s) having title to [a] patent" does *not* have "the right to exclude others from making, using, offering for sale, or selling the invention throughout the United States of America or importing the invention in to the United States of America" against larger companies. So, for example, if an inventor invents a better way to ship products and obtains a patent for it, and suppose a company like Amazon decides it wants to take the patented invention and use it, it can do exactly that, and the inventor is compelled to license the patent at a price determined by a court, nevermind, if she wants to be the exclusive entity to utilize the patent and bring competition to the market.

Each of these issues—the *America Invents Act* and how it created the underrepresented inventor; *TC Heartland* and the loss of a convenient venue for the underrepresented inventor; *eBay* and the loss of the exclusive right, stripping the ability for inventors to compete—represent real challenges in the plight of today's inventor. Consequently, independent inventors and small businesses owned by those inventors can no longer expect a granted United States patent will protect their innovations and allow them to compete in the marketplace against larger, financially-abled entities. This is because an independent inventor becomes underrepresented the very minute she receives her patent grant. There is no equal outcome.

III. The Golden Standard Program Without a Diversity Gap

Notwithstanding the difficulties in equal outcome for the underrepresented inventor, we must recognize research received by the U.S. House Subcommittee on Courts, Intellectual Property, and the Internet. As Chair of the Subcommittee and U.S. Representative Hank Johnson stated on May 9 at the aforementioned USPTO Oversight hearing, "[W]e are falling behind in [creating and encouraging the next

[14] 137 S. Ct. 1514 (2017).
[15] 126 S. Ct. 1837 (2006).

generation of innovators] because our patent system demonstrates a lack of diversity in who is getting patents."[16,17]

Turning to Chair of the Judiciary Committee and U.S. Representative Jerrold Nadler's statement in the hearing "Lost Einsteins: Lack of Diversity in Patent Inventorship and the Impact of America's Innovation Economy", held on March 27, 2019, we learn:

> With so much of our economy dependent on IP-related industries, it is critical that everyone share the economic opportunities these industries offer. Promoting greater inclusion in the innovation ecosystem is good for our economy, good for underserved communities, and good for all Americans. Unfortunately, research shows that many segments of our society continue to be underrepresented as inventors on patents.
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> The USPTO's recent report on gender diversity finds that women are very much underrepresented as patent holders. Analyzing data on U.S. patents granted between 1976 and 2016, the report shows that women comprised only 12% of the named inventors on patents in 2016, representing an increase of only 2% over the last 16 years. Clearly, whatever progress is being made is happening far too slowly, and much needs to be done to promote greater gender diversity among inventors. Moreover, the USPTO's research shows that the underrepresentation in patenting is not solely a function of women entering science and engineering fields at lower rates than men, although that continues to be a problem. In 2015, women comprise nearly 28% of the total science and engineering workforce, but only 12% of inventors'-granted patents. Even where women are in the fields most associated with patenting, they are not patenting at the same rate as their male colleagues. This shows that the gender gap in patenting is likely to be caused by many factors, not just because there are fewer women scientists and engineers.
>
> Unfortunately, because the USPTO does not collect demographic data on inventors, it has been more challenging to study racial and ethnic diversity among U.S. inventors. Nonetheless, the studies that have been done also show significant disparities in patenting rates along racial and ethnic lines.
>
> I hope to learn more from the witnesses about how we can improve data collection on this issue, and learn more about the causes of these disparities, since *the first step towards solving the problem is understanding its scope and root causes*. For example, *one study found that exposure to innovation during childhood has a major impact on an individual's desire to become an inventor*, and a child's likelihood to becoming an inventor increases if he or she grows up in one of our country's technology hubs. I am proud that New York City,

[16] https://judiciary.house.gov/legislation/hearings/oversight-us-patent-and-trademark-office
[17] https://www.youtube.com/watch?v=Y-XyuoRZ_Fs

> where my District is located, counts as one of these hubs, and *I hope we can figure out how to replicate this sort of inventive environment elsewhere throughout the United States*.[18,19]

In fact, this study—"Who Becomes an Inventor in America? The Importance of Exposure to Innovation"—presents new evidence on the factors that determine who becomes an inventor. It states:

> Most previous work on innovation has focused on factors such as financial incentives, barriers to entry, and STEM education. *Our results point to a different channel – exposure to innovation during childhood – as a critical factor that determines who becomes an inventor*. A lack of exposure to innovation can help explain why talented children in low-income families, minorities, and women are significantly less likely to become inventors. Importantly, such lack of exposure may screen out not just marginal inventors but the "Einsteins" who produce innovations that have the greatest impacts on society. Policies that increase exposure therefore have the capacity to greatly increase quality-weighted aggregate innovation.[20]

Accordingly, and in line with the sentiments of Representative Nadler, I find it prudent to identify and focus on a program that a) showcases this type of exposure to innovation during childhood, b) is successful in encouraging inventing and entrepreneurship, c) has evidence of lacking a gap in diversity, and d) has replicative power. In fact, I have personal experience with such a program. Accordingly, I would like to introduce the USPTO to the *Young Inventors Showcase*, a project and competition of which I was asked to be a judge this year. I personally know the founder of the showcase, Greg Micek, and I strongly advocate *this program as the very program that should be replicated throughout the United States*.

Interestingly, the Young Inventors Showcase actually spawned indirectly from USPTO activities in Houston, Texas, where the concept for an inventors' association originated. In 1983, the USPTO, pursuant to the Small Business Innovation Development Act of 1982, co-sponsored the University of Houston's Hilton Hotel conference, where more than four hundred attendees were present. The Patent Office specifically requested that an inventors program be started in Houston, and Houston businessman and attorney Greg Micek accepted the mandate. During the next two years, Mr. Micek helped maintain a productive relationship with the USPTO and the University, volunteering the use of his offices for dozens of monthly meetings for local inventors, resulting in the formation of the Houston Inventors Association (HIA)—a Texas non-profit organization. The HIA's mission is to provide education, technical assistance, and support to creative thinkers in the greater Houston area and across the nation. From the beginning, the founders acknowledged the need for high quality educational information for members and the public at large, as well as a priority for outreach to children.

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[18] https://judiciary.house.gov/legislation/hearings/lost-einsteins-lack-diversity-patent-inventorship-and-impact-america-s

[19] https://www.youtube.com/watch?v=CCOeRO2NBCw

[20] Bell, A.M., R. Chetty, X. Jaravel, N. Petkova, and J.V. Reenen, 2017. "Who Becomes an Inventor in America? The Importance of Exposure to Innovation". National Bureau of Economic Research Working Paper No. 24062. https://doi.org/10.3386/w24062

Shortly thereafter, the Young Inventors Club was started as a subordinate project that reported to the HIA Board and operated under the HIA's 501(c)(3) sanction, and in 2002, the non-profit project grew into its own organization—the Young Inventors Association of America (YIAA).

The Young Inventors Showcase is an annual competition held by the YIAA, and it excels in encouraging and fostering innovation among today's youth and their families. The competition requires that participants identify a problem to solve, solve it, describe and/or demonstrate the solution, and name the invention. Participants learn valuable problem-solving, expression, and presentation skills that they will carry for a lifetime. Meanwhile, while the participants are presenting their skills to the judges, the families of the participants attend sessions in a separate meeting space on entrepreneurship and how to start a family business, including seeking protection via copyrights, trademarks, and patents.

Furthermore, the competition features two categories for winners that tie directly into USPTO activities—"The Most Patentable Invention" and "The Best Trademarkable Name". Also, unique to the Young Inventors Showcase this year, a volunteer patent attorney judged and researched the USPTO database for these categories live during the competition, and the elected winners for these categories receive prosecution and filing fees with the attorney pro bono as part of their prize. I asked this attorney what his motivation was in doing this, and what he told me was astonishing. He shared a story of how when he was in elementary school as a child, his teacher took him into the hallway and told him that he was incredibly gifted, and that he scored at genius levels. He said, "Whether this was true or not, it didn't matter. From that point on, I knew I was intelligent and different, and my life as a result shot upward in a magnificent trajectory that wouldn't have happened otherwise. Look at these kids here. Just the fact that these kids made it here to the finals. They invented something, and they are told they are inventors and they are intelligent. And someone believed in them. Because of that, they have already won in life. It is for this reason I do what I do."

Moreover, the competition clearly demonstrates how innovation is the natural diversity engine. This past competition, over 700 participants entered the competition, and of the seven elected winners, three were female, and three of the four male winners were minorities. As I took a photo of these winners with my smartphone, I was literally in tears as an inner voice deep inside whispered, "And this why you do what *you* do. This is who you are fighting for."

If exposure to innovation during childhood is indeed a critical factor that determines who becomes an inventor, and, given that the Young Inventors Showcase is clearly a program where there is no diversity gap and also sets the next generation of winners on a trajectory of success, the government getting behind programs such as this should be paramount.

As such, I would be happy to meet with the USPTO and Congressional leaders to discuss this program in more detail and how it may be expanded throughout the United States. Furthermore, I have recently spoken with Mr. Micek, and he has also expressed a willingness to meet as well. The Young Inventors Showcase presents the golden standard model of which the USPTO can report to Congress, and with proper government backing and nationwide replication, this very program and policy could close the diversity gap with underrepresented classes when it comes to equal opportunity in the pursuit

of entrepreneurship and the U.S. patent bargain. As the cited study states: "If women, minorities, and children from low-income families were to invent at the same rate as white men from high-income families, there would be four times as many inventors in America as there are today."[21]

IV. Congress & Simultaneous Pursuit: Equal Opportunity + Equal Outcome

At the May 9 USPTO Oversight Hearing, Representative Doug Collins, expressed concern regarding outcome via the USPTO's implementation of IPR proceedings:

> Another area of the patent system that requires our attention is the USPTO's implementation of the [] IPR proceedings. ... [Many] argue that the PTO has implemented countless rules skewed against patent owners that result in good patents being struck down in bad IPR decisions. I have heard numerous reports that defendants in litigation are filing multiple similar attacks on the same patent or are using surrogates to skirt prohibitions to repeat attacks. I've also learned that since, in instance, where small businesses sought to assert their patents in federal court to stop the theft of their valuable IP from those thieves, are instead forced to defend themselves their patents before the PTAB, which issued a questionable decision invalidating the patents. Fortunately, some of these small innovative companies could afford to appeal the PTAB's final decision and have their patents restored by the Federal Circuit. But this demonstrates the PTAB proceedings may be used by well-funded companies to harass small businesses in submission. The cost for appealing a bad PTAB decision may be too much for small businesses to bear, resulting in their loss of their patents, innovations, and business at the hands of an unscrupulous copycat. Again, the very thing that we're trying to avoid, we're actually seemingly incentivizing. That's something that we need to look at.[22,23]

Recognizing these matters within the state of the U.S. Patent System, my wife Patricia Duran stated the following in her oral testimony on May 8 at the USPTO:

> [A]lthough pursuing equal opportunity with women, minorities, and veterans in obtaining a patent is a valuable effort, *if it does not coincide with equal outcome in one's ability to utilize the patent once received*, regardless of the person's financial state, telling women,

[21] *Id.* at 34.
[22] https://judiciary.house.gov/legislation/hearings/oversight-us-patent-and-trademark-office
[23] https://www.youtube.com/watch?v=Y-XyuoRZ_Fs

> minorities, and veterans that they stand to benefit from a patent will simply be false doctrine.[24]

Indeed, our current system does not provide equal outcome for an underrepresented inventor once she receives the patent grant. Therefore, if the government wants to encourage the pursuit of more patents among the underrepresented, there needs to exist a worthy incentive in terms of outcome. However, the imbalance in outcome between the underrepresented inventor and the financially-represented business today negates that incentive. So, there must be a simultaneous pursuit towards creating both equal opportunity and creating equal outcome in one's ability to defend a patent once it is issued.

As previously stated, Congress has expressed that they desire to *fully* understand underrepresentation in the U.S. patent system, in terms of equal opportunity as well as equal outcome. In fact, immediately following Representative Johnson statement at the May 9 USPTO Oversight Hearing on this desire, he immediately then directed his concern to the reliability in the resulting patent grant:

> A strong patent system requires clear rules, which lead to *reliable patent grants* that attract the investment needed to turn a patentable invention or innovation into a marketable product or service.[25]

Additionally, Congresswoman Sheila Jackson Lee has expressed explicit interest in the stakeholder feedback that the Patent Office has received from the public as part of its SUCCESS Act study. Recall, in my oral testimony on May 8, I quoted Congresswoman Jackson Lee by looking back to the 2011 Congressional Record where she added her sense of Congress amendment during the debate on the floor. Even then, she expressed great concern on how changes to patent law would affect inventors and small business and their patent rights:

> My amendment speaks ... to the vast population of startups and small businesses that are impacted by this legislation. ... This sense of Congress will put us on notice that we need to be careful that we allow at least the opportunity for [] investors, and that we continue to look at the bill to ensure that it responds to this opportunity. ... [M]y amendment also reinforces that we do not wish to engage in any undue taking of property... Small businesses should be as comfortable with going to the Patent Office as our large businesses. ... We must always be mindful of the importance of ensuring that small companies have the same opportunities to innovate and have their inventions patented and that the laws will continue to protect their valuable intellectual property. ... [W]ithout strong patent protection, businesses will lack the incentive to attract customers and contribute to economic growth.[26]

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[24] https://www.youtube.com/watch?v=2fF7d9i0Km4 (See also Attachment 2.)
[25] https://judiciary.house.gov/legislation/hearings/oversight-us-patent-and-trademark-office
[26] https://www.congress.gov/congressional-record/2011/06/23/house-section/article/H4480-1

In my testimony on May 8, I asked, "What happened to those investors the Congresswoman mentioned?" I then explained that according to a report from the Alliance for U.S. Startups & Inventors for Jobs (USIJ), in strategic sectors where patent protections are key, venture capital funding has dropped from being 20.95% of total VC funding in 2004 to a mere 3.22% in 2017.[27] "The VC money is gone," I said. I then declared that "now is the time to look at that bill and its consequences—not to lawyers, not to big business, but to the true stakeholders: the American Inventors".[28] So, very fittingly, Congresswoman Jackson Lee today still maintains her interest in looking at the AIA's consequences and its affect to the underrepresented, as she submitted Questions for the Record[29] for the USPTO following the May 9 USPTO Oversight Hearing – questions inquiring about stakeholder feedback, such as:

- Have stakeholders who have provided testimony pursuant to the SUCCESS Act identified any other people(s) as being underrepresented?
- Has the USPTO received stakeholder feedback expressing concern on an underrepresented inventor's ability to financially enforce her patent rights?
- What legislative recommendations has the USPTO received from stakeholders that would increase the incentive for underrepresented classes to apply for and obtain more patents, and does equal outcome with respect to a patent holder's financial ability to enforce their rights against well-funded companies play a part?
- Given that contingency law firms rely on damages to recoup their investment, and in the case of the PTAB, there is no monetary compensation for prevailing patent holders, have stakeholders expressed concern whether the underrepresented classes have the financial means to receive legal representation?
- What legislative recommendations has the USPTO received from stakeholders that would help the underrepresented classes avoid such a financial burden while still achieving the end result of determining patent validity/eligibility?

It goes without saying, clearly Congress is concerned with stakeholder burdens and solutions, both in the pursuit of equal opportunity and in the pursuit of equal outcome. As such, a desire to fully understand the contours of underrepresentation to aid in designing policy, as Representative Hank Johnson put it, is evident.

Now, to aid the USPTO with Congresswoman Jackson Lee's questions, by way of the oral testimony provided by my wife and me, and of this very written testimony, the Patent Office has indeed received stakeholder feedback clarifying that the underrepresented class includes not only women, minorities, and veterans, but additionally includes independent inventors and small businesses owned by those inventors. The Patent Office has also received stakeholder feedback expressing concern on an independent inventor's ability to financially enforce her patent rights, that feedback also expressing concerns on the lack of contingency representation at the PTAB. In lieu of legislative recommendations that would increase the incentive for the underrepresented inventor to apply for and obtain more patents, and legislative

[27] https://www.usij.org/research/2018/7/9/us-startup-company-formation-and-venture-capital-funding-trends-2004-to-2017
[28] https://www.youtube.com/watch?v=2fF7d9i0Km4
[29] See Attachment 1.

recommendations to help the underrepresented inventor avoid the financial burden of the PTAB while still achieving the end result in determining a patent's validity/eligibility, I have provided legislative recommendations that address these questions and more in the following section below.

V. Legislative Recommendations

Pursuant to the SUCCESS Act, the Director of the USPTO is to conduct a study that provides legislative recommendations for how to a) promote the participation of women, minorities, and veterans in entrepreneurship activities, and b) increase the number of women, minorities, and veterans who apply for and obtain patents.

Legislation that would help in the pursuit of **equal opportunity** for underrepresented classes would include:

1. **Women, Minorities & Youth**. Establishing and providing funding from Small Business Innovation Research (SBIR) grants or otherwise to be used to build educational programs that expose our young generation to inventing, programs such as the Young Inventors Showcase, including funds to replicate this model throughout the United States. This falls in line with the study showing that exposure to innovation during childhood leads to higher inventor rates, helping close the diversity gap by focusing on education in and exposure to inventing. Reach could be maximized to all demographics by placing inventing into the public-school system curriculum.

2. **Veterans**. In return for their service to the United States, allowing veterans to enjoy reduced filing fees, and perhaps, fees reduced to an even greater extent than that of a micro entity. This would encourage veterans to partake in innovation with a lower barrier to entry, as well as show our appreciation for their service to our country.

3. **Minorities & Immigrants**. For the purpose of bringing the best minds and the best ideas to the United States, rather than exporting them overseas, upon issuance of a U.S. patent, allowing immigrants who a) are named inventors on the patent, b) have applied for U.S. residency and/or U.S. citizenship status, and c) have satisfied the requirements and do not pose a security risk, to enjoy the benefit of no waiting time to receive their residency/citizenship appointment at USCIS, similar to the benefit received by a spouse of a U.S. citizen seeking the same. Given that the majority of immigrants are minorities by nature, this would help address any diversity issues with regard to those minorities, while encouraging the world's best innovators to contribute in and to American society and commerce. This would also help satisfy the current

concerns of U.S. valuable IP being sought outside the U.S. and in Europe and China, particularly in areas such as 5G, artificial intelligence, and medicine.

It has been shown here that a patent is only valuable if it can be trusted to be reliable and if an underrepresented patent holder enjoys the means to defend it. Recall that *the government must simultaneously provide equal outcome in the resulting patent grant so that equal opportunity in the pursuit of the grant even presents an incentive worth pursuing*. Accordingly, **simultaneous legislation** that would help provide **equal outcome** for underrepresented inventors who hold patents would include:

4. **Venue Reform**. As a result of *TC Heartland*, an underrepresented inventor who wishes to enforce her patent rights against an infringer does not have a convenient venue to do so. She did nothing wrong, yet now her work on innovation must halt while she spends the additional time and cost to traverse the United States to infringer-friendly district courts to enforce her rights against theft. The solution to this can be found in the proposed Section 1400(b)(4) of S.2733 of the 114th Congress—the Venue Equity and Non-Uniformity Elimination (VENUE) Act of 2016[30], legislation that was tabled given that *TC Heartland* was underway. Now the pendulum in full swing in favor of an infringer due to *TC Heartland*, this bill seeks amends Section 1400(b) and contains a provision allowing an infringement action to be brought in judicial districts "where an inventor named on the patent in suit conducted research or development that led to the application for the patent in suit". This bill would allow an underrepresented patent holder to more conveniently enforce her patent rights in the judicial district where she conducted her research; moreover, this language of this bill does not allow bad actors to participate in forum shopping.

5. **Defining Inventor-Owned Patents and PTAB / Declaratory Judgement Venue Consent**. Underrepresented inventors likely retain ownership of their patents, or assign their patents to a small business they own. Accordingly, Section 100 of 35 U.S.C. shall be amended with the following new subsection: "The term 'inventor-owned patent' means a patent held entirely by the inventor(s), or held entirely by a business owned solely by the inventor(s), of the claimed invention." Once that is established, patent validity challenges petitioned on inventor-owned patents at the USPTO must first be agreed to by the inventor(s); otherwise, said challenges will occur in traditional district court. This provision would allow an underrepresented inventor maintaining possession of her patent to receive contingency fee representation, while still achieving the end result of determining patent validity. This also serves to protect against the threat of bad actors who are said to buy up patents and file frivolous lawsuits, as these supposed bad actors are not the original inventors listed on the face of the patents they potentially might buy. Furthermore, in accordance with the proposed venue reform regarding where research was conducted, claims for declaratory judgement

[30] https://www.congress.gov/bill/114th-congress/senate-bill/2733/

relating to an inventor-owned patent should also be limited to the district where the inventor is domiciled or has consented to jurisdiction.

6. **Restore Constitutional Exclusivity**. Article I, Section 8, Clause 8 of the U.S. Constitution gives Congress the sole power to "promote the Progress of Science and the Useful Arts, by securing for limited times to Authors and Inventors *the exclusive Right* to their respective Writings and Discoveries."[31] However, in *eBay*, the Supreme Court elected that it could decide what promotes the progress of science and the useful arts, and in doing so, it fundamentally changed the constitutional exclusive right bestowed upon an inventor by the grant of a letters patent to where a patent holder can be forced to license her invention, which is equivalent to her losing the right to exclude others. This represents a real challenge for the underrepresented inventor if she wants to compete in the market. If Congress wants to provide equal outcome for underrepresented inventors in the competitive market with more financially-abled businesses, Congress must enact a provision that includes the right to injunctive relief for patent holders upon a finding of infringement, providing underrepresented inventors true ownership and exclusive rights over their disclosed inventions.

7. **Abolish Retroactive Application of the AIA**. The Supreme Court in Oil States opted not to address retroactive application of IPRs on patents having priority dates that predate the AIA; nevertheless, the AIA provides that the USPTO can unconstitutionally take a patent away from a patent holder by instituting an IPR on said patent. Moreover, such a taking by the Patent Office from inventors who disclosed their inventions prior to the AIA and who did not subject themselves to the provisions of its title is unjust, violates due process, and destroys any confidence in the social compact between inventors and the government, because, at any time, the government can change a legal contract *ex post facto*. Congress must restore integrity and confidence in the U.S. patent system. Abolishing retroactive application of the AIA on patents having priority dates that predate the law would restore confidence held by the underrepresented inventor in her government and in the social compact patent bargain with the people, without fear that the government can unfairly change the rules in the middle of the game on a patent bargain already entered.

The legislative recommendations above will restore reliability for the underrepresented inventor in seeking a U.S. patent grant. These recommendations will provide her both a new and restored incentive to seek patent protection for her inventions, thus receiving the protection she needs to engage in entrepreneurship and the American and global innovative economy.

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[31] U.S. CONST. art. I, § 8, cl. 8 (emphasis added).

VI. Federal Register Notice Questions

As part of the Federal Register Notice[32], the Director provided questions as a preliminary guide to aid the USPTO in collecting relevant information and to evaluate possible administrative or legislative recommendations that may be provided to Congress. The Federal Register notice stated that comments from the public on any issues that they believe are relevant to the scope of the study are welcome, but the USPTO was particularly interested in answers to the questions in the Notice. I have provided my answers to selected questions in Attachment 3.

VII. Conclusion

This testimony has shown that in order to provide equal opportunity to underrepresented classes in entrepreneurship and invention, the government stands to benefit in this quest by supporting and replicating educational programs such as the Young Inventors Showcase nationwide, fostering innovation among today's youth and their families; allowing veterans to participate in the patent system with reduced fees; and encouraging those seeking U.S. residency and/or citizenship to bring their ideas to be protected in the United States and be rewarded with waiting time advantages. Furthermore, in order to provide an incentive to those underrepresented classes pursuing equal opportunity when filing for and obtaining patents, Congress must ensure there is equal outcome in lieu of the ability for the underrepresented patent holder to be able to rely upon and defend her granted patent rights. Policy that will restore representation to inventors, reliability in their patent grants, a convenient venue for enforcement by inventors, and exclusive rights as stated in the Constitution, will bring the necessary incentive and encourage those underrepresented groups seeking to protect their intellectual property. Only by coupling equal outcome with equal opportunity in such a two-pronged approach can the United States fully harness the maximum innovative potential of its people and continue to promote U.S.-based leadership in the global innovation economy.

Both the USPTO and Congress should be commended on their dedicated attention to this issue of underrepresentation, and the USPTO especially should be commended for involving the public as stakeholders in their required study pursuant to the SUCCESS Act. Concurring with Representative Martha Roby's statement made during the March 27, 2019 House Judiciary Committee "Lost Einsteins" Hearing,

[32] 84 FR 17809 (2019).

I too look forward to viewing the USPTO's report on the results of the study conducted by the USPTO pursuant to this SUCCESS Act.

It is my hope that the USPTO finds this testimony useful in its report to Congress. Given that it is the sense of Congress that the United States has the responsibility to work with the private sector to close the gap in the number of patents applied for and obtained by women and minorities, I look forward to continuing the conversation and/or engaging with the USPTO to that end.

ATTACHMENT 1
TO

Written Testimony of
JEFF HARDIN & PATRICIA DURAN

Before the
UNITED STATES PATENT & TRADEMARK OFFICE
(USPTO)

Pursuant to the
Study of Underrepresented Classes
Chasing Engineering and Science Success
(SUCCESS) Act of 2018

Submitted on
June 30, 2019

SHEILA JACKSON LEE
18TH DISTRICT, TEXAS

WASHINGTON OFFICE:
2160 Rayburn House Office Building
Washington DC 20515
(202) 225-3816

DISTRICT OFFICE:
1919 SMITH STREET, Suite 1180
THE GEORGE "MICKEY" LELAND FEDERAL BUILDING
HOUSTON, TX 77002
(713) 655-0050

ACRES HOME OFFICE:
6719 WEST MONTGOMERY, SUITE 204
HOUSTON, TX 77019
(713) 691-4882

HEIGHTS OFFICE
420 WEST 19TH STREET
HOUSTON, TX 77008
(713) 861-4070

FIFTH WARD OFFICE:
4300 LYONS AVENUE, SUITE 200
HOUSTON, TX 77020
(713) 227-7740

Congress of the United States
House of Representatives
Washington, DC 20515

COMMITTEES
JUDICIARY
SUBCOMMITTEES
COURTS, INTELLECTUAL PROPERTY AND THE INTERNET
IMMIGRATION AND BORDER SECURITY

HOMELAND SECURITY
SUBCOMMITTEES:
RANKING MEMBER
BORDER AND MARITIME SECURITY
TRANSPORTATION SECURITY

SENIOR WHIP
DEMOCRATIC CAUCUS

CONGRESSWOMAN SHEILA JACKSON LEE OF TEXAS QUESTIONS FOR THE RECORD FOLLOWING HOUSE JUDICIARY SUBCOMMITTEE ON IP: OVERSIGHT OF THE U.S.P.T.O MEETING HELD: MAY 9, 2016 QUESTIONS SUBMITTED: MAY 16, 2019

As required by the 2018 Study of Underrepresented Classes Chasing Engineering and Science (SUCCESS) Act, the USPTO is to prepare a study on the participation of women, minorities, and veterans in entrepreneurship activities and the patent system. Section 3 of the SUCCESS Act requires the study to provide legislative recommendations for how to increase the number of women, minorities, and veterans who apply for and obtain patents. To assist in gathering information prior to compiling the report, the USPTO has invited the public to provide written comments and also oral testimony at one of three hearings.

1. Have stakeholders who have provided testimony believe that the underrepresented classes only consist of those who are considered women, minorities, or veterans, or have any of the stakeholders identified any other people(s) as being underrepresented? In the case of the latter, who else, or what other group(s) of people, have the stakeholders identified as being underrepresented?

2. Have stakeholders expressed concern regarding the underrepresented classes' financial ability to enforce their rights once they do obtain patents? What legislative recommendations has the USPTO received from

stakeholders that would increase the incentive for underrepresented classes to apply for and obtain more patents, and does equal outcome with respect to a patent holder's financial ability to enforce their rights against well-funded companies play a part?

3. The PTAB/IPRs are purported to being a cheaper and faster alternative than district court litigation in achieving the end result of determining patent validity/eligibility. Given that contingency law firms rely on damages to recoup their investment, and in the case of the PTAB, there is no monetary compensation for prevailing patent holders, have stakeholders expressed concern whether the underrepresented classes have the financial means to receive legal representation? What legislative recommendations has the USPTO received from stakeholders that would help the underrepresented classes avoid such a financial burden while still achieving the end result of determining patent validity/eligibility?

4. What legislative recommendations has the USPTO received from stakeholders that would help underrepresented classes apply for and obtain more patents in lieu of patent eligibility?

ATTACHMENT 2
TO

Written Testimony of
JEFF HARDIN & PATRICIA DURAN

Before the
UNITED STATES PATENT & TRADEMARK OFFICE
(USPTO)

Pursuant to the
Study of Underrepresented Classes
Chasing Engineering and Science Success
(SUCCESS) Act of 2018

Submitted on
June 30, 2019

SUCCESS Act: Oral Public Testimony at First Public Hearing
Patricia Duran
"The True Underrepresented Class"

(This testimony below was delivered by Patricia Duran in Spanish, with Jeff Hardin providing the English translation.)

My name is Patricia Duran. Thank you for the opportunity to allow me to comment with you here today.

I am a woman, and I am considered a minority in this country. I appreciate the intent behind the SUCCESS Act for Congress to ask for legislative recommendations for how to increase the number of women, minorities, and veterans who apply for and obtain patents, but I must start with this question:

What good is a patent if one cannot feasibly defend it?

Regarding this SUCCESS Act, I am certain you will hear this theme from all independent inventors, who are the true stakeholders in the patent system and the true source of American innovation. The theme is this:

> Women, minorities, and veterans all reside in the same category with all the other independent inventors, and this class – the *independent inventors – this is the true underrepresented class*.

And here's why. Women, minorities, and veterans, once they receive a patent, are actually in the same predicament as all independent inventors and small businesses. With the current state of patent law in the United States, independent inventors and small businesses cannot adequately license the patents they receive with larger, financially-abled entities – the "represented" class – nor can they enforce their patents against this class when their patents are stolen. This is because this represented class can simply bleed the underrepresented class dry legally and financially by taking advantage of today's current patent laws.

So, although pursuing equal opportunity with women, minorities, and veterans in obtaining a patent is a valuable effort, if it does not coincide with equal outcome in one's ability to utilize the patent once received, regardless of the person's financial state, telling women, minorities, and veterans that they stand to benefit from a patent will simply be false doctrine.

Now that I have provided the above clarification, I will tell you a chapter in the story of my life.

I am a cancer survivor. I was diagnosed with breast cancer three months after my daughter was born. I am almost three years into my fight. After being diagnosed, I received a double mastectomy, and because the biopsy taken prior to my surgery of the suspicious lymph node adjacent to my tumor turned out to be negative, I was to receive simultaneous reconstruction during the mastectomy. Two birds with one stone. But as it turned out, my diagnosis was incorrect. A second biopsy of my lymph nodes was performed during the surgery, and it revealed that my lymph nodes in fact had been compromised.

The result was irreversible torture, and I had to relive this multiple times. During this double surgery attempt, my mastectomy had already been completed, and my plastic surgeon was already midway into his reconstructive procedure, using fatty tissue from my abdomen to reconstruct my breasts. Because my lymph nodes were discovered as compromised, he had to suspend his work, leaving me with a diamond-shaped incision going from hip to hip and plastic silicon sheets were to remain in my abdomen until I had undergone and

SUCCESS Act: Oral Public Testimony at First Public Hearing
Patricia Duran
"The True Underrepresented Class"

recovered from full chemotherapy and radiation therapy. Then I would have to come back and undergo surgery again to complete the rest of the procedure.

What was the end result in that follow up procedure one year later? I had complications and my reconstruction failed 3 times. I have not only endured and continue to suffer physical pain as a result of these surgeries, but I also endure psychological pain every day when I look in the mirror as a reminder. My scars remind me of the battle I fight, but every day I have is a gift. My blessing is that I am alive, and I have two beautiful children and a loving husband.

So how does my story relate to patents? Well, given that I endured misdiagnosis, the fact that medical diagnosis methods can be considered patent ineligible is concerning. The cure of cancer today is merely playing a game of statistics – crossing my fingers hoping that I fall within the percentage of people who survive in studied patient populations and clinical trials. The chemotherapies I received were a result of a strong patent system, but is there something better? For example, can more work be done in immunotherapies and other discoveries? Or, as Sherry Knowles, who is also a breast cancer survivor, has questioned: are discoveries now being thrown out? The Constitution includes discoveries, and so does the Patent Statute. Jeff will speak more on these, but this is my testimony, and I thank you for giving me the opportunity to share my comments with you here today.

SUCCESS Act: Oral Public Testimony at First Public Hearing
Patricia Duran
"The True Underrepresented Class"

(This Spanish testimony below was delivered by Patricia Duran, with Jeff Hardin reciting the English translation.)

Mi nombre es Patricia Duran. Gracias por la oportunidad de permitirme estar aquí hoy con ustedes y escucharme.

Soy mujer y soy considera una minoría en este país. Y quiero agradecer la intención de THE SUCCESS ACT que emite el Congreso en solicitar recomendaciones legislativas que contribuyan la fomentación del número de mujeres, minorías y veteranos que solicitan y obtienen patentes, pero debo empezar con esta pregunta:

¿De qué sirve tener una patente si no la puedes defender?

Con respecto a esta ley de THE SUCCESS ACT, estoy seguro de que escucharemos este tema de todos los inventores independientes quienes son los verdaderos interesados en el sistema de patentes y quienes son el verdadero origen de la innovación norteamericana. El tema es este:

> Las mujeres, las minorías y los veteranos están dentro de la misma categoría con todos los demás inventores independientes, y esta clase - los inventores independientes - *es la verdadera clase subrepresentada*.

La razón es porque las mujeres, la minoría y los veteranos, una vez que reciben una patente están realmente en el mismo aprieto económico que todos los inventores independientes y las pequeñas empresas. Con el estado actual de la legislación en materia de patentes en los Estados Unidos, los inventores independientes y las pequeñas empresas se ven en la incapacidad de licenciar adecuadamente las patentes que reciben, con entidades grandes y de mayores capacidades financieras – que representan la clase "representada" - ni pueden hacer valer sus patentes contra Esta clase cuando se roban sus patentes. Esto se debe a que la clase representada puede simplemente abusar gradualmente de todos los recursos legales y financieros sobre la clase subrepresentada y así con conllevándole a la extinción utilizando a las leyes actuales de patentes de hoy en día.

Por lo tanto, aunque perseguir la igualdad de oportunidades que las mujeres, la minoría y los veteranos en la obtención de una patente es un esfuerzo valioso, si no coincide con el mismo resultado en la capacidad de utilizar la patente una vez recibida, independientemente del estado financiero de la persona, decir que las mujeres, las minorías y los veteranos que pueden beneficiarse de una patente simplemente será una doctrina falsa.

Después de haberles aportados la aclaración anterior; deseo contarles un capítulo de la historia de mi vida.

Soy sobreviviente de Cáncer. Fui diagnosticada con cáncer de mama 3 meses después de nacer mi hija. Estoy casi tres años en mi lucha. A causa de este diagnóstico tuve que realizar una mastectomía doble lo cual fue planeada con una reconstrucción simultanea debido a que previa a la cirugía el ganglio linfático que presentaba características sospechosas adyacente al tumor fue biopsia y su resultado fue negativo. El plan fue matar 2 pájaros con un solo tiro. Pero ese diagnóstico fue incorrecto, una segunda biopsia de los ganglios linfáticos durante la cirugía revelo que estos estaban comprometidos.

SUCCESS Act: Oral Public Testimony at First Public Hearing
Patricia Duran
"The True Underrepresented Class"

El resultado fue una pura tortura irreversible y que luego tendría que volver a repetir. Durante este intento de doble cirugía, mi mastectomía ya se había completado, y mi cirujano plástico ya había avanzado su trabajo en su procedimiento reconstructivo usando tejido graso de mi abdomen para reconstruir mis senos. Pero el hallazgo de que algunos ganglios linfáticos sí estaban comprometidos conllevo a que la reconstrucción se suspendiera dejándome con una incisión en forma de diamante en la cadera cruzando de un extremo a otro, y dejando dentro unas hojas de silicona de plástico que permanecieran en mi abdomen hasta que el tratamiento de quimioterapias y radioterapias se completara para luego proceder con la reconstrucción nuevamente.

Entonces el resultado final al procedimiento reconstructivo de seguimiento fue que tuve ciertas complicaciones y la reconstrucción falló 3 veces. Batallo con el sufrimiento de tener diferentes dolores físicos como resultado de estas cirugías, pero también sufro dolor psicológico todos los días cuando me miro en el espejo. Sin embargo, estas marcas son de luchas ganadas en la batalla que estoy peleando, donde cada día no es un día más, es un regalo como las bendiciones de que Estoy viva, tengo dos hermosos hijos y un esposo amoroso.

Entonces como mi experiencia se relaciona con el tema de las patentes, dado que he sido afectada por un diagnóstico erróneo, el hecho de que los métodos de diagnóstico médico puedan considerarse inadmisibles en materia de patentes es preocupante. Y la cura del cáncer es un sorteo que En la que las estadísticas nos dan un numero de probabilidades donde yo cruzo mis dedos con la esperanza de quedarme dentro del porcentaje de personas que sobreviven en las poblaciones de pacientes estudiados y ensayos clínicos. Las quimioterapias que recibí fueron el resultado de un fuerte sistema de patentes, pero ¿hay algo mejor? Por ejemplo, ¿se puede hacer más trabajo en inmunoterapias y otros descubrimientos? O, como Sherry Knowles, que también es sobreviviente del cáncer de mama, ha cuestionado: ¿ahora se están desechando los descubrimientos? La Constitución incluye los descubrimientos, y también lo hace el estatuto de la patente. Jeff hablará más sobre estos, pero este es mi testimonio, y les agradezco por haberme dado la oportunidad de compartir mis comentarios con ustedes aquí hoy.

ATTACHMENT 3
TO

Written Testimony of
JEFF HARDIN & PATRICIA DURAN

Before the
UNITED STATES PATENT & TRADEMARK OFFICE
(USPTO)

Pursuant to the
Study of Underrepresented Classes
Chasing Engineering and Science Success
(SUCCESS) Act of 2018

Submitted on
June 30, 2019

Federal Register Notice Questions

(1) What public data are available to identify the number of patents applied for and obtained by women, minorities and veterans?

Regarding the number of women, the USPTO used particular methodology to reach conclusions as described in Appendix II in the February 2019 report "Progress and Potential: A profile of women inventors on U.S. patents". Although not definitive, the methodology did exhibit a level of confidence in its analysis. An analysis is minorities and veterans might be harder to identify. Moreover, what is the definition of a "minority", and how is it relevant? My wife is considered a minority. Does that mean my children are?

(2) What public data are available to assess the social and private benefits that result from increasing the number of patents applied for and obtained by women, minorities, and veterans, as well as small businesses owned by these groups?

====

(3) What social and private benefits would you identify as resulting from increasing the number of patents applied for and obtained by women, minorities, and veterans?

Unfortunately, because of the current state of the U.S. patent system, I honestly find it difficult to recommend that women, minorities, and veterans—or any independent inventor or small business for that matter—seek to apply for and obtain a U.S. patent. The benefit of protection that a patent once provided to an inventor has lost its reliance. This in part is because larger, financially-abled companies can partake in the strategy of efficient infringement on an underrepresented inventor's disclosed invention and bleed her dry legally and financially until she doesn't the resources to continue to try to defend her patent.

(4) What social and private benefits to small businesses owned by women, minorities, and veterans would you identify as resulting from increasing the number of patents applied for and obtained by those businesses?

Unfortunately, because of the current state of the U.S. patent system, I honestly find it difficult to recommend that any small business—whether owned by women, minorities, veterans, or any independent inventor for that matter—seek to apply for and obtain a U.S. patent. The benefit of protection that a patent once provided to a small business has lost its reliance. This in part is because larger, financially-abled companies can partake in the strategy of efficient infringement on a small business's disclosed invention and bleed it dry legally and financially until it doesn't have the resources to continue to try to defend its patent.

(5) Should the USPTO collect demographic information on patent inventors at the time of patent application, and why?

No. The patent system is a meritocracy. It goes without saying, an examiner of a patent application cares *not* of the gender, age, race, or otherwise of the applicant or inventor when examining the merits, as a patent is based solely on the merits of the claims, and nothing more.

If the USPTO desires to collect demographic information, providing this information should be voluntary for inventors, and should only be collected *after* the application has either been granted or abandoned, but definitely not before or during the application process, lest the application or the examination process run the risk of becoming tainted. E.g., what if someone at the Patent Office decides to use the demographic information to discriminate?

I elect for not allowing any form of bias to creep into an otherwise blind yet meritorious process.

Federal Register Notice Questions

(6) To what extent, if at all, do educational and professional circumstances affect the ability of women, minorities, and veterans to apply for and obtain patents or to pursue entrepreneurial activities?

See answer in (7) below.

(7) To what extent, if at all, do socioeconomic factors facilitate or hinder the ability of women, minorities, and veterans to apply for and obtain patents or to pursue entrepreneurial activities?

Educational, professional, and socioeconomic factors do affect the ability to apply for and obtain a patent, not just women, minorities, and veterans, but for anyone applying. This comes from understanding Maslow's Hierarchy of Needs, which entails a pyramid for the different levels of personal development. This explains that only when one reaches the highest level in the pyramid will one's genius begin to flourish. Now, do realize that this does *not* solve the problem that today's system does not have equal outcome, but this will at least help solve the problem of equal opportunity.

Maslow's Hierarchy of Needs explains a personal development pyramid containing five levels. Starting from the bottom and going up, there's

- physiological (food, water, shelter)
- safety needs (personal, emotional, and financial security)
- social and moral belonging (intimate relationships, friends, family, church, sports)
- self-esteem (feeling of accomplishment, confidence in one's abilities)
- self-actualization (utilizing abilities and talents. understanding and pursuing goals: creating or even inventing)

'Each lower level must be satisfied within an individual in order for one to be motivated to pursue the next level. Because if one doesn't have food to eat, then one is not going to engage in becoming an entrepreneur or pursuing a patent. That's just not on their mind.

Only until someone has all lower levels satisfied can they begin freely pursuing goals, creating, and inventing, so only then will you begin to see the genius flourish. Unfortunately, once those who reach this level will become educated on the state of today's patent system, and they will understand today's patent landscape is largely defined by unequal outcome, which might tend to discourage their participation on patenting as they look for other methods of receiving protection, such as trade secrets.

(8) What entities or institutions, if any, should or should not play an active role in promoting the participation of women, minorities, and veterans in the patent system and entrepreneurial activities?

For me, I had the privilege of having an established network – the third prong "social and moral belonging" in Maslow's hierarchy. That did not occur because of my gender or my race. That was because I knew a friend. When I had an idea for my first invention, I reached out to a friend who was in law school. He connected me with a patent attorney who had gone out on his own and would likely file my patent application at a deep discount, which he did. Again, I am in the underrepresented class, and this is what worked for me.

In my written testimony, I describe the Young Inventors Showcase, and it plays an active role in promoting the participation of all youth and their families in the patent system and entrepreneurial activities. I do believe programs like this should continue to play an active role, and this type of program creates a natural diversity engine.

Federal Register Notice Questions

(9) What public policies, if any, should the Federal Government explore in order to promote the participation of women, minorities, and veterans in the patent system and entrepreneurial activities? Are there any public policies that the Federal Government should not explore?

The government (Congress) needs to correct the imbalance in equal outcome for the patent holder. The value of a patent should not depend on the financial resources of the entity who possesses ownership of the patent.

In my written testimony, I outline seven legislative recommendations that the Federal Government should explore that would promote the participation of the underrepresented in the patent system and entrepreneurial activities.

Public policies that the Federal Government should *not* explore include policies that focus on the post grant review proceedings. Post grant review is an experiment that Congress should end. Rather, any focus on bringing additional reliance to issued patents should be during the initial examination phase, *prior to* when a patent is issued. Bringing into question the patent grant that is issued by the USPTO only serves as a detriment to investment, and thus serves as a risk, rather than an asset, for a patent holder. An underrepresented inventor's biggest fear today is being dragged into a post grant review proceeding, where the cost to defend a patent cannot be arranged on a contingency basis. This cost is on the inventor's dime, and being dragged into this proceeding is not due to any fault by the inventor. The patent has already been vetted by experts in the field, so the inventor should receive quiet title, or at least the same level of reliance that existed for a patent prior to when the America Invents Act went into effect, where patent validity challenges occurred in district court, and an underrepresented inventor could be assured of contingency fee representation.

(10) What action could USPTO take to address the participation of women, minorities, and veterans in the patent system and entrepreneurial activities?

In my written testimony, I outline seven legislative recommendations that the Federal Government should explore that would promote the participation of the underrepresented in the patent system and entrepreneurial activities. The USPTO should share these recommendations with Congress. Furthermore, the USPTO should learn more about programs like the Young Inventors Showcase, while working strategically with, and sponsoring, such programs, so they may be rolled out nationwide.

(11) Are there policies, programs, or other targeted activities shown to be effective at recruiting and retaining women, minorities, and veterans in innovative and entrepreneurial activities? Are there policies, programs, or other targeted activities that have proved ineffective?

In my written testimony, I explain the Young Inventors Showcase. This is such a program shown to be effective at recruiting and retaining all peoples in innovative and entrepreneurial activities. I provide a demographic sampling of this year's elected winners as proof of its effectiveness.

Written Testimony

Paul Morinville
US Marine Veteran
US inventor
3290 Ridge Road
Highland, IN 46322

I'm Paul Morinville. In World War II, my grandfather was a Navy Corpsman serving with the Marines as they island hopped across the Pacific and onto Hiroshima after the war ended.

He was my hero so as soon I turned 17, I joined the Marine Corps. The Marine Corps shapes the character of young men and women.

It taught me to stand up and keep going until the mission is completed. The Marine Corps made me a patriot, proud of my country and its heritage.

I worked at Dell in the 1990's. My first invention was invented there in late 1999.

I brought it to Dell executives, who told me to put it in a business plan and Dell would fund it. I left Dell on April 3rd, 2000 with high hopes and big dreams.

Within a few weeks the dot-com bubble collapsed, and Dell Ventures was shuttered. That ended my funding.

For the next four years, I kept inventing and over time my inventions became the industry standards in multiple areas of enterprise middleware. Today there is over $50 billion dollars of infringing product on the market.

But it wasn't until 2011 that I was able to obtain funding again. I started working with the Purdue Technology Center to commercialize my inventions.

I hoped to create a couple of hundred tech jobs in Gary, Indiana -- one of the poorest areas of the country.

But in 2013, the 90% kill rate of PTAB was revealed. This turned my patents into junk assets.

My company was in a market controlled by Big Tech monopolies. If patents can't be defended, Big Tech just steals them and, using their huge markets and deep pockets, massively commercialize them. Big Tech has huge market reach, political influence, and in many cases is or owns the media.

So, my investors stopped investing. That's when I hopped in my pickup truck and drove to Washington.

Today, my mission is to educate the government about what the patent system means to America and Americans.

My mission will be complete when my government gives my rights back to me by restoring the patent system for individual American people.

The Patent Act of 1790, only the third Act of Congress, granted patents to "*he, she, or they*" at a cost that even a pauper could afford.[1]

At a time when most women and African Americans could not own property, both could own patents… and they did.

In 1809, Mary Kies became the first woman patentee for an invention of weaving straw hats. During the 1800's, more than 3,000 women patented 4,196 inventions and many made their living by licensing or commercializing their own inventions.[2]

In 1821, Thomas Jennings became the first African American patentee by inventing a method of dry scouring clothes.

Granville Woods, who people of the day called the "Black Edison", patented dozens of railroad related inventions in the late 19th century.[3]

The patent system leveled the field regardless of race, gender or economic status.

In many ways, it was the first equal opportunity law.

The patent system fueled the greatest economic expansion in the history of man, propelling America to lead the world in every technology revolution from potash processing to smartphones.

But for women, minorities and veterans, the patent system was a social and economic equalizer enabling them to invent things and build our largest and most powerful corporations.

An everyday American could unseat huge incumbents and take their place in society based solely on the merits of their contributions to society -- not on their money, power and lobbying.

But in just the last fifteen years, all of that has been destroyed.

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[1] See Patent Act of 1790, Ch. 7, 1 Stat. 109-112 (April 10, 1790) The First United States Patent Statute CHAP. VII. --An Act to promote the progress of useful Arts.(a) Section 1 and 2

[2] See The Democratization of Invention: Patents and Copyright in American Economic Development, 1790-1920, by B. Zorina Khan, 2005, Cambridge University Press

[3] See http://www.biography.com/people/granville-t-woods-9536481

The government changed rules on prior art scope, invention priority, injunctive relief, venue, claim construction, error correction, disclosure requirements, mental step and abstract idea doctrine, invalidation procedures, damages models, fee reversals and much more.

Every single long held construct of patent law was changed. Many of these changes are the results of Supreme Court decisions often directly contradicting statutes and without any public debate. [4] Congress, thanks to the lobbying and political contributions by the biggest companies, optimized the patent system for corporations, the largest customers of the USPTO.

In the dust of this rubble, the USPTO set up the PTAB skewed to invalidate huge percentages of the very same patents that it just granted.

The PTAB invalidation rate is a shocking 84%.[5] Only 16% of patents survive unscathed. The cost of defending a PTAB assault is $450,000.

But only commercially valuable patents are challenged at the PTAB. These are the patents that inventors have put their trust in, betting their careers and sometimes their entire life savings to commercialize or license, only to have that trust betrayed and then to lose everything.

Even if their patent is never challenged at the PTAB, the market effects of the huge invalidation rates harms all inventors by making investors, customers and others believe that their patents cannot be defended.

It is a CEO's fiduciary duty to shareholders to steal patented inventions and massively commercialize them thus running the inventor into the dustbin of history. This "Efficient Infringement" enables high stock prices which fuels CEO pay and CEOs earn hundreds or thousands times more than workers.[6] Stopping change and disruption pays.

Most contingent fee attorneys and investors have left the patent business for more predictable investments.

Individual inventors are now defenseless against that theft.

Inventors are duped into revealing their trade secrets under a false promise that they are going to get patent protection only to have that protection destroyed after the fact with no way to take the secret back.

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[4] https://www.ipwatchdog.com/2016/06/06/supreme-court-legislated-patent-reform/id=69646/
[5] https://www.usinventor.org/2019/03/25/inventors-to-senate-ip-subcommittee-venue-hardship-efficient-infringement-ptab-crisis/
[6] https://www.vox.com/recode/2019/5/2/18522927/ceo-pay-ratio-tech-employee-salary-2018
https://www.usatoday.com/story/money/2019/04/17/these-ceos-make-1000-times-more-than-their-employees/39350499/

The SUCCESS Act is intended to increase the participation of women, minorities and veterans in the patent system.

It also extended the USPTO's temporary fee setting authority.

The PTAB has not been financially solvent – it loses money. So the USPTO transferred fees paid for examination and maintenance to the PTAB to make it solvent. More recently the USPTO increased fees to try to make PTAB self-sufficient.

This diversion of applicant and owner fees grabs resources intended to grant better patents and transfers those resources to the PTAB to destroy patents.

The only reasonably expected result that can come from this is to create lower quality patents with higher invalidation rates.

With the passage of the SUCCESS Act, the USPTO raised fees for examination and maintenance. This significant fee increase makes it more likely that women, minorities and veterans will be forced to abandon patent applications and issued patents.

The goal of the SUCCESS Act is to encourage women, minorities and veterans to invent new things and patent them.

It is unfortunate that the SUCCESS Act has been used to achieve an opposite result.

The Constitution secures a patent for an *inventor*, a human being, not a corporation. Somehow this simple fact is lost by current patent theorists, lobbyists and lawmakers.

The foundation of America law is to protect of the fruit of one's labor. The labors of one's mind must also be protected. If nobody discloses their inventions, innovation in America will collapse.

This is proving to be true. China is taking the lead in many technologies critical to our national and economic security.

This is directly related to China improving their patent system, while we were busy destroying ours. Today tech inventions are protected in China, but not here.

We responded to China's threat with a trade war that is hobbling China's tech companies apparently to protect our own big tech monopolies from superior Chinese products.

But the root of the problem is that our patent system is destroyed. We have done next to nothing to fix it again to protect big tech monopolies by eliminating the threat of creative destruction served up by inventors with better inventions.

Big tech monopolies are built on business methods and software. These are the inventions that are core to their business models and the very type of inventions that cannot get a patent issued and are invalidated in courts and the PTAB.

If business methods and software cannot be patented, big tech cannot be challenged, and their monopolies are untouchable.

If you can't measure it, you can't manage it. The first step to including more women, minorities and veterans is to measure it.

But the USPTO cannot determine who is inventing what. Small inventors are grouped in with huge universities with multimillion-dollar endowments.

If a small inventor licenses a patent a large entity, no matter what the license pays, they are classified as a large entity.

And we should no lump in inventors who assign their rights to big corporations. People who don't use a patent to attract investment to startup a company or license it are not real inventors. They do not understand why patents matter.

But none of that makes any difference if we do not fix the underlying issues that affect women, minorities and veterans.

Just patenting an invention can cost tens of thousands of dollars. Commercializing inventions often requires millions of dollars.

Big corporations have this kind of money. But that cost is too high for women, minorities and veterans.

You don't have to believe me. At the most recent PPAC meeting on May 1st, three PPAC members took to task the USPTO chief economist for his report that failed to deal with the main barrier for women to get patents and to grow their businesses – lack of investment.

A stable and predictable patent can attract investment. That was the case for the first 215 years of our patent system.

For two years I drove across the country in my pickup talking to inventor clubs and recruiting the 13,000 activists of US Inventor.

Go to any small town in about any state and find the biggest and oldest mansion. It was probably built by an inventor. Their stories are told in small town libraries and historical societies across America. It is our story. It is America.

These mansions represent the effects of a working patent system enabling everyday Americans to achieve the American Dream.

We all want more women, minorities and veterans to climb social and economic ladders. But to do that a patent must be capable of attracting investment.

It must be a presumed valid exclusive right. And can't cost so much to obtain and defend that nobody can do it, as it does today.

$450,000 to defend just one PTAB procedure is outrageously expensive for small inventors, especially if there is only a 16% chance that the patent will escape unscathed.

If it does escape, you gain nothing. The only difference is that you are a lot poorer and your patent's term is several years shorter.

Director Iancu has taken very important steps by eliminating BRI and switching Phillips. This will eventually help.

But the PTAB kill rate has barely changed. Far too many meritorious inventions are still being destroyed.

We need a lot more work. US Inventor is happy to help. I am too.

Overwhelming Financial Burden for Inventors

AIPLA reports that the average cost for an AIA trial is $450K. Only 16% patents emerge the PTAB intact. Small businesses built on a patented technology don't have $450K to wager on a 16% chance of holding on to their primary asset. Furthermore, we have been in contact with many inventors and small business owners that have retained unqualified counsel for these high stakes litigations. These attorneys are unaware of the latest guidelines, precedents, and strategies. Inventors lack access to effective advocacy when attacked in AIA trials by aggressive litigators allied with hostile PTAB APJs.

Example 1: Jan 24, 2019 / IPR2018-01129. Emmy award winning inventors Glenn Sanders and Howard Stark are not "patent trolls" asserting "bad patents". These pioneers of digital wireless microphones built their company Zaxcom in reliance on their U.S. patents. Now their competitors are using their technology and the PTAB is helping them by unwinding the patent grant, declaring their invention obvious 14 years after the fact.

Example 2: April 3, 2019 / IPR2018-01754. The PTAB ignored the §315(b) time bar and permitted GoPro to file an IPR 2.5 years after they had filed a declaratory judgment against inventor Michael Kintner's company 360Heros. The once growing business has drastically downsized and Kintner has informed US Inventor that he does not have funds for a legal defense of his patent at the PTAB. Contingency firms rely on damages to recoup their investment, but in the PTAB there is no monetary compensation for the inventor that prevails.

Example 3: April 30, 2019 / IPR2019-00233. Apple refused to pay inventor Mark Kilbourne for his remote control deadbolt, so they asked the PTAB to revoke his patent. The panel ruled that it "would have been obvious" to combine an old-style deadbolt with a Swiss army knife! This type of reasoning jeopardizes every patent ever issued. Kilbourne runs a small business manufacturing his invention and this unnecessary and duplicative PTAB trial imposes an extreme burden and risk to his business.

Word Games Used to Invalidate Patents

A common tactic employed by infringers and the PTAB is to interpret the words and phrases in the patent broader than intended by the inventor, and to use that stretched interpretation to invalidate the patent. Egregious examples include construing "no arcing" to mean "a little arcing", "single merchant" to encompass multiple merchants, and "gasoline" to include butane.

Example 1: January 10, 2019 / IPR2018-01043. American inventor Ryan Jurgenson greatly improved the reliability of magnetic disk drive heads. But the USPTO helped a Japanese infringer by cancelling the patent. The PTAB adopted broader construction of several terms than what the inventor claimed, effectively accusing him of claiming rights to an earlier invention. The Article III courts would have applied the plain an ordinary meaning for the terms and resolved any ambiguity in favor of upholding the patent. Unable or unwilling to incur the cost of a full PTAB trial, the patent owner elected to dismiss the case.

Example 2: April 8, 2019 / IPR2019-00025. PTAB rejected the definition of "gasoline" adopted by the inventor, examiner, and Illinois district court. They instead adopted their own unique definition of "gasoline" that includes all the distilled components of crude oil. Thus according to the PTAB "gasoline" includes butane. The PTAB refused to apply discretion under §314(a) and §325(d) and instead is interfering with the district court litigation, adding unnecessary cost and duplication.

Example 3: April 16, 2019 / IPR2019-00030. Corephotonics inventors developed a compact telephoto lens for smartphones. The USPTO is yet again assisting Apple by taking back the patent from the inventors. The invention is a tiny optical design with "total track length" of only 6.5mm. The PTAB construed "total track length" as "partial track length" so they could find prior art with a "partial track length" of 6.5mm. If inventors cannot rely on the USTPO to stand behind their patents then businesses like Corphotonics cannot afford to invest in R&D and innovation is discouraged.

Administrative Patent "Judges" Are Not Experts

The idea of the PTAB being staffed with technologists that are subject matter experts has not played out. Most PTAB APJs have a bachelors degree with zero years of professional experience in technology. They are administrative lawyers, not technologists. Analysis of their written opinions often reveals superficial wordsmithing to support a conclusion at odds with the intent of the inventor, the examiner who approved the patent, and common sense.

Example 1: April 19, 2019 / IPR2017-02097. APJs at the USPTO overruled the examiner at the USPTO, who is an expert in micro-fluidics. John Gilbert, Manish Deshpande, and Bernard Bunner created an amazing device to precisely place particles into a moving stream, an important technology for biomedical research. The examiner allowed their patent noting that it was an improvement over the prior art such as a patent by "Wada", but the PTAB APJs (who have zero experience in microfluidics) falsely charged these inventors of claiming the same device as Wada and stripped them of their patent rights.

Example 2: April 19, 2019 / IP2018-01630. PTAB APJs that have zero experience with video compression technology violated several of the new rules and helped Netflix avoid paying the inventors for their asymmetric video compression technology. One APJ has a B.S. in computer science with no professional experience, one a degree in molecular biology, and another in materials science. They do have 30+ years combined experience disparaging patents as litigators and PTAB APJs. They are in way over their heads causing total chaos and destruction to the U.S. innovation economy.

Example 3: April 29, 2019 / IPR2018-00146. Rocky Snawerdt invented a secure fiber optic switch, extremely important technology. But he made the mistake of revealing his discovery to the USPTO who decimated his patent to help another big corporation. The task achieved by the panel was to find 3 or 4 components of Rocky's invention in the prior art, using his patent as a roadmap. That doesn't mean it was obvious. That's what an invention is – putting things together in a new way no one else thought of. These APJs have no experience in the technology and don't understand the law. What they are doing is analogous to a child assembling a jigsaw puzzle using the picture on the box as a guide. It has nothing to do with the technology, the invention, or the law.

Interference with Article III Courts & Delayed Justice

PTAB was intended to be a faster, cheaper, alternative to district court. It has proven to be the exact opposite: slower, more costly, and in conflict with district court. It is only cheaper and faster when it puts the inventor out of business by cancelling his key patents or draining his bank account. Those that survive are hampered with millions of dollars of unnecessary expense and years of market growth lost.

Example 1: March 12, 2019 / IPR2018-01597. Steven & Mary Reiber's semiconductor wire bonding patent survived a validity challenge in district court, but the PTAB doesn't honor that holding. In addition the PTAB allowed Toshiba to play games with their corporate structure to get around the one year time bar.

Example 2: March 13, 2019 / IPR2018-01632. Bad Boy Mowers is a classic American success story. It was founded in Batesville, Arkansas in 2002 and has grown to employ 700 people to design, develop, and build their innovative zero-turn mowers. A company break-up spilled into district court with disputes over inventorship, validity, and infringement. Rather than let it play out in court, the PTAB jumped into the fray by overruling the examiner that had recently allowed the patent over identical prior art.

Example 3: April 2, 2019 / IPR2018-01500. PTAB instituted review of a haptic feedback patent by prolific artificial intelligence and augmented reality inventor Louis Rosenberg. Once again Director Iancu's new rules are tossed aside by the PTAB. Rather than let the real court resolve the dispute at the jury trial this very week, the PTAB insists on inserting themselves into the middle of it. The same prior art considered in examination. Incorrect claim construction by the PTAB. The USPTO is taking the side of the multi-national infringer. More cost. More delay. Inventors betrayed by the USPTO. Nothing has changed at the PTAB.

Example 4: April 22, 2019 / IPR2015-01691. Geoff Gosling and Mogens Smed lost 4 years and 2/3 of their patent as the USPTO intervened to help their competitor escape liability for stealing their invention for joining modular office partitions. Now they have to decide if they want to pay an additional $2-300K for another appeal to the Federal Circuit. A jury trial would have been faster, cheaper, and fairer. Small businesses like theirs cannot withstand 4+ years and millions of dollars fighting over their primary asset.

Due Process, Takings, Appointments Violations

Barely one year ago, the Supreme Court ruled that patents are no longer property rights but are "public franchise rights" like the right to erect a toll bridge, thus revocation by the Executive branch does not violate separation of powers or 7th amendment. The American ideal used to be that anyone of any status could obtain a property right in exchange for revealing their invention to the world. Today only the wealthy elite can secure these rights.

Example 1: November 18, 2018 / CAFC 18-1489. DOJ attorneys argue that inventors are not entitled to compensation when their patents are revoked. The reasoning is that if the USPTO determines that they should not have issued a patent the inventor never had a patent to begin with. This argument ignores the fact that the agency applies stricter rules, guidance, burdens of proof, and procedures that often result in revoking a patent that would be upheld in an Article III court. If the USPTO is going to take back patents from inventors without a full and fair trial to decide their property right, then it must be presumed a taking has occurred and compensation is due.

Example 2: January 23, 2019 / IPR2018-00315. The USPTO continues to run roughshod over the 5th Amendment. The inventor Dr. Michael Masini was prohibited from testifying at the trial over his own patent. The PTAB doesn't care to hear his views on his improved artificial knee joint. The right to testify in person is one of the many fundamentals of due process absent from PTAB proceedings.

Example 3: April 1, 2019 / CAFC 18-1768. PTAB "judges" have near total power over deciding who owns the rights to patented inventions. They overrule real judges and juries. They overrule examiners. Their findings are given deference by the appellate courts. They alone decide which inventors get to keep their property rights and which ones don't. Yet the DOJ and USPTO say in their brief that APJs are merely inferior officers and do not need formal vetting required by the Constitution. Real judges have to be appointed by the President and confirmed by the Senate. But we are supposed to just trust these administrative patent "judges" without looking at their qualifications, associations, and sympathies.

If the USPTO is to be successful at encouraging participation of women, minorities and veterans in the patent system, the patent system itself must be improved making it fairer to all small entities. Today the deck is stacked against small entities at all levels.

The PTAB kills patents at unprecedented levels. The effect is to infect all patents with a presumption of invalidity, which encourages infringement and discourages investment.

Judicial exceptions to subject matter eligibility also kill patents at unprecedented levels. This affects all patents in the same way encouraging infringement and discouraging investment.

eBay v. MercExchange created a public interest test that must be satisfied for a court to order an injunction upon a finding of infringement. This test effectively makes it impossible for small entities to be awarded injunctive relief. This reduces the value of all patents especially by investors looking at early stage investments. It encourages infringement because the infringer can gain control of the market without the risk of losing it later.

Many other changes to patent law have crashed the patent system for women, minorities, veterans and all other small entities including negative changes to damages, venue, obviousness and more.

Women, minorities and veterans generally have very small patent portfolios often consisting of only a few patents. But today, small patent portfolios cannot be collateralized, sold or defended. Thus it is exceedingly difficult to return the investment of hard work and money that goes into patenting. It is not surprising that small entities, including women, minorities and veterans, have substantially slowed down in filing for patent protection.

From: Inventors Association
To: successact
Subject: Public Hearing for Success Act
Date: Tuesday, June 25, 2019 11:42:44 AM

Hello,

My name is Laura Myers and I am one of the female leaders in our country at the helm of a non-profit inventors organization called the Inventors Association of Arizona (IAA). Our organization consists of 100+ paid memberships with a newsletter reach to over 1200 inventors in our state. A large part of my responsibility as the Executive Director of the IAA is to help inventors navigate the difficult path of bringing an idea to fruition, including guiding them through the patenting process so the invented product is protected once it reaches the market.

My concern is that the patent system in our country has been weakened by a series of legislative actions and court decisions over the past decade. Consequently, the enforceability of protecting a patented product has been weakened. Independent inventors risk thousands of dollars in developing and patenting their products only to find that the greatest liability is to have a product reach success in the marketplace. Under our current weakened patent system, large corporations with deep pockets and teams of attorneys can easily infringe on a small, independent inventor's product, swamping the inventor with litigation costs and extreme financial stress in trying to protect their own USPTO issued patent. If the enforceability of a United States patent is not strengthened, the cost of trying to protect a product may end up destroying the lives of the very people who the SUCCESS Act is attempting to help.

The USPTO must take a closer look at how PTAB is being exploited by large infringing companies. With their deep pockets and high-level attorney teams, large infringing corporations are utilizing PTAB as a convenient and useful tool to invalidate the claims of small, independent inventor's patents. The independent inventor does not have the finances to hire high power lawyers to fight back, thus making the patent they worked so hard to obtain useless to them. The USPTO issued patent means nothing if the promised protection is not enforced. To complicate matters further, investors are hesitating to invest in and fund innovation built on patented products of the small, independent inventors due to the high PTAB invalidation rates. The recommended legislation will not help women, minorities, or veterans if it does not come with PTAB reform as well.

Our country was built on innovation by hard working individuals who were promised and given protection of their products to build companies, expand on their ideas and enjoy the prosperity they earned. All that has changed by PTAB being exploited and used as a power tool by large corporations. Many innovators are now choosing to get their patents issued in China where the patent system is stronger and better protects the small inventor. A US patent

no longer provides value to its owner. Instead, it has become a liability.

Patent protection is a topic of great interest and lively discussion with the Inventors Association of Arizona. We appreciate the intention behind the SUCCESS Act, but we cannot stress enough the importance of increased protection for independent inventors. Without substantial reform to the patent system, the women, minorities, and veterans attaining patents as a result of legislation following the SUCCESS Act will be ruined by the hidden costs, false promises, and lack of enforceability of a US patent.

Sincerely,

Laura Myers
Executive Director
Inventor's Association of Arizona

H.R. 6758- Success Act

Public Comment by Martin Khang Nguyen

My name is Martin K. Nguyen and I'm an American independent or "small" inventor of two US granted patents: 1- Vehicle monitoring and control using radio frequency identification(RFID), 2—Managing Retail Transactions, and several other patent applications that I have abandoned because I see no hope of protection. I'm now a founder of a small business based on a mobile app called Gyft Thanks. The app helps connect businesses, consumers, and charities together using today's technologies. As a minority patent holder, the **Success Act** is very important to me and to other minority inventors as well.

I strongly support increasing the number of women, minorities, and veterans who hold patents. The US is the only country in the world, no other country that has the patent system that gives a great opportunity for anyone who would like to pursue his or her interests in business. However, the recommended legislation has to help protect those inventors as well. If a product is successful, large companies come in and steal the idea and force the patent owner to start a lawsuit that they rarely can afford. Then, even if the inventor can pay the enormous legal fees, if the infringer chooses to take the patent to the PTAB, the inventor has almost no chance of surviving.

I came to the United States as an immigrant in late 1981. I have attended college here in the US, and I love solving problems, especially when those problems happen to me or around me. As an example, I've been hit by a drunk driver when he ran on red. Luckily, my life was saved, but I know that many similar situations end in tragedy. After my experience, I spent substantial time and effort creating a solution and finally filed for a patent on my idea, "Vehicle monitoring and control using RFID". On another occasion, I was shopping at a supermarket and there was a shopper holding up the line ahead of me with many paper coupons. The barcode was hard to read on one of the coupons, so the line behind the shopper became very, very long. "There has to be a better way," I said to myself. I created a solution, did the search, and filed the paperless couponing systems.

As mentioned above, some of the applications and ideas I dropped or abandoned most at the early stage because, as an independent inventor, I saw very little hope in protecting these ideas from businesses and/or people who have big money if these applications eventually got granted. Why would I continue to spend the money which, in my case, I borrow from family to get these patent applications approved when they'd later be invalidated by the PTAB? How would I be able to defend my ideas from a group of attorneys hired by large corporations with their only goal to invalidate my patents? It is better for me to keep my ideas locked away. I know that I cannot enforce my patent in court, and if it is a very useful idea, many big companies will steal my patented idea, and the patent will just be taken away by the PTAB. The same entity that promised to protect my idea is the one taking it away. It doesn't make sense. America is falling behind in development because there is no incentive to innovate.

However, as an inventor like many other inventors whom I've talked to, we'd always like to see innovative products or services being introduced. We hope that soon our patents be protected and be enforced no matter we are a big company or a start-up business formed by an independent inventor.

Please give us the protections for our efforts; ask the courts not to take back our patents once they are issued; help us to prohibit infringers, both US and foreign companies, from using US inventions without permission. We count on you for the true reward after days, months, or years of our hardworking, sleepless nights trying to first get our patent or patents approved, plus the money that we have invested. If the recommended legislation does not come with added protection for inventors, then you will end up ruining the lives of all the new women, minorities, and veterans who get patents. They will build businesses on the promise of exclusive right, then all their investment will be lost when they learn how the patent system really works. We inventors want to contribute to the US economy with our talents and skills in developing innovative products or services, but we need to be able to depend on the patent system.

Sincerely,

Martin Khang Nguyen

From: Alberto Ratmiroff
To: successact
Cc: Stringing 102 LLC
Subject: "SUCCESS Act Study."
Date: Saturday, June 22, 2019 5:55:11 PM

Thank You for the opportunity to write about the subject manner, in general!!

I assume that this one is going to be a little lengthly email, sorry!

I will divide the email in 3 parts: THE GOOD, THE BAD, AND THE UGLY.

THE GOOD

I am grateful for the approval of Patent No. 7862455, which, I have to pay my dues, in order try, to keep it up to date, on the list, of patents, in your organization.

I wrote the provisional patent, which was an idea, for a product/service, after doing research for about 4 to 5 years, before the AHA moment, came to me, or myself. The initial work before I could begin, the patent process was years, not days, or weeks. Effort, time, consistency, money, thesis about the purpose for the research and work, that had to be done, without any guarantee that that work was going to pay off, at all! POINT: there are a lot of work that has to be done, before one, US, I, can begin a process of trying to make a company or the selling of a product/service for a market or customers in general. Protect this work, and effort that people bring to the table of innovation, for the U.S and for the rest of the world.

Later, I had to write the Non-provisional patent application, due 1 year

from the date of acceptance of the provisional patent application; which was a big challenge for me or myself. I had no idea, and I had no money to pay a Patent Lawyer, $ 10,000, $ 15,000, $ 20,000 or more for a patent idea, that I had no idea, how to put the idea into words or description, as a way to go forward in the application.

I Google it, for months until I found way and a window of opportunity on a company, and a Patent Lawyer, that had a PATENT PROGRAM, for patenting ideas, products, it was named many years ago: PATENTPRO. I bought and I used the program to write the patent, with the help of the program, and all the examples on the file, program. It was not easy at all!! POINT: I had no money, and I was lucky that that company and Lawyer had the audacity of making that program available to average people like myself, and others!! Protect the option to help write the Patent application with some aid or assistance to minorities or people who have the WILL to continue in such a difficult path and goal, I CAN TELL YOU, THE PROCESS IS VERY HARD, FROM THE BEGINNING.

It took 2 more years of waiting before the patent application was approved at all!!, to my surprise, and delight. Now you are taking about 5 + 1 + 2 years, for a total of 8 years, before a person has a patent approved and ready to think that it is easy to commercialize the product/service, which is a myth, by itself, this is very hard process, overall!! You have a person who have invested 8 years of time and research, so that an idea can come to market or at least try to go to market, in the U.S., and on the rest of the world.

The approval of the patent cover a period of over 50 years going back to see, if there was something similar, or if somebody copy an idea from somebody else, 50 years, all over the world. POINT: Time searching, work, money, computer database researching process, a lot of work,

before an idea/service/product can be approved into a Patent Application, for a person or company. Please protect all the time, work, money, for the person or small entity that is trying to make a living from a Patent, and into a company for profit, for jobs, for commerce in general, for the benefit of most. Offer a TAX BREAK for people that try to finance such off the wall ideas and products, that some may or may not make it, but, that, at least, people try to the best of their abilities and of the abilities of others also. It is very hard to finance a project of 8 years, without some kind of revenue source or TAX BREAK, encourage people to take risk and to to invest in the Patent gambling process, it is much better than NOT DOING ANYTHING AT ALL! There are 1000 excuses for taking a Patent application forward, and there is only 1 reason for making it happen, to make it a reality, that idea, that product/service, PASSION for that idea, product, service, industry, sport.

THE BAD

Most of the patents that I heard from people in LinkedIn, are from small entities that are minorities: females, of other races, small companies, startups people, that are trying to male a living out of an idea, and that caught the attention of BIG ENTITIES, because, of the Industry/Market potential, that the patent may or may not possess, and so the target of the people, who claim that the patent is not valid or is missing an item, in the description of the writing, in general, terms. The initiation of the process litigation, makes a dent on the cash flow potential of the to be startup, or person, money that is tight, or money that have to borrow to defend themselves from people who claim that the patent needs to be invalidated, given expert advice from lawyers, in general. The process of reaching a Patent Level is usually around 3 to 4 years, and many $$ thousands of dollars, that that person, may have, or may owe to a third party, and so the dilemma, of the process. If you do not do anything, YOU LOOSE, and if you do something, to defend yourself, given that one has a valid Patent from the USPTO, there is a high probability that

over time, the small entity is going to loose also, because, money talks, in general. POINT: the process of approving patents, would have to be reviewed, to see, that a patent is a legal patent, and not an invitation to challenge the patent, once, some BIG ENTITY sees, a lot of potential revenue, or the opportunity for revenue in that small entity, in general. There are exceptions in all cases, but from what I have seen and heard, the rule is that most most entities with a Legal Patent, eventually loose to the big, entities, in general!! The process could be more visible and more clear, before an entity gets attention from companies that make a living selling products and millions of dollars, from inventions from small entities, in general!!

THE UGLY

The need to create an UNION of inventors, a club, where people can get advice, aid, comfort, monetary loans, as a way to test to see, if the patent that they are holding is good, bad, or just a waste of time, money, when it comes to defending the legal Patent prescribed, by the USPTO, after many years of work, time, money, etc. There has to be a political arm of the USPTO, that is in charge of defending the Inventors, just like there is a department of Labor to protect the rights of the employees, against the big companies, and events that create adverse situations for the employees at work, just like that, an analogy, of labor forces. One has an institution for protection, the other one, (the inventors) that loose their patents to BIG ENTITIES, when the small entities are right on their claim, most of the time. At least there has to be an government department that has the duty to protect Inventors in general!!

Thanks for your time and consideration, on the matter.

I see myself in potential conflict, once I go to market, with my idea, product, service on the Global scale, and in the U.S., if I do not voice my word about the issue in general!!!

--
Stringing 103 Corp

Regards,

Alberto Ratmiroff

Thomas P. Riederer
Santa Barbara, California

SUCCESS Act Public Comment

June 25, 2019

In The United States Patent and Trademark Office, Department of Commerce:

My name is Thomas Riederer and I am the inventor of several patented digital stereoscopic (3D) cameras, systems and their methods of use. I am the co-founder of TrueVision 3D Surgical, a company which has revolutionized brain- and eye-surgery through the use of these inventions. As a Vietnam-era veteran and patent holder, the SUCCESS Act is very meaningful to me.

I support increasing the number of women, minorities, and veterans who hold patents, but that action must be coupled with actions that strengthen those patents. Patents have become liabilities for independent inventors thanks to the PTAB and lack of strong enforcement in court. If the recommended legislation does not include increased protection of patents, the lives of women, veterans, and minorities will be ruined by attaining patents.

As an independent inventor I have written, prosecuted and obtained several patents entirely on my own, due to the significant costs involved should professional patent attorneys be utilized. Due to passage of the America Invents Act (AIA), with its provisions of the Patent Trial and Appeals Board (PTAB) and post-grant Inter-Partes Review (IPR) process, my business model has been made nearly obsolete. The IPR process through the PTAB, known informally as the Patent Death Squad with its high invalidation rate, is completely unfair to small operations like mine.

According to the 2017 AIPLA Report of the Economic Survey, the estimated mean legal fees of an IPR proceeding through appeal runs nearly half a million dollars. If a patent is challenged and the patent owner loses, his patent is invalidated and his investment is lost. If he wins, he effectively "wins" nothing, since he still has a patent but there is no consequence to the challenger, often a large infringing company. A business such as mine could be ruined by a single IPR.

In order to retain some capital from my investment in my patents, I have sold the bulk of them. The only sale I could execute was for far less than previously appraised. Instead of pouring the capital back into further developing my technology, I am instead exploring endeavors such as the real estate business. The rights given by the government in real estate are not easily taken away, as is a patent "right", now referred to as a "franchise" due to recent SCOTUS court decisions.

The purpose of this comment is to change the outlook for independent inventors. For example, a high school STEM student may have an ingenious project for the school Science Fair and is encouraged to file a patent to "protect" it. Once the student's family finds out about the huge cost of defending a patent in an IPR, encouragement is lost, along with any aspiration for invention, directly contradicting the intent of such Science Fair.

Thomas P. Riederer
Santa Barbara, California

My legislative recommendations are summarized in the attached Inventor Rights Resolution. The main points are as follows.

A. The USPTO must stop taking back patents from inventors.
B. Courts must prohibit use of a patented invention without permission.
C. Infringers must not profit by using an invention without permission.

Please consider adding these changes to the proposed legislation at the conclusion of the SUCCESS Act Study. If the patents held by underprivileged and underrepresented independent inventors are not protected, their involvement in the patent system will be detrimental.

Sincerely,



Thomas P. Riederer

INVENTOR RIGHTS RESOLUTION

Our patent system is in crisis. Recent changes to patent laws and Supreme Court decisions have adversely affected inventors such that the requirement in Article I, Section 8 of the Constitution of "securing for limited times to inventors the exclusive right to their discoveries" is no longer achieved. It is nearly impossible to stop an infringer from using an invention without permission, or to make them to pay for the damage caused when they do. The undersigned inventors call on Congress to pass legislation to address these critical issues.

PTAB – *The USPTO Must Stop Taking Back Patents From Inventors*

Patents that are infringed are often contested in the Patent Trial and Appeal Board (PTAB), which is an administrative tribunal within the USPTO, purported to be an alternative to traditional federal courts, and created by the 2011 America Invents Act. To defend a patent costs the inventor several hundred thousand dollars, and usually cannot persuade the PTAB to uphold the patent. Even if the inventor prevails in the first challenge, others are allowed to challenge the same patent over and over again. This has been devastating to inventors and small businesses that rely on patents to protect investments and build businesses. Participation in PTAB reviews should be voluntary at least while the patent is held by the original inventor. If PTAB reviews become a fair alternative to validity challenges in a traditional federal court, then inventors will participate voluntarily. Otherwise, patents that are believed to be invalid can be contested in a traditional federal court, as has always been the case.

INJUNCTIONS – *Courts must prohibit use of a patented invention without permission*

In the 2006 *eBay* decision, the Supreme Court held that in most circumstances a patent cannot prevent an infringer from using the invention. For instance when a large corporation can produce the invention faster, cheaper, or in greater quantities, they are allowed to keep selling in perpetual violation of the patent. Thus the inventor has no say in who gets to use the invention and what they do with it. The inventor cannot determine the price, the quality, the brand, the features, the materials, the factory location, the working conditions, environmental sustainability, or any other concern. Indeed, the inventor is compelled to grant the infringer a license for a royalty amount determined by the court. The *eBay* decision should be overturned, and the court should issue an injunction ordering the infringer to stop using the invention until they have obtained a license negotiated in good faith with the inventor.

PROFITS – *Infringers must not profit by using an invention without permission*

Current law limits most inventors who win in court to only a "reasonable royalty", which in many cases does not cover legal fees and is too little to serve as a deterrent against large corporations with deep pockets. Large corporations simply ignore patents, knowing that few inventors can afford the millions of dollars and many years required to enforce their patents in court. In the rare case that an inventor survives the legal gauntlet, the infringer usually is ordered to share only a small percentage of their profits with the inventor while keeping the rest for themselves. Without penalties infringing is much more profitable as a business strategy than inventing. To restore fairness and respect for patents, infringers should not be allowed to keep their profits made from someone else's invention.

From: Ari@IPCpricing.com
To: successact; IntellectualProperty@tillis.senate.gov
Subject: Two birds, one stone and a single death
Date: Tuesday, May 14, 2019 10:02:08 PM

My name is Ari. I am real person. I am a husband, a father of a little boy, and the owner of a story you would not wish on your worst enemy.

I live in NYC. But years ago, while living in San Francisco and working at a dot com publisher called Snowball.com I had "a dream" that contained the single most impactful idea in business. I know this is true because that idea, which was granted two patents for its complete contradiction to conventional thinking that solved the problem plaguing publishers in Internet advertising, was stolen right from hands and put into practice at Google.

Oh right, this is where I sound like the crazy one with a tin foil hat.

This story is 100% true -- people I worked with who went to Google, implemented my patented solution, gave credit to someone else at the company to cover their tracks, and then thanks to the absurdness of the AIA that allows for the retroactive invalidation of patent claims for not passing a current test -- killed the very patents Google stole from me.

How can this be is what the lament asks me. How can a patent granted, and currently licensed to companies that don't steal, be incinerated when the inventor had no chance to reword his claims to match today's tapestry? I can't explain it but I can tell those listening now -- this has killed me. I can't look my son in the eyes I can't be with my wife -- I can't feel any longer beyond the feeling of being a failure. How else can you describe a person who came up with an idea that powered the growth of the second largest company in the world, and in return got nothing. I am a failure to my wife, my child and to myself because my life's work was taken away from me not once, but twice -- the PTAB proceedings I endured were a joke -- one of the judges was inserted at the last second and clearly did not read our briefs. At the Fed Circuit appeal,one of the judges just didn't show up to the oral arguments -- *was busy that day.*

I know am dying from this and I have never written those words before but I know it and can feel it. And now I am supposed to email to address like this blindly to tell you that what you are doing to somehow correct this tragedy is going to make things worse.

101 objections were just an excuse to give Google and the other big tech companies what they paid for lobbying Congress and me, I am just a dumb schmuck who thought I would get the chance to plead my case in front of a jury of my peers -- how stupid am I to expect that kind of fairness from my own government. The PTAB judges treated my like I was the criminal, the Fed Circuit judges didn't even treat me with enough respect to all show up.

So here is my email sharing my pathetic story. My patents were 7,089,195 and 8,799,059 and a really smart and really tough Patent Examiner granted them after extensive work on his part. He must be an idiot too.

Thanks for listening -- I have to get to bed now for yet another sleepless night. Thank you U.S. government for helping me die a slow and painful death. You think I am exaggerating? You have no idea how this AIA feels to inventors -- none.

Ari

Ari Rosenberg / President & Founder
IPC PRICING

http://www.ipcpricing.com/

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lincolnlawschool
OF SAN JOSE

SUCCESS Act Oral Public Testimony at San Jose USPTO Satellite Office

Hearing June 2, 2019, Testimony by Britten Sessions[1]

Thank you for the opportunity to testify today in relation to the Success Act.

Director Iancu indicated that "our patent system is at a crossroads."[2] I agree with this statement. Will we, as a nation and as a patent market, continue our legacy of building upon fundamental patent rights, or will we potentially remove such rights of patent owners.

The Success Act fits squarely into this focus of ensuring that we are continuing to build upon such patent rights by evaluating whether individuals and entities (with particular emphasis on women, veterans, and minorities) have effective access to the patent system.

This emphasis – effective access to the patent system – is also in alignment with many USPTO initiatives, namely the Pro Bono Patent Program and the Law School Clinic Certification Program. Both programs were introduced roughly in the 2008 timeframe, and both take a distinct and different approach to answering the essential question – how can the USPTO assist with providing greater resources to those that otherwise would be financially estopped from receiving such services.

The Pro Bono Patent Program "is a nationwide network of independently operated academic and nonprofit organizations that endeavor to match volunteer patent practitioners with financially under-resourced inventors seeking patent protection."[3]

Additionally, my clinic, which is part of the Law School Certification Program, trains students who, in turn, provide patent services, under the guidance, mentoring, and ultimately, approval of a licensed practitioner, to those in our community.[4] It is a literal win-win situation where the students can get experience while they are students, and the community benefits from having high quality patent services without any legal expense. Over the years, it has been my experience that what the Success Act is

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[1] Associate Dean of Intellectual Property, Founder/Director of IP Clinic, Lincoln Law School of San Jose
[2] Remarks by Director Andrei Iancu at U.S. Chamber of Commerce Patent Policy Conference, April 11, 2018, available at https://www.uspto.gov/about-us/news-updates/remarks-director-andrei-iancu-us-chamber-commerce-patent-policy-conference.
[3] *See, e.g.*, Webpage, "Intellectual property legal assistance programs," USPTO, available at https://www.uspto.gov/learning-and-resources/patent-and-trademark-practitioners/intellectual-property-legal-assistance.
[4] *Id.*

presently evaluating coincides with the types of people and entities – namely women, veterans, and minorities – that come to such USPTO approved clinics.

It is precisely therefore this perspective – my dealings, representation of, and interactions with – these types of inventors that I feel compelled to speak on behalf of today.

I've segmented my remarks into two main categories: 1) indications of success; and 2) actual feedback from inventors, including potential avenues for further development.

Indications of Success

The initiatives put forth by the USPTO I believe are assisting with improving effective access to the patent system. For example, with respect to the Pro Bono program, "[d]uring the first three quarters of FY 2018, the program assisted under-resourced inventors and small businesses in the filing of 205 patent applications, fielded 1,757 public inquiries, and matched 432 under-resourced inventors with qualified patent practitioners."[5]

Additionally, with respect to the Clinic Program, over 875 patent applications have been filed since the beginning of the program, and for FY 2017 and FY 2018, there were over 4,100 clients engaged by clinics in the program.

Clearly, therefore, the numbers alone speak for themselves. These initiatives are providing services to those who generally would not otherwise receive such services.

In short, when I look over the impact that my little clinic alone has provided, I am not only encouraged by the number results alone, but also by the ways in which these inventors have literally been granted effective access to the patent system. Suffice it to say that the many thank you notes my clinic has received all indicate a similar theme – immense appreciation for the services we have provided, and relief that they finally found a financially viable channel to the patent system that could provide them with assistance.

All of this in my mind shows the success of these initiatives in that women, veterans, and minorities, are being granted more effective access to the patent system than before.

However, the universal adage that all things can be improved I believe applies to even our currently improving patent system as well.

Actual Feedback from Inventors and Avenues for Development

Rather than solely speak for inventors, I want to take give many of these individuals a chance to speak for themselves. To that end, at a recent inventor conference, I interviewed inventors (including some of my own clients of the Clinic), asking them what issues they are facing in today's patent market.

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[5] USPTO, "FY 2018 Performance and Accountability Report," page 109, available at https://www.uspto.gov/sites/default/files/documents/USPTOFY18PAR_1.pdf.

Their frank responses, I've concluded, provide some of the best instruction on the issues these inventors face in today's patent market. I've organized their lengthy input globally into a few categories, followed by my recommendations on how to potentially resolve these issues.

Category 1: My Patents Can Easily Die

Quote 1:

> "There is risk in working with a large company. If one goes and presents intellectual property to them, the company may look at it in a different way. For example, they may consider simply going ahead and infringing the rights, and then appealing it to the PTAB, which has a high chance of invalidating the patent."

Quote 2:

> "Due to how easy patent invalidation has become, companies do not feel a need to license. Instead of licensing, it can be more economical to infringe and invalidate the patent."

It is startling to me to receive repeated feedback from many inventors that companies blatantly will disregard patent rights because "it is cheaper to kill a patent than take out a license for it." If patent owners cannot rely on the granted patent protection as a basis for protection, and if the risk for invalidation is high, then this causes the inventors to wonder why they went through the time and expense to even get a patent in the first place.

Recommendation 1: Provide greater stability for 101

The past seven years, at a minimum, has taught us that many are a bit confused on how to rule or deal with 101 issues and patents. The Supreme Court in the *Alice* decision left open much of the implementation of 101 construction to the courts, which subsequently, created a fragmented landscape with often conflicting opinions. The USPTO has repeatedly recognized this issue and sought to provide greater consistency of analysis relating to 101 by issuing several guidelines.[6] They even appointed individuals to eliminate inconsistencies in the interpretation and implementation of the *Alice* test among different branches of the USPTO. This is a monumental task – and one that, in my opinion, deserves some of our greatest attention. I applaud the USPTO for their attempts to rectify this issue.

However, USPTO guidance and policies do not extend to other courts, nor are the USPTO's recent guidelines a permanent fix (for example, the next Director may modify the current guidelines). Thus, in order to effect lasting change at not just the USPTO level, but nationwide in each PTAB hearing and federal court, Congress needs to come together to more fully implement rules that bring stability to a very volatile

[6] *See, e.g.*, "Subject Matter Eligibility" resources available at https://www.uspto.gov/patent/laws-and-regulations/examination-policy/subject-matter-eligibility; *see also* Press Release "U.S. Patent and Trademark Office announces revised guidance for determining subject matter eligibility," Jan 4, 2019, available at https://www.uspto.gov/about-us/news-updates/us-patent-and-trademark-office-announces-revised-guidance-determining-subject.

subject. I acknowledge that Congress currently has many proposals (in both the House and the Senate) relating to patent reform, and nearly all of these proposals include some provisions relating to subject matter eligibility. At a minimum, we need to do everything we can so that Congress recognizes the importance of stability for patent subject matter eligibility, and implements policies that allow courts to act in a consistent manner.

Category 2: I can't find financial backing to assert my rights

Quote 1:

> "If you do not have millions of dollars at your disposal, you will need a contingency attorney or investors, both of which are now in short supply. Without these resources, patent holders are defenseless and incapable of licensing."

Quote 2:

> "The effects of the PTAB and Alice decision made me unable to defend my patent rights and caused my investors to leave."

The risks of the patent market have caused contingency arrangements – which was the primary manner in which inventors historically had effective access to the courts – to vanish. Litigation is expensive. Without a financial way to represent these smaller entity inventors (including women, veterans, and minorities), they are effectively prevented from being able to assert their rights.

Further, the increased risk has caused investors to close their pockets.

Recommendation 2: Reduce the risk

To simply indicate to reduce risk is an easy conclusion to say, but hard to implement.

For example, one of the main goals of the America Invents Act (and subsequent court direction) was to eliminate "trolls" and "bad patents." I believe all in the patent market agree that assertions without merit and bad patents should be removed. However, as Director Iancu recently indicated "[I]n our zeal to eliminate 'trolls' and 'the bad patents'...we have over-corrected and risk throwing out the baby with the bathwater."[7]

Bringing balance back to our system must include some way for patent owners to have financially viable options to assert their rights – both with respect to contingency options and funders. I agree with Director Iancu who indicated "let's work together to find narrowly tailored measures to eliminate only the faults in the system, while promoting the vast amounts of amazing innovation America is capable of."[8]

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[7] *See* "Remarks by Director Iancu at the Eastern District of Texas Bar Association Inaugural Texas Dinner," October 18, 2018, available at https://www.uspto.gov/about-us/news-updates/remarks-director-iancu-eastern-district-texas-bar-association-inaugural-texas

[8] *Id.*

So what narrow measures can we consider?

- We can support Congress in bringing greater clarity to subject matter eligibility.[9]
- We can grant the USPTO greater autonomy of the money it collects.
- We can restore injunctive relief. Patent rights allow for a "right to exclude"[10] and yet, under the current standard set by *Ebay*,[11] the right to exclude is greatly restricted.
- We can minimize multiple proceedings or serial filings to dispute the validity of a patent. Large corporations can weather and finance multiple proceedings – inventors (including women, veterans, and minorities) often simply cannot.[12]
- We can deter "efficient infringers,"[13] which may include those who prefer to purposefully infringe a patent and dispute its validity rather than take out a license, by enforcing "willful infringement" provisions, or as some have even hypothesized, levy criminal sanctions similar to other forms of IP, particular in relation to trademark and copyright penalties.[14]
- We can ensure that PTAB judges are properly appointed, per the appointments clause of the Constitution[15], and that they comply with the judicial rules or codes of conduct consistent with federal court judges that rule on patent related issues.[16]

Category 3: Should I simply pursue protection outside of the US?

Quote:

> "I am considering no longer patenting in the U.S. I can get better protection in China. As a veteran, I do not want to move my creations elsewhere, but feel that in view of the current market conditions, I do not have any choice."

Inventors feel that foreign jurisdictions currently offer more stability for asserting patent rights than what the US provides. This is also consistent with the fact that investors generally are pushing dollars to other jurisdictions to pursue patent protection and assertions.

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[9] *See herein* Recommendation 1.
[10] *See, e.g.*, 37 USC § 271.
[11] *See, e.g., eBay Inc. v. MercExchange, LLC*, 547 US 388 (2006).
[12] *See, e.g.*, Rob Sterne "PTAB challenges are a costly, uphill battle for patent owners," IP Watchdog, April 22, 2018, available at https://www.ipwatchdog.com/2018/04/22/ptab-challenges-costly-uphil-battle-patent-owners/id=96158/.
[13] *See, e.g.*, Joe Nocera, "The Patent Troll Smokescreen," NY Times, Oct 23, 2015, available at https://www.nytimes.com/2015/10/24/opinion/the-patent-troll-smokescreen.html?_r=0.
[14] *See, e.g.*, 17 USC § 506(a); 18 USC § 2320.
[15] *See, e.g.*, Alex Chane "Are Administrative Patent Judges Properly Appointed Under the Appointments Clause?" American Bar Association, Feb 15, 2019, available at https://www.americanbar.org/groups/litigation/committees/minority-trial-lawyer/articles/2019/are-administrative-patent-judges-properly-appointed-under-the-appointments-clause/.
[16] Note that the USPTO "Ethics Guidance" (available at https://www.uspto.gov/patents-application-process/patent-trial-and-appeal-board/ethics-guidance) does not include any rules of judicial conduct or codes of judicial conduct.

Recommendation 3: Learn from history

The *Diamond v. Chakrabarty*[17] case allowed for living matter to be patent eligible. As a direct result, the U.S. became globally dominant in the biotechnology industry for more than a generation. Currently, the U.S. is falling behind in many industries. For example, China is leading with respect to artificial intelligence investment. Investors follow the money, innovation follows the investors, and economic growth follows the innovation.

As such, having incentives in place, consistent with the measures I've previously indicated,[18] will ensure that the US remains on the forefront of economic growth, innovation, and investment.

Conclusion

We indeed do stand at crossroad. I stand with Director Iancu who stated: "[b]orn of our Constitution and steeped in our glorious history, the American patent system is a crown jewel; a gold standard." [19] Let's take action now to ensure that inventors, and in particular, women, veterans, and minorities, have effective access to getting a patent, as well as effective access to the courts in enforcing their rights as well.

Thank you.

[17] *See Diamond v. Chakrabarty*, 447 US 303 (1980).
[18] *See herein* Recommendation 2.
[19] *See* "Remarks by Director Iancu at the Eastern District of Texas Bar Association Inaugural Texas Dinner," October 18, 2018, available at https://www.uspto.gov/about-us/news-updates/remarks-director-iancu-eastern-district-texas-bar-association-inaugural-texas; *see also* "Remarks by Director Andrei Iancu at U.S. Chamber of Commerce Patent Policy Conference," April 11, 2018, available at https://www.uspto.gov/about-us/news-updates/remarks-director-andrei-iancu-us-chamber-commerce-patent-policy-conference.

Hello, I currently own a small business but I want to speak as an individual inventor, a single human being with ingenuity.

As a young, minority, female inventor and entrepreneur, I do not expect that my ingenuity will be rewarded by the US patent system.

The problems that my white, male counterparts have faced give me a sense of foreboding.

The real disparity that we need to address is one of financial resources and not of color or sex or veteran status.

After all, my mind and its abilities are not of a color or sex. However, I am of limited financial means as are many of my white, male, and non-veteran peers. And we all struggle to provide the world with something more than our wealthy, incumbent competitors can provide.

I don't expect to participate in the US patent system any further unless this financial disparity is addressed.

The USPTO should eliminate the IPR process for all of the patents initially filed by a small entity, a micro entity, and for inventor owned and controlled companies.

When large corporations undergo the IPR process they utilize less than 1% of their resources. When my peers of limited financial means undergo the IPR process then we face business and personal bankruptcy just to afford to defend ourselves. If we cannot scrounge up half a million for attorney fees then we cannot defend our patents. And there is nothing to gain even by a successful defense- we will end up spending half a million dollar just to maintain status quo and may still face personal and business bankruptcy.

We passed laws to lower fees for micro and small entities for the same reasons -- the true disparity is of financial resources and means.

From: Darrell Thompson
To: successact
Cc: Darrell Thompson
Subject: Reply
Date: Friday, May 10, 2019 10:01:13 AM

Good Morning

I am a afro American Male inventor and my wife who is also an afro American inventor who is my co inventor. I have a lot to say about the patent system. Yes the lady is correct. We are labelled patent trolls which is wrong. Yes the cost is high to litigate to protect you patent claims against infringers and yes the cost is high to fight Againt big companies who label you trolls and invalidate you patent.

These companies know that you do not have the resources to fight back because you cannot hire honest attorneys for a reasonable fee or on a contingency.

They are hard to find and when you find one they refuse to represent you because they know the system is design for you to fail. It has become difficult for attorneys who represent the individual inventor because their law firms do not have the resources to fight the case. An now with the new changes inventors and attorneys are afraid to fight against any infringer because they may have to pay for not only their attorney fees but the attorneys that are representing the infringer

We do not have the resources and we the individual inventors are not respected by the system.

It is amazing, these companies will take your idea knowingly many many times. Because they realise that those inventors do not have the money to stop them and if, by some chance you win the court will only allow for reasonable royalties which is a slap in the face.

What kind of court system allow a company to still you idea make money and when you catch them the court system has no way of punishing them except make them pay you what they should have if they hadn't violated you at all.

My name is Darrell K. Thompson

I am willing to participate and address the audience if need be to tell my story.

Thank you for the article

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My name is Bob Zeidman. I am an inventor, author, and entrepreneur.

The USPTO's goal to increase the number of women, minorities, and veterans who attain patents is a noble one. More important is the goal to give them opportunities for success through the creation of independent businesses, and that can be achieved by eliminating the impediments to enforcing patents and restoring the penalties to patent infringers that have been lessened in the past decade by legislation (the America Invents Act) and by the courts (e.g., *Alice Corp. v. CLS Bank International*).

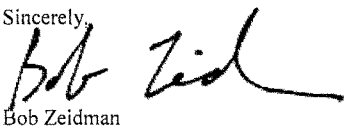
The answer to question 4 is that the social and private benefits gained by obtaining patents should be obvious in the economic empowerment that patents have given historically. The U.S. patent system has been a great equalizer, even when the other laws and customs of our country have been discriminatory. Women and African Americans, for example, have utilized the patent system to commercialize their inventions and create wealth when our society otherwise would not allow it. Mary Dixon Kies obtained a hat weaving patent in 1809, long before women had the right to vote or even the ability to own property. Ms. Kies and her patent helped fuel the growing American hat industry at that time. And when African Americans were slaves with few rights whatsoever, Thomas L. Jennings patented the dry-cleaning method in 1821. He leveraged his patent to grow his tailoring business and used the profits from that business to support the abolitionist movement, defend civil rights organizations, fight racial segregation in the courts, and purchase his wife and children out of slavery.

These days, however, the risks and costs taken on by a patent holder can outweigh the advantages. With extremely high PTAB invalidation rates, patents offer little protection to the inventor, and potential investors in these inventors are unwilling to take on the risk. I know this firsthand. The "exclusive right" promised by a patent is now nearly unenforceable. The tool that most empowered the individual inventor since the original Patent Act of 1790, the injunction, has been revoked by the decision in *eBay Inc. v. MercExchange, LLC*. The exclusive ability to control the invention must be returned to the inventor, to empower all inventors, but particularly those who otherwise may be at a disadvantage, such as women, minorities, and veterans.

Many independent inventors, particularly those from underrepresented classes, are unable to pay to defend a patent in an IPR, which has been estimated by the American Intellectual Property Law Association (AIPLA) at $450,000. Patents only have value if they are a dependable right without the risk of being so easily revoked. The USPTO must stop taking patents back from inventors, and the penalties for infringement, particularly willing infringement, must be restored.

Success for independent inventors is much too rare in the current system. The goal of the SUCCESS Act must be to restore inventors' rights and reduce their risks as was the intent of our Founding Fathers. Such legislation will help women, minorities, veterans, and all inventors upon which our country depends to maintain its economic advantage in the modern world.

Sincerely,



Bob Zeidman

From: Ronald Zhang
To: successact
Subject: SUCCESS Act Study
Date: Monday, June 24, 2019 4:11:27 PM

Dear Director,

I hope Congress can take actions in creating a more encouraging environment for women, minority and veterans to innovate and invent, and take actions to protect their inventions, and further help them apply their inventions to advance our country's economic and social development. However, the current environment is far from it, and is actually very discouraging.

My experience with the patent system illustrates how detrimental it can be for an individual to attain patents. Without accompanying reforms to the patent system, the legislative recommendation is likely to destroy the lives of the very individuals it aims to help.

Over the past several years, I borrowed a huge amount of money to conduct technological research and development based on my technical background and strength. I have successfully obtained 33 patents in the areas of advanced methods of information processing using computers. My patent portfolio was ready to be used for both product development and licensing. However, after the controversial Supreme Court Rulings on Alice, and the PTAB's practice in invaliding a huge number of software related patents, my patent portfolio is now valued for less than 10% of its original value, which is way below my cost of obtaining the patents plus the maintenance fees paid to USPTO.

I am heavily in debt. My patents have relegated my socioeconomic status to economic distress. I myself am in a minority group, but I would encourage others to stay far away from the patent system in its current form. Businesses cannot be built on false promises of exclusive right and patent enforceability. I am forced to abandon more and more patents also because I cannot borrow more money to pay the ever-increasing fees. Due to the discouraging environment and the confusing patent system here in the US, I am forced to look for opportunities overseas. I am forced to work with foreign companies where my technologies are better protected and thus valued higher. I wish I did not have to do this.

I hope Congress can take actions in creating a more encouraging environment for women, minority and veterans to innovate and invent, and take actions to protect their invention so that they can be more economically and socially independent and

successful. Without that additional protection, the USPTO should not encourage more women, minorities, and veterans to file for patents, or its effect will be like a trap, or even a fraud, because after spending so much money and time obtaining a patent from our government, the patent can be easily infringed or even invalidated by an agent of the same government, without any compensation.

Sincerely,

Ronald Zhang

UNITED STATES PATENT AND TRADEMARK OFFICE

PUBLIC HEARING ON THE "SUCCESS ACT"

Alexandria, Virginia

Wednesday, May 8, 2019

PARTICIPANTS:

USPTO:

LAURA PETER, Deputy Under Secretary for Intellectual Property and Deputy Director

ANDREW TOOLE, Policy and International Affairs

Public Testimony:

PATRICIA DURAN, Houston Inventors Association

JEFF HARDIN, Houston Inventors Association

BRIAN AUMILLER, Individual Inventory

DARCY BISKER, Independent Inventor

PAULA MURGIA, Personal Beasties Group, LLC

DR. LESLIE FLYNN, University of Iowa

* * * * *

PROCEEDINGS

(9:00 a.m.)

MR. TOOLE: All right. Good morning everybody, and welcome to the first public hearing for the Success Act. My name is Andrew Toole. I am the chief economist here at the US Patent and Trademark Office, and I have the distinct pleasure this morning of introducing our deputy undersecretary for intellectual property and our Deputy Director of the US Patent and Trademark Office, Laura Peter, who will be providing our introductory remarks.

So before assuming her role here, Deputy Director Peter was the Deputy General Counselor of A10 Networks. In that role she helped shepherd the company through its initial public offering and oversaw daily legal matters such as litigation, intellectual property, portfolio development, and commercial agreements. Ms. Peter has practiced law for over 20 years and her former positions include vice president and general counsel at Immersion Corporation, Assistant

General Counsel and director of intellectual property at Foundry Networks.

Ms. Peter also holds an impressive array of degree; a bachelor of science in industrial engineering from Cornell University, a masters in public policy from University of Chicago, a JD from Santa Clara University School of Law, and an LLM from -- in international business from King's College, London. So ladies and gentlemen, please join me in welcoming USPTO Deputy Director, Laura Peter.

MS. PETER: Thank you.

MR. TOOLE: Thank you.

MS. PETER: Thanks so much. Thanks so much Andy for that kind introduction. And it's a delight to be here this morning and talk to you about how we can further expand the innovation ecosphere. Women constitute over half of the United States population and get their participation in the general workforce is almost -- was almost -- excuse me -- was almost two-thirds in 2016. Yet women's participation in

STEM fields and in the IP system lag far behind their male counterparts.

In the United States, less than one quarter of the STEM workforce comprises women, plus half these women who work in the STEM fields leave after 12 years, most within the first five years. The participation of women as inventors named on US patents is even lower.

On February 11, 2019, the USPTO released its report entitled Progress and Potential; a Profile of Women Inventors on US Patents. This study found that although the number of patents with at least one woman increased from about 7 percent in the 1980s, to 21 percent in 2016, women inventors still comprised only 12 percent of all inventors on patents granted in 2016. We can and should do better than that.

If we are to maintain our technological leadership, the United States cannot continue to compete with so much talent left untapped in order to unleash this talent, industry, academia, and universities and governments must work together to

address these issues and drive toward real progress.

We at the United States patent and trademark office are committed to making opportunities for innovation available to everyone. A recent Harvard study found that increasing invention rates among women, minorities, and children from low income families could quadruple the rate of United States innovation. Clearly, unleashing this untapped potential holds tremendous benefit for all Americans.

The Trump administration and Congress have recognized this crucial issue and the need for action. And so on October 31, 2018, president Trump signed into law the Study of Underrepresented Classes Chasing Engineering Science Success Act of 2018, also known as the Success Act. The Success Act requires that the director of the United States patent and trademark office in consultation with the administrator of the United States Small Business Administration,

also the SBA, to provide Congress with a report on publicly available patent data regarding the representation of women, minorities, and veterans, and make legislative recommendations.

Specifically, the recommendation should be provided on how to promote the participation of women, minorities, and veterans in entrepreneurial activities, and how to increase the number of women, minorities, and veterans who apply for and obtain patents. In accordance with the Success Act, the USPTO is currently gathering information on the participation of women, minorities, and veterans in patent and entrepreneurship activity.

We are engaging with the Department of Commerce bureaus and consulting with United States government agencies including the SBA and the Department of the Treasury regarding the possible sharing of data and analysis relevant to the number of patents applied for and obtained by women, minorities, and veterans and the benefits there from.

Broadening the innovation ecosphere to

include underrepresented groups is critical to inspiring novel inventions, driving economic growth, and maintaining America's global competitiveness. So let's all work together to unleash this untapped potential. Today's event represents one step in advancing this dialogue. Everyone, individuals, businesses, nonprofit organizations, can contribute valuable information and offer productive recommendations to stimulate entrepreneurship and use of the patent system by these underrepresented groups.

Today's hearing is the first of three public hearings that the USPTO is holding throughout the country to obtain public comments in support of the Success Act study. We will also be holding public hearings at our regional offices in Detroit, Michigan on May 16, and in San Jose, California on June 3.

At each of these hearings, we welcome representatives from industry, law, and academia to present oral testimony on the participation of women in the, minorities, and veterans in

entrepreneurship and patent activities. We value your insight and your recommendations regarding concrete ideas and action plans to increase the number of women, minorities, and veterans applying for patents, public policies or other initiatives to promote the participation of such underrepresented groups in the patent system and entrepreneurial activities and the role that the United States patent and trademark office should play in addressing these important matters.

Thank you, so much for your participation here today. And I'm so sorry. I cannot stay to attend your full day of sessions, but I'm sure you will have a very productive and informative day. And thank you again for inviting me here.

SPEAKER: I'm sorry (inaudible) comments. And the director's not here either. I feel like this is the diminishment of the overall importance of this hearing.

MR. TOOLE: Well, we are taking this opportunity here now to hear about the oral

testimony of public -- members of the public. And all of this information, I'm happy to say, will be incorporated -- will be read and incorporated into the materials that we put together in response to the Success Act. And it will be of course including the Deputy Director and the director on all of these activities.

So I want to thank the Deputy Director for being here this morning. And all of the information that we collect today will be incorporated and be part of what we do as an agency together. So again, thank you very much -- I'm really happy to invite -- or happy to have all of you here today. I know that we have a number of people online, not just here in person. And that's going to be true for all of the events that we have with respect to the Success Act. So is not just an opportunity to be here in person, which is a very valuable thing, but it's also an opportunity to see and -- to witness and to understand what people are saying through the webcast.

Now, I would like to spend a couple of minutes, if I may, just to review the parts of the Success Act that are going to be very important for us going forward in our work to respond to the congressional act. So I have a few slides here. Some of this information may actually be -- and I hope some of this information is repetitive to those of you online and some of you in the room, because it will be taken from the Act itself. But it is important that we understand what this says in order to properly respond. So if I may, I have a couple of PowerPoints. All right.

So the first part of what I would like to say is to reiterate some of the points that the Deputy Director made in her opening comments. And that is to review key parts of the Success Act. Now, we know that the Success Act was signed by Pres. Trump on October 31 of 2018. And we have a one-year period in which the study the underrepresentation of women, minorities, and veterans in the pool of patent inventors.

And our work is going -- is involving

several components. In addition to our agency specific work, we're going to be, and we are consulting with the Small Business Administration. But we are also reaching out to other agencies across the US government including the Department of treasury and the department -- and folks over in the Department of Defense, for building out the information on underrepresented groups among patent inventors. Excuse me.

So this language here is the language of the Success Act. And I just want to briefly highlight a few points. So identify publicly available data. So this is publicly available information. This is not information that somebody has as a proprietary resource. We are trying to find out what publicly available information is available. And what do we want it on? We want it on the number of applications annually and the number of patents granted annually for women, minorities, and veterans.

So we are trying to characterize the participation of women, minorities, and veterans

among the pool of patent inventors, which is part of overall invention, but it's not the full picture of innovation, for instance. We would also like to know, what are the benefits associated with increasing the number of patents applied for and granted to women, minorities, and veterans, and also to the companies that they own. So these are all the critical components of what the Success Act is asking of us at the USPTO and our collaborators.

The second part which was mentioned again by our Deputy Director, is to provide recommendations. And here we want to learn about how to promote the participation of women and minorities and veterans in entrepreneurial activities and increase the number of women and minorities and veterans who apply and obtain patents. These are the fundamental components of the Success Act. It's short and to the point, I would say.

Having the Success Act in our hands, what we did is we moved forward with an

implementation plan. The implementation plan includes not only our own work to identify the sources of public information but engage with other agencies across the US government and to have public hearings. And as the Deputy Director mentioned, we have three public hearings across the United States. One on the West Coast, one in the middle part of the country, and one in the eastern part of the country, thereby covering the United States fairly comprehensively.

So these three events that are taking place, these are going to cover the United States, but they are going to allow people the opportunity, as we are here today, for oral testimony. So I would like to point out a couple of things. Today's testimony is going to be recorded and transcribed and included in the official record for these Success Act.

Now if there -- if an individual, perhaps somebody watching online, would like to add comments to the proceedings today or at any of the other locations, they have basically two

options. They can email us at successact@uspto.gov and tell us, I would like to -- I would like to come and present my opinion with respect to the Success Act components. And we would be very happy, and we welcome all of those comments.

We will have, today for instance, a walk-in session after 10:45 this morning. I have to pull out my agenda, but it's after -- yes, after -- at 10:30, we have some scheduled testimony. But then we will have some extra time. So if somebody is watching online right now, for instance, and says, I would like to say something today and I'm not far away, I will go -- you're welcome to come here today and provide some testimony after 10:30 this morning.

Now, in addition to the oral testimony that could be given here today, we will have oral testimony in San Jose California at the Silicon Valley office, and in Detroit, Michigan. Detroit, Michigan will be on May 16 and San Jose, California will be on June 3.

We are welcoming all interest to participate in those events up until about 48 hours in advance, maybe three days. Let's say three business days in advance. Now, the reason we must have three business days in advance of the event is because we had to prepare the agenda and these kinds of things. But we want to give people the opportunity to come to us at the latest possible moment. We want to incorporate people's opinions and give them ample -- as much opportunity as possible.

Our objective is to collect as much information as we can from the public. So if the oral testimonies don't work out, your schedule does not permit, we also allow you to submit written testimony. And written testimony can be submitted all the way through up until June 30. So almost two months from now, so the rest of May and all of June, can be used to prepare written testimony, and we will incorporate that written testimony enthusiastically into our materials.

So I will not take up too much more time

since we are on schedule here. Let me just go over some of the logistics of what we're doing here today and give people a feel for things, because the public hearings are not quite the same as other events. So for instance, at today's events, our objective is to listen. We are not in the position, and we are not having a debate. We are not having a discussion. We are not having a roundtable exchange.

This is a chance for the USPTO to listen uninterrupted and without any kind of questioning, the individual's opinions about women, minorities, and veterans and the aspects that I described to you earlier as I went over the Success Act.

In the federal registry notice, by the way, we included 11 questions that we thought would help stimulate thought and help stimulate people to think about the issues. I was initially going to read those questions to you this morning, but I will hold off on doing that. But I urge you, if you don't remember some of those questions, please go to the federal registry

notice because I think they are very helpful in outlining what we are looking for and what you can contribute if you take a step back and reflect a little bit on what's going on.

So let me just highlight a couple more points before we start, just in terms of procedure. So first of all, I'm the -- we have a clock up here for the timing. When the individual said that they would like to testify, we asked them how long would you like. And they submitted a time to: five minutes, 10 minutes, and so forth.

We are not -- because today, we have a little extra time which is a good thing, we are not going to be super strict with the time that you gave us. So if you said I want 5 minutes and you take 6 minutes, that's okay, but 10 minutes is not, right. And we're going to -- and that's part of my job. I am kind of the enforcer person. I want to try to keep people on time. But I want to have a little bit of a bleeding edge.

So I want people to be able to express themselves. And because we are not constrained by

time today, it seems like a good opportunity to let people have a couple of minutes more if needed. Again, there is no Q&A today. And the order of the speakers will be -- the order of the individuals listed on the agenda. So this morning, we have two sessions. One beginning at 9:20, which is nearly right now. Then we will have a break at 10:15. Then we will have a second session beginning at 10:30.

In the first session we have a number of people; one, two, three, four, five different individuals who will be speaking to us about their opinions on the Success Act and helping us together information. In the second period, the second timeframe, we have three individuals and we might have some of time for some walk-ins. And I hope somebody is stimulated and excited to come down and talk to us. We do have some extra time then at the end.

So without further ado, let me invite up our first person to speak, Mr. Jeff Hardin. Mr. Jeff Hardin is an independent inventor associated

with the Houston Inventors Association and the Inventor Rights Coalition. And please come on up.

And after you, Patricia will come. Oh, you want Patricia -- that's fine. The order is not critical. Patricia Duran is also here. She is an independent inventor. As I understand, she will be giving her testimony in Spanish and Jeff Hardin will be translating that testimony. So we have an extra microphone here to accommodate that. So please let me just get this done here. Okay.

MS. DURAN: Hi. Okay. We're going to have to --

MR. HARDIN: Yeah, that's fine. Okay.

MS. DURAN: Good morning. My name is Patricia Duran. Thank you for the opportunity to allow me to comment with you here today.

I am a woman. I am considered a minority in this country. I appreciate the intent behind the Success Act for Congress to ask for legislative recommendations for how to increase the number of women, minorities, and veterans who apply for and obtain patents. But I must start

with this question. What good is a patent if you cannot feasibly defend it?

Regarding the Success Act, I am certain you will hear this theme from all independent inventors who are the true stakeholders in the patent system and the true source of American innovation. The theme is this; women, minorities, and veterans all reside in the same category with all the other independent inventors, and this class, the independent inventors, this is the true underrepresented class.

And here is why. Women, minorities, and veterans, once they receive a patent, are actually in the same predicament as all independent inventors and small businesses. With the current state of the patent law in the United States, independent inventors and small businesses cannot adequately license the patents they receive with larger financially able entities, the represented class, nor can they enforce their patents against this class when the patents are stolen. This is because this represented class can simply bleed

the underrepresented class dry, legally and financially, by taking advantage of today's current patent laws.

So although pursuing equal opportunity with women, minorities, and veterans in obtaining a patent is a valuable effort, if it does not coincide with equal outcome and one's ability to utilize the patent once received, regardless of the person's financial state, telling women, minorities, and veterans that they stand to benefit from a patent will simply be a false doctrine.

Now that I have provided the above clarification, I will tell you a chapter in the story of my life. I am a cancer survivor. I was diagnosed with breast cancer three months after my daughter was born. I'm almost three years into my fight. After being diagnosed, I received a double mastectomy. And because the biopsy taken prior to my surgery of the suspicious lymph node adjacent to my tumor turned out to be negative, I was able to receive simultaneous reconstructive surgery

during the mastectomy; two birds with one stone. But as it turned out, my diagnosis was incorrect. A second biopsy of my lymph nodes was performed during the surgery and it was revealed that my lymph nodes, in fact, had been compromised.

The result was irreversible torture and I had to re-live this multiple times. During this double surgery attempt, my mastectomy had already been completed, but my plastic surgeon was already midway into his reconstructive procedure using fatty tissue from my abdomen to reconstruct my breasts. Because my lymph nodes were compromised, he had to suspend his work leaving me with a diamond-shaped incision going from hip to hip, and plastic silicone sheets were to remain in my abdomen until I had undergone full chemotherapy and radiation therapy. And then I would have to come back and undergo surgery again to complete the rest of the procedure.

What was the end result and that follow-up procedure one year later? I had complications and my reconstructive surgery failed

three times. I've not only endured and continue to suffer physical pain as a result of the surgeries, but I also endure psychological pain every day when I look in the mirror as a reminder. My scars remind me of the battle I fight, and every day is a gift. My blessing is that I'm alive and I have two beautiful children and a loving husband.

So how does the story relate to patents? Well, given that I endured misdiagnosis, the fact that medical diagnosis methods can be considered patent ineligible is concerning. The cure of my cancer today is merely playing a game of statistics. Crossing my fingers hoping that I will fall within the percentage of people who survive and study patient populations in clinical trials. The chemotherapies I received were a result of a strong patent system but is there something better.

For example, can more work be done in immunotherapy than other discoveries? Or as Sherry Knowles, who is also a breast cancer

survivor has question, or discoveries now being thrown out? The Constitution includes discoveries and so does the patent statute. Jeff will speak more on these, but this is my testimony and I thank you for giving me the opportunity to share my comments with you here today.

MR. HARDIN: Thank you. Thank you, Patricia. And I thank the Patent Office for allowing me to comment here today. I can personally vouch for Ms. Duran and her testimony here. I'm her husband. Her being alive today and our children still having a mother is a testament to a strong patent system. And moving forward, our fear that our current weak patent system will fail us not only medicine, but in artificial intelligence, robotics, computer software, and many other disciplines.

Regarding what Ms. Duran said regarding patent eligibility, I hope to submit for the record along with my written comments, a copy of the paper entitled, Unconstitutional Application of 35USC section 101 by United States Supreme

Court written by Sherry Knowles and Dr. Anthony Prosser published in the John Marshall review of intellectual property law in 2018. This paper speaks on how the court has extraordinarily -- extraordinary judicial activism essentially using white correction fluid on whoever discovers in the patent statute, as well as on the word discoveries in the patent clause of the Constitution.

The Supreme Court's judicial acceptance to patent eligibility have led to quite a bit of confusion as to the patent eligible subject matter. Now with section 101, Director Iancu of this office did provide his revised guidance in January 2019 and say that Congressional redo of section 101, I welcome his guidance. It provides clarity as to what is eligible and consistency among the Patent Office.

Unfortunately, the Federal Circuit expressed in the Cleveland Clinic Foundation v. True Health Diagnostics, they simply are not bound by it. The opinion reads, "while we greatly respect the PTO's expertise in all matters

relating to patentability, including patent eligibility, we are not bound by its guidance." So first, Director Iancu's January guidance has no legal binding. And who is to say that the next director won't change the guidance?

So second, the patent system should not be political. Patent law should not be malleable subject to whomever the current president nominates for the director position, which could easily be persuaded by the donors in his pocket. For these two reasons alone, it is Congress who is the proper entity for addressing 101. Even though the Supreme Court in Alice said to tread lightly let that swallow all of patent law, it doesn't appear the lower courts are heating to that warning and Knowles shows historically that the High Court has similarly written their own exceptions into the law from the bench.

Now I'm aware that the Congress has members at the house and the Senate IP subcommittees currently looking into section 101 today and the Patent Office hopes Congress uses

their framework as a guide. And these members of Congress have indeed published a framework. They published it. They sought stakeholder feedback. And if Congress does continue the path with what they did publish, they will actually be codifying what the courts have written from the bench.

And there was the representation of the people in that law writing. As Knowles explains in her paper, the court, when creating these exceptions did not refer to the statute, but they rather referred to their own previous decisions all the way back. This would be an outrage to our founders, and it would be an outrage to any informed citizen. It is Congress who writes law and we elected them.

Congress has the constitutional power to decide what promotes the useful arts and sciences for the citizenry, not the courts. The court is not an elected body. What Justice Cavanagh wrote in Henry Schein in 2019 was correct. The act contains no holy ground with exception, and we may not engraft our own exceptions onto the statutory

text. He is holding to the text. Simply put, the statute as it was written in 1952 and the historical reasons behind it, should stand as is.

The word any means any. The words, or discovers, means what they say too. But because the courts have shown a propensity to make exceptions, I suggest the following language for 101. It reads; "without exception, whoever invents or discovers any non-natural process, machine, manufacture or composition of matter, or any improvement thereof, may obtain a patent therefor subject to the conditions and requirements of this title. Compliance with this section is not a condition for patentability under section 282."

And I also believe that it's imperative that senators and representatives provide any legislative history that the intent is to expressly repeal myriad (inaudible) and Alice. And I say this here in this venue regarding the Success Act, because of this. The Patent Office published a report in February 2019 entitled,

progress and potential a profile of women inventors on US patents. If you look at page 8 and 0 of this report, you see this; "within chemistry, certain subcategories exhibit even higher women inventor rates; in 2016 for example, women accounted for more than 1/5 of inventors granted patents in biotechnology, 25 percent inventor rate, pharmaceuticals, 23 percent, and organic fine chemistry, 21 percent."

Page 9; "when a patent is granted, a company, university, or other entity is assigned ownership and identified as the assignee of the patent. The female share of patent inventors is trending up across assignee types but universities and hospitals in public research organizations show the largest and most continued improvement."

So given that there are many women in medical history, or in the medical industry, that the Patent Office is to recommend legislation to Congress that may help increase the number of women who apply for and obtain patents, it is my hope that the Patent Office would make the

suggested language for 101 above part of the recommendation to Congress, as this would also help resolve any product of nature or diagnosis method ambiguities currently being judicially excluded. As shown by the testimony of my wife and her misdiagnosis, we need continued innovation in these disciplines.

Now, on to minorities and women. I will quote two of them. First, a woman and a Latina like Patricia here, Supreme Court Justice Soto Mayor. In the oral argument of (inaudible) in February 2019, Justice Sotomayor said this of the post grant review of the proceedings here at the Patent Office. "It does seem like the deck is stacked against a private citizen who is dragged into these proceedings. They've got an executive agency acting as judge with an executive director who can pick the judges, who can substitute the judges, who can re-examine what the judges say, and can change the ruling."

So this, two points. One, Justice Sotomayor did not say it seems like the deck is

stacked against a woman or a minority or a veteran. She said private citizen. And this is the one thing that makes the patent system resemble America. A patent is not based on the color of your skin, your gender, your race, or otherwise. A patent is based solely on the merits of the claimed invention and nothing more.

And two, this reinforces what Patricia has already stated here. When it comes to patent challenges within the system, Congress created with the American Invents Act in 2011, Congress unintentionally created an unrepresented class, the independent inventor and small business. And this brings me to my second minority woman of whom I will quote, House representative Sheila Jackson Lee of Texas. Let's set the stage, shall we. June 23, 2011, the American Invents Act is being disclosed and discussed on the floor.

Congresswoman Jackson Lee rises to offer an amendment and she says, "my amendment speaks to the vast population of startups and small businesses that are impacted by this legislation.

Small business makes up a large portion of our employer network. It is important to understand how they would be impacted as a result of patent reform." This is 2011, American Invents Act. She is on the floor talking.

This (inaudible) of Congress, her amendment will put us on notice that we need to be careful that we allow at least the opportunity of investment and investors and that we continue to look at this bill to ensure that it responds to that opportunity. My amendment also reinforces that we do not wish to engage in any undue taking of property because we indicate that we want to see the innovativeness of American businesses continue.

And this one is key. Small businesses it should be as comfortable going to the Patent Office as our large businesses. Then she provides her (inaudible) per amendment. And she says we must always be mindful of the importance of ensuring that small companies have the same opportunities to innovate and have their

inventions patented and that the laws will continue to protect their valuable intellectual property.

Without strong protection of patents, businesses will lack the incentive to attract customers and contribute to economic growth. So what happens to that investment that Ms. Jackson Lee mentioned? Well, according to the alliance for the United States startups and inventors for jobs, the USIJ, and the strategic sectors of core internetworking, wireless communications, Internet software, operating system software, semiconductors, pharmaceuticals, drug discovery, surgical devices, and medical supplies, venture capital funding has dropped from being 20.95 percent of the total VC funding in 2004, to a mere 3.22 percent in 2017.

The VC money is gone. I hope to include this report from the USIJ along with my written comments here. Just like representative Jackson Lee warned with her sense of Congress amendment, Congress was put on notice that they need to be

careful to allow opportunity for investors and Congress must continue to look at this bill to ensure that it responds to that opportunity.

Given the evidence, showing investors fleeing these sectors, now is the time to look at that bill and its consequences. Not to lawyers, not to big business, but to the true stakeholders, the American inventors. Where are they in the conversation? And are they being left out?

Interestingly, Congressman Smith as seen in the Lee Smith Inventors Act, American Invents Act Congressional record, responded to Congresswoman Jackson Lee and he said this. Immediately after she sat down, he stood up and said, "I want to make it clear that my interpretation of this and its intent is to highlight the problem posed by entities that pose as financial or technological businesses, but whose sole purpose is not to create, but to sue. I am talking about patent trolls. Those entities that vacuum up patents by the hundreds or thousands whose only innovations occurred in the

courtroom."

And yet even more interestingly, it was just last October in 2018 when the director of this office, Director Iancu, called the patent troll narrative Orwellian doublespeak with mentions that the patent troll narrative being synonymous with a fairytale throughout. He did that in Texas. Others in the industry have even come voicing that this is just a ploy by big tech to weaken the patent system. Director Iancu said in his speech, "In our zeal to eliminate quote, trolls and the quote, bad patents, we have overcorrected and risk throwing out the baby with the bathwater. This must now end, and we must restore balance to our system."

So where is this imbalance amongst these two groups? The underrepresented and the representative? What can you not get from a PT post grant review proceeding that you can get from the traditional article 3 court? If we ignore now having no stacked panel and a partial judge on a jury, full discovery, and presumption of validity

that you do get in an article 3 court, I will summarize it in one word; representation.

Per the 2017 AIPL report of the economic survey, the estimated mean cost of a post grant review proceeding through appeal was at $450,000. This is how much it costs a patent holder for a single post grant review proceeding. There are still problems with, what the real parties of interests. What about game tackling and serial attacks, et cetera? Before a single post grant review, a patent holder, the independent inventor will need just shy of a half-million dollars.

And with stats showing the kill rate for patents at the PTAB between 75 to 85 percent, no attorney is going to take this on contingency especially when there are no damages on mere success at the Patent Office. This cost is on the inventor's dime. And this is just the reach the same state of reliance that previously existed on the day patent was granted before the America Invents Act went into effect.

In other words, if you don't have a

half-million dollars to spare for a single patent challenge at the Patent Office, you will not find representation if you ever want to license your patent or someone does the math and challenges you or if you want to protect your patent when someone else deals your invention.

Is this a fair shake? Does the patent give women, minorities, and veterans any real benefit, or all independent inventors or small businesses, for that matter? With advances like this, the question that arises if you were to encourage these groups, women, minorities, and veterans get more patents, it's not what we doing for them, but what are we getting them into because they have no idea.

So what is the legislative recommendation that the Success Act is looking for from this office and from stakeholders? How do we create equal outcomes of the equal opportunity even presents in a sense that's worth pursuing? That recommendation is this. The Patent Office must recommend to a Congress that if Congress was

to keep their American Invents Act system that created the represented and underrepresented classes, Congress must recognize the underrepresented class in the statute.

And doing this is simple. Recognize patents with the inventors or small business owned solely by the inventors retain ownership of the patent. These are not the so-called patent trolls. These are the true American innovators trying to start a company in their garage. They're the ones who own their patents. They retain ownership of it. Establish and identify them, inventors who own their patents, in the statute. This is the true underrepresented class. Give them preference when it comes to the patents being challenged.

If it's more economic and economical and faster to go to the PTAB then they will go. If not, then they will stay in the traditional article 3 court. Give them proper venue, 1400 B, and places where they performed the research, for example. The face of the patent says that the

patent holder has the right to exclude others. They should have that right when it comes to injunctions.

Once Congress does this, the playing field will be more level. Independent inventors and small businesses and all women, minorities, and veterans who reside there in those categories, they will all have a more equal outcome. And that baby that has been thrown out with the bathwater, as Iancu mentioned, will have been safely taken out of the bathtub before the bathwater has been tossed and the patent bargain will be worth pursuing again for the underrepresented group to which you wish to promote. Thank you.

MR. TOOLE: Thank you. Thank you very much, Jeff. Thank you, Patricia, very much for your testimony today. Okay. So we now have Brian Aumiller.

MR. AUMILLER: (Inaudible).

MR. TOOLE: Yes, that's true. Also an independent inventor. And he has requested about six minutes or so.

MR. AUMILLER: Attendees, thanks for coming. Mr. Hardin, he said a lot of stuff that I'm going to say. I think it's very fitting for us to get this out. Thank you for your time.

My name is Brian Aumiller. I served about 11 years in the National Guard. I served multiple deployments from 2001 and got out in 2008. I deployed to Germany. I was activated to do basic security at Fort Riley, Kansas and I volunteered on an Iraq deployment that would turn in to become the longest military deployment of OIF.

I didn't grow up with a lot of fancy toys or fancy vacation experiences. I got a push mower. My father believed in a hard-working keeping busy and there's always work, to be done. This later probably to joining the military after high school. My parents couldn't pay for my college, so I joined the military.

After my Iraq deployment Congress passed the post- 9/11 G.I. Bill leading into the summer of 08. My civilian job cut my hours and I made

the decision to go back to school. I found and I applied for and got accepted into a watchmaking program in Oklahoma. After two years of school, I graduated in 2013.

My wife and I moved to Florida for a job. It was my first start as a civilian professional. Fast-forward five years, I come up with an idea and I have no clue what to do. I found it hard to find help or even talk about it with someone because of patents. Because the last thing you want is someone stealing your idea. The VA didn't have any resources, but they did recommend the SBA. They help vets, I was told.

The SBA didn't really help that much before I was even able to ask about patents because they wanted a business plan. I didn't have one let alone have an idea how to do one. So moving forward, I unknowingly did what every inventor does. I went out, get a lawyer, and start my patent for my new idea. I did the track one option and it was issued within seven months. It felt great. It's an unexplainable feeling

getting that letter from the USPTO. I was excited because now I have something that is mine.

I paid for and the government gives me control of it. Is mine. I think to myself; this is what it feels like to live in America and to go through the process of getting ahead. I can play by all the rules set in front of me and have this feeling, this is what I fought for in the military and this is why I served; for the American dream. This is becoming mine and it has changed.

My patent was issued, and I have yet to discuss it publicly, even to the majority of my family. In front of you is my first time doing so. I don't know what success my product brings, but I would like to know there is a level playing field for me as an individual inventor.

After getting my patent issued and going through the process, right away the patent is only valuable if you can defend it. When I got back from Iraq, there were home improvement shows that would go in, fix up the house for that, in turn over to usually a disabled vet. And then I heard

a story about how the veteran had lost his house because he couldn't keep up with the maintenance or the tax assessed on the property. And it just made me think, why would anyone have thought of this.

And I feel like that's why we are here. Helping us get a patent is a good start but helping us enforce it or make is easier on the business owner to protect is the easy part. Again, getting the patent is the easy part. Protecting is the hard part. It could cost tens to hundreds of thousands of dollars and years to complete.

I read stories on products on Kickstarter of being knocked off in China and being sold and delivered to the US before the Kickstarter project has even finished regardless of if they had IP or not. If that don't kill the business, I don't know what will.

I feel the larger companies don't want to visit and they label us patent trolls to defending our patents. And we -- and the use the

courts to take advantage of us knowing full well that we can't do anything to beat them. I would also like to add that I think the USPTO can work with the SBA on helping -- getting that educating on us for us unrepresented, on helping us to defend our patents.

I also feel that needs to be more accountability with those companies that do prey on people as well. I would also like to add that securing a patent helps with getting money and investment. I will keep moving forward and I can with this process. And I will keep hoping changes will be coming from Congress. And on a side note, I don't have $400,000. That's it.

MR. TOOLE: Thank you very much. Appreciate that. All right we have -- it's Paula Murgia. Okay. Would it be okay for you to wait until the next -- after our break? Okay? Very good.

So our next speaker is Darcy Bisker. She is also an independent inventor and she has requested 15 minutes to speak to us this morning.

Please step up.

MS. BISKER: My name is Darcy Bisker. I am an artist, an entrepreneur, and a patentee. I need to take a couple of minutes after Brian's moving testimony, and Paula and Jeff's as well, with such great information and forethought.

I would like to take a few minutes just to -- actually three minutes to tell you my life story and how it ended in an inability to protect my patent. I was born in Ohio. My father was a genius, uneducated. He worked at International Harvester and created many amazing inventions that were primarily design improvements. He made his own flying Gyrocopter, two all-terrain vehicles, a snow mobile, a water wheel, a solar panel. And we built log cabins in the wilderness in Canada.

During that time, I learned the value of understanding process improvement and how to take an idea into a project and make it happen. I went to public school. I went to a public university, Ohio University, where I graduated summa cum laude with a bachelor of fine arts in photography. I

emphasize this because we have a very nice afternoon here related to success in engineering and sciences however, the general arts and the general population needs to be informed about happens.

People are afraid to even use the word. I think you experienced that, Brian. When a person does invent or create, to not even understand the basic concepts -- and they were not taught to us in high school. I recently formed a company called Invent Yourself. My idea was to help inform kids in high school when their neural plasticity is that the greatest, what patents and trademarks mean, how they will be a part of it. It can be done in 45 minutes.

I made three presentations, discussed the history, importance, and showed some funny patents; beer keg on the head. Kids love it. And then they understand the basic concepts and how this is a civil right, that this is something that all citizens can participate in.

However, after graduating college, I

went out West to Colorado, joined a very nice company for $5.00 an hour, which was the minimum wage at that time. As a woman, I was underprivileged. At that time, there were 12 -- this is 1982. There was 12 percent unemployment. I, with a degree, I started as a receptionist at a photo lab.

I then switched companies, brought in the first million dollars in sales, and said, we can take this and become a national entity. We can do it by love and passion for our work. While in that company, we grew to about 40 people. We started taking -- having national accounts just as I had envisioned. And then created several products.

One of them I thought was quite interesting. Wow, this is something so obvious and it has not been done before. Does that mean it's nonobvious? Is it useful? Oh, it really seems to be useful. I started doing tests in house and then publicly. When I realized that, at my first public tradeshow, there were 700 people

surrounding my booth with people like the gap in the back saying, will you call us. I had really hit on something.

So immediately within the time constraints, began talking to a patent attorney, spent the time and money through a four-year prosecution and retained every word of 26 claims. Now this is relevant because during that time, my patent was very widely accepted and utilized, produced, sold, manufactured and made by everyone.

Now you might say, well, was the patent valid? Well, it was issued valid. There was no prior art. There were no invalidating publications. And what happened was it was such a successful project -- like Brian, you mentioned what happens on eBay. When something is successful, big companies come in.

At this point, and of course I had made millions on the product too. It was by this time, 1999, my patent 5,000,008632. So that shows you in the last 20 years we've gone from that number to 10 million. So the slope was low. It's gone

high. We all know that. By the time my patent was issued, only 2 percent of patents had ever been issued to women.

Because I was also owner of the company by this time, or part owner I should say, I obtained full -- I did not assign my patent to another company. So I am the inventor and owner of my patent. Because infringement was so great, News Corp. -- the business was in that -- I'm sorry. I don't even know the numbers anymore; hundreds of millions. I -- we decided to sell the company. We made seven times earnings because we were a very good, solid, profitable company employing 87 people and 37,000 square feet of manufacturing in Denver Colorado.

The company was (inaudible) and Visual. Once we sold the company, my business partner of, at that time, 20 years, decided that we needed to start -- that it was incumbent, as we were told, by the patentee to take on lawsuits. And Jeff, the figure that you -- I'm sorry -- Brian, the figure that you used of 400,000, is just the

beginning. You have to sue and sue.

I decided it was wise to take on the largest infringers first. I did pass reexam, a forced reexam, completely. And at the same time, I was ruled a -- I'm sorry. There was a summary judgment of noninfringement by a judge in Texas, a magistrate. The appeals court chose not to overcome that ruling.

So while there was nothing in this field and then suddenly a multi-hundred billion dollar -- million dollar industry that is now in the billions, sold by News Corp., sold by 3M, sold by Hewlett Packard, infringing products all around. I lost the money that I put in, that I could've been generating more business.

But because the patent was not respected by commercial businesses, by the large corporations, and not by the court, I have to question, is United States Patent and Trademark Office issuing valid patents. And if so, why are they not being upheld in the judiciary?

Now, to address this meeting. I'm

sorry. I know I probably started off on the wrong foot with the undersecretary. I think that when a department or a government of the people, for the people, and by the people chooses to determine and spend taxpayer dollars on further studies in how to make improvements and they say that this is an important issue that women, and minorities, and veterans are underrepresented, then I expect more than a week's notice in the public register. Yes, this hearing was notified last September when the report was issued.

And then it was published late in the public -- in the Federal Register for request to hear to be at this hearing, only -- with only a week's notice. I'm sorry. I didn't say that quite right. I will correct it in the written record, which I know of course we have until June. And I also understand that this testimony as well as others will be read at some point by the, hopefully, by Director Iancu and hopefully by the Deputy Director Peters.

I am very disappointed that neither are

here today. I'm very disappointed that there are only a few of us. And it seems it's the individual -- the independent inventors who are best represented here, trying to plea. As Patricia so well put it, and thank you Patricia, yes, we are part of the underrepresented class. As a woman, as a minority, and as a veteran we are part of the true underrepresented class of independent inventors.

Now, as I mentioned, I started a company in January called InventYourself.org. I have out -- it was about educating 15 to 25-year-olds on the patent system. I don't think I'm going to continue with that. I don't believe that I should help lead a sheep to slaughter. There is, at this time there are -- there is no action toward understanding the PTAB issues.

The point that you made Jeff, are so interesting and well taken. In the need to be a reform. We don't need to continue to focus on what we already know. Women are disadvantaged. If I have five fingers and I take one, it's the

thumb that I've taken that is a disadvantage of 20 percent. So once I have only four fingers to work toward innovation, how will I use them. Well, it probably isn't going to be to take the money that you earn, the jobs you create and put it in the public (inaudible) openness; and have it usurped and taken away from you. Instead I expect more closing of that. We've already seen the statistics.

There were two questions that you asked Mr. Ross. For they are of primary interest in the success act study. Again, I challenge -- I know that it is necessary for us to study, but something the Department of Commerce knows how to accumulate information without making it personally identifiable and so therefore overcoming the perception of bias. That is known. Do it.

Secondly, there are approximately 5 million inventors alive. Let's survey them. Again, (inaudible) is open. My home address is published. Okay. Now we don't want to associate,

obviously, what class a person is in with a patent process. But once a patent is issued what's the difference? There is no privacy anyway. And, of course, that address was acted on. It's public information. Lots about the publication of a patent, that causes an inventor to be acted upon by sharks, trolls, and by infringers.

I think also, not only should there be a survey of existing live inventors, ask about their story. Get their story down, understand it. Women are underrepresented in patenting and engineering and sciences because while we may be equal, or even better at those arts, we are also quite good at the other arts, the material arts. And the idea that women do not know that they can -- well, again, I keep stopping myself because I don't want to encourage women to get patents. This is a heartfelt issue for me right now.

And by the way, when we lost our summary judgment of noninfringement; that was on Tuesday afternoon at 4:00 that I was given notice by our attorneys, and the next morning my business

partner, Ed Sykes, we had worked together for 28 years; he had a heart attack. He had a stroke while he was being operated on and died soon later.

So these issues, while they may seem tangential, they may not seem all that important, they are very important issues. They are how the country was developed and the potential is enormous.

And one of the questions I thought was interesting, that I kept stumbling over, was what is the benefit? Well, we already know that the potential for commercial benefit -- the potential is for the commercial benefit to quadruple. So what does it benefit? The benefit is self-evident, equality is self-evident. The benefit of the quality is self-evident. It asks how to --

I'm sorry, I also wanted to mention another thing about the survey and how they gather data. Obviously, you could do -- we've got a 2020 year coming up here, start a 10 year initiative at

state, as for anybody who applies for a patent to be part of a survey. You know, certainly, if there's going to be 10 million patents filed in the next in 10 million years - I'm sorry, in the next 10 years, which will probably be decreasing, and since it's a decreasing, I'm not sure what those numbers would be. I was looking at the chart. Even a small portion of those participating and willing to have a tracking of their life, and results going forward, would be helpful because PTAB and the post-grant process are too expensive. They are inhibitory, and they are preventing all individual inventors as well as women, minorities, and veterans.

I'm just going to check to see if there's anything else. Oh, I did want to mention that -- actually, I'll leave it at that. Thank you for your time.

I'm sorry I do -- I would like to go on the record to say that the United States Patent And Trademark Office is one of the most efficiently run professional and excellent

organizations that I, as a citizen, have ever dealt with. That does not mean that there aren't problems. This hearing should have had greater notice. There should be more than three public hearings. There are 150 million women in the country. Okay. There are three locations at which this hearing will be made. And the information will be in the same circles, it always is, the attorneys and the inventors and the USPTO people. Let's do some public information. Let's get some -- pay as much attention to this as we did to other campaigns for important public notice.

Thank you.

MR. TOOLE: Thank you very much, Dorsey. I agree completely. In fact we want to spread the word as widely as we can. We use the social media as an outlet to spread the word for the oral testimony opportunities, and the written testimony opportunities. And I hope that that's been a little bit more effective in reaching outside the traditional circles. I know some folks who are

not directly involved in patents do follow the PTO in the social media. So we have use that.

Now, it's time for us to take a 15 minute break, and then we will return here at 10:30 to finish the rest of the testimonies from our individuals. So we will see you here in 15 minutes, please.

(Recess)

MR. TOOLE: All right, let's take our seats, please. So we've had a very successful morning so far. We've heard some very compelling oral testimony. I just want to mention that Drew Hirschfield, our Commissioner for patents has been in the room this morning listening, as well as Bismarck Myrick who is the director of the office of equal employment opportunity and diversity are also here. He's also here. So just to recognize these individuals.

Now, without further ado we have the next testimony by Paula Murgia, she has kindly waited until after the break to give her testimony and she says for 10 minutes to talk. So please

come on up.

MS. MURGIA: Thank you. Hi, I'm Paula. And this is what I've learned how to say since February. Hi, my name is Paula, and I'm a debtor. I recently joined Debtors Anonymous. I didn't even know it existed, but I've been put into that situation. I'm sorry. I am going to break down, so get ready everyone; as I have periods of the emotional outburst.

I didn't even know that Debtors Anonymous existed until I tried to pick my life back up after October. That's when I was invalidated in the US court, in the Southern District of New York. So to call myself down I'm going to read some things. I put some things together so I could be a little coherent, and put actual words, not just emotions on the record.

One of the thought leaders who I follow in law, I guess, a policy advocate is Tim Wu, professor Tim Wu. He teaches at Columbia Law school; he is an author of this book, the master switch. He also wrote The Attention Merchants and

the Curse of Bigness. Professor Wu settles my nerves because he has a better way with words, so I will read a short review of this book before I read an excerpt from this book of which I requested his permission this morning in an email and he hasn't yet responded so I don't know if I'm breaking copyright laws, but I hope he doesn't mind.

In 2010 the review for this book. "In his new book, The Master Switch, Mr. Wu defines and explains what he calls the cycle. The cycle basically describes the typical evolution of an information technology from the domain of hobbyists, think Alexander Graham Bell in his attic in Boston, and Steve Jobs and Steve Wozniak Los Altos garage.

"Two large monopolistic institutions such as AT&T and pre-cable network TV, the general pattern of disruptive technology spawns a fledgling industry which is largely open and accessible to many players. Slowly, it evolves into a closed industry controlled by one, or a few

big corporations. Those in control tend to fight innovation because it threatens their own power base and source of profits. This state of control prevails until another disruptive technology succeeds in upstaging the dominant one."

I went to see Professor Wu speak at a book signing for The Curse of Bigness on April 9. And I couldn't rate for the Q&A and I raise my hand and asked him, I was like, but don't small inventors deter monopolies when they have the right to ask for a license? And his reply was that I needed to check out what he wrote in The Master Switch about Bell patents. And he does support small inventors in this piece.

In antiquity, Cronus, the second ruler of the universe, according to Greek mythology had a problem. The Delphic Oracle having warned him that one of his children would dethrone him, he was more than troubled to hear his wife was pregnant. He waited for her to give birth then took the child and ate it. His wife got pregnant again and again, so he had to eat his own morak

more than once, and so derives the Cronus effect. The efforts undertaken by a dominant company to consume its potential successors in their infancy.

Understanding this effect is critical to understanding the cycle. And for that matter, the history of information technology. It may sometimes seems that intervention and technology advances are a neutral, are a natural orderly process. That this is an illusion. Whatever technology reality we live with is the result of tooth and claw industrial combat. And the battles are more decisive than those in which the dominant power attempts to co-opt the technologies that could destroy it; Goliath attempting to seize the slingshot.

I'm going to talk about Bell patents. 1878. For months Bell suffered under the onslaught of Western Union. As if warning his company Alexander Bell became a bed written invalid in the grip of such a depression that he checked himself in to the Massachusetts General Hospital. The struggle between Bell and Western

Union over the fate of the telephone was, in retrospect, a match to the death. The victor would go on to prosper while the loser would wilt away and die. This is how the cycle turns.

Bell was overmatched in every area; finances, resources, technology, except one, the law, where it held its own, it's a one all-important patent and so as the firm's eponymous founder late in the hospital Hubbard, Hubbard was his business partner, an experienced patent attorney himself, retains a team of legal talent to lots of bells only realistic chance of survival. A hard-hitting lawsuit for patent infringement. The papers were filed in September 1878. If Western Union was a figurative Goliath, the lawsuit was David's one slingshot stone.

The importance of Bell's lawsuits shows the central role that patent plays in the cycle, and it is a role somewhat different than is usually understood by legal scholars. Patents are, by tradition, justified as rewards for invention. Owning a patent on the lightbulb, or a

cure for baldness means that you, or your licensee can profit from its sale. The attendant games are meant to encourage investment in intervention.

But in the hands of an outside inventor, a patent serves a different function. A sort of corporate shield that can prevent a large industrial power from killing you off or seizing control of your company and the industry."

Thank you, Tim Wu. Now I'll give you a personal story because I'm delighted to be here, I have to let you know, even though it's emotionally traumatic because I really think that by getting stories, personal stories it hits home. Tim Wu settles me, but it also sort of lays the foundation for my story, and I feel like the story of all inventors here.

Okay. Starting with my background, I worked as a young woman in my early 20s with at risk children as a behavior modification milieu therapist at Emma Pendleton Bradley Children's Psychiatric Hospital in Providence, Rhode Island. This experience and these children motivated me to

dedicate my life to the pursuit of manifesting ideas so as to further benefit at risk children in crisis.

So in the early 80s, I'm sure you all kind of remember the nascent videogame industry at the time that basically was just like Atari; simple Atari systems, Pong, those type of very simple games, but as a milieu therapist working with deeply disturbed children and trying to have a behavior modification program for them, I leveraged anything I could. And the video games, the children would do anything, anything just to have video game time.

Having those ideas, connecting those dots was really inspirational. I was like, oh my god, if we can only get these video game systems somehow into these behavior plans, you know, these kids will do anything. And full eight-hour days with children who are suffering is very tiring and you lose your motivation quickly and you really seek tools to help them. So that started my journey and led me to earning advanced degrees at

renounce and very, very expensive institutions of higher learning.

I didn't know what to do. Like you say, you have these ideas, you have no idea how -- what -- my grandmother would say to me, isn't it always strange when you want to fix a product or do something to it it's always, they? Who are they that made this product? And she inspired me. She was a very clever woman. She only had a third-grade education, but I wanted to become one of the "they".

I was undiagnosed as a dyslexic, so I had very difficult times in the regular schooling and I didn't now what to do with these ideas. So I was 30 years old at the time, so it was 10 years with the children and I just though I'd risk it all. And I said what would you do if you had a million dollars? What would you do? And I was like, oh my god, I would go to the prestigious Rhode Island School of Design that was so much a part of the neighborhood in Providence, Rhode Island.

And I was accepted. It was the beginning of technology. I was an older student in my 30s, an undergraduate taking classes with rather privileged younger people who I kind of gathered around in a computer lab. Started some of the first technology and art groups at Rhode Island School of Design. The technology at the time was so simple -- it was the 90s by then, early 90s and it was just like Mosaic was your browser.

So I went through my core studies and became very inspired to get a masters degree, and came to NYU where they had the interactive telecommunications program, which at that time was second only to MIT media lab. And that was it. Those were the two technology programs where you could get an advanced degree. So I kept betting and getting those loans and getting further and further in debt. But I was banking on my creativity to be able to pay those back. I really wanted my ideas to generate some sort of the income that would pay for this American system of

education.

So, my ideas were cohesive with another group of students who all had medical backgrounds too. And so we were able to do a thesis for our graduate thesis which we patented ourselves, and that was the beginning of getting a patent. But I really have to thank those children that I worked with for really giving me the hutzpah to even think I could do such a thing.

So the path to manifesting ideas requires great commitment of time, money, courage, perseverance, and an absurd level of optimism and suspended belief that if you bootstrap and invest all of your savings, energy and grit to build any type of proof of concept of whatever it is that you invented, that industry, and for me it was the technology industry, at large would applaud and welcome you. So this was the super naïveté thinking and that I had done something really good. I mean I was happy I did it, and I thought other people would sort of be happy about the fact that I did it.

This, however, was not the reaction I received. As by the time I was granted my software patent in 2004 big Tech was well on its way to demonizing patent holders and by association inventors. Accusing us of impeding innovation, when in reality, we were just in the way of them steamrolling their own way towards monopoly status. They labeled all software patent holders as patent trolls, and I personally experience of being shunned, scolded, and lectured whenever I mentioned being a patented inventor in the digital technology industry.

I would go pitch, and pitch, and pitch. I would do everything that was by the book. I had people laugh at me. Oh, you think a cartoon character is going to encourage someone to stay healthy? Get out of here. Yeah, and by 2005 Nintendo had launched Wii fit. I had a former senior executive from Activision just blatantly tell me you are the problem. You are not the solution. My self-esteem has really taken a lot of blows. Venture capitalists were not

encouraging either give them the Goliath size of the competitors, soon to be infringers, like Nike, Fitbit, Apple, Samsung with whom we were in the same market space as.

Like many software patents, post-2014 my first attempt to enforce my rights as a patent holder was defeated this past October in New York Southern District Federal Court. US 6769915 was invalidated under Section 101. We filed our appeal last week, so I guess I'll be coming back to Washington in a few months and I don't know. You can't take it out of me. I am still holding on to some sort of hope that something could happen.

I mean I'm happy to testify here today. It's to help you collect any information that could be valuable for you that could help other people not go through what we're going through. Encourage more women, minorities and veterans to invent here in the U.S. rather than in China as seems to be the current trend due to the switch in the patent laws.

So it's my continued optimism that my own dreams to appeal my status as being invalidated and to have that be realized, crazy as it may seem, and I'm really motivated just to be with this group of inventors and to meet you all personally to share these stories, because I'm kind of like a people person. So that's why I'm here.

Thank you.

MR. TOOLE: Thank you very much, Paula. That was also very personal. I'm struck by how personal how all the stories are today, but please share as you want.

I think we don't have a couple of people who were on the list. Dan Sullivan. Is Dan Sullivan in the room? Steven Key? Right. Okay. So these two folks who had signed up are not here. Of course there's still an opportunity to testify orally at one of the other venues or to submit a written testimony. So the opportunities are not lost.

But we have an additional speaker today.

Dr. Leslie Flynn from the University of Iowa. And if you would like to come up here, we're ready for you.

Thank you.

DR. FLYNN: First of all I want to thank all of the speakers who went before me for their testimony, and it really will impact the work that I do moving forward. I also want to thank you, USPTO for this opportunity to share information about the participation of women and other unrepresented groups in the innovation, innovation, and entrepreneurship ecosystem in the United States.

As Andrew said, I'm Leslie Flynn. I'm a professor of innovation and entrepreneurship at the University of Iowa. I'm housed in the Jacobson Institute for Youth Innovation and Entrepreneurship which is part of our Papa John entrepreneurial center. Our work focuses on positioning youth and young adults with the skills, mindset and knowledge to persist to be the next generation of inventors in the United States.

I see my work in this area as not really a job, but a life-long passion; one that many of my colleagues and you across the nation have shared and one I am pleased to know the United States Patent Office is advancing through these hearings.

I'm a first generation college graduate in my family to hold degrees in science and I'm also a small business owner. This has afforded me great opportunities to pursue a happy life, serve my community and secure economic vitality. Many women and other underrepresented populations do not have access to the same experiences I did as a daughter of a business owner.

It is a national imperative that all young adults be provided an education that invites them to the innovation table. In order for the United States to progress as a nation we need a larger pool of citizens engaged in technological advances to fill high-skill jobs. We need to begin our work- force development before students leave our K-12 education system. Students in

middle school and high school are already making decisions about their ability and interest to pursue degrees in STEM and their position in our U.S. work force.

As evidenced by recent STEM work force and patent data, Undersecretary Peter highlighted this morning, women and other groups are not pursuing opportunities in comparison to their male, white counterparts. The current educational system does not distribute opportunities equally to all K-12 students and by extension to all U.S. citizens.

Our team took up the challenge to research how students from all backgrounds can gain access, ability, confidence and interest to pursue innovation and the entrepreneurial spirit as a post-secondary and career option. In 2013, in collaboration with over 50 industry experts we created STEM Innovator, a platform to engage middle and high school student teams in designing solutions to complex problems while working with business and industry partners.

Students engage in a start-up methodology which takes them from idea generation to possible commercialization. Students engage in authentic practices of innovation including rapid proto-typing, data driven decision making, agile and lean methodologies, collaborative teaming, utilization of digital platforms for research and development. Design thinking and pitches to the community for feedback on the value of their solution to solve problems they are tackling.

Students gain access and exposure to many careers they didn't know exist through multiple interactions with industry experts. Through the experience students demonstrate a variety of skills, mindsets and knowledge we seek in post- secondary students and a highly-skilled workforce. We seek to transform the student experience from sit and get to generate and crate. Our current education system does not engage all students in these experiences and therefore is not preparing them for our future.

To provide evidence of our educational

system -- that our educational system needs a radical pivot we have engaged in a robust research agenda to study the impact of students engaging in the STEM innovation and entrepreneurial process. In 2016 we engaged in a three-year longitudinal study to collect data on high-school students from across the United States engaged in the STEM innovator platform. To date, over 2,000 students have submitted an innovation portfolio, data, which is bench versus industry standards. The digital portfolio collects data from multiple sources across the student's educational experience, allowing growth to be captured over years. The final data capture will be complete this June. Because the STEM innovator platform is infused in the student's normal school day and mostly in required classes, all demographic data matches those of the communities we study. Our population identifies as 48 percent female and 49 percent male. Thirty percent of participants identify as non-white. Geographically we have an equal number of participants drawn from rural,

urban and suburban areas.

Our team, working with other research one universities will release full results this November at the Lemelson Foundation Invention Convening held in Washington, D.C. Closely following this public disclosure, detailed findings will be available in research journals.

Here are a few of our key findings. Today I will present sample findings from our research, and provide specific, concrete action items the administration can take to facilitate women and underrepresented groups' engagement in the innovation and entrepreneurial ecosystem. Our longitudinal study is conducted with young adults age 15 to 18 to measure the impact on their workforce and college readiness skills, mindsets, and the knowledge as they collaborate on teams with industry mentors to advance a prototype solution to a challenging real-world STEM problem. This information is important as young adults are making decisions now about their ability, interests, and future work first choices. These

decisions will impact their future economic vitality and the nation's ability to include a more diverse pool of future innovators and entrepreneurs needed to solve our most pressing national issues.

Finding one; we know the list of skills, mindsets, and knowledge needed to engage in the innovation and entrepreneurial process. These were identified by industry leaders and benchmark versus additional national research and federal workforce documents. Examples of these mindsets and skills include risk-taking, adaptability, resilience, initiative empathy collaboration, creativity, critical thinking, data driven decision making, science and engineering practices and digital fluency.

Finding two; our stem innovator digital platform allows students to identify and reflect on how, and why these attributes are changing over time as a result of engagement in the innovation process. We call this and their innovator profile.

Initial data was collected on 760 high school students, a minimum of three times across the school year. Results indicated all high school students significantly increase their innovation and entrepreneurial skills and mindsets. Students provide evidence of what experiences influence to their growth. For example, Emily from an East Coast public school states, "I know I don't have to be a perfectionist. Failing is important and critical. That is what my industry partner taught me, and I believe him."

Finding three; when the data is disaggregated by gender, we see significant growth at the same rate as male counterparts between females and males. There is no difference between males and females. This data provides evidence that young adult women are as capable as male peers to attain and demonstrate competencies in innovation and entrepreneurial skills and mindsets.

Finding four; when the data is

disaggregated by race, students of white, non-Hispanic or Latino background and all other underrepresented groups all significantly increase the skills and mindsets and do so at the same rate. Again, our white non-Hispanic Latino students and all other races can equally engage in the innovation process and demonstrate these skills.

Action items; young adults, especially women and underrepresented groups, need to be able to engage in the innovation and entrepreneurial process while still in our K-12 education system so they persist and identify as inventors. There tends to be a systemic cultural change or shift in our public schools to give our students opportunities to gain these skills. This should be advanced through legislation, K-

Research and development funds and a serious call to action for private and public partnerships where business and industry partners both financially and through mentorship engage in the K-12 arena.

An additional fighting is that we collected data on the teachers of the same students. To do this, teachers -- to understand how teachers would engage in this type of activity teachers engage in 100 hours of STEM innovator professional development. Educators took the same innovator profile as their students, but they were also asked about their ability and capacity to teach these skills and mindsets to their students. Teachers identified that although they may feel they have some of the skills and attributes like resilience, they have no idea how to facilitate these into their practice and translate these to their students.

They also initially indicate that they have no capacity to lead teams in bringing an idea to sustainability and how to work with industry partners. For this action item, in-service teachers need to be provided access to research driven professional development to catalyze innovation schools. Once the innovation and entrepreneurial process is present in K-12 schools

more women and underrepresented groups will have a need to file US patents because they will identify as innovators.

We are excited to work on advancing this with the United States Patent Office and with our research partners across the United States and we look forward to sharing our results with you in the fall.

Thank you.

MR. TOOLE: Wonderful. Thank you very much. Really appreciate hearing about that program. So now, we've reached the end of our scheduled testimony and there is opportunity at the moment for unscheduled testimony. However, if my eyes don't deceive me, we do not have any new folks in the room for unscheduled testimony. Is that true? Can I see if there's anyone who would like to speak as an unscheduled individual?

SPEAKER: (off mic)

MR. TOOLE: Would you like a few more minutes? Okay. We have time. So coming back up to share a few more faults is Darcy Bisker,

independent inventor.

MS. BISKER: Thank you. After hearing the emotional testimony by the independent inventors represented here, I have to ask a question. Why are there no attorneys here or other members of the public? Why is the USPTO director, Deputy Director, why are they not participating? And why are there not more USPTO office of employment or -- I don't know, other advisory committees that might be interested in hearing from people?

Now, I do realize you will read this as a report and that the USPTO is highly skilled at reading. However, as a citizen, I do not know who will read those reports. I actually expected the director to be here today. I was looking forward to seeing him because the last time I spoke to him it was asking if a patent is issued as valid where is the problem with the court? Now, I hoped that I could have either a sidebar conversation or at least have some access to -- a question that maybe he had an answer to.

But that was at the New York Intellectual Property Lawyers Association dinner, their 97th where there were 2,300 intellectual property attorneys represented. Now, this is a very, very, very, very, very, very big business. If you heard the five people who showed up here today to testify to the problem, where are the beneficiaries? Where are the people who are benefitting from the problems that are continuing? How will they be part of the change? How can there be a multi-billion, yea, nay, trillion dollar industry that is not participating in solutions for individual citizens but benefit from the issuing of valid patents by the USPTO.

Now, again, we had some sort of administrative problems. Maybe something didn't get scheduled early enough and there wasn't time for the hearing to go into the federal register and then there will be the report in time for the public to participate. But maybe the Agency, and including the SBA needs to ask how they can get the public involved outside of their own agencies

and outside of their own conversation with each other to included the public, not only in education, but in participation as an American.

We anticipate that there will be administrative problems, but what are the -- how can the citizen, when there's this spiral that's happening patent -- patenting is declining. Individual inventors are being bankrupted and there's not an attorney here to stand up and talk about it and to have an opinion about how minorities, how women, minorities and veterans can be more justly represented and served.

I'd like that to be part of what the USPTO considers and also consider how this testimony itself -- how can the public become more informed? This is a very important issue. Not just informed about the patent system, which is, I think the USPTO does an excellent job with the videos and education, but the citizens themselves do not know about the engagement and in fact we even, as a group discussed how it almost seems like a bad word now. You feel almost ashamed.

I literally at an art gallery yesterday had some woman say, well, her friend was, you know, working in patenting but she was trying to keep everybody else from infringing her patent, and saw that as a really negative thing. And again, it's an overall lack of education that can be easily supported. Easily. The -- Leslie your study, I'm sorry for calling Dr. Leslie -- it sounds like your study and your efforts are very well placed. But again, are you leading sheep to the slaughter? And you know, because I really appreciate the point that you made which I had also initially wanted to make is that it's not as if we have, like in a golf score, some sort of handicap. Just get the information out there to allow people to participate and keep an industry like the intellectual property lawyers from taking advantage of small fish swimming in a shark tank.

Thank you.

MR. TOOLE: Okay. Thank you very much. I think that that leads me to my final comments for today. And I want to reassure everyone in the

room and online that the director and the Deputy Director are deeply involved in this process. We've met several times. They can't be everywhere, although we had the Deputy Director here this morning, that was wonderful. They are deeply involved, and a lot of us are also deeply involved.

It's a multifaceted effort going on with respect to the Success Act. And I just want to reassure you that he's very much involved, and we have some of our senior executive leaders here as well, who have been here the whole time. So I just want to reassure you that we are very serious about the Success Act and all of the leadership at the USPTO are deeply involved, although maybe cannot be present at every event.

I want to echo what you said though, and that is to say that we would love to hear testimony from many, many people from all across the spectrum including law firms, independent inventors, members of the public generally. So I want to echo your call to folks to come and speak

at the oral testimony events, or to submit written testimony because I think it does help us all to hear these -- the plurality of voices. So thank you for mentioning that.

And I just want to say finally, then, thank you to all of you who have expressed your opinions today and this has all been recorded and will be transcribed and included in the record and I appreciate your comments today. So thank you very much and have a great day.

(Whereupon, the PROCEEDINGS were adjourned.)

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CERTIFICATE OF NOTARY PUBLIC

COMMONWEALTH OF VIRGINIA

I, Irene Gray, notary public in and for the Commonwealth of Virginia, do hereby certify that the forgoing PROCEEDING was duly recorded and thereafter reduced to print under my direction; that the witnesses were sworn to tell the truth under penalty of perjury; that said transcript is a true record of the testimony given by witnesses; that I am neither counsel for, related to, nor employed by any of the parties to the action in which this proceeding was called; and, furthermore, that I am not a relative or employee of any attorney or counsel employed by the parties hereto, nor financially or otherwise interested in the outcome of this action.

(Signature and Seal on File)

Notary Public, in and for the Commonwealth of Virginia

My Commission Expires: September 30, 2022

Notary Public Number 301609

UNITED STATES PATENT AND TRADEMARK OFFICE

PUBLIC HEARING ON THE "SUCCESS ACT"

Detroit, Michigan

Tuesday, June 18, 2019

PARTICIPANTS:

WELCOMING REMARKS:

DAMIAN PORCARI, Director of the Elijah J. McCoy Midwest Regional USPTO

CONSTANCE LOGAN, District Director, Michigan District Office, U.S. Small Business Administration

OVERVIEW OF SUCCESS ACT and ROUND TABLE LOGISTICS

ANDREW TOOLE, Chief Economist, Office of Policy and International Affairs, USPTO

PUBLIC TESTIMONY:

DR. DANNY BRIERE, Chief Entrepreneur Officer, The Henry Ford, Global Director, Invention Convention Worldwide

MARJORIE WEIR, Independent Inventor, U.S. Inventor, and Minnesota Inventors Network

DR. LISA COOK, Associate Professor, Michigan State University

MARIA McKENDRICK, Inventors Association of Metropolitan Detroit

WILLIAM J. COUGHLIN, Retired Assistant General Counsel

for Intellectual Property at Ford Motor Company
(speaking independently)
PAUL MORINVILLE, OrgStructure, LLC (defunct)

PUBLIC TESTIMONY: (continued)

TESIA THOMAS
DR. NICHOLE MERCIER, University of Washington
HOLLY FECHNER, Covington & Burling, LLP
NICHOLAS RIPPLINGER, Battle Sight Technologies,
A Service Disabled Veteran Owned Small Business
DR. KELLY SEXTON, Associate Vice President for
Research, Technology Transfer and Innovation
Partnerships, University of Michigan
DR. RORY A. COOPER, Human Engineering Research
Laboratories, University of Pittsburgh
QUINTINA WILLIAMS
KELLY K. BURRIS, Burris Law, PLLC
KATRINA L. ANDERSON, CommodiTeas, LLC
CARRIE HAFEMAN, Independent Inventor
DARLENE McCOY
LAURIE GATHMAN KOWALSKY, Philips Corporation

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P R O C E E D I N G S

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(9:02 a.m.)

MR. PORCARI: Good morning, everyone. Welcome to the Elijah J. McCoy Midwest Regional U.S. Patent and Trademark Office. My name is Damian Porcari. I'm the Director here, and we are very happy to have everyone in attendance today. I'm going to have some informational. Please silence your phone. We're recording this event. And if you could, do us a favor, and silence your phone. That would be terrific. Bathrooms are out that door and to the left.

I will place a timer within eyesight with 15 minutes max. Please take a look or glance there. I apologize that it's a little bit out of sight, but I will sit over there and operate the timer. So that's just kind of the rules for today. Please, to the extent possible, limit your comments to the purposes of the SUCCESS Act, and that will be great. So good morning. Thank you for coming to this, our third hearing of the SUCCESS Act, and it's a pleasure to host all of the speakers and the attendees.

So women constitute over half the U.S. population, and their participation in the general U.S. workforce is almost two-thirds as of 2016. Yet,

women's participation in STEM fields and in the IP system lags far behind their male counterparts. In the U.S., less than one-quarter of the STEM workforce companies comprises women, plus half of these women who work in STEM fields leave after 12 years, most within the first 5 years. The participation of women as inventors named in U.S. patents is even lower.

So on February 11th of 2019, the USPTO released a report titled Progress and Potential, a Profile of Women in Inventors on U.S. Patents. And this study found that although the number of patents with at least one woman inventor increased from about 7 percent in the 1980s to 21 percent in 2016, women inventors still comprise only 12 percent of all inventors on patents granted in 2016. So if we are to maintain our technological leadership, the U.S. cannot continue to compete with so much talent left untapped.

So in order to unleash this talent, industry, academia, and government must work together to address these issues and drive toward real progress. So we at the USPTO are committed to making opportunities to innovation available to everyone. A recent Harvard study found that increasing invention rates among women, minorities, and children of low income families could quadruple the rate of U.S. innovation. So

clearly, unleashing this potential holds tremendous benefit for all Americans.

Thank you for your participation here today. We look forward to a productive and informative day, and we ask that you focus on the purpose of this hearing and direct your remarks to how the government can promote the participation of women, minorities, and veterans in entrepreneurial activities, and increase the number who apply and obtain U.S. patents. So I'm going to introduce the first one speaker, not three, that have appointments and can't stay for the entire event. We want to accommodate their schedule as well as to allow them to present their information.

So first, we're going to have Connie. So let's -- so Constant Logan -- Constance Logan. So it's my pleasure to introduce our next speaker. Constance Logan is the Michigan District Director of the U.S. Small Business Administration, and in this role, she's responsible for the implementation of the SBA's program and services in Michigan's 83 counties. Constance also oversees the SBA's resource partners throughout the State, including 11 regional small business development centers, nine SCORE chapters, and three women's business centers, and a veterans business outreach center, and seven micro lenders.

Constance recently served as Michigan's SBA deputy director for 5 years, and prior to her appointment, she led the District's business development division overseeing the 8A and the Hub Zone certification programs, and served as the executive director member and leading small business initiatives for the Detroit Empowerment Zones, One Capital Shop Detroit, and for three consecutive years, led the SBA's prestigious Emerging Leaders program. Constance?

MS. LOGAN: Good morning. Thank you, Damian. On behalf of the U.S. Small Business Administration, Michigan District Office, I am very pleased to be here this morning to collaborate with and to support the USPTO's efforts to obtain information doing public hearings with the goal of increasing entrepreneurship and the utilization of the patent process by women -- women -- by women, minorities, and veterans. Through the SBA, we are committed to serving all entrepreneurs wishing to start, grow, expand, and recover. However, through data, we are very aware there are gaps in certain industries and markets.

For example, in Michigan, we support and oversee three women business centers, a veterans business outreach center, and have implemented an emerging leaders program that targets entrepreneurs in

underserved communities. And this is our 11th year, and the demand continues to grow. I am happy to report the SBA and the USPTO here in Michigan have a great relationship already. We collaborate on many fronts in terms of providing training, programs, and just outreach to small business communities.

The SUCCESS Act is a fine example of government collaborating. I encourage all of you to be open, candid regarding your issues and concerns. It is only through this type of feedback that studies can be conducted and solutions or recommendations can be implemented to improve accessible economic opportunities, which will result in better communities throughout our nation. Thank you.

MR. PORCARI: Okie doke. And next, I'd like to introduce Andrew Toole. He's our next speaker. Dr. Toole is the Chief Economist at the U.S. Patent and Trademark Office and a research associate at the Center for European Economic Research, Zew, Z-e-w. I think that's it.

DR. TOOLE: Z-e-w.

MR. PORCARI: Okay. Dr. Toole joined the PTO with experience in the private sector, academia, and government, and while completing his Ph.D. in economics at Michigan State, Andrew was the senior economist

at -- for Dr. Christian -- oh, for Dr. Laurits Christians Associates, where he conducted studies on the total factor productivity, cost and price analysis, and competitive strategy. In 2010, he joined the Science Policy Board at USDA's economic research service, and his research focuses on the economics of innovation, intellectual property, and related science and technology policies. Dr. Toole is published in the Journal of Law and Economics, and the Review of Economics and Statistics Research Policy and Management Science, and many other peer review journals. Dr. Toole?

DR. TOOLE: Thank you, Damian. Thank you very much. And I want to say thank you to all of you here at the Midwest Regional Office for hosting this event. This is the third public hearing for the SUCCESS Act. It's an opportunity for individuals and organizations to go on the record, and to express ways in which we can improve the participation of women, minorities, and veterans in the invention system, in the innovation in the United States. So I'm super happy about that. So thank you to all of you are here in person, and thank you to all of who are online, and we'll -- some folks will be participating via Webex, so online.

I would like to also highlight -- so I don't have a clicker; I'm not sure how we should -- how we should advance this -- but I would also like to highlight that the oral testimony in this particular setting here today is not the only opportunity to articulate how you feel and how you think we can improve the system to make it more diverse and more inclusive. And there's an opportunity on June 30th of this -- that's coming up pretty quickly -- but by June 30th, you can submit written testimony, and that written testimony will also be incorporated into the final report to Congress with respect to the SUCCESS Act.

So let's see if I can advance this a little bit. The SUCCESS Act, just to highlight -- I want to just highlight a couple of things. And I'm going to be very brief, because I know we need to move on to get to the importance of the things of today, and that's the testimony of each of you individuals and organizations. But President Trump passed the -- and Congress passed the SUCCESS Act. President Trump signed it on October 31st, 2018. And what that requires, one part of that SUCCESS Act requires the USPTO to prepare a written report to Congress. The written report is being done in collaboration with the Small Business Administration

and in cooperation with some other agencies.

So, for instance, we are reaching out to the Department of Treasury, who that group was actually involved in the study that was mentioned a minute ago by Damian that came out of Harvard, which they connected patent records to the Treasury tax records, and were able to talk about women and minorities -- not veterans, per se -- in the patenting process. It's a very interesting and important paper. So we're working collaboratively -- and I'm so happy that Constance was here today and was able to talk to you all for a moment -- to go ahead and prepare this report. What does this report require?

And we have to stick to the requirements. We can't really go beyond the scope of what we've been asked to do, so let me just highlight what we've been asked to do. And I want and I would really urge all of you to stay focused on those particular objectives, because to the extent that you can, you will help us to write a better report for Congress. So you are also participating here in the process. The first thing that we'd like to know is are there any publicly available data? Are there any publicly available data that shed light on the participation of women, minorities, or veterans as inventors in the U.S.

innovation system? And what is publicly available data?

Publicly available data is information that we can collect for free. It's not a database that's owned by a company that you need to pay a subscription for. So are there publicly available data sources? We really would like to know. We would like to know as well what are the benefits to women, minorities, and veterans from receiving a patent? And so this could be a personal sense of achievement, but it could also translate into economic returns of some kind. One step further than that, the third component here, is what are the benefits to women, minority, and veteran-owned firms -- and this is where the SBA is very much a key player -- what are the benefits to those firms from receiving a patent?

And this is particularly focused on the marketplace and commercialization, as you might -- as you might imagine. So the final part of our report is to provide recommendations to Congress and for the Federal government to consider for increasing the participation of women, minorities, and veterans in the patent system. So we want to promote the participation of women, minorities, and veterans, and we want to increase the number in participation of women,

minorities, and veterans so that we have a more diverse and inclusive patent system. So what are the recommendations, the actions that we can take to actually get this done? And to the extent that you all can help shed light on that, we're very, very happy. So thank you very much, and a thank you to Damian, and I'm looking forward to all of your testimony today.

MR. PORCARI: Cool. So with that, I would like to introduce our first speaker. Our first speaker is Dr. Danny Briere. He's the Chief Entrepreneur Officer of The Henry Ford, and he's the Global Director of Invention Convention Worldwide. Danny, I'm going to turn that little timer on, and if you can glance that way, it'll give you 15 minutes. Thank you.

DR. BRIERE: Okay. Thanks a lot. I want to thank the USPTO for the opportunity to address the exciting opportunities presented by the Study of Underrepresented Classes Chasing Engineering and Science (SUCCESS) Act. My name is Danny Briere and I am the Chief Executive Officer of The Henry Ford here in Dearborn, Michigan, and I'm also the Global Director of its Invention Convention Worldwide initiative.

The Henry Ford is an internationally recognized cultural destination that brings the past forward by immersing visitors in the stories of

ingenuity, resourcefulness, and innovation that have helped shape America. It's also a global force in extending this same knowledge and experiences worldwide so that everyone can experience the learning and innovation that has marked our nation's past.

The Henry Ford Invention Convention program is an invention education program as an outreach program that empowers young people in grades kindergarten through 12, to develop the skills and self confidence they need to identify and solve real world problems through the inventing process. The Invention Convention encourages students to explore ideas based on their own life experiences, and to develop real inventions worthy of taking to marketplace. The Invention Convention program is designed for all students of different abilities, and its accessible, free curriculum and extensive professional development programs are available across the U.S. and almost a dozen countries globally.

The curriculum is based on significant research on the efficacy of the project-based personalized learning undertaken by educators and neuroscientists who understand the benefits of undefined problem solving on brain development. You can find invention conventions programs in schools in

48 U.S. states, and formal large scale Henry Ford Invention Convention programs across 21 states and in eight countries.

Now, the stated goal from Congress with the SUCCESS Act is to work with the private sector to close the gap in the number of patents applied for and obtained by women and minorities to harness the maximum innovation potential and continue to promote the U.S. leadership in a global economy. The SUCCESS Act specifically seeks to: (A) promote the participation of women, minorities, and veterans in entrepreneurship activities, and (B) increase the number of women, minorities, and veterans who apply for and obtain patents.

The Henry Ford believes that to address these two issues, and the larger issue of future American innovation and global economic power, we need to start in K through 12. If we start in K through 12, the adult participation of women, minorities, and veterans will naturally increase at a greater rate than other classes because of other focused programs to support their entry into the innovation ecosystem.

While there are many university, government, and private sector initiatives -- including co-working spaces, incubators, accelerators, and hubs -- that are

designed to try to coax would-be entrepreneurs to leave their jobs and start companies or become entrepreneurs during and after their college years, we need yet more entrepreneurs to power the growth of our local ecosystems.

Trying to change the mindsets of adults is really hard, particularly when they have kids, mortgages, and other family expenses to pay, increasing the risk of taking a shot at being entrepreneurial. It's a big leap for most to make this change in mindset later in life when they have not been thinking about this way all along. We need to think about changing this mindset earlier so we raise them thinking that being an inventor and entrepreneur is as valid as becoming a doctor, a lawyer, or a police chief from the start, and train them in core skills in invention, innovation, and entrepreneurship for any job they get, whether they create their own job or not.

Problem solvers solve problems, creating many inventions. If we make more problem solvers, we make more inventions, which should lead to more patents, more innovation, and more success for America. The Henry Ford's Invention Convention program teaches students how to invent to solve problems, and how to take products to market. They create real inventions.

We teach them about Intellectual Property, and a not insignificant number file for patents and each year. And each year, a good number take their products to marketplace.

We do this largely in school, alongside math, science, history, and other core coursework, and we train teachers how to teach invention and entrepreneurship education. We're doing this all across America today with more than 120,000 students annually, and we're rapidly growing. At our recently concluded 2019 Invention Convention U.S. Nationals held here in Dearborn, The Henry Ford hosted a student inventor pool that was 58 percent female -- okay, let that sink in -- 58 percent female, 31 percent non-white ethnic minority, 10 percent English as second language, 27 percent financially underserved, and 51 percent below median household income in the U.S.

We are already helping solve the problem that Congress has asked the USPTO to solve under the SUCCESS Act. We are graduating into the local communities a diverse study workforce specifically trained to be inventive, innovative, and entrepreneurial. Some of our schools, like the Charles H. Barrows STEM Academy in North Windham, Connecticut, are doing this every single year. I know several young inventors who are

serial inventors who have been inventing for seven or eight years straight. Emma Ruccio from Southington, Connecticut and the Connecticut Invention Convention program, is a seven-time serial inventor who has created, among other inventions, a means to help students with scoliosis track the success of their physical therapy while at home. She's in the 9th grade now, and she's be in the workforce in eight years.

So let's talk about what sort of impact this approach would have on a community. We are designing a new urban community initiative with a partner that will involve all the students in our partner city's surrounding metro area, some 600,000 students in the local K through 12 school systems. All the students will review invention education in K through 5, innovation education in 6 through 8, and entrepreneurship education in 9 through 12 and compete at an Invention Convention annually.

Over time, each year, the schools will be graduating into the local workforce and colleges more than 50,000 students, specifically trained in these skills. That will fundamentally change the local ecosystem, and this is a top 50 city we're talking about, and importantly, the population of the people who are behind new products, companies, and patents.

Imagine that. 50,000 Emma Ruccios entering the workforce every single year. Now, suppose we did that all across America.

So when it comes to trying to encourage women, minorities, and veterans to become patent filers, if they were raised that way from kindergarten, they would be problem-solvers and critical thinkers predisposed to invention and entrepreneurship opportunities when they arise throughout their entire life, and this is fundamental community-wide approach that will raise their engagement in innovation and intellectual property pursuits. A curriculum-based in problem solving and innovation is a necessary shift in how schools move from rote memorization and standardized knowledge to creating change makers with critical thinking, creativity, and problem solving skills.

So that's the first thing The Henry Ford would suggest we do, work with the U.S. Department of Education to create a more national policy around invention, innovation, and entrepreneurship education in K through 12. That will grow and sustain American innovation for all classes. Now, we need to make sure we can protect these students' intellectual property, and that we want to make sure that what they invent

stays within their purview. When the USPTO moved from a first to invent to first to file system, the issue of protecting inventions very much became a timing issue, making sure you don't wait to file for your protection, because you need to file before anybody else. But for someone to undertake the time and expense of patenting their invention, they generally need to have the confidence that their invention is worthy of that investment. That takes time too.

A challenge for the underrepresented classes we're talking about today is that they often do not have the confidence, time, and resources to make that assessment that quickly. Consider the typical K through 12 or college student who has done research and created an invention. Within his or her world, it might seem like a great idea, but until shown to others for feedback, it's hard to tell if it's really unique and substantive.

It is highly typical that student will present his or her invention at their school's science fair, invention convention, STEM fair, entrepreneurship expose, pitch competition, or other public event. Many of these events are competitions and select the most promising student inventions for recognition and ascension to higher competition levels, like national

and global competitions. It is this recognition and acclaim that sparks the idea, hey, I might be on to something. I need to get a patent.

The good news here is that these national and global competitions often provide pro bono patent application awards to students who win. Indeed, at The Henry Ford's 2019 Invention Convention U.S. Nationals showcase and competition, for instance, nine students were provided with free patent searches, and if applicable, patent applications, from leading IP firms like WilmerHale, Cooley, and Cantor Colburn. Some state feeder competitions do the same. The Connecticut Invention Convention, for instance, awards one pro bono patent application from McCormick, Paulding & Huber. More good news is that over half of the available patent applications went to girls, and from households where parents earned income is below the national average.

The bad news is while these are great solutions for a few of the topmost student inventions, nationally, more than 120,000 students also created inventions this year. In all of these inventions, largely are not protected by any intellectual property or patent application. Some of these are indeed patentable and even ready for market to be

commercialized. What's more bad news is because they are displaying log books about how their inventions were created and prototyped, and poster boards and pitches explaining the details, these students incur a public disclosure risk relative to their inventions. This is true of every science fair, invention convention, STEM expo, pitch competition and other public events in local schools and other venues across America.

We need to protect these students' inventions sooner. What we need is a more accessible, provisional patent process. This process requires funds, which some women, minorities, veterans, and K through 12 students don't have. Just the $70 or more to file a provisional patent for an invention that they might not know is worth anything is a burden for low income students.

The practical reality is that most students in the described situation find out that they might be on to something within 6 to 12 months of their first disclosure of that invention. We at The Henry Ford would propose that the USPTO, together with Congress, consider creation of a more underrepresented class friendly provisional patent process. With age, we specifically suggest that the USPTO consider a waiver

of all provisional patent fees for filers 21 years of age or younger, to allow them to file and give them temporary protection and enough time to assess whether their invention is worthy of a full non-provisional patent application.

There's a precedent for the USPTO to treat filers differentially based on age. There is a petition to make special for any applicant who is 65 years of age or more to advance the time frames for examination of the application. We would urge the USPTO to consider such a petition to make special for age for filers 21 years of age or younger, the outcome of which would be a waiver of the filing fees.

With such a process in place, students in K through 12 and college will be incented to take part in the patenting process in a more early fluid fashion. For instance, The Henry Ford builds into our Invention Convention curriculum the process of creating a provisional patent cover page and taking pictures of the poster and log book to document and protect their inventions as soon as they make repeated public displays and disclosures as they weave their way through the competition layers. However, few students take advantage of this because of the cost. A fee-waived process will protect them from disclosure

issues, which will have an impact both here and outside the U.S., and protect them from intellectual property thieves at public events.

For other underrepresented classes, we should also consider a similar treatment if we want more filings from underrepresented populations, although not all underrepresented class entrepreneurs are limited by the costs of filing. But even at its lowest cost, $70, this is still too much of a burden for many in America.

The Henry Ford encourages the USPTO to consider a broader mandate in its response to Congress so that age is considered as part of the underrepresented class analysis, alongside gender, race/ethnicity, and military service history. With age, we're not only talking about K through 12. The world of entrepreneurship and innovation ecosystem building is replete with programs designed to encourage greater participation of college students, adults, and senior citizens as well. Indeed, it's not unusual to find development planners that are talking about K through Gray, which represents their focus across the whole age spectrum, from kindergarten all the way through senior citizenship.

A rising tide floats all boats. Inventing and entrepreneurship are team sports. If you train the

students in school to work together and to work to integrate local out-of-school programs as well, we believe that women, minorities, and veterans will advance in their participation in the local ecosystems organically. We have already seen this with our programs. Recall that our invention engineering programs are 58 percent female, and that's a national number.

We recognize we need to craft specific policies and programs to help underrepresented classes. The Henry Ford does this now. For instance, we have programs specifically designed to ensure students in inner city schools have a level playing field with their peers in wealthier areas by providing additional mentoring, school supplies, resources, and other extras for teachers and students. We want to raise all students with the confidence, experience, and tools to be successful inventors and entrepreneurs. We don't want women, minorities, and future veterans being raised thinking they are any different from anybody else in these regards. Equal capability means equal opportunity.

Finally, our researchers need to have access to accurate data to evaluate our impact. We need to track their efforts in the U.S. patent system. To that

end, the USPTO necessarily needs to add fields to it patent application forms for gender, race, veteran status, and date of birth, or at least age of inventor. The Henry Ford is thankful to you for allowing us time today to present our thoughts. We believe that while short-term policies, like reduced fees, will help, it is the long-term approach to basic and sustained education in invention, innovation, and entrepreneurship for K through 12 students that will make fundamental advances in the fabric of American innovation.

We need to start early. And as we think about American competitiveness on the global stage, we should consider the example of Korea, where all K through 12 students are required to have invention education before they graduate high school. All students. America was founded on principles that included respect for invention and self-determination. If we want to promote such characteristics in our underrepresented classes, let's raise our children that way. Thank you very much for our time.

MR. PORCARI: Thank you, Danny. Thank you so much. Thank you so much, Danny. So Dr. Cook -- is Dr. Cook here? Not yet? Okay. So we're going to take our speakers out of order, because we have a change of

lineup. So our next speaker is going to be Marjorie Weir. She's an independent inventor from Minnesota Inventors Network. Marjorie, thank you so much. Thank you so much.

MS. WEIR: Thank you. Okay. I wasn't planning to be this much after that. But I do -- I guess there's some things that it triggered listening to those well-thought out plans. I'm an independent inventor, and I have been for 20 years, and I have not yet been able to monetize my first patent. And that utility patent, I'm still working on it, because it's a very -- it's a great product, and every woman I talk to understands it and feels that it's something worth doing, but it's hard to find venture capital. It's hard to find investment, especially when we have a PTAB that will take away your rights to your patent once you are -- you know, once it does matter. Because our patent system is becoming so weak, knockoffs are allowed all over the place, and it's so easy with the Internet to find ways around. And I feel like that's where the Patent Office has to put all of its energies.

So when I first showed my -- the first time it went to Electronic Retailing Association event in Florida, and that is a -- it was a trade show. And I was so excited, because a company was interested in my

product, said this is really a great idea. And mind you, this was many years ago. And they said this is -- you know, call her up. Call this guy at our office when you're back, and after the show, and we'll talk.

And on my way home, I got on my cell phone in the car, and I was excited to talk to him, and it was a major company. And that guy said, I don't need to talk to you. Your patent's on the Internet. I can read everything there. It hadn't been issued yet. This was 2014. And it was slightly terrifying, because it was like I had no idea from my attorney that because I was going to file internationally, that it would be displayed on the Internet. And so he -- and nobody had told me it had already been put out there, because what happens is that within -- I think it's within 18 months; I'm going to be not correct on some of this -- but within 18 months, it's showing online, even though it didn't get issued until 2008, and it required -- it was over $40,000 in the end.

So I think leading children, and women, and minorities, and veterans down the path of let's invent, let's invent, and you're never going to make money off of it is just leading them to the poor house. I'm just -- I feel that patents have to be taken more -- it needs to be either better on the front end when you

issue them, or at least uphold what has happened. And I hope everyone here and everyone that sees this has that opportunity to watch the movie -- I'm going to forget the name -- Josh Malone put out about the balloon, his balloon invention. And they've spent 20 or 40 million to fight knockoffs, which means there's a lot of money that got made off of a kid's invention, because you wouldn't have 20 to 40 million to fight it.

But it's the PTAB, if they can just take back a patent that's been issued without any -- without -- really without a jury trial or anything, that's a huge problem for others, or if knockoffs are allowed so easily. So I have another -- I have a couple patents pending, because I feel that they're still important, and before I ever had seen that money. But I feel like getting -- nowadays, it's very hard to license something, unless you already make it, and show it, and people see it, and you have your proof of concept. And then you have to run fast so somebody doesn't knock you off.

I have a great little invention that's selling, but once -- you know, once some -- I can't go to a bigger venue, because once somebody sees that that's -- that that is viable and they actually do some testing, they'll be able to, you know, easily work

around and knockoff something like that. So I feel like patent pending should be private until it is actually patented. I don't feel 70 is a -- if you can't come up with seven people putting in 10 bucks to pay for your provisional, maybe it isn't a great idea. I mean, you should at least talk to seven people in your family and say -- I don't feel that the fees -- I didn't know about micro entity when I started.

I feel like attorneys should -- any patent attorney should have to give information to independent inventors that micro entity as a status where the fees are 75 percent off. I don't know how many of you know about that, but I was -- I got a bill for 1500 to renew my fee, which that attorney never even told me that it was -- that I was a micro entity, and could pay 400. I think it was 400. I'm hoping I'm giving the right amounts, but it was something I wasn't even told, and I found that out from the USPTO office.

So every attorney should have to -- I mean, there should be information, and the information out there more widely of what the steps are. And, you know, that first to file is a problem when it is first to invent. So the first to invent, get a provisional, maybe the provisional time needs to be longer. I'm not sure how to make that work, but I feel like, you know,

you really have to do your due diligence on whether it's a valid product, and then how are -- if no companies are going to license it anyway, if we don't have a strong patent office, we're not going to have a company license it anyway. So why go down that path?

I do think creativity in school is very important. I feel like there was a lot that was said that makes sense, but there's so many inventors who have not -- what do they say? -- 2 percent make money off their patents. And that's -- I don't know if that's including corporations or not, but independent inventors as a group should be treated differently. I think if we're trying to make a more equal world, equal capability equals equal opportunity, then it should be independent inventors, man, woman, veteran, minority, and independent inventors should be treated differently than corporate inventors, because the corporations have the big bucks, and can work around you.

And part of that is just getting the information out. When I started with that first patent, I had a woman who I'd met a trade show, at the housewares show, who had done something similar to my product. And I didn't meet her. I met the husband at the trade show. And I came on the booth, and I was like I already invented this. I already have a patent

issued on it. And he was surprised, took my name, and she called me, you know, just to -- kind of upset later. But she had looked it up, and she said, you know, my patent attorney never said that I should do a search first. So she spent $7,000 on a patent that was totally worthless, because mine had already been issued.

And it was very -- virtually the same thing. It was, and we talked quite a bit after that. But I just feel that it's really important to get correct information out, and the patent office already has a lot of resources, but a lot of us don't even know about it. So that's, to me, the main thing. I'm sorry that I don't have this a little bit more in order, but I think most of the points, this -- the PTAB is a big deal, and being first to invent, and having a way to get that information in as a provisional patent.

And even if it was a provisional patent, with that fee, if it was a first look where there might be some questions brought up right away, that this -- you know, before you spend a year on it -- I know provisional patents aren't even looked at, but maybe with independent inventors, they need to be looked at and say, please do better research. You know, this already exists, or, you know, this -- you know, here's

five questions we see. That could maybe be done by that same board of inventors that are the volunteers that help at the patent office with information.

But that would be my points. I still am sure that I will end up making money off my patents, and it might take awhile, or it might end up that something makes money. I just think that they're valid ideas. And I did a lot of work in the beginning having people give me opinions. I did survey in groups, and changed my product because of -- because of the information I got from my end users. And I think that's so important, because I do see -- I'm on that board of inventors network. I'm in different invention groups online.

I see some crazy inventions that I just can't even believe people put the kind of money -- I mean, I know somebody who's, you know, just sold their house, and, I mean, they're going all in on something that I do not -- I can't even envision that that'll make them money. But because you watch Shark Tank and you think this person made it with this, now I can do the same thing. And it's like you need some real solid opinions on whether that's doable. So I'm worried about giving kids false hope, but I do think creativity is something that we can certainly teach in school.

And the way the world is working, companies do not take care of you anymore. You, you know -- every -- they say that the vast majority of the population will be freelancing. I've freelanced for 20 years, so I'm very -- for 20 years before I did this, so I'm really used to being -- working independently, and making my own money, but it's hard road, you know, if you don't have companies that are taking care of the details. So thank you.

MR. PORCARI: Thank you so much. Thank you so much. So our next speaker is going to be Dr. Lisa Cook. Dr. Cook is an associate professor in the Department of Economics and International Relations at James Madison College at Michigan State University, and as a Marshall Scholar, she received a second MBA from Oxford University in philosophy, politics, and economics. Dr. Cook earned a Ph.D. in economics from University California Berkley, and her current research interests are in economic growth and development at the National Institution and Market Innovation and Economic History, and is the senior economist with the President's Council of Economic Advisers during the 2011 through 2012 academic years. Dr. Cook worked on the Euro zone financial instruments, innovation, entrepreneurship. Thank you, Dr. Cook.

DR. COOK: So just because this is being recorded, I don't want my -- I don't want to make my deans mad, but I'm actually in the Economics Department and at James Madison College, so I want to make sure that that is recorded. Thank you so much, Directors Porcari and Logan, for having me here today to testify about the SUCCESS Act, and thank you to Andrew Toole for the invitation to do so.

While we have my cousin, Percy Julian, to thank for cortisone, which he developed in the 1950s, it was difficult living as an African-American inventor at that time. His home in Oak Park, Illinois was fire-bombed twice. We as a society have made progress since then, but invention and innovation could be more inclusive and beneficial to everyone as a result. Unequal access to invention and innovation could lead to suboptimal outcomes for individuals and for the economy as a whole.

My research with Concherin (phonetic) offers evidence that women in underrepresented minorities are less likely to participate in invention and innovation at each stage of the innovative process, education and training, the practice of invention, and commercialization of invention. For women and African-American participants or would-be participants,

this can result in an earnings income, employment, and wealth gap. For the economy as a whole, this can result in lower output and living standards. My and others' research calculates that the size of the economy could be roughly 3 to 4 percent higher if women and underrepresented minorities were included in the innovative process from beginning to end; that is, living standards could be higher for all Americans with a more inclusive innovative economy.

My research with Cocherin (phonetic) in 2010 was to first study to systematically examine racial and gender gaps in innovation and invention. Allow me to say a little about my and related research. In the early stages of education and training in STEM fields, women and underrepresented minorities lag in participation in nearly every STEM field. In 2014, women were awarded 35 percent of the bachelor's degrees in STEM fields. For advanced degrees, women outnumber men in some STEM fields like biology. And in 2016, women received 53 percent of the doctoral degrees in biological science, but only 23 percent of doctoral degrees in engineering, and 17 to 18 percent of those in computer science and physics went to women.

The recent literature on the gender and racial gap related to participation in the STEM fields,

including the impact of social norms and gender stereotypes, peer effects, and professors' gender on tests scores and college majors -- sorry -- let me -- let me repeat that. The recent literature on the gender gap and racial gap related to participation in STEM fields attempts to identify the factors affecting these differences, including the impact of social norms and gender stereotypes, peer effects, and professors' gender on test scores and college majors.

With respect to practicing invention and creating new knowledge or products, women and African-Americans not only engaged at generally lower rates than their counterparts, but they earn less and are employed less than their counterparts. In 2010, the median salary for whites was $72,000 in the innovation economy, and for African-Americans, it was $56,000, which was 78 percent of the median white salary. In 2015, the share had only moved slightly to 79 percent.

In 2015, the median salary for men was $87,000 in the innovation economy, and $62,000 for women, which was 71 percent of the median male salary. Among scientists and engineers, in 2015, African-American unemployment was 4.7 percent compared to 2.9 percent for whites in the innovation economy.

Unemployment for underrepresented minority men at just above 4 percent is higher than for white and Asian men, and higher than the average for all scientists and engineers. A few papers in the last decade have focused on the misallocation of talent among inventors and other high-skilled workers.

My research found that coed patent teams are more productive at commercialization than single sex male or single sex female patent teams. Harmon and Monroe investigate the gender gap for commercialized patents, and show that the gender gap among science and engineer degree holders is due primarily to women's underrepresentation in patent intensive fields and patent intensive job tasks. They also find that closing this gap could increase U.S. GDP per capital by 2.7 percent.

My 2018 research with Yang executes a similar exercise using more recent patent data, and finds that GDP per capita would be 0.6 percent to 4.4 percent higher, if more women and African-Americans received some training and worked in related jobs. Shea, Hirsch, Jones, and Clinow (all phonetic) analyze a gender and racial distribution for highly skilled occupations over the last 50 years. They show that the change in the occupational distribution since 1960

suggests that a substantial pool of innately talented women and African-Americans in 1960 were not pursuing their comparative advantage, and this misallocation of talent affects aggregate productivity in the economy. They find one-quarter of growth in aggregate output from 1960 to 2010 could be explained by an improved allocation of talent.

Bell, Chetty, Jaravel, Petkova, and Van Reenen investigate the characteristics and life trajectories of inventors, and find that income, race, and the gender gap in invention find -- and income, race, and gender gap in invention that is primarily due to environment barriers in acquiring human capital. A lack of mentoring and exposure to careers in science innovation in childhood, and they're not due to differences in ability. This evidence suggests policies that target lower income underrepresented minority and female children may be more effective in closing the gender gap than other policies.

Concerning the final stage of commercializing invention or innovation, outcomes are starkly different. Women are only 8 percent of new hires at venture capital firms. Female CEOs receive only 2.7 percent of all venture funding, while women of color get virtually none, 0.2 percent. Women and African-

Americans are often found in legal and marketing departments, but are largely missing in technical positions and among executives and on boards. In 2014, Fortune ranked several large tech firms based on recently released demographic data. With respect to women executives, one firm was ranked highest with women constituting 43 percent of leadership roles, and two firms who ranked lowest with 19 percent of those in leadership roles.

Women constituted just 18.7 percent of boards of S & P firms in 2014, which is up from 16.3 percent in 2011. In 2015, 11 percent of venture capitalists were women, and 2 percent were African-American. This is a state where incomes can be high, and wealth generated can be substantial. It is also the stage at which one would observe the most unequal outcomes by gender and race. This is immediately apparent when considering the prominence of tech firms, and the most valuable public firms, and the relative size of these firms. The trillion dollar valuations of tech firms put them roughly on par with the GDP of The Netherlands, Mexico, or Australia.

Workplace issues for women and minorities go beyond the opportunity to participate in invention and innovation. Recently tech workers in the U.S. have

demonstrated to protest sexual harassment and misconduct, lack of transparency includes forced arbitration for sexual harassment claims, workplace culture, and pay, and opportunity, and equality. To be clear, this is not just the pipeline. Among the Forbes list of richest people in the world, five of the top 10 derive their wealth primarily from the innovation economy. The nine tech firms with IPOs last year were valued at roughly $36 million, and the most valuable one was valued at approximately $20 billion.

In the last two decades, researchers have made substantial progress in studying the participation of women and African-Americans at each stage of the innovation process. Nonetheless, if the aforementioned losses to GDP were to be tolerated, firms, technology, officers, and patent teams are not being good stewards of America's human capital and inventive capacity. This is a classic coordination problem and market failure. Public policy can help in the research, analysis, and promotion of diverse participation in inventive activities.

Legislation, such as the SUCCESS Act, would be critical to researchers to develop this research further. Having patentees or their agents and attorneys voluntarily and separately report demographic

data, gender, race, ethnicity upon submission of a patent or other IP application would advance this important line of research further with more precise data. Having the USPTO report on these data annually will shed light on important dimensions of the problem and changes over time. I would propose adding two additional data series for collection, disability status, and veteran status.

The literature on innovation related to the inclusion of these groups is just developing, and this would be an opportune time to include these inventors in the counts proposed in the legislation, which would be in line with data collected by the Small Business Administration, for example. Thank you for the opportunity to speak to you today about the timely and important issue of building an inclusive innovative economy that has the potential to raise living standards for all Americans.

One of the things that I would point out is that the testimony before the House Judiciary Committee, the subcommittee that deals with intellectual property, said that this was the lost Einstein's testimony. But I want to say to you that based on my research, I would call it the lost Katherines, the lost hidden figures' testimony, because

we're not only looking for the people we already know. We're looking for the people we don't know who haven't been included in the past. So I will end there, and I look forward to any questions, if they can entertained, if we have time to entertain them. We don't? Okay.

DR. TOOLE: No questions.

DR. COOK: Okay. We're not taking questions. Okay. All right. Thank you.

MR. PORCARI: Thank you, Dr. Cook. Appreciate your time.

DR. COOK: Thank you.

MR. PORCARI: If you can stay until later in the afternoon, we'll have a round table2. At that time, people can chat with you.

DR. COOK: Okay.

MR. PORCARI: So I was told that I have to speak closer to the microphone and louder. I was reminded that I didn't give you all the housekeeping. Our wi-fi password is up there. Our public wi-fi is over on the whiteboard, and we have coffee that's available. So thank you. Thank you, Dr. Cook, for that. Our next speaker is Maria McKendrick. She is the Director of the Inventors Association of Metro Detroit. The Inventors Association is a not for profit association established to educate inventors of all

levels to navigate through the invention process. In addition to being a resource center, the IAMD serves as a support group for inventors who can exchange information, experience, and advise others on how to successfully complete a project. Maria? Thank you so much.

MS. MCKENDRICK: Thank you, Director Porcari. I don't know if I'm coming across very clearly, but thank you for having the opportunity to speak today. I'm going to be a lot more informal than Professor Cook, and I'm the boots on the ground. I'm the closest Inventors Association to the Patent Office here. I want to reach out to Alexandria and just acknowledge the fact that we are so very grateful that we got the first satellite here.

It is impactful, and I really do see that our work here and my relationships that interact with our outreach coordinators -- Director Porcari has been supportive, the previous director has been supportive, and numerous support staff that I've gotten to interact with since their opening here in 2012, and really got direction in 2013, has been impactful. So being that boots on the ground, I can speak now a little bit about reflecting, because I know that it radiated out from Detroit down to -- over to Denver, Silicon Valley, and

Houston. I know the East Coast is all Alexandria, and I know there's a need.

I know that I've been working in this space for 3 or 4 years, and this is all my non-profit work. I bring 30 years of intellectual property strategic management. I'm a business degree. I know that on some of the paperwork today, it says doctor. I have to correct that. I am not a Ph.D., a doctorate. I am a business school graduate, proudly from U of M. The Dearborn --

AUDIENCE MEMBER: Go Blue.

MS. MCKENDRICK: -- yes, Go Blue -- and it's the Dearborn campus, so we're more known for, you know, the commuting, the working, boots on the ground. So I sometimes like to identify myself as Maria imported from Detroit via Dearborn. I enjoy a good relationship with academia in the community, Automation Alley is also all liaison, industry, and my background, I want to just share with you, comes from tooling. Okay? Actually having to make, use engineering surfaces, produce engineering surfaces, and I know that gives me a unique perspective that has put me in community where advanced manufacturing lies. And to be able to see that and where we evolve has given me that unique perspective that I hope to capture and relate.

So now I want to tell you about my Investors Association Metro Detroit. I help people who show up. It's $30 a year membership. And if you can't afford it, the first meeting is free. Come in. Tell us what you want. We're a community of like-minded people. I do want to take a moment at the mike here to say we are ridiculously underfunded. Global Inventors Association Metro Detroit, shoot me an e-mail. I'll give it to you at the end. And if you see that we can do some good, engage with us.

And that's where I feel I can bring the most to this dialogue and this conversation. It's about the community outreach and it's about the engagement. I know the plan going forward for Detroit, especially the Midtown, between the main branch of the Detroit Public Library, and the exciting things that are happening in Midtown, I'd like to be based in the heart of it, and I'd like to have that opportunity to community outreach.

With that said, how? I want to engage with people who are like-minded and want to invent. What we are dealing with in our community today is AI is moving very fast. We've got a lot of incredible technology silos, and I just want to say take a breath. Lead with compassion, and then engage. Go about engaging,

because there is nothing more human in the qualities of human behavior at our best as human beings than invention. That doesn't come with AI. It's uniquely human. And if we can re-evaluate, focus, and give people who say I have an idea, where do I go next, and direct them to community resources, it can prove to be impactful.

I don't have the statistics. I'll look to Dr. Cook for that, and I know she'll be amazingly incredible as an ally to get that information to where it's needed. But then I say look at this. Let's scale it, and once we perfect it here in the next 3 years in Detroit, and recognize that as its regional satellite, we've served -- eight or nine states? --

MR. PORCARI: Nine.

MS. MCKENDRICK: -- nine. So what we do here, we know is going to be impactful in Wisconsin, in Kentucky, in Illinois, Missouri, and through the other nine. So as that radiates and we grow these concentric circles that overlap, it's that beehive activity that will generate that innovation. So any more thoughts or questions, I'd like to field them.

I see Mr. Coughlin in the audience, and I used to have lunch with Jerry Rivard at Rotary. And one of the things -- a retired Ford Motor chief

engineer -- one of the things I can give you anecdotally about women inventing more and getting engaged more, what he was when the economy crashed, they actually did a lot of studies. And the studies indicated that it was two engineer couples, the husband and the wife, the woman always dropped back for that, and they got by. And we lost a lot of women in information technology and in engineering as a result of the economic downturn.

So working toward quality of life in the community is imperative, and providing support systems is what will help to grow those numbers. But at the end, when it comes to getting STEM and women in STEM, young women in STEM, we have to start early, middle school, lots of math in 4th and 5th grade -- we know these things work -- engage in the first robotics, engage in what Danny Briere, who spoke ahead of me, did. These are all things that help build traction in our community. We're very proud to show this off in Detroit, and we really do work toward the goal of expanding it, getting traction, and implementing it in the other nine states -- eight. We're here. We're on our way. Questions? Anyone can e-mail me.

MR. PORCARI: After.

MS. MCKENDRICK: Anyone can e-mail me, if

you've got questions, artcraft@umich.edu. Thank you.

MR. PORCARI: Thank you. Thank you, Maria. Appreciate that. So we don't have an opportunity to take question during the public testimony, but we'll have a round table later in the afternoon where you can chat with all of the speakers and presenters. So our next speaker is William Coughlin. He is the CEO of Twin Manor Farm. Before that, he was the president and CEO of Ford Global Technologies. That was the IP office of Ford Motor Company, and while there, he supported innovation and inventorship, and he was my boss there for 20 years. Before that, he led Chrysler's IP group and the Daimler Chrysler IP group, and was an adjunct professor at Western College of Law and taught IP there. Bill? Thank you.

DR. COUGHLIN: Thanks, Damian. Appreciate the opportunity to talk to you today. So in -- at Ford, I led a very successful effort to increase the number of inventors, and almost frighteningly successful. So this can be done. And my goal was not to be let's hire more inventive people, but really get the people that we had, who are very bright people, to be more inventive. And it was, you know, really successful. And once someone starts thinking like an inventor, they can't turn that off.

They see, you know, challenges as fun opportunities to invent. So but this creates a good problem to have for corporate IP departments, because now you've got many more inventions than maybe you had before, and most corporate patent teams have got budgets that are either fixed or renewed annually, usually with some downward pressure from the finance staff. So, you know, we want to be able to, you know, make a difference here, big, small organizations, which leads me to my recommendation, because corporate patent teams in particular are under a lot of pressure.

You don't see them here today frankly, because they already have too much patent work to handle, to be candid, and, you know, the pressure is on, so that it'd be nice to do. They would love to support an effort like this. You know, it's difficult to do when, you know, you're trying to drain the swamp. So, you know, it's clearly our national interest to be able to have all segments of society being as inventive as possible. And, you know, frankly to me, whether some -- like it's an underrepresented group or not, can we increase, you know, their inventiveness? It'd be a great thing for our country.

So I would urge the USPTO, with the blessing of Congress, to create an incentive program that

financially encourages organizations to experiment with ways to increase inventiveness where it's really needed. For example, the USPTO could reduce the fees for some period of time in some sensible ways, such as a first time female, minority inventors, veteran inventors, the first time. Why not give them a break, you know, from a fee standpoint and encourage the organizations to participate?

The requirements of such a program could be fairly simple. You know, designate a leader for the program, interview your female, you know, minority, and veteran inventors. See what inspires them. See what's maybe held others back. What a difference, you know, they would make. Take two action steps, whatever that may be, and then report it out to the USPTO that next year. To me, experimentation is the key. We're a nation of thinkers, so let's use that to our advantage. I doubt that there's a one size fits all answer to this, but frankly Ford Motor has proven that you can take people and make them much more inventive, and I look forward to seeing what answers that come out of this program. Thank you.

MR. PORCARI: Thank you. Thanks, Bill. Appreciate that. With that, we are going to take a short break. I think our program says we're going to

regroup. Does that say 10:40? Okay. So we're going to be starting back up at 10:40. There's coffee there. Bathrooms are off to the left, and the wi-fi's there. Thank you so much.

(Off the record at 10:08 a.m.)

(Back on the record at 10:39 a.m.)

MR. PORCARI: Okay. So thank you so much for that. We are 2 minutes late for our break, and so I'm -- all right. We are starting our program up again, and our next speaker is Paul Morinville. He is the founder of U.S. Inventor, and he has nine U.S. patents. And, Paul, please come up and take the stand. We have moved our timer to the front, and I will get it running. So thank you so much.

MR. MORINVILLE: Okay. Thank you. So I testified to the Senate two weeks ago, and an old, old friend of mine who I've known since I was 13 said I was too grouchy, so I'm going to try to be a little nicer this time. I'm Paul Morinville. In World War II my grandfather was a Navy corpsman, serving with the Marines as they island-hopped across the Pacific, and on to Hiroshima after the war ended. He was my hero, and soon -- as soon as I turned 17, I joined the Marine Corps. The Marine Corps shapes the character of young men and women. It taught me to stand up and keep going

until the mission is completed. The Marine Corps made me a patriot, proud of my country, and its heritage.

I worked for Dell in the 1990s. My first invention was invented there in late 1999. I brought it to Dell executives, who told me to put it into a business plan, and Dell would fund it. So I left there on April 3rd, 2000 with high hopes and big dreams. Within a few weeks, the dot.com bubble collapsed, Dell Ventures was shuttered, and that ended my funding. The next four years, I kept inventing. And over time, my inventions became industry standards in multiple areas of enterprise software. There is over $50 billion of infringing product on the market right now with -- on my inventions.

But it wasn't until 2011 that I was able to obtain funding again. And I started a company called OrgStructure, and started working with the Purdue Technology Center to commercialize these inventions. I helped to create a couple hundred jobs in Gary, Indiana, one of the poorest areas of the country. But in 2013, the 90 percent kill rate of the PTAB was revealed. This turned my patents into junk assets. My company was in a market controlled by big tech monopolies. If patents can't be defended, big tech just steals them, and using their huge markets and deep

markets, massively commercializes them. Big tech has huge market reach, political influence, and in many cases, owns the media.

So my investors stopped investing, and that's when I hopped in my pickup truck and drove to Washington. Today my mission is to educate the government about what patents -- what the patent system means to America and Americans. My mission will be complete when my government gives me my rights back to me by restoring the patent system for individual American people. The Patent Act of 1790, only the third act of Congress, granted patents to he, she, or they at a cost even a pauper could afford. At the time when most women and African-Americans could not own property, both could own patents, and both did.

In 1809, Mary Kies became the first woman patentee for an invention of weaving straw hats. During the 1800s, more than 3,000 women patented 4,196 inventions, and made -- many made their living by licensing or commercializing their own inventions. In 1821, Thomas Jennings became the first African-American patentee, inventing a method of dry, scour, and close. Granville Woods, who people of the day called the Black Edison, patented dozens of railroad-related inventions in the late 19th century. The patent system leveled

the field regardless of race, gender, or economic status. In many ways, it was the first equal opportunity law.

The patent system fueled the greatest economic expansion in the history of man, propelling America to lead the world in every technology revolution from potash processing to Smart phones. But for women, minorities, and veterans, the patent system was a social and economic equalizer enabling them to invent things that built some of our largest and most powerable corporations. Everyday Americans could unseat huge incumbents and take their place in society based on the merits of their contributions to society, not based on money, power, or lobbying. But in the last 15 years, all of that has been destroyed.

The government changed the rules in prior art scope, invention priority, injunctive relief, venue, claim construction, error correction, disclosure requirements, mental step and abstract idea doctrine, invalidation proceedings, damages models, fee reversals, and much more. Every single long-held construct of patent law was changed. Many of these changes are the result of Supreme Court decisions often directly contradicting statutes and without public debate. Congress, thanks to lobbying and political

contributions by the biggest companies, optimized the patent system for corporations, the largest customers of the USPTO.

In the dust of this rebel, the USPTO set up the PTAB skewed to invalidate huge percentages of the very same patents that it just granted. The PTAB invalidation rate is a shocking 84 percent. Only 16 percent of patents survive unscathed. The cost of defending a PTAB assault is $450,000. But only commercially valued patents are challenged at the PTAB. These are the patents that inventors have put their trust in, betting their careers and sometimes their entire life savings to commercialize or license them, only to have that trust betrayed, and then to lose everything.

Even if a patent is never challenged in the PTAB, the market effects of the huge invalidation rates harms all inventors by making investors, customers, and others believe their patent cannot be defended. It is a CEO's fiduciary duty to their shareholders to steal patented inventions and massively commercialize them, thus running the inventor into the dust bin of history, and this efficient infringment enables high stock prices, which fuels CEOs' pay, and CEOs earn hundreds or thousands of times more than workers.

Most contingent fee attorneys and investors have left the patent business for more predictable investments. Individual inventors are now defenseless against this theft. Inventors are duped into revealing their trade secrets under the false promise that they are going to get patent protection, only to have the protection destroyed after the fact with no way to take that secret back. The SUCCESS Act is intended to increase participation of women, minorities, and veterans in the patent system. It also extended PTO's temporary fee setting authority. The PTAB has not been financially solvent. It loses money.

So the USPTO transferred fees paid for examination and maintenance to the PTAB to make it solvent. Most recently the USPTO increased fees to make the PTAB self-sufficient. This diversion of applicant owner -- applicant and owner fees robs resources intended to grant better patents, and transfers those resources to the PTAB to destroy patents. The only reasonably expected result that can come from this is to create lower quality patents with higher invalidation rates. With the passage of the SUCCESS Act, the USPTO raised fees for examination and maintenance. This significant fee increase makes it more likely that women, minorities, and veterans will

be forced to abandon patent applications and issued patents.

The goal of the SUCCESS Act is to encourage women, minorities, and veterans to invent new things and patent them. It is unfortunate that the SUCCESS Act has been used to achieve an opposite result. Constitution secures a patent for an inventor, a human being, not a corporation. Somehow this simple fact is lost by current patent theorists, lobbyists, and lawmakers. The foundation of American law is to protect the fruit of one's labor. The labors of one's mind must also be protected. If nobody discloses their invention, innovation in America will collapse.

This is proving to be true. China has already taken the lead in many technologies critical to our national and economic security. This is directly related to China improving their patent system while we were busy destroying ours. Today tech inventions are protected in China, but not here. We responded to China's threat with a trade war that is hobbling China's tech companies, apparently to protect our own big tech monopolies from superior Chinese products. But the root of the problem is that our patent system is destroyed. We have done nothing to fix it, again to protect big tech monopolies by eliminating the threat

of creative destruction served up by inventors with better innovations.

Big tech monopolies are built on business methods and software. These are inventions that are core to their businesses and the very types of inventions that cannot be patented and are invalidated by the courts and the PTAB. If business methods and software cannot be patented, big tech cannot be challenged, and their monopolies are untouchable. If you can't measure it, you can't manage it. The first step to including more women, minorities, and veterans is to measure it. But the USPTO cannot determine who is inventing what.

Small inventors are grouped in with huge universities with multi million dollar endowments. If a small inventor licenses a patent to a large entity, no matter what the license pays, the inventor is classified as a large entity. And we should not lump in investors who assign their rights to big corporations. People who don't use a patent to attract investment to start up a company or license it are not real inventors. They do not understand why patents matter. Just patenting an invention can cost tens of thousands of dollars. Commercializing inventions often requires millions of dollars. Big corporations have

this kind of money, but that cost is too high for women, minorities, and veterans.

If you don't believe me, at the most recent PPAC meeting on May 1st, three PPAC members took to task the USPTO chief economist for his report that failed to deal with the main barrier for women to get patents and grow their businesses: lack of investment. A stable and predictable patent can attract investment. That was the case for the first 215 years of our patent system. For two years, I drove across the country in my pickup talking to inventor clubs and recruiting the 13,000 citizen activists of U.S. Inventor. Go to any small town in about any state, and find the biggest, oldest mansion. It was probably built by an inventor.

Their stories are told in small-town libraries and historic societies across America. It is our story. It is America. We all want women, minorities, and veterans to climb the social and economic ladders, but to do that, we must have -- we must be -- a patent must be capable of attracting investment. It must be a presumed valid, exclusive right, and can't cost so much to obtain and defend that nobody can do it as it does today. $450,000 to defend just one PTAB procedure is outrageously expensive for small inventors, especially if there's only a 16

percent chance that the patent will escape unscathed. If it does not escape, you gain nothing -- excuse me -- if it does escape, you gain nothing. The only difference is that you're a lot poorer and your patent term is several years shorter.

Director Iancu has made very important steps to eliminating BRI and switching to Phillips in PTAB procedures. This will eventually help, but the PTAB kill rate has barely changed. Far too many meritorious inventions are still being destroyed. We need a lot more work. U.S. Inventor is happy to help. I am too. Thank you.

MR. PORCARI: Thank you. Our next speaker is going to be via Webex. Jermaine, are we ready to introduce our next speaker? Okay. So I'd like to introduce Tesia Thomas. She's our next speaker, and she'll be presenting remotely via Webex. Tesia, are you ready?

MS. THOMAS: Hello?

MR. PORCARI: Thank you so much. And then before you start, is it possible -- I don't know if she has -- does she have a video feed, or is this just going to be an audio feed? So it's audio only. Can you hear? Can you just say your name again, so we can confirm that we can hear you?

MS. THOMAS: Yes. Tesia Thomas.

MR. PORCARI: Oh, Tesia Thomas? Okay. We can hear you. You can proceed. Thanks.

MS. THOMAS: So you know that I hoped to be there, but I'm just going to present in audio. I'm a little under the weather. So I currently own a small business, so I want to speak as an individual inventor, a single human being with ingenuity. As a young minority female inventor and entrepreneur, I do not expect that my ingenuity will be rewarded by the U.S. Patent system. The trouble is that my older white male non-veteran counterparts I have faced give me a sense of foreboding.

The real disparity that we need to address is one of financial resources, and not of color, or sex, or veteran status. After all, my mind and its abilities are not of color or of a sex. However, I am of limited financial means, as are many of my white male and non-veteran peers, and we all struggle to provide the world with something more than our wealthy incumbent competitors can provide. I don't expect to participate in the U.S. Patent system any further, unless this financial disparity is addressed. The USPTO should eliminate the IPI process for all of the patents initially filed by a small entity, a micro

entity, and for inventor owned and/or control companies.

When large corporations undergo the idea process, they utilize less than one percent of their resources. When my peers and myself of limited financial means have to undergo the IPI process, then we face business and personal bankruptcy just to afford to defend ourselves. If we cannot scrounge up half a million for attorney fees, then we cannot defend our patent, and there's nothing to gain even by a successful defense. We will end up spending half a million dollars just to maintain the status quo, and then still face personal and business bankruptcy. We pass laws to lower fees to micro and small entities for the same reason. The true disparity is of financial resources and means. Thank you.

MR. PORCARI: Thank you. Thank you so much. Thank you for that. So our next speaker Dr. Nichole Mercier from Washington University in St. Louis. Dr. Mercier leads the tech transfer and business development department at Washington University. She evaluates academic discoveries in biotechnologies, and partners with potential biotech companies for their further development. Dr. Mercier?

DR. MERCIER: First, thank you for the

opportunity to address the SUCCESS Act and to Director Porcari for the invitation to be here today. As Director Porcari pointed out, my name is Nichole Mercier, and I run tech transfer at Washington University in St. Louis. I have been with the University for the better part of 14 years since moving to St. Louis. Washington University is a major research institution comprised of a Tier I medical school, and a strong engineering school as well.

Collectively, the University has greater than 700 million in sponsored funding for research. We have almost 4,000 faculty members, of which 33 percent are women, and 11 percent are minorities. The perspective I bring to you today is that of the University where I would argue many inventors in industry, startups, and non-profits get their start, and where they should gain exposure to patenting and commercialization of their research findings. We are here today because there is a clear disparity in how women and underrepresented populations engage in patenting. The data is clear, and it goes back decades in the university space as you can see from the limited number of publications I have here.

Despite the disparity, there is a body of work that details the reasons why we see these gaps,

and there are groups out there who are piloting, and so we can point to them as pilots to -- for closing this gap. So we first need to start by understanding the why behind the disparity, and there are several papers that corroborate the evidence in the differential way men and women approach commercialization. I highlight Stefan's paper published in the Journal of Technology Transfer in 2007, because it pulls together the collective of rationales for why women differentially participate in commercialization and patenting of their research findings. And while there are varying factors weighing in here, certain of these are easy targets to tackle, and the ones I've highlighted have become the basis of solutions at our University and others.

When it comes to minorities and how these populations engage in entrepreneurship and patenting, there is far less data available. But there are certain things we know, and again, some of these are easy to tackle in trying to bridge the gap and promote a diverse pipeline of inventors and entrepreneurs. Bio STL in St. Louis is an example of an economic development entity with an interest in diversity and inclusion whose programming for underrepresented populations has engaged almost 900 individuals in the St. Louis region in four years. This targeted

programming has led to 94 future company founders trained in entrepreneurship. Eight new companies formed, and over 38 million in capital raised since 2015.

But what is the incentive for universities to pilot efforts in diversifying inventors and entrepreneurs at their own institutions? I think that the limited number of institutions with actual programming in the innovation space suggests that a large number of academic entities haven't yet made the correlation to the advantages for them, and most institutions, including my own, are not resourced to take on diversity and inclusion efforts in this space. Yet, there are groups such as WashU who, despite the lack of resources, believe it is important to engage at the university innovator level. And with enough examples, individual institutions may find models that work for their specific needs and institutional culture.

Additionally, external groups that support tech transfer have been active in thinking about how to close this gap. The Association of University Technology Managers, or AUTM, has been working to create awareness around the problem, specifically right now as it relates to women engaging in patenting and

commercialization. AUTM, through its women inventors special interest group, has made an earnest attempt to convince university tech transfer offices to track gender. To this end, the group has successfully convinced AUTM to put questions relating to gender on its annual survey of metrics of tech transfer offices.

For the last three years, tech transfer offices have been encouraged to submit how many invention disclosures, which is the very start of the innovation process at the University, and how many patents have a woman listed on them. The AUTM women inventors group has helped tech transfer offices also to understand the barriers of the problem, and they've produced a tool kit for institutions to download off the website and start their own diversity programs. More recently, the AUTM Foundation has been attempting to put together somewhat individualized programs that universities will have the opportunity to institute in their home turf. And full disclosure, I am on the AUTM Foundation Board and tasked with driving this effort.

But I want to highlight the benefits of such a diversity program, and obviously the program I know best is the one at Washington University, which we call WIT, Women in Innovation and Technology. WashU is a pioneer in putting together programming for women

innovators in hopes of converting researchers to inventors and entrepreneurs. We started in 2013 with support from our Provost. In the early phase of the grant, we took a hard look at our data pertaining to female participation in our own tech transfer office. Our program was primarily based on the barriers that I showed you on the previous slide.

So the critical factors in WIT provide the education around patenting and commercializing technology, showcase women who have commercialized their work through startup companies or direct licensing with existing companies, and provide opportunities for participants to grow their networks with individuals who can actively help participants with strategic direction, capitalization, and connections. And importantly, our program relies on the invitation to participate. We actively solicit names of women who might benefit from WIT. We make calls and stop by their offices, and we provide personalized invitations with specific reasons why she might be a good person to participate.

One note, we started with women because of the density of faculty as compared to minorities, and this enabled us to track meaningful data before and after the start of WIT programming. When we started

our programming, we relied on a cohort model, but we have been able to expand the model to modular programming where we engage more than 150 women each year, graduating women as they leave for post docs and faculty positions at other institutions. Our programming consists now of two large events, an annual kickoff and a fall day symposium.

In addition to that, we provide specific and topical programming throughout the year, where we bring an injury representative, or a venture capitalist to engage in a more intimate grip of women innovators, and next June, we are planning the first academic women pitch competition that will national where academic inventors will pitch to and be coached by strategics and investors. And we have seen a difference. We have seen the overall population of women far outpace new male innovators, and we see a higher increase in our women faculty population compared to our male population.

When we looked at traditional science of engagement, we went from just over 30 percent of invention disclosures to last year breaking 50 percent for the first time of women representation. We also track patent filings, and we have seen a growth in representation on patents as well. What I haven't

shown you here is the data around women engagement in startup companies. When we started out program, we had zero startups with female founders, or where our female inventors were heavily engaged. Now we have four companies that fit this description, two with female founders, and two that have in licensed intellectual properties from our women inventors, and where the woman inventor is on the board or actively engaged in some other meaningful capacity.

This means we now have role models at our own institution. In 2018, our program was recognized by the Association of Medical Colleges, and we published our early findings in Technology Innovation Journal out of the National Academy of Inventors so that other universities could see that these efforts are meaningful. Despite the institutions that are working hard to enable diversity and inclusion, and university and entrepreneurs, it's simple not enough. So the USPTO could represent a real partner to academic institutions to help drive conversations around diversity and inclusion, and help these institution this to better engage women and minorities in patenting their research.

As I mentioned before, three years ago the AUTM women inventors special interest group launched an

effort to encourage technology transfer offices to track data around gender, both on invention disclosures and patent applications. Unfortunately, there's not a consistent practice in tracking, and what we found after three years of asking these survey questions is that there's limited consistency of those reporting year to year. Some universities reported in year one or two with no follow-up, and many universities have never reported on this data.

As you can see, there's a downward trend in the number of respondents, and only 69 schools have reported their data for all three years, which is only about a third of the institutions that report to the AUTM survey. This means that trying to make sense of progress over time is impossible, unless we are able to get a rigorous set of data. Moreover, at least right now, most universities and academic institutions are not tracking minority status or veteran statistics in the innovation space.

Therefore, the USPTO has the opportunity to be the driver that, one, strengthens partnerships with academia to educate women, minority grad students, post docs, and faculty around patenting, two, enables opportunities for underrepresented academicians to find networks and branch points, three, engages with

universities to establish the importance of this topic, and communicate the variety of ways to attract and retain underrepresented innovators, enabling them to become inventors and entrepreneurs, and four, track dynamic data in the USPTO system in order for the USPTO to make a clear statement that diversity matters, and provide a source for institutional benchmarking. Of course, certain data may be sensitive, and could be kept confidential in the USPTO system, which might give more assurances to inventors about providing this sensitive information, but would also provide a robust source of data. Again, I'd like to thank you for your attention and the opportunity to address this Act today.

MR. PORCARI: Thank you, Nicole. Thank you for coming. So our next speaker is Holly Fechner. She's with Covington & Burling. So she is an adjunct lecturer in public policy, and is a partner at Covington & Burling. Ms. Fechner handles teams that handle public policy, government affairs, and regulatory matters for clients in Washington, D.C. and around the world. Prior to joining Covington in 2007, she was the policy director for Senator Edward Kennedy, and in that position, she developed policy initiatives, legislation campaigns on a broad range of issues,

including the economy, health care, employment, education, retirement policy, and civil rights. She was the chief labor and pensions counsel for the Senate health, education, labor, and pension committee. Ms. Fechner served as the chief negotiator on legislation to reform the private pension system and increase the Federal minimum wage. Thank you.

MS. FECHNER: Well, thank you so much, Director Porcari, and I also want to recognize Director Logan, and thank Mr. Toole. It's a pleasure to be here today to discuss the SUCCESS Act. As Director Porcari said, my name is Holly Fechner, and I'm a partner at Covington & Burling in Washington, D.C. But just to connect myself to this area, I'm also a proud graduate of the Adrian, Michigan public school system and the University of Michigan Law School, and it was my honor to clerk for Judge Jon Feikens of the Eastern District of Michigan here in Detroit. I appreciate the opportunity to discuss the state of gender, race, income, and veteran diversity in our patent system, and to propose policy solutions for the USPTO and the SBA to consider as you prepare the SUCCESS Act report on these topics.

We are indebted to the leading researchers in this field, including Dr. Lisa Cook, who testified

earlier, and also Drs. Barbara Gault and Jessica Milli at the Institute for Women's Policy Research, and Alex Bell and his colleagues at Harvard. They have found that women, people of color, and lower income individuals, patent inventions at significantly lower rates than their male, white, and wealthier counterparts. Fewer than 20 percent of all U.S. patents today list a woman as an inventor among college graduates. Fewer than half as many African-Americans and Hispanics hold patents compared to their white counterparts.

Moreover, a child born in the U.S. to a family living below the median income is 10 times less likely to receive a patent in his or her lifetime than a child born to a family in the top 1 percent of income. And incredibly, we see these patenting disparities even at the very top income levels. So children born in the top 1 percent of income are 22 percent more likely to patent an invention in their lifetime than those born in the top 5 percent.

As the USPTO and SBA know, patents are a critical driver of U.S. innovation and economic prosperity. Patent rights incentivize high risk, long horizon investments in innovation. By ensuring that inventors own their inventions, intellectual property

rights provide monetary reward for resource intensive research and development by inventors. Patent rights also facilitate commercialization, collaboration, and follow on invention, especially by small inventors, by ensuring that invention can be freely bought, sold, or licensed. This allows patent owners to reap the benefit of their invention while transferring their invention to the party best positioned to commercialize it.

Intellectual property protections unlock a vast innovation economy in the United States, that according to the USPTO, accounts for more than 8 trillion in economic activity, which is more than one-third of the U.S. GDP. Public policy plays a critical role in ensuring that we create equal opportunity for all inventors. We cannot afford to leave the full measure of our country's talent, creativity, and ingenuity out of the innovation ecosystem. Achieving greater gender, race, and income diversity in inventing and patenting will unlock a wealth of innovation, economic growth, and job creation that is now untapped, bringing new inventors, new ideas, and new technologies into the innovation pipeline.

The SUCCESS Act report is an important step

in understanding these disparities and in identifying how public and private action can address them. In addition to the important efforts of the USPTO and the SBA, the House and Senate judiciary committees have also recently held bipartisan hearings on increasing patent diversity. We know that lives will be improved by the countless innovations that we cannot envision today.

As one example, Jessica Matthews, the CEO of Uncharted Play, invented a soccer ball that can harness energy and power lamps, an invention inspired by a power outage during a family wedding in Nigeria. Today, Uncharted Play holds 15 patents for technology that can be installed in any device that can harness kinetic energy, such as baby strollers, floor panels, and furniture. Without her perspectives and experiences, innovative ideas to solve significant problems might not have emerged.

Numerous factors contribute to gender, race, and income patent gaps, including lack of exposure to inventors, inadequate STEM education, a lack of formal and informal mentoring, and support networks, and systemic discrimination and bias, and of course, the complexity and expense of the patent system itself. Exposure to invention and inventors has effects that

are hard to understate. Most obviously, according to a study by Alex Bell, those with inventor parents or parents in high innovation fields are substantially more likely to hold patents later in their lives.

Indeed, Bell found that simply growing up in an area with a high number of inventors makes a child more likely to become an inventor in the future. STEM education, of course, also plays a critical role in feeding the patent pipeline. According to the Institute for Women's Policy Research, women make up only a quarter of the STEM workforce today, and underrepresentation of women in STEM fields is only part of the story, because even women with STEM degrees patent at significantly lower rates than their male counterparts.

Patent gaps are also driven by a lack of social networks and mentoring. Informal social networks contribute to professional development and lead to innovation. Public policy and the private sector can help close these gaps. A key initial step in closing the gaps is diagnosis. Who becomes a U.S. patent holding inventor is extraordinarily difficult for researchers to study now. The USPTO does not currently collect demographic data on patent applicants. Researchers have to rely on sophisticated

name matching software to identify the demographics of U.S. inventors.

So we believe that it is critical that the USPTO begin collecting this data, both to fully evaluate the scope of the patent gaps that exist today, but also to have a baseline to begin measuring future progress. As with other Federal programs, this information would be separated from the patent application itself to ensure the consideration of the application is free from bias. More broadly, we need to expand opportunities to expose young Americans from all demographic groups to inventors and entrepreneurs. Michigan is an important case in point.

According to USPTO study, the state ranks near the very bottom of states when it comes to women patent holders. At the same time though, the Bell study shows that Detroit is among the top five areas in the United States where children are most likely to grow up to be inventors. Midwestern regions around cities like Detroit, Minneapolis, Madison have among the highest patenting rates in the country. Detroit and its environs are fertile ground for closing patent gaps -- patent diversity gaps, as high innovation with significant room for diversity growth, policies and programs to expose children to innovation, supports

STEM education, promote patenting among university and industry inventors, and teach women and people of color about the importance of patents to the commercialization process would accelerate the reduction of race, gender, and income disparities in patenting.

A number of private, public, and university programs offer models for promoting patenting and commercialization. Here in downtown Detroit, for example, wireless technology Qualcomm partners with the University of Michigan and the Detroit Public Schools to offer its Think Of It lab. Think Of It is an initiative that engages elementary and middle school students with cutting edge technologies through a hands-on approach. Students participating in the Think Of It program learn about 5G wireless, the Internet of things, and careers in technology, and then they program a simple circuit board to act as the core of their own TOI invention.

And we know about other model programs, such as the previous speaker spoke about. There's one at the University of Illinois Urbana, Champagne, called Accelerated Women and Underrepresented Entrepreneurs. There's a strong program at the University of Florida, Empowering Women in Technology Startups. The Federal

government also offer programs that can engage underrepresented communities in innovation and commercializaton. For example, the Department of Energy's Small Business Technology Transfer program works one-on-one with women and minority small business owners to help them apply for competitive grants. But importantly, that program also includes an intellectual property consultation.

Businesses and trade associations are also taking important steps to build pro patent and pro diversity initiatives into their culture. And I think the more we can do to encourage industry and trade associations to develop and facilitate best practices accuracy in their industries, that will have a very far reach in terms of changing this dynamic. Congress and the USPTO can also directly reduce some of the disparities in patenting. High fees associated with filing and defending a patent can pose a substantial barrier to patenting.

Programs like the USPTO pro bono assistance and the pro se assistance program can help mitigate the high cost of patenting, but they could be expanded to help small businesses and individual inventors for whom attorneys' fees are a major barrier. Efforts to promote equality and innovation must ensure that

non-discrimination laws in education and employment are fully enforced. It is essential to promote paid family and medical leave and work life balance to ensure that everyone can contribute to the innovation economy while also participating fully in their personal and family lives. Greater inclusion in the innovation ecosystem means more perspectives and more ideas in the innovation pipeline. Without broader perspectives and experiences, innovation ideas to solve significant problems might not emerge.

Equal opportunity to invent, patent, and commercialize innovative ideas will drive the U.S. innovation economy ever forward creating countless new products and cures, and will create jobs, stimulate economic growth, and improve the quality of life for millions of people. Thank you for inviting me to testify here today, and I look forward to our discussion later on.

MR. PORCARI: Thank you so much. Thank you so much, Holly. Nicholas, do we have -- Nicholas is our next speaker. Okay. Thank you. Our next speaker is Nicholas Ripplinger; right?

MR. RIPPLINGER: Close enough, yeah.

MR. PORCARI: He's a U.S. veteran and a founder of Battle Sight Technologies, and he's traveled

to Detroit from Dayton, Ohio. Battle Sight Technologies makes products to help military and first responders as they enter battle fields or dangerous areas. Nick, thank you so much.

MR. RIPPLINGER: Thank you. Good morning, everybody, and thanks for the opportunity to speak to the Directors, the Detroit USPTO office, and the inventors in the crowd, and the opportunity to kind of share our story with you today. First and foremost, I want to apologize. We were kind of still editing these 5 minutes ago. So my name is Nick Ripplinger. I'm the found and CEO of Battle Sight Technologies in Dayton, Ohio, former U.S. Army soldier, operations non-commissioned officer in charge, and completed several tours between Iraq and Afghanistan, both with U.S. and coalition forces.

When I was first asked to speak, I was pretty excited to dig into the data my fellow veterans, especially the service disabled veteran inventors; however, it's incredibly difficult to find any significant data on the topic. As an inventor and the founder of commercialization firm with several patents, licenses under our belt, I reached out to my network of fellow veterans as well as investors and government agencies who support service disabled veteran-own small

businesses to get their personal stories. While their stories and challenges were different, for each party there is one sentiment that everyone shared, that we desperately need better resources to support -- and support for veteran entrepreneurs and inventors.

John Norton, a veteran entrepreneur inventor and creator of the Rope Safe Edge Protection system, was able to obtain a patent, because he found a patent attorney with the University of Connecticut who was willing to give her time and expertise pro bono; however, most veterans don't have access to pro bono services, making it difficult to navigate the complicated and lengthy patent process. Additionally, most universities do not provide these resources as continuing services to graduates. Danny Lipschitz -- I believe that's how it's pronounced -- the executive director of the EBB Foundation, an organization that supports and invests in disabled veteran-owned businesses, shared that the EBB Foundation Board often invest hours and personal funds to cover the cost of patents for veteran businesses.

They'd like to see this option for expedited patent approvals and reduced fees for men and women who served our country. The Institute for Veterans and the Military Family Affairs, run out of the University of

Syracuse, is an organization that supports veteran entrepreneurs to launch, grow -- to launch and grow their business, provides no cost training and resources to assist companies to getting to the point of filing for IP protections. This organization is a game changer to most veterans, but only supports up to the point of filing, and the filing fees and additional legal fees are what holds most veterans back from filing.

The government's SBIR program, the Small Business Innovative Research program, encouraged domestic small businesses and veteran-owned companies to engage in Federal research and development, and has the potential for commercialization. The phase three contract award is sole sourced to the SBIR firm without competition, according to the SBIR and STTR law. The program is the source of non-diluted funding that helps small businesses to examine the feasibility of technology solution and develop that prototype to demonstrate.

While exploring commercial and DOD markets, while this is an incredible opportunity for veteran businesses, the SBIR program cannot fund the filing or legal fees for these IP protections. At Battle Sight, our business model is to license technology from, you

know, people that are a lot smarter than us for the purpose of commercialization; however, we often have to file our own patents and trademarks for our products. In our experience, as a service disabled veteran-owned small business, the process has been long, costly, and at times, overwhelming. I firmly believe that veterans are underrepresented as patent trademark holders; however, there's no data to confirm that.

Discounted prices already exist for small businesses, so there's really no reason that we cannot include lower tier pricings for the underrepresented demographics, including veterans. Delays might not seem significant -- might not seem like a significant challenge for veterans due to the first -- wow. Somebody screwed up these remarks. Delays might not seem significant -- like a significant challenge to veterans, but additional time and office actions add up to significant hours of work, legal fees, and financial resources that many veterans do not have. The resources could be used to further innovation, expand company growth, expand product lines, and expand additional protections.

I strongly believe that there should be additional pricing tiers for veteran innovators, if the goal is to balance these demographics. I want to

ensure that all veterans are supported by reducing the cost and time required for veterans to file both trademarks and patents, we are allowing the men and women who served our country to build and grow their own businesses and become self-sufficient, productive members of the civilian society. Thank you for your time.

MR. PORCARI: And our next speaker -- thank you so much, Nick. Thank you for coming up to Detroit. Our next speaker and our last speaker before we break for lunch is Kelly Sexton. She is the -- an associate vice president of research, technology, and innovation partnerships at the University of Michigan. She works to connect the University with companies and facilitate commercialization of university research discoveries. Thank you so much.

DR. SEXTON: Well, I'm standing between everyone and the next break, but I want to thank Director Porcari for the invitation to be here, and especially thank all of you for your time and attention to this important issue. And so my perspective on the gender disparity issues around gender, race, and veteran status are largely informed by my experience, having spent a career at universities, first conducting basic research in the sciences, and then more recently

in supporting the commercialization of university research discoveries. And, you know, I'm of the opinion that if we want to increase the participation of women and underrepresented groups in innovation and entrepreneurship and in patenting, we need to also be focused on addressing the parity issues and their participation in STEM disciplines, and you really can't start early enough.

Simply put, we need to ensure that those engaged in science and engineering fields actually represent the diversity of our society. As a society, we face tremendous challenges, health care outcomes, social, environmental, and we need to ensure that our scientists and engineers are developing broad and innovative solutions to these challenges. We need to ensure that those engaged in the STEM disciplines represent the diversity of our society. I'm sure that I'm not the only one who shares the concern that the predominantly white male engineers designing the software and AI solutions for the future from Silicon Valley might not have the best interests of diverse communities in the Midwest at heart in their product solutions, and we need to ensure that there's opportunity for everyone to participate in the future innovation economy.

So from this perspective, in my view, I think universities are important for a variety of reasons. First, universities are major contributors to innovation and discovery. The Smart phone that we take for granted, the search algorithms, if you think about your phone, everything from the batteries to the LED to the software, all of these things can trace their roots to basic research that occurred on a university campus, often with funding from the National Science Foundation and other Federal programs. The lifesaving innovations, the medical devices, the therapeutics, a recent study showed that from 2000 to 2007, every single FDA approved drug could trace its roots to basic research that had been funded by the National Institute of Health.

So we know that universities are important contributors to the innovation that saves lives, improve health care outcomes, and improve our quality of life, and drive economic growth. We need those teams at universities to be comprised of diverse individuals, and so in that regard, I applaud my colleague Nichole's remarks and all of the wonderful programmings that they're putting in place to help increase diversity. We know that the Internet itself had foundations in basic research conducted at

universities, and we know that if we can create an open and inclusive environment for all innovators, we will increase the overall diversity of participants in the innovation pipeline, with the outcome of finding solutions for a much wider set of the ground challenges that face our society and shared planet.

But there's another reason that we need to look to our universities for leadership on this front. Our universities are responsible for inspiring and educating the next generation of innovators and leaders, so it's important that our campuses are creating environments where all individuals have the opportunity to access an exceptional education, and it's also important that while these students are on campus, they witness diverse teams of researchers, they see people of color and women in positions of leadership, and actually participating in the process of innovation, bringing their research forwarded, having it patented, participating in technology.

We know that mentorship is so important in training the next generation of innovators, and so we need them to see role models who have this language of innovation of patents, of licensing, of entrepreneurship, and who have that skill set, and can pass it on to the next generation. I always think in

order to understand where we are and how we came to have such gaping disparities in participation in innovation, entrepreneurship, and the STEM fields, it's important to think about how we got here. And I like to look at the model of computer science as an example.

We know that women were leading innovators in the computer science field in it's earliest days. A lot of the early programming work was unglamourous, and it tended to be accomplished by women and people of color. We heard earlier this morning reference made to the mathematicians at NASA from Hidden Figures. You can look into programs like the Harvard Computer, which was a female run initiative. We have notable individuals like Grace Marie Hopper, who created one of the first computer programming languages, and that is actually still in use today. But then something happened. And that was the advent of the personal computer in the '80s.

Visionaries, like Bill Gates, had a vision of a personal computer, a laptop on every desk, but the marketing was almost exclusively to men and boys. If you go back and look at the early advertisements, it's really quite shocking today, because it's almost always a man or a boy at the computer while their sisters and wives look on admiringly. And so personal computers

tended to be purchased by affluent parents for their male children. And so when these kids grew up and entered the classroom, something happened. The women in the classes suddenly felt like they had missed a secret prerequisite.

Everyone who didn't grow up with a computer in their home and in their bedroom felt like they couldn't speak the same language. They felt like they were lacking an innate ability for computer science, but, of course, that wasn't the case. They just had not had that exposure. And so the women, minorities, people who didn't feel like they belonged in these classrooms, they left in droves. And we know that nationally the data does not look great. According to National Center for Education Statistics, 28 percent of bachelor degrees in computer and information science went to women in 2000. In 2016, it was 18 percent. But there are reasons to be hopeful. It's not an insurmountable problem.

There have been some innovative practices at places like Carnegie Mellon University and also Harvey Mudd that we can look to. Universities like this are tackling this head on with innovative programs that they've piloted that we can expand and learn from. For instance, at Harvey Mudd, they make computer science --

introduction to computer science a required course, creating an environment that is supportive and engaging for everyone. The outspoken individuals who tend to know all the answers and want to lead the discussion, they quietly ask them, let's talk during office hours. I love your enthusiasm, but you're kind of dominating the conversation in the classroom, so let's find another way to engage. And really importantly, and I think the biggest take away is they are instilling the concept of a growth mindset, the idea that ability in computer science is gained through hard work and practice.

It is not an innate ability. It is not something you were born with. It is something you can gain through education, through hard work. Just because you may not have the skills today does not mean that you cannot acquire them. Harvey Mudd actually graduated its first majority female computer science class in 2017. So when you think back to the fact that as recently as 1971, they had actually had a policy that limited the total percentage of women that could even be enrolled at the University, capped at 11 percent. That highlights just how far we've come and how hard we need to work to overcome these barriers to access in STEM, which are going to be very important

drivers of future economic prosperity.

At the University of Michigan, we are a leader in these efforts as well, prioritizing diversity, equity in inclusion at all levels. As our President, Mark Schlissel, recently said, as a physician, scientist, professor, and university president, I believe wholeheartedly that talent is ubiquitous in our society, but opportunity most certainly is not. And it is for these reasons that the University of Michigan over the past several years has launched a number of innovative programs. Starting in 2017, the University began offering HAIL, High Achieving Involved Leader scholarships, offering up to $60,000 in free tuition over the course of four years to high achieving low income students from throughout Michigan. That fall, there were 262 HAIL scholarships.

This program was informed by research by Susan Dynarski, Professor of Public Policy Education and Economics, who showed that with an early commitment of aid, high school students were twice as likely to apply to the University of Michigan, 67 percent as compared to 26 percent, and twice as likely to enroll, 26 percent as compared to 12 percent. So think about that. These were kids that were qualified for a University of Michigan education, but because of the

economic concerns, they didn't consider themselves to be viable applicants. Simply by changing that conversation and making them aware of the financial aid opportunities that were already available, we've been able to change that dynamic.

And so based on the success of this program, the University has boldly expanded it with what we're now calling the Go Blue Guarantee, which promises free tuition for families with incomes of $65,000 a year and under for all in-state students admitted at the University of Michigan-Ann Arbor campus. Tuition support is also available under the programs for families of annual household incomes up to $180,000. In addition, U of M supports a program called Wolverine Pathways, which is a free year-round college readiness program for grades 7 through 12 for students who live in Detroit or within the boundaries of Southfield Public or Ypsilanti Community School Districts. Students who successfully complete the program and are admitted to the University of Michigan's Ann Arbor or Dearborn campuses receive four-year tuition scholarships.

We're proud of the fact that the University of Michigan ranks number three in the country for the number of women engineering graduates, and we're very

proud of the progress we've made in our college of engineering where half of the faculty leadership positions are held by women. Again, it's mentoring is important. Role models are important. At the University of Michigan, we ascribe to the belief that a diverse leadership can help overturn a system that suppresses talent. On campus, we have a student-run program called Women Who Launch, a student-led group that is working to achieve gender parity in our campus' entrepreneurial ecosystem. Mentorship, role models, these things matter.

When I arrived at the University of Michigan to lead their technology commercialization efforts last year, we began to talk about the way that women are represented in technology commercialization at the University. We began to look at the committees we were putting together at the panels we were hosting at the awards we were providing. We found that for one committee that selected the recipient of a very prestigious innovation award, there were no female participants on that committee. How can we select and highlight the diversity of our research community with a committee that doesn't reflect that diversity?

We had examples throughout our campus of very successful women innovators, successful women

entrepreneurs, but we were not finding the opportunities to highlight their stories and to share them. We realize that an area within our office that we had set aside to honor our University's innovators and entrepreneurs was essentially a wall of men, and we have worked to recast how we celebrate and honor our diverse community of innovators. We have also begun tracking the percentage of women that engage with our office to receive patents and to commercialize their inventions, and yes, we are reporting those stats to AUTM, so we're happy to be one other the universities that's now participating, and will continue to participate.

You can't improve that which you can't measure. I applaud the USPTO's efforts to begin to assess the participation of women, veterans, and minorities in the patenting system, and I encourage you to continue this work. We realize there's difficulties around it. It's a fraught topic, but surely within the USPTO there are ways to keep certain information confidential as you work through the patenting process. In order to impact gaps in the participation of women and underrepresented groups in innovation and entrepreneurship, we believe it's important that universities are part of the conversation and are

leading the way. Universities exist to serve society by creating new knowledge and by inspiring and educating future innovators. We need our work and we need our campuses to reflect the diversity of the communities that we exist to serve.

In conclusion, this is both a massive challenge and a massive opportunity. There is not a single easy fix. We are who we are due to history, and our resulting societal and economic disparities. We need to be mindful of the problem. We need to work in ways large and small to address and recognize our inherent biases, and address underlying problems. The opportunity we have here is tremendous. Unlocking the creative and innovative potential of our entire society can both increase access to economic opportunity and drive our nation's economic competitiveness and future prosperity. So we need to measure, we need to understand, and we need to keep at it.

I want to close with a quote from an article in yesterday's New York Times. In a piece about inherent bias in artificial intelligence, the Times included a quote from Peggy Johnson, Executive Vice President of Business Development at Microsoft, who said the way to turn anything around is to shine a light on it. You keep the light on there until the

data surfaces, and then you have to find a way to fix it. It's not a check the box, move on, everyone take the unconscious bias training, and we're all good now. You have to keep at it, keep at it, keep at it. So thank you for your efforts. I encourage you to keep at it, and that's certainly what we plan to do at the University of Michigan. Thank you.

MR. PORCARI: Thank you. So thank you for that. That'll conclude the morning presentation. I just wanted to recognize Darlene McCoy. I spoke a little bit about who we are named after, Elijah J. McCoy, and this is Elijah McCoy's grandniece -- correct? --

MS. MCCOY: Great-grandniece.

MR. PORCARI: -- great-grandniece -- sorry -- I missed a generation there -- great-grandniece. So she -- we are going to break. If you wish, there is a small cafeteria downstairs. I'm going to try to grab a very quick lunch, so that I can come back here and be ready to start up around 1:00 o'clock. So thank you so much.

(Off the record at 11:51 a.m.)

(Back on the record at 1:06 p.m.)

MR. PORCARI: Thank you very much for coming back from lunch. It was really nice talking to people

at lunch. So I wanted to introduce our next speaker, whom I had the pleasure of meeting at the Smithsonian three years ago. He had a display there, and I had a display there as well, and I got the chance to talk to Dr. Cooper three years ago, and found him to be just fabulous. I remember sending him an e-mail afterwards. So Dr. Cooper is a Distinguished Professor at the University of Pittsburgh. He is a U.S. Army veteran with a spinal cord injury, and he has used that to really advance the cause of people with spinal cord injuries. He is an inventor of 25 patents. He is senior scientist at the VA Rehabilitation Research and Development Center in Pittsburgh, and he's a pioneer in the field of improving wheelchairs and their use, and advancing mobility devices in assistive technologies. And I'm very pleased to introduce Dr. Cooper as our next speaker.

DR. COOPER: I appreciate this opportunity to share my thoughts. I am a U.S. Army veteran with a spinal cord injury resulting in paralysis of the lower extremities. After my injuries, I attained undergraduate and graduate degrees in engineering with the assistance of the U.S. Department of Veterans Affairs. In 1994, I established the Human Engineering Research Laboratories (HERL), which is a joint effort

of the University of Pittsburgh and U.S. Department of Veterans Affairs. HERL has grown to become one of the largest research and development organizations in the world focused on technologies to individuals with disabilities and older adults, especially veterans of the armed forces.

Our goal is to promote full inclusion through the creation and application of appropriate advanced technologies. Our team has developed over 100 inventions and holds numerous patents related to wheelchair, robotics, and wearable instruments that have improved the lives of people with disabilities and military veterans. We continue to make a real and positive difference in people's lives. A key to our success is diversity in all of its forms. A high percentage of our team are people with disabilities and veterans. Among them and our other team members are engineers, physicians, therapists, statisticians, and business experts. We are also engaged with community based organizations and industry from large companies to startups.

We promote the participation or women, minorities, and veterans in entrepreneurial activities. Institutions of higher education and technical industries must do more to create inclusive

environments for women, minorities, and veterans especially in science, technology, engineering, and mathematics. People need role models that reflect their life experiences, and who are similar to themselves, or who were at a similar point in their life. Fewer than 3 percent of faculty in institutions of higher education have a visible disability despite that fact that they represent about 15 percent of the working age population. The percentages are worse in most other sectors of the economy. There needs to be investment capital available to people from underrepresented groups.

Most people with disabilities in the USA live on very low incomes, and the unemployment rate among people with visible disabilities is nearly 75 percent. Entrepreneurship is likely a good avenue for social mobility, but opportunities need to be available. The risks of being an entrepreneur need to be mitigated. Most people do not become wealthy, but their work may be of tremendous social good, for example, creating technologies to help people with low-incidence injuries or diseases. There needs to be capital available to target entrepreneurs with disabilities. For people with disabilities, there are risks to losing social benefits that they rely on to survive before achieving

a sustainable income to replace public services.

The USA and most other countries still include many physical, social, and economic barriers to people with disabilities that are a deterrent to assuming the inherent risk of becoming an entrepreneur. People with disabilities are America's largest underserved population. It is diverse and anyone can become a member in an instant. It is by and large a smart, clever, and technically savvy population of tremendous untapped potential. Veterans are a growing population of entrepreneurs and many have become very successful, but their measures of success are non-traditional. For example, veterans have had a propensity for service to others and personal sacrifice. This has led veterans to focus their entrepreneurial activities on organizations that support social good, such as Mission Continues, Wounded Warrior Project, Team Red White & Blue, Travis Manion Foundation.

Veterans are also entrepreneurs in goods and services too. Many still focus on serving others through job creation for veterans and other underrepresented populations. The armed forces are one of the most integrated and socially equitable organizations in the USA, and has a culture of

improving in this area as can be seen by the growing population of women serving and the variety of military occupations available to them. The Armed Forces are one of the USA best leadership academies. Everyone is trained to lead. This translates into their desire to continue to lead and to serve once they become veterans. Selfless service and leaderships are traits and skills that need to be valued and encouraged. They are a good investment.

We need to increase the number of women, minorities, and veterans who apply for and obtain patents. It has become nearly prohibitively expensive to apply for and obtain a patent for most small entrepreneurs. Because many people with disabilities live on low income levels, the patent application process is cost prohibitive and the costs of defending a patent unreachable. If the process of applying for a patent were simplified and less costly, I and others like me would have many more patents. For most of my career and as a student, I could not afford to pursue patents or defend them. It was only when I became a prominent professor at a major university that I was in a position to pursue patents.

I have helped to start several successful businesses both with and without patent protection. It

is really a matter of weighing the cost benefit of pursuing and protecting a patent. The USPTO has a program to assist individual inventors, but it is understaffed, and underresourced, and insufficiently advertised. There needs to be more legal aid, free or at very low cost to help people apply for patents from underrepresented or low income groups.

There are many great people at the USPTO. They work hard, are committed to the mission, and they are friendly and genuinely interested in helping inventors and entrepreneurs. My experiences with USPTO have been genuinely positive. The challenges that underrepresented populations face tend to be less related to USPTO, and more related to access to capital, lack of appropriate mentors and role models, and the costs of attorney fees associated with obtaining and defending a patent. There has developed a culture of large tech companies dominating the patent process, and to some extent patent trolls, filing for patents that are little more than ideas or concepts. There needs to be an alternative pathway for applying for patents for underrepresented populations and for patents to improve the social good.

Lastly, USPTO should be encouraged to develop strategic partnerships and creative programs such as

the Collectible Card series, the activities with the Smithsonian Institute, National Academy of Inventors, National Inventors Hall of Fame to include encouraging greater recognition of inventors from underrepresented populations, especially those not focusing on financial gain, and the AAAS-Lemelson Foundation Invention Ambassadors. So that's the end of my testimony. I'd be happy to answer any questions. Thank you for this opportunity.

MR. PORCARI: Thank you so much. That was terrific. We don't have opportunities for questions at this time, but as we have our round table, if you can hang on during that, we can make it available at that time. And so our next speaker -- and I didn't set a timer for that -- I'm sorry -- is Quintina Williams. Is Quintina here? Oh, thank you. So I'd like to introduce our next speaker. Quintina Williams is a local inventor and entrepreneur. She holds multiple patents on extension, attachment apparatus, and other related products, and we're very grateful to have you join us today. Thank you so much.

MS. WILLIAMS: Thank you. Yes. My name is Tina Williams. I am the owner of QT Business Solutions, and inventor of Quick-Do Strips. I want to first thank everyone for inviting me to testify, and I

want to first say that I am super proud to be an American and also a patent holder. So I am obviously African-American. I'm obviously a woman. And this was a feat for me. My patent was just issued October of last year, and we're in the process of getting it to market. And it was very important for me to come here to let you know what my process was and how long it took, and, you know, some of the pitfalls and greatness of the process. So I filed my patent in 2015, and I was -- it was November of 2015. I came up with the idea because, you know, my daughter's hair was -- she kept waking me up in the morning saying, glue my hair down, so I didn't want to do that. So I kind of came up with the idea, you know, went to sleep, and was praying before. Went to sleep, and woke up, and the idea and everything came to me, even the name. So I immediately went to Kmart, bought me some ghetto prototype stuff, and sewed it together. And my patent attorney, which happened to be across the aisle from my office, I called him on Monday. And I said, hey, Arnie, I think I have an idea for a patent. So he comes over and he sees this is a hair extension. He says, oh, no, there's so much prior art. But mine doesn't have hair attached to it, which was kind of weird, because he's like a hair extension with no hair.

So have asked for drawings. I gave him my ghetto prototype, and he said, I think you have something here. So to make a long story short, went through the patent search, you know, filed it. Everything's great. Asked my parents -- well, after I filed the provisional, went to my family and friends, and raised about $30,000 from mostly my husband, my mom, and, you know, my friends. Some of my friends gave me money too. So then we went and I went through all of the patenting processes. What happened was there was nothing like it. There is nothing like it on the market. There was something that was a Velcro wig from 1920 that they had, but the patent -- which was totally nothing like mine. It was kind of similar, but it's Velcro and not what I had. And so, you know, got a rejection. Had to turn some things around. My attorney was really great. Got to 2017, and got it -- got -- my attorney got an agreement to move forward, and then next thing you know, he called her back when he didn't get the letter or whatever you're supposed to get, and she had changed her mind. And I was amazed, because I'm -- how do you get an agreement -- and my attorney said in his years, he had never heard of that before, and he's older. So he had never heard someone get an agreement, and then change their mind. So then

he asked for the supervisor. Then she said, no, no, no, we can get it done. And so she didn't have to -- he didn't have to go to the supervisor, but a couple of months later, we got a letter of abandonment. So then, now, I found this out after the fact, because my attorney didn't tell me any of this after he fixed it, because he was upset with the process of getting a changed mind, and then an abandonment right after it. I did end up getting a letter stating that -- you know, stating that they apologized for any inconvenience that was caused, and they sent me a letter of rescinding notice of abandonment. If my attorney had not cared about me, I would not have my patent. So it's important to me to let people know that this process, it should be a little bit easier for people that are like me, you know, that went to my family and got money, and, you know, there's nothing like that there. So proudly to say, I then got my letter of issuance right after that, and then I have my patent today. So just want to say please help us. Help us. We're underrepresented, and we don't know what we're doing. And many of the time, most of the time, we're trying to get our family to help us, so that we can help our families become better and give, you know, some legacies and generational wealth to our children, and

then things like this could help -- could harm us. So a better process in the patent, getting all the way through. But thank you, guys.

MR. PORCARI: Thank you. Thank you, Tina. Thank you so much. So our next speaker is supposed to be Calvin Flowers, but I didn't see him. Is he online or, is he walking in at this second or not? Okay. And I think we're going to move forward with our speaker after that. Kelly, you're up after that. So our next speaker is Kelly Burris. She is the owner and founder of Burris Law. That's just downstairs. It's the office with all the cool Shinola bikes made in Detroit. Her energy and enthusiasm for client goals combined with her deep experience in mechanical, material science, and electrical arts help the clients secure hundreds of U.S. and foreign patents each year.

She's a licensed pilot since 1985, and an aeronautical engineer in her prior career. Kelly has a natural affinity for aerospace technology, but also works in other sectors, including automotive, semiconductor, and medical technology. She has significant experience with design patents, and has testified twice before the U.S. Congress in opposition to propose legislation that would significantly impact the term of those patents. And prior to practicing

law, Ms. Burris spent more than 11 years in the aerospace industry with McDonnell Douglas and Boeing where she was an inventor, and worked in areas of advanced composite material, structural design, production, manufacturing, ballistic research, virtual reality, CAD/CAM, and many other applications. She's also an adjunct professor at Western Michigan University and Thomas Cooley Law School. I'd like to introduce Kelly.

MS. BURRIS: Thank you. Thank you very much, Damian. I appreciate that lovely introduction. And as my dad always tells me, I don't let the grass grow between my toes. So it really is a pleasure to be here today. It's an honor. I really appreciate the opportunity that the Patent Office has opened this up for discussion. It's a topic that's very near and dear to my heart as you maybe could tell by my background. So I was an aeronautical engineer in the late '80s, early '90s in St. Louis for a defense contractor. Not very women and minorities down there; however, a lot of veterans. And I was working with a senior engineer on some really cool technology -- we were in an R and D -- and he was my mentor.

And one day, he came to me and said, hey, you know, I think we really -- I think we should get a

patent on this idea that you have. And I thought -- this was 1994, '93 -- what is a patent? And that right there, that's a problem, because I had an undergraduate degree in aeronautical, had a master's -- well, I didn't quite have my master's yet from WashU at that point, but I didn't know what a patent was. I didn't really know what an invention was, so obviously one of -- I mean, we -- this has been a theme throughout the day, but a big component of this is education and exposure, and getting people to know about what a patent is, and what an invention means.

And from a personal standpoint, I thought oh, that's really neat. I like that idea, and the company would pay us a little bit of money. You know, you're young and money's always good, good to have a little extra money. And at the end of that process, when we got our patent, once a year, the company would have a big awards ceremony that was at the corporate headquarters, in the auditorium, and I got to go with my mom and dad, and be amongst a group of engineers, and get my plaque, and it was a very proud moment for me. The invention really didn't go anywhere. It was just too costly, but, you know, I could just see -- I felt really good about myself as a -- as an engineer. I could see my mom and dad were really proud, and I

thought wow. This should be a -- everybody should know about this. This is like exercise. This is like a good diet. It's like a good night's sleep. This is something that's really energizing and good for everybody.

So that's my background. And so during that process, I got to know a patent attorney, and I learned about patent law, and honestly, you know, okay, so I can make a little more money being a patent attorney, and I might be able to afford that airplane versus those engineering salaries, so I became a patent attorney. And, you know, in that experience as an engineer in the defense industry and still now in the field of intellectual property law, there's a lot of -- there's not much diversity. And it's a topic that's very important to me, because I've experienced diversity. I've been around it and seen how it can really just open up your world and your thinking.

And so I want to make an observation -- I want to show a video, and make an observation about a point that has been mentioned a couple of times today just about exposure, and about, I think -- there's -- like there's one of me -- I think, Nichole, you mentioned something in your presentation about, oh, one of -- there's me too, or there's one of me there. I

don't know if you've seen the Tony awards recently, but there was a young woman who was in a wheelchair who won a Tony award for her performance in Oklahoma, Ali Stroker. And there was a young man -- so I do have a video. It's a minute and 45 second video. But before we launch that video, the mother -- I see heads nodding in the room.

There was a mother who took a video of her son who was in a wheelchair, who was watching this wheelchair-bound woman receive a Tony award, a very prestigious award. And he just covered his face, and, mom, that's me. And he cried. It was just this, kind of like, I get it, buddy, I get it. When you see there's one of you out there, it opens up that possibility to your world. So I have a video that I would like to show, and this is a commercial, a TV commercial that I saw just the other day on TV, that's a Volkswagen commercial for one of their new, I guess, electric initiatives, but an electric vehicle. So I will stop talking as soon as the video starts, and I'll mention a few things after the video's over here.

(Playing of video)

MS. BURRIS: So great commercial; right? Awesome. And even the audience they're marketing to seems to be a younger audience that wants to, you know,

do great things for the planet, drive electric vehicles. But what did you notice about that commercial? If that would have been a minority designing that car, would have been African-American woman, think about how much more powerful that would have been. And if there was a young woman or a young minority seeing themselves designing that car would have, I think, helped open up that possibility to them. So I think -- I'm going to talk financial in a minute -- but I think that there's this whole social part of this issue that we're facing that we need to set examples.

The gentleman that spoke last talked about mentors, about role models. That is -- you can't overstate the importance of having that. That's how I got my patent, not an important patent at all, but the only barrier I had was knowledge or information. And I had a role model. I had somebody who said, hey, kiddo, let's go get a patent on this, and that's what we need more of. I think that this Invention Convention program that The Henry Ford talked about is phenomenal, and I can't wait until tomorrow morning, because I'm going to make some phone calls and find out how we can help out, because you're grabbing them at a younger age, and making it a part of their -- you know, part of

the curriculum.

You know, why is -- why didn't we have -- I mean, it's in our Constitution -- this is what I didn't want to do, for crying out loud -- it's in our Constitution. Why are we not teaching this in the classrooms to our children? Not just patents, but trademarks, and copyrights, and, you know, making this a part of our education. I think it's getting better, with STEM especially, and in high school curriculum, and college curriculum, but the education, providing opportunities for people that wouldn't have those opportunities, the mentoring in addition, a very key component to solving this problem. And then the financial aspect of it.

You know, I actually am a lawyer, so I read through the language of the Act, and in Section 2, paragraph A, subparagraph 2, it talks about many innovative small businesses, subparagraph 3 talks about universities and then the next subparagraph talks about women and minorities. Well, in that first paragraph, small business, you get a discount. It's small, you know, you get to pay half. Universities pay half. Women and minorities, there's no -- I mean, clearly in the fee setting authority in this Act, there -- it's like the door's been opened. It's very obvious to me

that there are fee setting programs that can be put in place to address this. Now, I think everyone knows that the patent office fees are only one component to the fees. You have legal fees as well, which are, I think most cases, are more, a lot more than the USPTO fees.

So how do you address that problem? I would love to do more work with small inventors. It seems that sometimes it's more engaging, because you have a -- like a personal stake in helping them succeed. But as a small business owner, I can't afford to represent individual inventors, because there's -- you don't get paid a lot of times, which is fine. I like doing pro bono work, but I can't run my business that way. So I'm forced to work -- not forced -- but I work with larger companies who pay their bills, and that's just -- that's business. And I enjoy working with those inventors as well, but there has -- you know, there's got to be some discussion around how do you help fund these individual inventors and small companies that can't afford the legal fees.

And there was mention about the PTAB a couple of times, so I will take this as an opportunity to express some observations about the PTAB. When the post grant proceedings were announced, I got really

excited. I thought, wow, this is great, because there will be proceedings that will be much less expensive, much less time consuming, get out of the courts and litigation. And I respect litigators, but sometimes it's an awful darn, large, huge massive waste of money. And I thought this is going to be very efficient and great. We can go back to the Patent Office, and get down to what the claims really should cover. And that's not how it's turned out so far.

I have participated in many European patent office proceedings. They're called oppositions or even oral hearings, where you go in, the opposing party goes in. And there's a panel and you talk about what your claims cover, what they don't cover in the prior art, and you iterate, and you iterate, and you iterate, and you walk out of that room with a decision. And I think if everyone's honest about those proceedings, you feel pretty good about what you walked out with. I don't know why the Patent Office can't have proceedings like EPO opposition proceedings. And the main reason why European don't use our post grant proceedings is because they're too expensive. They can't afford that $500,000 that everyone was talking about earlier.

If I have the EPO opposition, it's an order of magnitude less than that, maybe 25-, maybe $50,000

tops. So why can't we have proceedings like Europe has, where you can get down to really what, what those -- what should those claims really cover? Because in all honesty, as a patent attorney, I'm trying to get the biggest, broadest claim I can for my client. And, yeah, it might be a little too broad, which is why I write more claims. And someone's going to come and challenge it with prior art, but if I end up proceeding, I have a chance to make amendments multiple times. They're called auxiliary requests in those proceedings. I'm going to be able to walk out with a good patent for my client.

With the PTAB, they're not there yet. They're starting to move in that direction, and I understand that's a big ship to turn around, but there are some things that could be done there as well. On the fees, I mentioned there is an opportunity to reduce the fees personally. I will just say that without trying to get emotional, no veteran of this country that volunteers to fight for our freedom should pay a dime for a patent application. Period. Shouldn't happen. I'm sorry, but there should be no charge for veterans. And I'm happy to write patent applications for them as well. There we go. I'm a patriot. What can I say? You know, and there's other programs that

can be put in place too as well, in terms of grants.

You know, maybe there can be law firms that qualify as a government -- qualified law firm to help these small businesses, if you meet certain criteria, and then, you know, the government can help fund that somehow, some way. I think there's a lot of -- we have a lot of smart people in this country to come up with a solution. But I agree that the independent inventors and the small businesses, it's unfair. It's unfair, because they're up against a huge gigantic wall versus these big companies that have, you know, real deep pockets. So with that, I will again thank you for this opportunity, and thank everybody for coming today. It's an important -- it's a very important Act, and has big significance. So thank you very much.

MR. PORCARI: Thank you Kelly. That was terrific. Thank you. So did Calvin -- did Calvin Flowers come by? No? Okay. With that, I'm going to go to our next speaker, Katrina Anderson. Katrina is a local entrepreneur and owner and founder of CommodiTeas, a Michigan based business that offers premium tea, and related gifts. Her company is a previous recipient of the Detroit Economic Growth Corporation's Motor City Match Program, and we're very glad to have you here today.

MS. ANDERSON: Thank you, and good afternoon again. My name is Katrina Anderson. I am the owner of CommodiTeas Company here in Detroit. I'm going to mention a little bit of my background, and you'll figure out why it's relevant in a minute. I hope you connect those dots. I grew up as a daughter of a Ford Motor Company executive. He was a member of the recall department, and that this how he spent all of his waking hours. And I grew up as a scientist, very interested in science as a student. In elementary school, won multiple science awards, and all of that sort of thing. Decided I was interested in health care, so pursued the typical path into medical school, became a med student here at Wayne State University here in Detroit, and from there, embarked on a career path that involved medical ethics, bio ethics.

Now I own a tea company. Okay? I want to use my experiences to give you an anecdotal analogy of what the life cycle of an idea is, the life cycle of an invention. So it starts off as a question; right? Then you wind up with some kind of an answer, usually in the form of an idea. From there, you wonder if it's a good idea. Then you explore whether it's a worthy idea, and hopefully you wind up with a patented idea, what we call an invention here in our culture. The

conversations I had along that journey were both internal and external. They involved large paradigms. They involved my micro culture. They involved a lot of things. It started off with me sipping tea. I'm using a tea bag in my living room, and I said, man, I hate it when my tea bag does that. Someone -- someone -- should do something about that. Hum.

Two weeks later, two weeks worth of tea later, aw, why does my tea bag keep doing that? This is a simple problem of physics. Someone should do something about that. Grrr. Tea bags. Grrr. Okay? Then you walk into, you know, this is simple problem of physics. All you have to do is modify this tea bag this way. Yeah, that would probably work. It's really simple. Why isn't this on the market? Eventually as I'm developing a tea company, and I'm also tinkering with tea bags in the meantime, I stumble upon a competition for pitching, a pitch competition for businesses here in Detroit. I signed up for the boot camp, prepared for the pitch.

My mentor one day is watching my slides. He's watching me go through my presentation, and he says wait. Back up. I said okay. What did you just say there? Oh, yeah. Yeah; yeah. I tinkered with the tea bag. I made some modifications. Blah, blah, blah.

He goes why is this the first time I'm hearing that in week 10? I didn't think it was worth mentioning. I just threw it in there. Have you explored a patent? Why would I do that (in my mind)? Has it been done before? It's not on the market. I checked on a couple of things, but there are major differences from the way I handled this problem, and the way everybody else is doing it. Katrina -- he did everything short of curse at me; I kid you not -- why have you not explored a patent?

Now, again, remember all of that lovely science background. It never once occurred to me that my idea was not only good, but it was worthy and potentially patentable. Never occurred to me. With all of my STEM training, I did forensic science for the Detroit Police Department. I did a DNA manipulation here at Wayne State. I was a part of a qualitative research team here at Wayne State, studying HIV research in southeastern Michigan, and not once did it occur to me that my idea was good enough to take to the government and say, hey, this is mine. Paradigm shift. So once my coach got finished yelling at me -- in front of everybody, I might add -- it occurred to me that you know what? Maybe the issue is me. Why didn't I think I was worthy of this? Where did that come from? A

woman that could not find a local university to teach her bio ethics went to Wayne State, went to the interdisciplinary studies department, and created her own degree for a master's of arts, but I did not have a clue that my ideas were worthy of someone else's resources, someone else's time, someone else's documentation.

Why would Uncle Sam care what I think? I am not like your typical African-American woman. I was raised in a middle income household. I have two children. We are going through some very hard times, so yes, I qualify as low income seasonally. I am raising my kids to prepare them to think outside of the box, but I was a victim of the only box that I had ever known, which was telling me that you had to be a white male in order to succeed at these things. The middle of the night when you see those lovely commercials of, hey, if you have an invention, come to our service, and we will help you get a patent on it. They use a white cave man to invent that little wheel, and you only see it at 3:00 in the morning. So when I have insomnia, I'm staring at the white cave man. Yeah, he invented the wheel. I get it. What does that have to do with me? He doesn't look like me.

It took a male to tell me why aren't you

patenting this? He didn't sound like me. His background had nothing to do with my background. Then we get into the patenting idea, and I did investigate this, and I am in the process of investigating it. I'm speaking to an attorney. Call up the State Bar Association. Yeah, you pay us $25, and we'll refer you. Okay. Great. Had the initial phone call. He says three things to me. He says have you researched this? Yeah. Okay. Well, what did you do? Okay. Well, I did some Google. I went to the USPTO website, and I did some initial, you know, searching, and this is what I'm finding. And he says okay. Good. I need you to spend 2 hours, research that, because you don't want me to charge you $300 an hour for research. You want to do that yourself.

All of a sudden, this woman with 15 years of academic research in her CV is questioning whether she is capable of researching this for herself on a level that would be relevant enough to spend money. Ah. Number two, well, then you have to think about the ambiguity. Is this obvious to somebody with minimal skills? Obvious? That is a gray area. Obvious. It wasn't obvious to me when I was sipping tea the first two weeks, but then when I did it, it became obvious. I don't know what obvious means, sir. Is this worthy

of money, paying you $300? Then the third thing was there's a statute of limitations. When was the first time you discussed this publicly? Bless God, it was just a week ago. But had it been 11 months and 3 weeks ago, I would be in deep trouble. Okay? So now we've got the statute of limitation.

I won the pitch competition, thank you, Lord, but that grant money was earmarked for something else. But now you're telling me that all of that grant money, all of that funding that I worked 10 weeks for will likely go to this guy that I've never met, the faceless male on the phone, saying are you sure you want to do this. Because his next recommendation was, you know what you could do, is just sell the heck out of this for two years, and then when somebody starts knocking it off, just do something else. I hung up the phone, and I said, was he trying to talk me into a patent or out? I'm not sure. And on top of that, I heard a voice outside of myself say you were willing to assume that your pet peeve was exclusively your pet peeve. You took ownership of the pet peeve, but you're not willing to take ownership of the solution. Again, this is a paradigm problem.

So moving forward, STEM is a great way, absolutely, to approach people and get more innovators

into the system. What about the innovators like myself who are not in a lab, not on a hospital floor, doing things that seemingly have nothing to do with technology? I was drinking tea in my living room. How do you find them? Your next great innovator might be at a Mommy and Me club right now, playing in a sand box. Your next great innovator -- I was telling Ms. Burris that my daughter has an interest in technology and aerospace, but she chose to go into the arts. So she is now doing music and visual arts, but if ever there was a person that is well-groomed to marry creativity and technology, to marry the creative space with technology, or even to partner with somebody else that has an engineering background, and create something incredible for our society, it is her. I can prep her, but I need you to go get her.

Stop showing us white cave men. Don't limit yourself to just the STEM program. I am a product of the STEM program, so I am absolutely thrilled that my kids have the opportunity to go to more science camps and to learn things in school. However, go to some of the art fairs. Go to Mommy and Mes. Go to community groups, because technology is not just about the laboratory. It's also about everyday life. So the U.S. Patent Office has the opportunity to do something

incredible. Descartes said, I think, therefore I am. If this holds true, validating someone's idea could, indeed, validate their existence as a U.S. citizen. Ooh, paradigm shift. And that, ladies and gentlemen, is how you leave your mark on society. Thank you for your time.

MR. PORCARI: Thank you, Katrina. That was terrific. I appreciate your time coming down here. And we will have search programs that you can take advantage of in our office. And I think -- so before we have our last speaker, just kind of housekeeping, we're going to have one more speaker. Then we're going to wrap up, and then we're going to have a round table where you can ask questions of the people that are here, as well as those people that are online. And if Calvin Flowers shows up, you're going to let me know, Jermaine.

But our last speaker is going to be via Webex. Is that set up? Okay. So I want to introduce Carrie Hafeman. She's our next speaker. She is the founder of World Computer Security Front Door Software Corporation, and she holds multiple patents in computer security, advertising, and communication, including Find My Phone patents in the U.S. and in Europe. She has a long history of working in the computer security

and software industry, and is skilled in startups, business planning expertise, enterprise software, entrepreneurship, venture capital software license, patent litigation, and marketing. Carrie?

MS. HAFEMAN: Yeah. Hi. Can you hear me?

MR. PORCARI: Yes, we can hear you fine. Thank you.

MS. HAFEMAN: Okay. Well, thank you. Thank you for letting me contribute, and hopefully I have something to contribute. But I also apologize. I was planing on trying to be there in person, and then something came up so that I can't. But I did do a couple slides, and I just want to just say that I did speak to -- regarding the SUCCESS Act last week. I think in the middle of the week, they were talking about what they were kind of looking for, and it was a study on participation of women, minorities, and veterans, and, you know, entrepreneur activities in the patent system, and just some of the challenges that the USPTO had.

And so anyhow, I've -- I mean, and obviously I don't know as much about the USPTO as the people at the USPTO, but listening to these challenges, you know, perhaps I could be helpful. So if you go to the next slide or slide two, so this is me. My background, I

have 10 patents, and I have 9 U.S. patents, and I have a European patent, one in Germany and other countries in various continuations. And I actually am getting my 10th U.S. patent today. It's being published today, which I'm actually very proud of, because I applied for it in 2002, so this was various continuations. So it's been a long time, and it's the best one, and I actually survived a 101 challenge. So you know, there were challenges regarding that, so that was good.

And then a little more about me is, you know, I guess the reason why I probably, you know, ended up applying for a patent, because my father is very entrepreneurial, and he has 10 patents. Growing up with my dad was kind of growing up with that guy like from Chitty Chitty Bang Bang. It absolutely was. He literally was like that guy. I mean, lights would beep in our house, you know, when the power would go out, and he'd wear things on his head, and go down the street. I'm going to check this transmitter, you know, so let me know if you get the signal sort of guy. So that's how I grew up, so I think, you know, that had a lot to do with -- my environment had to with like the fact that I'm an entrepreneur and have applied for patents.

And I've been the founder of various startups

in computer security. I've been lucky, lucky enough to have had millions in sales, and tens of thousands of downloads in over 100 countries, and then I've sold my patents, which were licensed to inventions at Cornell, UCLA, USC, Brown, Johns Hopkins. I have two girls, and they both graduated. My youngest one graduated last month, so it was our last college payment, which we're excited about. The first one was in engineering, and the second one was in bio chem. So if you could go to the third slide -- thanks for helping me with this slide thing. So basically this is what I heard last week, you know, that the USPTO was trying to get -- how do you get data? You know, you're trying to get the number of women that are applying for a patent in your studies, minorities and veterans, and they were saying how minorities and veterans were harder to collect that data, and that for women, you were kind of guessing at the names, but coming up with studies.

And then how -- you know, a second challenge was how do you rate the participation by women, minorities, and veterans. And then where do you focus the resources? Somebody said, you know, to focus on young girls or women grads. I mean, I'm more familiar with the women issue than the other ones. And then should you do more study or time for action? So just

the way I'm wired, I'm always for action, and I think when you start action, you can actually learn more faster, just from making the stakes quicker and pivoting. So if you want to go to the next slide, so basically here's action number 1, I was thinking about, regarding some of those challenges that somebody mentioned on the phone. And that was like how do you create -- how do you find out, you know, who's really applying? And you could create an optional checked box, you know, when you're applying for a patent, you know, minority -- you know, women, minorities, and veterans. And then some people won't check that box, and probably, you know, a lot of people won't. So you could create an economic incentive.

So it's similar to the small entry fee, and I think one of the speakers had just mentioned it, because I just watched them. I think Kelly Burris. And why couldn't you have like a discounted fee for any of those categories? And I don't know whether that's appropriate or not, or what the rules are based on that, so the other idea would be that they could -- if they checked that box, they could get -- apply for a grant or its continuation. I had a rumor -- I heard a rumor a week ago that the Patent Office actually breaks even more when people file for continuations, so you

could get like a 500 dollar grant if they checked a box for a continuation, if they got the first patent. And that way, it wouldn't really cost the Patent Office very much, and it would accomplish two birds with one stone. You would be able to collect the data, and you would actually encourage people to file for continuations.

And then you could also -- to get the data, you could provide a spotlight series on your website. So you could have women inventor spotlight, you know, veteran spotlight, and you could shift all that work actually to the applicant. I mean, people after the month or after the spotlight, they could actually send in a video to you why they think they might be women inventor, you know, of the month, or whatever, the spotlight. So lots of inventors would actually want to do this, because they would want to promote their business and get some, you know, notoriety, and help with investments and sales. So that would be something, you know, possibly you could do to actually collect that data.

And speaking of website, which gets me to the next slide of what you could do, is you really should think about updating your website. So I was on your website, and I was trying to go to the USPTO. Like,

you know, women incentives was what I, you know, Googled, and I couldn't really find anything. But then what I did was, I looked at like NASA. This is an example of NASA. And then this is just one. There's a Natural Education Society. There's all kinds of websites like this, The History Channel, National Geographic. And what they're doing is they're leveraging their information with STEM. And even this website is NASA/STEM. So basically you could actually do something similar, and by doing that, you could leverage -- the United States Patent Office could leverage getting their information to women, minorities, and veterans, you know, through the STEM organization that's already growing.

The STEM people, they're just totally hungry for -- they're hungry for information; right? They want content. So you could actually provide content for them to actually share with kids in the classroom and that kind of thing. And, you know, this NASA thing had featured the 8, the Figure 8 girls from -- or women from NASA. That kind of story, you could have role models, videos, all kinds of things. So, I mean, that was just an idea. And then you can see they have all these downloads. They download information. So anyhow, speaking of downloads -- you can go to the next

slide -- the next slide is -- what people were talking about earlier is -- I think Kelly was talking about it too -- is you really need to have -- you need to see and hear role models that look like you.

And I just -- you know, just yesterday, I was looking at -- I think everybody in this room might have seen this Schoolhouse Rock Bill, which is a popular video with, you know, how do you make a bill, you know, for the patent -- I mean, for the government, and it has over 5,000,000 views. If you look at that video, which that actually is a link, you can see that there's all different type of people in the video. I mean, they're trying to have minorities shown, women shown, all kinds of things in the background. But the other thing I found was Schoolhouse Rock for Patents. And basically that's like some old lady there. She's called the Mother of Necessity. And she's literally in this video, you know, has a problem, and then is asking, you know, what do I do about it, and then it's just a bunch of guys, and it's, you know, a very important inventor side, you know, helping solve the problem.

So basically what the -- and I think the Patent Office could do is actually create videos that would be for different -- you know, avoid the

stereotypes, and be age appropriate for different years. So if you look at the NASA website, they actually have videos for, you know, the 8- to 12-year-olds, and videos for 13- to 16-year-olds, and maybe females, and males. You could have all kinds of different videos, and if you have that concept out there, then people could download it and share it. And I think it's just also -- you know, just super important to see people that look like you that can do something.

I mean, I personally, you know, I was a math major and in high school, I got skipped in math. And I'll never forget the teacher saying to these two girls and this guy, you know, I can't believe we're skipping you in math. I can't believe it, because girls are typically not good in math. This is my sophomore year in high school. It's a very good high school. And I was like what are you talking about? I mean, I have no idea what you're talking about, girls aren't good math. I mean, that was my favorite subject. I mean, luckily I didn't hear that when I was younger, so I just think, you know, that's very important. I mean, just, you know, the whole idea of role models is just -- it's just a huge factor in identifying what you -- you know, what the possibilities might be, and just to avoid kind

of role models on different videos that you might be posting.

I remember when my kids were in like I think it was 1st grade. They had a role model. You know, who is a stranger? And they put up this picture of this like horrible looking guy. You know, is this a stranger? And everybody in the class, just like yeah, that's a stranger. And then you put up this picture of a beautiful white woman, and it's like is this a stranger? And everybody in the class was just like, no, she's not a stranger. So I think that creating downloadable material that isn't contacted, that avoids stereotypes, and also targets early year students, is like, you know, very important. You know, obviously somebody could be older, and think they're going to invent a product, and that's fine. But the probability of planting a seed I think is super important when you're younger.

I mean, I have these two girls, and I don't know if you guys have kids, but I think for the ages from zero to 10, you have more influence over them, you know, than when they are 10, 12, or older, in which case they start listening to their friends a little bit more than their parents. So well, anyway, that's my possibly action number 3. And then number 4, which is

the last one, is if you could please fix the America Invents Act, and because, you know, things have changed lately, and it's been very -- it's had a devastating effect, I think, on individual patent owners, and, you know, currently. So either you get a patent or you don't. You can't get a patent and then have something where it's like six, seven years later, oh, maybe we made a mistake, and then they just take it away.

Just make all patents high quality in the first place, so that's it's important, and then people aren't second guessing. Because the AIA for me, personally, has had a devastating effect on me getting outside investors and funding. I mean, there's an 85 percent clobber rate with the, you know, PTAB. So basically you have a patent, and that's great, but you only have a 15 percent of keeping it, and you have to spend another 450- to prove to keep it. The current cost of a good patent -- I mean, I'm sure people get patents, my dad has one, that nobody has breached it, so that's fine -- but if you want to get a good patent, you have to spend more than 8 to $10 million.

You have to spend a half million dollars, because you have to go through all that as well. And if you're not getting the investors in Silicon Valley, in Europe, Boston, and Boulder, Colorado -- they have

told me this -- that they're not excited about patents since the AIA has come about. And there's another investor also not making investments in this current climate, and is after looking at me, because I do have 10 patents and I'm going to continue them, and I'm going to keep up what I have going on right now, but I do actually -- I'm one of those people that do -- I do have a lot of other ideas, but I'm not going to invent and patent right now unless this gets fixed basically. So basically what I do is I write them down on a piece of paper, and I put them in a drawer.

So anyhow, that's my opinion on the whole PTAB situation. For me, it's like I religiously patent for property rights. It's like let's say you bought a car from General Motors, and you pay for the car, and you get a title, and you get a title, and you pay for it, pay for it, pay for it. You get the car, and then 8 years later, a department in the thing -- group says, we shouldn't have given you car. It doesn't work right, and we made a mistake, and then they take the car back, and they don't even give you your money back.

So anyhow, I just want to thank everybody again for letting me speak. And so your potential ideas, drafted ideas, you know, are kind of like new action items. They really might not cost very much to

help get -- you know, help women, minorities, and veterans get more involved in the process. That's it.

MR. PORCARI: Thank you, Carrie. I greatly appreciate your participation and thank you for that. Do you want us to include your slides in the public record that goes with this hearing?

MR. WILLIAMS: Yeah, that's fine.

MR. PORCARI: Good. And to anyone I forgot to ask, if we have your slides, would they be acceptable if we put those in the public hearing? Just see me. I don't want to put them in the public record, unless you guys were okay with it.

MS. WILLIAMS: Could I just add one last thing?

MR. PORCARI: Sure.

MS. WILLIAMS: Could I just add one last thing?

MR. PORCARI: Absolutely.

MS. WILLIAMS: I really, really, really do like the new director. The new director has made all kinds of positive changes, which a lot of inventors are very excited about. And it was because -- I got a 101 rejection last November, and then he had guidelines that he published, and it was very, very, very helpful, and I just want to appreciate everything he's doing,

and Laura Peter, and, you know, everybody trying to help. So I just wanted to say that.

MR. PORCARI: Thank you for those comments. Thank you. I'll pass those on. And so with that, before we close, I'm going to introduce -- I'm going to reintroduce Andy Toole, but I just wanted to say thank you to everyone for your participation and your energy and your enthusiasm. I came to this job so that I could connect with inventors and the public, and this is why I came to the PTO, and I'm very, very glad that I did. I believe that we will make a difference. We will increase the number of women, minorities, and veterans in our inventor population, and I especially hope that happens in Detroit and throughout the Midwest, because I think we could definitely take advantage of those jobs, and those ideas, and those innovations. And before we go off the record, Andy, do you want to say any last remarks?

DR. TOOLE: Just a couple.

MR. PORCARI: Sure.

DR. TOOLE: Thanks. I don't have a lot to say. Of course, I want to say thank you for all the greats insights, such creativity, and interesting personal stories that I think really will help, and so I really -- I hope to incorporate those. The only

other thing that we did leave time for, if there were individuals that wanted to -- were unscheduled; right? Is that still --

MR. PORCARI: Sure. Unscheduled.

DR. TOOLE: -- is that still --

MR. PORCARI: Yup. We're going to take a short break --

DR. TOOLE: And then we'll do that?

MR. PORCARI: -- and then we'll have a round table where people can share their views and their opinions, and ask questions, and --

DR. TOOLE: Okay. So that'll be -- that will be all off the record?

MR. PORCARI: Yeah.

DR. TOOLE: Okay. Again, thank you so much. That's all I have to say. I've really appreciated all of your comments today. Thank you.

MR. PORCARI: So we're going off the record.

(Off the record at 2:08 p.m.)

(Back on the record at 2:29 p.m.)

MR. PORCARI: Hello. I told people we would start up at 2:30, and we're having a small change of schedule. So why don't you sit there for the next 15 minutes, and then you can sit there? So we're having a little change of schedule. We have a request for our

last speaker. Our last speaker of the day -- this will be on the record, and Jermaine, this is being recorded, and it's being transcribed -- so this is our last speaker that will be part of the SUCCESS Act hearing. And I would like to introduce Darlene McCoy. She is the grandniece -- great-grandniece -- sorry; I've got to get that right -- she is the great-grandniece of our namesake, Elijah J. McCoy, who was a famous Detroit inventor, who I studied when I was in elementary school at Hunter School here in Detroit, and so he was one of the famous inventors that I got to follow when I was going to school. And I'm very, very happy to have Darlene here to talk to us about her experience and her family's experience. That would be terrific. Darlene?

MS. McCOY: Thank you. What an honor! Thank you very much, and I want to thank this office for this opportunity to be a part of this conversation, which is really important. I started out with a question on is this going to be a success because of the conversation, and it will be a success. But my question that I started out with, why should we have our students become interested in becoming inventors after they've majored in math? Well, it could be a he or she, but we want to focus on the young women, especially how they can become disciplined in the areas of the STEM

program. We should nurture them and encourage them that they are someone, and they can develop a mind to think and be creative like anyone else. We should encourage them, encourage that they can learn the meaning of what science can produce within them, and figure out the problem solving schemes. We should encourage them that they have logical skills, and they can do the things that increased their thinking outside of the box.

Everyone here that has spoken today has given us a lesson that we should learn about, you know, you can think beyond the figures, as Henry Ford has brought it out. Now they can give us the figures that we can go and make the money that we need to make from our intellectual properties. I think that's what this little office is all out. How can we produce to keep our country as a nation full of wealth? And as I want to close, in solving the problem, you know, young people are very creative, if we allow them the space. Yeah, they talk back to us. Yeah, they give us a hard time. But if we allow them the space and give them the right tools to think, to listen, to hear their ideas, to hear and use their five senses, they can become great entrepreneurs to build the wealth of our nation. And without that, we wouldn't be a weak nation. We'd

be a wealth of a nation that can work on their strengths. Thank you for this opportunity, and we're looking forward to great things from this office.

MR. PORCARI: And with that, we're going to close this, the third public hearing on the SUCCESS Act. We will put these chairs in a circle, and we will have a round table discussion, but it will be off the record. We won't have it reported. And anything else, Andy?

DR. TOOLE: No.

MR. PORCARI: We're closed.

(Off the record at 2:33 p.m.)

(Back on the record at 2:34 p.m.)

MR. PORCARI: Hello. To anybody online, if someone wants to speak on the record, Jermaine, do you have the ability to receive comments for someone who wants to speak on the record? Okay. So either send Jermaine a note, and he will unmute you. Raise your hand under the Webex. While we have our court reporter here, if there is anybody that would like to speak on the record during this time period, I'm happy to have them. We were going to have this as a -- because multiple people were going to be speaking in this round table, we couldn't have multiple people talking with the court reporter. But right now, anybody who's on

the Webex and wants to speak on the record before we have the court reporter leave us, please let us know, and make that available. Jermaine, is anybody raising their hand? Is it possible for you to show us -- oh, everyone now in the Webex is unmuted, so please identify yourself and let us know if you want to speak on the record where we have it recorded.

MS. GATHMAN: Hello. This is Laurie Gathman. Can you hear me?

MR. PORCARI: We did. It had a small dropout. Could you say your name again?

MS. GATHMAN: Sure. It's Laurie Gathman Kowalsky from Philips.

MR. PORCARI: Oh, hi, Laurie. I'm sorry. I didn't hear you. Can you spell your last name, Laurie?

MS. GATHMAN: Sure. It's Gathman, G-a-t-h-m-a-n.

MR. PORCARI: Okay. And you're with Philips Electronics?

MS. GATHMAN: Yes. It's Philips North America Corporation. It's a subsidiary of Koninklijke Philips, NV.

MR. PORCARI: Go ahead, Laurie. We can hear you fine.

MS. GATHMAN: Okay. Thank you, Director, for

providing me with this opportunity to speak on this very important topic of increasing the participation of women and minorities in the patent process. I'm a principle intellectual property attorney at Philips North America, a subsidiary of Koninklijke Philips, NV, a Dutch corporation. Now, a little bit background on Philips, we are a leading health technology company that generated in 2018 sales of 18 billion Euros, and we employ approximately 77,000 people with sales and services over 100 countries. We have filed over 1100 new patent applications in 2018, with a strong focus on the health technology services and solutions area.

We also participate in many intellectual property industry organizations, including the AIPLA, the IPO, the NYIPLA, and LEF, among others, and we're a strong supporter of diversity and inclusion in all aspects of innovation and practice. The recent study taps on there is a significant gap in the number of patents applied for and obtained by women and minorities. As a large multinational corporation, we understand that patents are a driver of innovation. As a global organization, we embrace diversity in the broadest sense and we recognize the proven benefits of enhanced innovation that will derive from a diverse, inclusive workplace. As part of this culture of

diversity, we understand that having women in leadership roles is critical to narrowing the gender gap, including gender gap in innovation.

Philips has a new bold agenda diversity goal to grow percentages of our women and seniors in leadership to 25 percent by 2020. From a corporate standpoint, we believe that more internal and external leadership opportunities should be available for women and minorities in the patenting industry, to not only provide women and minority role models, as mentioned by others today, but also to provide them a seat at the table to participate in role making and provide input on new initiatives at the patent office and on proposed legislation. This means we believe there should be more board opportunities for women and minorities in some of the IP organizations that provide input to both the USPTO and Congress on innovation. The inputted comments provided by the organization has a multiplying effect, as it typically represents a number of members of that organization, and can be very influential at the USPTO.

It is common for organizations to state the technology areas they represent, but is the question ever asked by the USPTO about diversity on their boards? A diverse board, before signing off on the

letters to the USPTO, perhaps will have at least to state the issues affecting women and minorities. Many organizations will have limited IP committees, but are they really providing women a seat at the decision making table when sending off their letters to Congress and the USPTO? If not, this might be the subject for a yearly survey by the USPTO to some industry organizations, requesting diversity percentages in their organizations, and more importantly, on their boards. Asking such a question at the minimum starts a conversation. As part of procedures of input, the USPTO could ensure that they are aware of the percentage of women and minorities leadership positions and on such boards when receiving such recommendations and considering the input.

A second aspect is that as part of internal processes for ensuring that invention disclosures are received from a more diverse workforce, including women inventors, and that there are no barriers to filing by this workforce. Corporations should start the process by making sure we have women and minority attorneys responsible for obtaining and reviewing patent applications for filing. Having diversity in the decision makers responsible for selecting and filing patent applications in a corporation provides less of a

chance of invention disclosures being tossed based on a conception that women derived invention disclosures are less valuable than invention disclosures for men. This process should continue at the patent office, making sure that the USPTO has a diverse patent examining workforce to help remove barriers to women originated inventor filings. Both of these initiatives should provide a first step improving women and minority participation in the patenting and innovation process. Again, I want to thank you, Director Porcari. I want to thank you for giving me this opportunity to provide input.

MR. PORCARI: Thank you so much, Laurie. That was terrific. Is there anyone else online that would like to speak and go on the record? So just raise a hand on the Webex or send a note, and Jermaine will read it. Paul, did anybody else text you that --

MR. MORINVILLE: No, looks like they did, but now they don't. I don't know.

MR. PORCARI: Okay. So, Jermaine, can you continue to monitor that? And if we do, we'll go back on the record, and -- we'll just go back on the record, if someone walks in in the next hour or so while we're having our little round table. But, Laurie, and everyone else online, please join us, ask questions.

Jermaine, they can hear us on the Webex? Okay. We're going to continue the Webex.

(Proceedings concluded at 2:43 p.m.)

CERTIFICATE OF NOTARY

STATE OF MICHIGAN)
) SS
COUNTY OF WAYNE)

I, MELYNDA JARDINE, certify that I electronically recorded the foregoing proceedings at time and place hereinbefore set forth; that thereafter the same was reduced to computer transcription by myself; and that this is a full, true, complete, and correct transcript of said proceedings.

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MELYNDA JARDINE, CER-7536
Notary Public,
Oakland County, Michigan.
My Commission expires: March 23, 2021

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PUBLIC HEARING ON THE SUCCESS ACT

Monday, June 3rd, 2019

9:00-4:00 p.m. PT

Silicon Valley United States Patent and Trademark Office

West Wing Building of San Jose City Hall

26 South 4th Street

San Jose, California 95113

PUBLIC HEARING ON THE SUCCESS ACT

AGENDA

WELCOMING REMARKS
- John Cabeca, Director of the Silicon Valley United States Patent and Trademark Office
- Julie Clowes, District Director, San Francisco District Office, Small Business Administration

PROGRESS AND POTENTIAL: A PROFILE OF WOMEN INVENTORS ON U.S. PATENTS
- Amanda Myers, Deputy Chief Economist, Office of Policy and International Affairs, USPTO

OVERVIEW OF SUCCESS ACT
- Amanda Myers, Deputy Chief Economist, Office of Policy and International Affairs, USPTO

ROUNDTABLE LOGISTICS
- Amanda Myers, Deputy Chief Economist, Office of Policy and International Affairs, USPTO

PUBLIC TESTIMONY
- Robert F. Granadino, COO, inteliGlas Corporation
- Cecilia Corral, CareMessage
- Stephanie Couch, Executive Director, Lemelson-MIT Program, MIT School of Engineering
- Colleen Chien

BREAK

PUBLIC TESTIMONY
- Sheng Tai (Ted) Tsao, President of STT WebOS, Inc.
- Britten Sessions, Lincoln Law School of San Jose
- Robin Feldman, University of California, Hastings College of the Law

LUNCH

PUBLIC TESTIMONY
- Tina Dorr, Counsel, Cantor Colburn LLP, Secretary, Women in IP Committee, Intellectual Property Owners Association
- Liji Gopalakrishnan, Rambus, Inc.
- Charu S. Kurani, Facebook

CLOSING REMARKS
- John Cabeca, Director of the Silicon Valley USPTO

PROCEEDINGS

MR. CABECA: Good morning, everyone. We're going to go ahead and get started so apologies for the delay, and we'll continue to work out our technical difficulties for those online, but I didn't want to put us any further behind the schedules since we have a tight agenda for today.

First of all, I'd like to welcome all of you to the SUCCESS Act public hearing. I'm John Cabeca. I'm the regional director here for the Silicon Valley USPTO, and it's a pleasure to be here today to discuss how we can expand the innovation ecosystem. Women constitute over half of the U.S. population, and their participation in the general U.S. workforce was almost two-thirds in 2016, yet women's participation in STEM fields and in the intellectual property system lags far behind their male counterparts. In the United States, less than one-quarter of the STEM workforce comprises women, plus half of these women who work in STEM fields leave after 12 years, most within the first five.

The participation of women as inventors named on U.S. patents is even lower. On February 11th, 2019, the USPTO released a report entitled "Progress and Potential: The Profile of Women Inventors on U.S. Patents." And you'll hear a brief overview of that report shortly, and I believe you-all have copies for those

of you sitting here around the room.

What you'll find is the study showed that, although the number of patents with at least one woman inventor increased from about 7 percent in the 1980s to 21 percent in 2016, but despite that, with the total pool of inventors in the U.S., women inventors still comprise only 12 percent of all inventors on patents granted in 2016.

The purpose of today's hearing is because we all realize that we can and should do better. If we are to maintain our technological leadership, the United States cannot continue to compete with so much talent left untapped. In order to unleash this talent, industry, academia, and government must work together to address these issues and drive towards real progress. We, at the USPTO, are committed to making opportunities for innovation available to everyone.

A recent Harvard study found that increasing innovation rates among women, minorities, and children from low-income families could quadruple the rate of U.S. innovation. Clearly, unleashing this untapped potential holds tremendous benefit for all Americans.

The Trump Administration and Congress have recognized this critical issue and the need for action. On October 31st,

2018, President Trump signed into law the Study of Underrepresented Classes Chasing Engineering and Science, SUCCESS Act of 2018 -- which is known as the SUCCESS Act. The SUCCESS Act requires the USPTO director, in consultation with the U.S. Small Business Administration, to provide Congress with a report on publicly available patent data regarding the representation of women, minorities, and veterans, along with legislative recommendations.

These recommendations should be provided on how to promote the participation of women, minorities, and veterans in entrepreneurial activities, and it should also suggest how to increase the number of women, minorities, and veterans who apply for and obtain U.S. patents.

In accordance with the SUCCESS Act, the USPTO has taken steps to gather information on the participation of women, minorities, and veterans in patent and entrepreneurialship activities, and today's hearing, in partnership with the SBA, is one of such efforts. Everyone -- individuals, businesses, and non-profit organizations -- can contribute valuable information and offer productive recommendations. This helps to stimulate entrepreneurialship and use of the patent system by these underrepresented groups. Today's hearing is the second of three

public hearings that the USPTO is holding throughout the country to obtain comment in support of the SUCCESS Act study. The first hearing was held at USPTO's headquarters on May 8th in Alexandria, Virginia, today is our second, and the third hearing will be in our other regional office in Detroit on June 18th. Is that right?

At each of these hearings, we welcome representatives from industry, law, and academia to present oral testimony on the participation of women, minorities, and veterans in entrepreneurialship impact activities. We value your insight and recommendations regarding efforts to increase the patents, applied for and obtained by women, minorities, and veterans regarding public policies or other initiatives to promote the participation of such underrepresented groups in the patent system and entrepreneurial activities and regarding the role that the USPTO should play in addressing these important matters.

So thank you very much for your participation today. We look forward to hearing everyone's views. And with that, it's my great pleasure to now turn the mic over to Julie Clowes, who is the SBA, Small Business Administration, district director for the San Francisco Small Business Administration. Is that right?

MS. CLOWES: Sure.

MR. CABECA: All right. Thank you.

MS. CLOWES: Good morning, everyone. Thank you, John, and thank you to the USPTO for hosting this hearing. Obviously, as SBA, we are the agency charged with assisting small businesses, and we do that in a variety of means, whether it's through financial assistance, whether it's through free business counseling and training and access to government contracts.

So I think with getting information from the community is really important and critical to make sure that we are providing and using our tools to create tools for you-all and for everyone to access the entrepreneurial system. There's a lot of resources, especially here in the Bay Area, and I am really interested to hear what some of the challenges are from your perspectives to see if we can channel those resources then to provide additional support and make sure everyone has got access to that support to be successful, to be innovative, and to be the next, you know, job creators in our economy.

So I really thank you, again, to PTO. I really am looking forward to hearing all of your comments and seeing what we can start implementing right away and then what the recommendations might be moving forward for, you know, new legislation or new programming that will benefit everybody.

So I appreciate your time and energy, and, again, I look

forward to your comments and perhaps working with some of your organizations as we move forward, so thank you.

MR. CABECA: Thank you.

MS. MYERS: Hello. My name is Amanda Myers. I am the deputy chief economist at the U.S. Patent and Trademark Office, and I am here to present -- if I can get my slides to work --

MR. CABECA: Try pointing that way.

MS. MYERS: I apologize. Technical difficulties. I am going to cut my remarks quite a bit just so we can stay on time with the public testimony.

ALAN: Do you want me to go ahead and share that screen right now?

MR. CABECA: Yes.

ALAN: All right. I just have to focus on that and then I can share the screens.

MS. MYERS: I'm okay.

MR. CABECA: Okay. Go ahead.

MS. MYERS: Well, hold on. All right. Let me get started.

I'm here today to present an overview of the report that John referenced entitled "Progress and Potential: A Profile of Women Inventors on U.S. Patents." This is a report that the USPTO

released in February. As I said, in the interest of time, I'm going to go through this pretty quickly and see if there were a few slides, just to catch us back up.

But just a quick on motivation and objectives in the report, we know that, historically and currently, women comprises a small minority of patent inventors, and this represents a significant untapped innovative talent that is untapped potential that may spur innovation and drive economic growth. And as John referenced, an interesting report out of Harvard that suggests that harnessing these very intelligent women and children of different racial minorities really could bring about economic growth and spur a lot of innovation outside of what we currently have.

And so we developed this report entitled "Progress and Potential: A Profile of Women Inventors on U.S. Patents" in order to study what we know about women inventors in the United States over a 40-year period. We really understand where they're patenting and on the trends that we're seeing over time.

And I'm going to skip through this part just in the interest of time and go straight to some of our findings.

So this is 40-year trends in women on U.S. patents. These are the women that are named as inventors on U.S. patents.

There are three different trend lines that we're showing. The purple line is the share of patents with at least one woman inventor on the patent teams, the share of patents that have a female as the sole inventor or part of an inventor team.

The green line is what we call the women inventor rate. This is actually the share of inventors that are named on patents that are women. And these -- and the yellow line is what we do -- is called the women share of total patenting. If there's multiple inventors on the team, we include the patent equally to each inventor on the team.

But I'm going to focus us on the first two lines. So the purple line is a figure that we see a lot and we have seen previously in other statistics and other reports that talks about women's increasing participation on patents. We see, over time, there has been some progress with women on 5 percent of patents in the early '80s, up to now, 22 percent of patents having at least one woman on the inventor team in 2018.

What we're seeing less of is that women are actually making up or comprising the inventor population at that rate. So the green line shows what portion of inventors, as unique inventors, that are women. And what we see is that that line had grown over time to about 2,000, where it settled at about 10

percent. And since then, we have only seen a little bit of progress.

In 2016, only 12 percent of inventors on patents were women. And so while we're seeing upward growth over time, we're actually seeing much slower growth in the last 15 years in all of these indicators than we have in the prior 30. These are just trends that we are showing that we have some progress, but it has slowed in recent years and suggest that more can be done.

Lost control of my sights. Okay.

MR. CABECA: Sorry about that.

MS. MYERS: We know that many factors contribute to the ability and propensity of women and others to become inventors, and one of those is clearly your occupational and educational choice. The vast majority of patent inventors are in the science and engineering fields, and if women are less represented in those fields, we would expect them to be less represented as patent inventors as well.

So, in the report, we actually compare the share of patent inventors that are women with the share of women that are in science and engineering occupations. These are occupation rates for females based off of national survey data from the National Science Foundation. And so what you see is that, across

various sciences in engineering disciplines, women are participating at a much higher rate than they are patenting. For example, the top purple line, which is biological and by scientist, women now comprise almost half of the scientists in those fields. However, when we look at patenting in those areas -- pharmaceuticals and biotech -- women are still only about 25 percent of inventors.

And so the green line is still that same women inventor rate from the prior slide, but this is just to show that we are seeing women in these fields and pursuing these careers but not patenting at the same propensity that we see them in those occupations.

And this is the top 20 states. This is the share of women inventors based off of where they reside when the patent was granted. We see the highest rates among Delaware, District of Columbia, New Jersey, and Maryland. These are areas where actually women are just more prevalent in the workforce generally. They tend to be higher female participation rates overall in the workforce.

They also tend to be characterized by a lot of public sector and academic activity, which -- where women are also more prevalent in terms of patents.

And this is a look at where women are patenting by technology sector. This is based off of the technology that we observed in the patent. And this is a 40-year picture. You see each decade over time. What we see over time is that women tend to be in certain areas, and that's where also we see the most progress. Women comprise about just over 5 percent of patents in chemistry in the late '70s, early '80s, and in the last decade, they're actually at about 18 percent of patents that are granted -- 18 percent of inventors with patents granted in chemistry.

We also see a lot of progress in design patents, which will be included in this report. Where we're seeing much less progress really is in the chemical and engineering. That's not entirely surprising. There are many fewer women in mechanical engineering, so it's not surprising that we are seeing them appear as inventors on fewer patents in those technology areas.

But, overall, what we see is women specializing in technology fields and sectors where their predecessors have patented in the past, not entering these male-dominated areas.

ARMANDO: You know what, I'm going to (indiscernible.)

MS. MYERS: A lot of technical difficulties. Just going to keep going, just in the interest of time.

In the report, we actually profile some of the top patent holders in the country, and we look at the share of women in their inventor populations. And this is very small, so you may not be able to see it. But at the top is Proctor & Gamble, Bristol-Myers Squibb, and Abbott Technologies -- I mean, Abbott Laboratories. These are all pharmaceutical, biotech companies where women do tend to be more prevalent, and we are seeing more participation.

And I'm going to do one more slide and then just go to overview of our key findings. When we go back and look at the share of patents with at least one woman inventor on the patent team, we see that most of that progress is really driven by gender-mixed teams. All women teams or just single female inventors continue to comprise only about 3 percent of the patents, and that's been consistent over time pretty much for the last four decades. So all of the participation improvement we have seen over time has been women participating on teams, and what we see is those teams are actually growing in size. Women are on larger and larger teams.

Skip that one.

So let me just quickly run through the findings in the report. Women continue to comprise a small minority of patent

inventors accounting for only 12 percent of all inventors on patents granted in 2016. Gains in female participation in science and engineering applications and entrepreneurship, which we don't show but is also the case, are not leading to broad increases in female patent inventors.

Technology-intensive states and those where women comprise a large percentage of the state's overall workforce show higher rates of women inventors. Women inventors are increasingly concentrating on specific technologies, suggesting that women are specializing in areas where female predecessors have traditionally patented.

Businesses have the lowest women inventor rates among the various categories of U.S. patent owners. Business rates tend to be much lower than academics -- academia as well as public research institutes for government-funded patents.

Women are increasingly likely to patent on large, gender-mixed inventor teams, highlighting the growing reports of understanding the relationship between gender and innovative collaboration.

So that is an overview of our report. I have handed out copies. I encourage you to look through it for more detail. And now, I'm going to switch over and discuss -- spend a few minutes

reviewing key parts of the SUCCESS Act, which is the reason we are all here today.

The SUCCESS Act -- this is a tongue twister. The SUCCESS Act was signed into law by President Trump on October 31st, 2018. It provides for a period of one year in which the USPTO is to develop and deliver to Congress a study on the participation of women, minorities, and veterans in patenting and entrepreneurial activities.

And let me highlight some of the key requirements of the study, as they are stated in the legislation. The study is to identify publicly available data on the number of patents annually applied for and obtained by women, minorities, and veterans. Per this provision, we are seeking to identify publically available -- that is, non-proprietary -- information that will allow us to characterize the participation of women, minorities, and veterans among the patent inventor population.

The study is also to identify the benefits of increasing the number of patents applied for and obtained by women, minorities, and veterans, as well as the companies that such individuals own and manage. Here, we are aiming to document the benefits, those economic, technological, and societal of attracting more women, minorities, and veterans to innovative

activity.

And, lastly, the study is to provide legislative recommendations regarding how to promote the participation of women by using veterans and entrepreneurial activities and patenting, particularly increasing the number of patents applied for and obtained by these underrepresentative groups. We are interested in documenting public policies and other initiatives intended to engender real change and effectively expand the innovation ecosystem to include more women, minorities, and veterans.

With these requirements in mind, we have developed and began fulfilling a SUCCESS Act implementation plan. We are consulting with the Small Business Administration as well as the U.S. Treasury Department and Department of Defense to compile richer information on underrepresentative groups among patent inventors. We issued a federal registry notice, commencing a two-month public comment period to compile information directly from individuals, companies, associations, and others.

In that federal registry notice, we posed 11 questions that are to provide a preliminary guide to aid the USPTO in collecting relevant information and to evaluate possible administrative and legislative recommendations that may be

provided to Congress. These questions, which I'm just going to read a few of them, include: What social and private benefits would you identify as resulting from increasing the number of patents applied for and obtained by women, minorities, and veterans? Should the USPTO collect demographic information on patent inventors at the time of patent application and why? What entities or institutions, if any, should or should not play an active role in promoting the participation of women, minorities, and veterans in the patent system and entrepreneurial activities? What public policies, if any, should the federal government explore in order to promote the participation of women, minorities, and veterans in the patent system and entrepreneurial activities? And what action should the USPTO take to address the participation of women, minorities, and veterans in the patent system and entrepreneurial activities?

During this two-month public comment period, we are holding three public hearings across the country to provide the public with the opportunity to speak publicly on crucial questions raised by the SUCCESS Act. Our objective at these hearings is to listen and collect as much information as possible from the public. Today's testimony will be recorded and transcribed and included in the official record for the SUCCESS Act. We will

convene our final public hearing on June 18th, as John mentioned, at our regional office in Detroit. We encourage interested parties in the Midwest region to participate in that hearing.

We also acknowledge that not everyone wishing to provide insights and recommendations relevant to the SUCCESS Act will be able to participate at one of these hearings, whether due to their locations or other constraints. Consequently, we will be accepting written testimony submitted via email until the comment period closes on June 30th, 2019. We urge those unable to speak at one of our hearings to contribute to the study by submitting written testimony.

All of the information gathered today and throughout the public comment period will be reviewed and incorporated into the materials we put together in response to the SUCCESS Act. The USPTO director and deputy director will be actively involved in this process as expanding the innovation ecosystem is a critical priority to the USPTO and our leadership.

Turning now to some logistics for today's hearing, myself, or Regional Director John Cabeca, will introduce each individual scheduled to testify according to the agenda. Each individual has previously indicated the duration of time they wish to speak. A clock is provided over here to my left to indicate to

speakers when that time has concluded. We ask that each speaker stick to their requested speaking times as much as possible to be respectful of the time and schedules of subsequent speakers.

After all scheduled testimony concludes this afternoon, there will be an open floor period for unscheduled testimony. Any speakers wishing to speak during their scheduled -- I'm sorry, wishing to speak beyond their scheduled time are welcome to come forward again during this open floor period.

We will have two sessions of scheduled testimony this morning with a break in between. We will then break for lunch and reconvene for a third session of scheduled testimony starting at 1 p.m.

With that, I'm going to ask John to come back and introduce our first -- any other logistics and introduce our first speakers. Thank you.

MR. CABECA: Thanks, Amanda.

So I just wanted to echo Amanda's comments with respect to today's logistics and add a couple more. One that may be of great importance is where are the bathrooms. So if you go through the door in the back and then continue straight around the guard's desk and exit out of that door, they will give you a badge with which you will need to get back in to enter through the side

entrance there; otherwise, you'll have to walk all the way around, and you don't want to do that.

With respect to the logistics for the hearing, again, I just want to thank you-all in advance for your assistance with helping us stay on schedule -- and thank you, Amanda, for getting us back on schedule -- and, also, to ask that you stay on topic. I think that today's topic is of such great importance that we look forward to hearing all of the views from the community on ways that we can improve the level of engagement and activities that we have with women, minorities, and veterans in the entrepreneurial-impacting space.

So just, again, ask that you try to keep your remarks to that topic. And also, Amanda mentioned the timer, so when we're about one minute -- in order to help us keep on schedule, when we're about one minute left from your scheduled time, we will chime in and give you a notice, just so you have a heads-up that you have a minute left, and if needed, to wrap up any final comments you would like to make. And, again, thank you for all of your help with that.

So the last thing I wanted to add is we also will not be taking Q and A throughout the event today, so, on the scheduled testimony, it will be made of record. We have a recorder here

that is tracking all of the testimony for the USPTO and the SBA to help them in developing a report.

So, as a result, we won't be taking Q and A, but if there is any comments that you would like to make, then we do kindly ask that you wait until the open sessions at the end of the day.

With that, I would like to go ahead and start our hearing and introduce our first speaker. The first speaker is Robert Gran- --

MR. GRANADINO: Granadino.

MR. CABECA: -- Granadino -- thank you, Robert -- who is the chief operating officer at inteliGlas Corporation. Robert.

MR. GRANADINO: Thank you. All right. Thank you, Director Cabeca, Directors Clowes, and Ms. Myers.

Ladies and gentlemen, my name is Robert Granadino. I'm the COO of InteliGlas Corporation, which is the world's leading artificial smart building platform in the world. Today, I'm really here speaking about my history with patents in my previous life. My background includes -- I have a BA from UC Berkeley in political science, and I'm a nine-time U.S. patent grant recipient as well. Back in May of 1992, my partner and I came up with a -- what we thought was a pretty good idea, and we developed the

popular standard for the ergonomic computer keyboard, which was licensed to the industry. We did that back in 1992.

My background, I think for today's discussion, how I fall in line is really I'm an independent inventor. I'm also a minority. My father was Mexican-American, veteran of World War II, had a background in the -- as an industrial designer in the Gemini, Mercury, Apollo, B-1 bomber program, working at North American Rockwell.

But today, really, I'm here to be a bit critical. All right? Because I bring 20 years of experience with our patents, defending our patent portfolio against some very large infringers, and it can be quite brutal out there. So I have got some ideas, I have got some criticisms, and I have got some recommendations for the USPTO. So I'm going to speak from that level.

Basically, I want to touch on five or six different areas. One is the imbalance in the disadvantage that independent inventors have. Women, minorities, veterans, they all fall into the same category if you're an independent inventor in the industry, the way it's currently set up to date. U.S. patents can be weaponized against independent inventors, that means women, men, you know, all sorts of minorities and veterans that, you know, come in to play here.

You also, as an independent inventor, from my perspective, deal with innate corruption in the system, whether it's with attorneys representing you or the other side, judges, even examiners potentially. I wish I had more time, I could speak to a lot of that, but I'll get into a bit of it.

And then I also want to touch on safeguards, safeguards that can be put in place, but without these safeguards, I don't think that asking women, minorities, independent inventors, veterans to get involved in the patent process makes a lot of sense because it can be, you know, very risky financially to go down this road. You know, part of it is the excitement, of course, of inventing, but the other part of it is really defending your invention when it's infringed, and that could be quite a daunting process.

So I do want to begin by saying something striking here which, in my opinion, I think U.S. patents from the United States Government is a terrible product, and I'll tell you, you know, part of the reason that this is, you know, not a good product is that there is an issue with validity -- a validity process that happens in the courts after a patent is issued that can really take it down, you know, a very difficult path as an independent inventor.

So let me talk a little bit about that imbalance here. As an independent inventor, as you, you know, are getting your first patents and apply to the marketplace, if an infringer comes along, you're required to stand up against that infringer if you think he's infringing your patent, and part of that process is to simply obtain legal counsel and notify the infringer that they're infringing on the patent. That can simply lead to predictable outcomes, which is, in part, a validity claim that's typical in the process where engaging with an infringer, typically what will happen is that the other side will say that a patent is invalid, it shouldn't have been issued. And this whole process that occurs here with these typical validity challenges can go on for years, and without adequate funding from an independent inventor, you really don't have much of a chance standing up against some of these big dogs in the marketplace.

And what I mean by that is simply that the typical strategy of a large infringer will be to run the independent inventor out of money. So the landscape basically that you're going into is just that. You're looking at years, hundreds of thousands, millions of dollars -- I see a gentleman laughing in the background; maybe it is that he understands what I'm talking about.

But this invalidity aspect is part of the Achilles heel of the patent system in obtaining a patent, and I think that that's, you know, from my personal point of view, unnecessary, sort of ridiculous. These patent invalidity actions through the statistics wind up to be 9 percent successful. That means, 91 percent of the patents are valid, but in these invalidity challenges, you could wind up in court, having a judge re-examine the entirety of the scope of the patent itself.

And, typically, this is what the attorneys, as well as judges will say. They'll say, Well, we have to go back to the very beginning of your patent. We have to examine everything within that patent to see if it was even valid. Of course the defense is going to be saying that it's not valid, there's plenty of prior art out there, and so on and so forth. So this strategy can really drain the funds of an independent inventor quite handily, and that is the strategy.

So this is also -- I just want to sort of lay into or describe a little bit about the high risk that is involved in defending your patent. So it may sound, you know, fairly flaccid at this point in time. Okay, so you have to deal with some attorneys that claim that there's, you know, not validity within the patent itself.

And then, you know, after you get through all of that process, which can be years, then you wind up talking about the infringement. And typically, the judges and the defendants will say that and recognize that, that you're not going to get around talking about the infringement question until you get through the invalidity question. And that invalidity question can exist at court and it can also be thrown back to the USPTO. It can be thrown back into it under a re-examination. So the threat to the independent inventor during this process is that they're going to lose the patent, and during this process of, you know, negotiation with the infringer, the infringer is basically saying we're going to take your patent away, and then you're going to wind up with nothing. All right? So how about if we cut a deal on pennies on the dollar and you walk away from this?

That's difficult, right, especially if you put a lot of time and effort, research and development, and you believe in your patent, you know that it's infringing, but you have questions. You don't know what you don't know. You don't know where the prior art was. You know that it was examined by the USPTO and that you had to go through a pretty rigorous program to get yourself to this point, and now you're having it all questioned once again.

And then the dirty side of it is that, if you withstand all of those challenges and you get through the -- get up through the question of infringement, then you're dealing with the potential of losing the case. And if you lose the case -- and this is what has happened to my partner and I -- the threats of holding us liable for attorney's fees and costs are real, especially when you're dealing with millions of dollars.

A friend of mine had a water balloon patent that just recently settled out, and reportedly -- I think it was the "L.A. Times" or the "New York Times" reported on this -- the defendants in this case spent $20 million in outside legal fees for attorneys. And this is relatively, you know, a small-type product. The revenues reportedly from the company for the water balloons was $100 million a year. And from the perspective of the inventor, that's his money being used against him in this case.

So what I want to say is that, at the end of this, there are even defenses that will threaten to pierce the veil, if you have a corporate LLC, to pierce the -- threaten to pierce the liability -- limited liability aspects of it and go after the inventor personally.

So how does that happen? Well, it happens that, if you drain your funds and fighting and defending your patent and your

LLC doesn't have any funds left, the defense attorneys will turn and say, "Well, somebody's got to pay the defense fees here," and they have got a defunct LLC, so they'll attempt to go after you individually by piercing the veil.

So these are some of the tactics that go on. So when we take a look at getting minorities, women, veterans, typically, I think we think of that as independent inventors. We're not talking necessarily here -- at least just my interpretation -- that we're not talking about corporate invention. I mean, certainly, it's noble to get, you know, folks in a corporate environment who are in this class to participate in patents, but, you know, that's -- to put it in the vernacular -- not where the money is. Right? It's a pat on the back and maybe a small bonus, but it's not -- you know, it's been my experience, working at some of the very large corporations, that they don't have programs to really reward inventors.

So we're really talking about independent inventors. And in order to make it worthwhile under the first -- under this construct, you have to talk about very big dollars. You know, the type of dollars that we were talking about in our cases were tens of millions of dollars, in excess of $50 million. And it would only make sense because, at the end of the day, if you win, you

know, you win something below that amount, well, the first cut goes -- if you're in a contingency with your attorneys, the first cut goes to your attorneys. The second cut goes to paying all those expenses of experts and court fees and everything else that go along with it. And then, after that, that's where you get your cut. So the dollars have to be big because the risks are very sizable.

So with two minutes left here, I have some recommendations. All right? And, you know, I know that these recommendations may run in the face of, you know, the going standard, but I would say, if you want to get -- if USPTO wants to get independent inventors involved -- women, minorities, veterans -- you're going to have to take a look at this validity process. In my opinion, you know, anything that's fair during the examination process of a patent, all the way up to the point that it is issued, but the patents don't have any teeth currently. So if you take a patent out, you know, the other side simply laughs at you now because everything has to be re-examined once again.

So I would recommend that statutes be crafted to end the validity issue prior to the issuance of the patent itself. So anything that -- any challenges that want to be made during that -- and up to the point of the issuance of the patent would be

gained. Anything after that, you can't talk about, you can't raise issues or make claims about invalidity at court or, you know, re-examination or anything else post issuance.

Now, what would that do? That would simply, you know, take, in large part, this phony argument -- again, only 9 percent are successful, so that means 91 percent of the patents issued are valid. It would take this weaponizing of the legal funds to get that out of the way and then go straight to the infringement question. And that's the important thing is talking about whether or not this product in the marketplace infringes your product and have an instrument in the patent itself that has some real weight behind it and some real teeth; that if an infringer decides to infringe your patent, they're not laughing at you, that they're actually quite concerned.

So with that, I'll come back.

MR. CABECA: Thank you, Robert.

MS. MYERS: And now we'd like to invite Cecilia Corral -- Corral?

MS. CORRAL: Corral.

MS. MYERS: Corral. Cecilia is the co-founder and VP of product at -- CareMassage or CareMessage?

MS. CORRAL: CareMessage.

Thank you all so much for having me here today, and thank you for the U.S. Patent and Trademark Office for just providing this forum for us to share our thoughts on how to get more women, minorities, and veterans involved. I noted the call for the commentary also posed a few questions surrounding entrepreneurship, so I wanted to take today to talk about my path both as an entrepreneur, as an inventor, that sits at the intersection of gender and race, but I also want to place a special focus on the important issue of socioeconomic status. I think the intersection of these characteristics place people from underrepresented backgrounds at a higher disadvantage than more affluent individuals, even when they both identify as women or minorities.

So I'll take today to highlight a number of my personal challenges and the opportunities available to people like me the in K through 12 education, higher education, and in the tech industry in hopes that it can spark some ideas and ways we can better support women, minorities, and veterans throughout their journey.

So my name is Cecilia Corral. I'm the co-founder and VP of a product at CareMessage. We're a healthcare technology non-profit that helps connect underserved patients with healthcare

organizations using text messaging. My family came to the United States from Mexico when I was one year old with nothing other than the clothes on our back, and I grew up in the Rio Grande valley of Texas. We relied very heavily on food stamps and medicaid to make ends meet. My parents sold goods at a local flea market.

Over 90 percent of my community lived in poverty, and no one I knew had gone to college. When I was in high school, I looked around and I realized that I wanted a better future, and my parents encouraged me to continue striving for more. So in my junior year of high school, I became a guinea pig for a new program aimed at helping high school students obtain an associate's degree in engineering before their high school graduation. This program played a pivotal role in my acceptance to Stanford University, where I went on to obtain a bachelor's degree in product design engineering.

So when thinking about how educational opportunities enable someone from the minority group to pursue entrepreneurial activities, I encourage you to look at early college high schools and dual-enrollment programs. These programs in South Texas led a partnership between local school districts in South Texas College have provided a bridge for students from low social economic backgrounds that would have never been able to afford going to

college. And I think the seed needs to be planted in our K through 12 education to show students very early on that they have options available.

So after graduating from Stanford University, I made my way back to Texas to study chemical engineering at the University of Texas at Austin; however, I was the only woman and the only Latin-mixed person in my classes, and I had a really hard time making my ideas be heard by my classmates. During a class project, we were tasked with creating an assistive device that could help children and adults with mobility issues fold laundry. My innovative idea was to take what I have learned from my brother and my sister's experience in the military to roll laundry instead of folding it. I designed and built a device that was sturdy enough to roll all types of laundry, from clothing to bed sheets. At the time, we considered filing a patent because no such device existed, but when we started to talk details, it was very clear to me that my original idea was being appropriated by the male team members, and I had no support from male faculty to ensure my contributions were not pushed aside.

My male advisor then told me "boys will be boys" when I tried to advocate for myself and the fact that my male peers have taken my ideas and marketing them as their own. So, at the end of

the day, I killed the idea of filing a patent because if I wasn't going to be first inventor, it felt worthless.

Microaggressions are sadly a regular occurrence for women and minorities in academia and the workforce. I believe educational institutions, like the University of Texas at Austin, should be held accountable for the environment they create, where women and minorities do not feel welcomed. I encourage you to think about a reporting process that would allow inventors to report privately or provide proof of being first inventor in situations where sexism or racism is preventing them from filing a patent.

So after being frustrated by my experiences in graduate school, I decided to drop out and co-found CareMessage. At the time, I really felt like I had nothing left to lose, that I didn't know well enough the challenges that came with entrepreneurship to be discouraged. So one thing I did learn very early on was I was going to continue to be the only woman in the room.

It's no surprise that the tech industry in the United States is the problem with women and a bigger problem with minority women. In 2013, Tracy Chow bravely forced the industry, who acknowledged it had a problem with higher and retaining female engineers, by simply gathering data. Over the years since, we

have seen little to no movement from large technology organizations like Google, Facebook, and Microsoft. All of them have less than 50 percent women and Latin-mixed employees in the single digits.

I believe this needs to change and technology companies should be penalized for not showing improvements at diversifying their workforce, particularly in critical areas of product design and technology. By excluding women and minorities, they have limited these populations' ability to generational wealth and participate in the creation of novel ideas.

On the venture capital side, the progress is equally weak. According to Crunchbase, 17 percent of venture funding is funded to companies with at least one female founder, in contrast with 83 percent to only male founders. Most of the excuses from the venture capital world and the tech industry are the same; that we women Latinos simply do not exist, so we can't be hired or funded.

In 2018, I decided that I have heard enough excuses, and I set out to find Latino founders myself. So over the course of a few weeks, I was able to identify 50 Latino founders and have raised over a million dollars in funding. This year, my list reached 100.

So let me be clear, these women have been here all along, but for some reason, they were never given the same level of disability or funding as other founders. What I learned from collecting this data is that it's helpful to shine light on the problem and showcase founders as a way to aspire others to see these challenges can be overcome.

Lastly, tomorrow, I will issue my first patent, Patent 10,311,535, on the use of text messaging for health coaching. CareMessage is a non-profit organization, and although a number of our competitors in large organizations are infringing on our patent, we had actively decided not to defend it mainly for two reasons. Number one, in the tech industry, when a small company tries to defend the work, it's labeled as a patent troll, and this is something that does not align with the values of our company.

And, two, since we know the process to defend patents is broken, we think it would be a waste of our limited resources to get ourselves into litigation with companies that are much larger and better resourced. We are very proud of our innovative work, but sadly, are currently patent system turns these innovations into something we can only showcase and talk about, not enforce.

I hope my story helps shed some light into the multiple barriers that prevent women and minorities for participating in

the patent and entrepreneurship ecosystem. There's value in having data about this problem at different stages to be able to force the necessary conversations of social justice issues that have plagued this country for centuries. We're a melting pot of people that we are here before and came from across the world, and I think it's our duty as a nation to boast freedom and opportunity to ensure that all people have the same opportunities to build the innovations of tomorrow.

So, in summary, I have five summarized recommendations. The first is to fund education programs that provide opportunities for low-income students to find their path into STEM fields while in K through 12. These programs provide students with the confidence and skills they need to succeed, and I think they play a key part in helping people from underrepresented backgrounds and poverty.

The second is to provide a way for inventors that lack the resources to file their patents and defend their work. Unwelcoming environments in academia and the workforce are pushing women, veterans, and minorities out. For people that come from low socioeconomic backgrounds, the constant lack of resources is likely a reason why patents are not filed in the first place.

The third is to hold the tech and the venture capital

industry accountable for the demographic background of their workforce and leadership positions. This should apply to everyone from small 10-person start-ups to multinational corporations where they're putting their money and their resources directly impacting (indiscernible) to invest in innovation.

The fourth is to gather data on patents filed by women, minorities, and veterans. This is critical for accountability and to measure progress. And I think, when gathering this data, ask people to self-identify instead of making assumptions. Latinos come in many different forms because we are a mixture of backgrounds. You can't simply go off of someone's name or skin color. Being asked to self-identify is not intrusive as long as you are clear about why you're asking for this information, provide an option to opt out, and you don't use this data to evaluate if a patent is issued.

The fitness to provide disability to those of us who are already here, because you can't be what you can't see. Like with the tech industry and the venture capital world, my guess is that you will have a lot of women and minorities like myself that have been awarded patents or in the process of being rewarded one. I recommend that you invest in marketing campaigns that share those stories throughout the right channels so we can inspire other

inventors.

So, in closing, I think patents are a mark of innovation, but without enforcement from our government, they will continue to be generated only by those that already have the means to do so. Along the way, women, veterans, and minorities face multiple challenges that deter them from entering the entrepreneurship ecosystem. We need baseline data to understand how big this problem is, and we need measurable strategies and results to ensure we provide equal opportunities for women, minorities, and veterans to participate in creating the innovations of tomorrow. I think that by increasing the number of women, minorities, and veterans that participate in the entrepreneurship and patent system, you will enable the people from these communities to solve the critical problems that are important to them and the people that are like them.

For me, that innovation has meant helping underserved patients to improve their health using mobile technology. Thank you.

MR. CABECA: Thank you very much. We'd like to introduce our next testimony, and that will be delivered by Stephanie Couch, who is the executive director for the Lemelson-MIT program at the MIT School of Engineering. Stephanie.

MS. COUCH: Thank you. I am an education researcher who has been, for the last three years, trying to understand what is the pathway of an inventor. And so I will lead you to a copy of a new publication that just came out, special issue from the National Academy of Inventors; it has a number of different articles on invention education as well as a detailed answer to some of the questions that you raise in 15 minutes, but I don't think we can touch on everything, so I'm just going to just highlight a few things.

First of all, our program, the Lemelson-MIT program, has been trying to inspire young people across the nation to pursue creative and inventive lives for 25 years. One of the ways we do that is we give a $500,000 prize each year to a mid-career inventor who has done something significant in the world in order to have someone to raise them as a source of inspiration.

We also search the nation and give prizes to college teens that have created inventions and graduate students who have also -- engender the spirit of creativity and inventiveness, and we give those awards to the students in four categories: Cure it, use it, eat it, and drive it.

And so when I look at the students who won the prizes and what they have invented, I think there's a lot of good data

there, as well as those who have applied for those prizes, to look at what are the possibilities if we had more diversity in the patent pool. We can look at what things have been created and brought forward. But we have not analyzed that data in that regard yet but we could.

But I have been working to analyze information from the invention education programs we have offered with high school students and middle school students for the past 15 years, and today, I want to talk more about what we have learned about the development of inventors in the high school years. We have worked with 450 high school teachers, provided them with professional development, and then we have provided grants to 243 high school teachers and teams of students -- there have been 2,750 students participating over the past 15 years in 43 states, and the most grants have been awarded in California, Massachusetts, Florida, New York, Oregon, Texas, New Jersey, and Virginia, and eight of the high school teams have received patents for their work.

So a number of the questions that you have raised for this hearing can be answered through the research we have been doing on the work with the teachers and the high school students. Question 6 asks about the educational and professional circumstances that affect the ability of women, minorities, and

veterans to apply for patents or to pursue entrepreneurial activities.

Based on our experience, we think that the opportunity for young people to learn to invent is especially helpful if it is in a team-based format with differentiated roles. A lot of times, the young women who come to these teams come because they're going to be the team leader, they're going to be the communications person, the project manager, and along the way, they discover their skills and capabilities in the STEM areas, and at the end of this year-long experience that they have, we can see that their interest, their confidence, their desire to persist in STEM college and career pathways falls out from that team-based experience.

I think if we ask them, you know, do you personally want to come invent a solution to a problem, they would, maybe in the beginning, wouldn't feel the confidence, but by the end, these young women that were interviewed would say, Oh, heck yeah, I'm an inventor, and here's what I'm going to invent next. And so we see the power of the experience.

Question 7 asked about the socioeconomic factors that facilitate or hinder the ability of women and underrepresented students. And, you know, again, we have end-of-year experience

data from 15 teams a year for 15 years, but recently, we have been doing case studies and I have looked at three young women, three young men, and I have compared what we can get out of our ethnographic interviews. And what we see is that the young men have had a lot of experiences, all the way from back in kindergarten in after-school programs like robotics, they have someone in their home who has been talking to this from an early age. A lot of times, these ways of inventors are passed down through families. We see them participating in experiences and in school, whereas the young women who are coming into these teams and having these experiences, this is the first time. And so that dovetails with, when we bifurcate our end-of-the-year experience data why young women and students from underrepresented backgrounds are rating much higher than the others what they have gotten from this year-long experience because they have not had it at all through their years of schooling. And so it really speaks to the comment of a prior speaker of needing these experiences to happen by design in the K-12 years.

Question 8 asked about the entities or institutions that should play an active role. In the model that we developed all through the school time, the K-12 schools get involved, colleges and universities get involved, STEM professionals in the community

get involved, and rank-and-file people who have problems that need to get solved get involved. And it's the student being able to pick, not happen upon, where a problem is given to them that they have to solve but where the students get to pick by conversing with people in their community and find something they personally care to solve that makes it a lot of the difference. So all of these folks have to be involved in an ecosystem-driven model.

Question 9 asks about the policies that the federal government should explore, and you know, we have been able to do this work because we're founded by a family foundation. The state and the federal education policies and funding formulas do not support this kind of work. We do not fit, which gets to one of your last questions about policies that hinder.

What happens now is our education standards, for example, in science and engineering, they lay out a linear progression of scaffolded learning of particular concepts and practices that grow year by year. And when we form teams of kids and they pick a problem they want to solve that means something to them, we cannot say that you're going to learn a particular science concept that's appropriate for 11th and 12th graders. You're going to learn science and engineering concepts appropriate to the invention.

And if we allow that to fall out, there is meaningful STEM learning taking place. I'll give you an example of how this works. So one team that we have had is one of many examples. It was a team of young Latinos from Southern California where an after-school leader recruited them from their high school math class. And this team of girls decided that the problem they wanted to solve was their homeless moms would get cellphones from the county, and they need to be able to charge them. So the young women invented a solar tent that would charge the cellphones.

So you can see how they're drawing on something that meant something to them, was close to them. We asked them how did you come up with the idea, and they said, we're just one paycheck away from that.

We asked them how they learned to do the coding required, and they learned by watching videos on their cellphones, and they describe their iterative cycle and how they wanted to give up, and yet, they persisted until they could get it to work. Again, that kind of experience changes lives. And I cannot say you're going to learn the types of environmental science problems that we specify for 11th and 12th graders, because that wasn't an environmental concept, it was different.

So that's why we need to be able to put this type of

strand of learning on the school day with educators supporting it, but it may not fit exactly what we have today. You can make the claim this is a great career or technical education strand in the school day and workforce development, yet when you look at those funding sources and strands as well, they tend to be specific to a particular industry sector, and this kind of work is transdisciplinary, it cuts across sectors. So we really need -- if you're going to consider a workforce, it would be an invention and innovation strand that cuts across all industry sectors.

So we have some work to do on policies, and I'd love to share more if you decide to dig in deeper in your final report. Let's see.

So I think one thing that could be especially helpful is if you were to look at models like ours. We have run across other models from other colleges and universities in our work. Some of them are documented in the journal, which I'll leave you a copy of that. But, regardless, because teaching the process and practices and ways of thinking as an inventor are so different than teaching a science and engineering class or a math class, we probably need to start with a handful of centers that could do this kind of work in our communities, grow the models, and grow the kinds of programs that you need to orient K-12 teachers to teach in this

kind of way.

In our research, we have been studying the students and the impact. Now, we have been studying the educators who carry out these kinds of work with their students and found that 67 percent of our teachers last year had a career in industry prior to teaching. So that, at least, gives us some clues as to, you know, the kinds of teachers who may, with a little more experience, can be especially good in creating these kinds of systems that need to exist and then we can -- after we grow a more formalized system in selective regions, the state can grow that out.

Let's see. This is still a hard road to go down, but we have found that we have been effective at being able to get young women to participate in these kinds of invention education projects. 35 percent of our students have been female. And our percentage from underrepresented backgrounds varies from year to year. In 2017, it was 44 percent. In 2018, it was 29 percent. So, you know, we still have work to do, but it is an effective approach, especially given the numbers that were cited in the beginning of the hearing. And I do think that a lot of the motivation to participate comes from the desire of young people to be engaged in meaningful work that helps people and changes lives.

And, you know, again, in the ethnographic interviews, some of the students were telling us this was the first time that they felt in their life that, as they engaged with the community around the problem, as well as getting feedback on the design of their prototype, that this is the first time they had a meaningful conversation with an adult.

And so I think there are lots of benefits that can come from an invention education strand in K-12 that would go alongside what we otherwise teach, and some of that just has to be about a social-emotional learning benefits. They go through struggling, persisting, coming out the other end with something you have created and connecting with members of your community.

MR. CABECA: Thank you.

MS. MYERS: Now, I'd like to invite up Professor Colleen Chien up to the podium. Professor Chien is from Santa Clara University School of Law and Columbia Law School.

PROFESSOR CHIEN: Good morning and thank you so much to the PTO for having this meeting today and to everybody for being here. It's my pleasure to testify a little bit and use my time. I come out from academia and research, where I have been spending the last 12 years trying to use patent data to advance innovators that patent but not just have an innovation and have a chance for

me to come up and reflect a little bit on this as part of this historic effort today.

So I want to use my time to make three points based on trying to work with patent data and also try to understand the various drivers that are contributing to the current gaps, and I would say underutilization of our country's talent. And this all took off from my work in government where there was a real effort when I was in the Obama Administration to really think about innovation for all, by all, and to really think about all the untapped sources of talent that we have a challenge to try to bring forward.

So the three points I want to make are about, first, the particular moment, how we place that in the patent system's long history and commitment to advancing innovators and not just innovation. And I just wanted to place that into context because this moment, I think, is part of a longer conversation that will continue that has been about this topic and about the democracy -- democratization of innovation that is particular to the U.S. patent system.

The second point I want to make is about the PTO's particular comparative advantage as an aggregator of information about innovators that has really come to the fore. The study that

was cited earlier by Raj Teddy (ph) is extremely influential, what's going on patent data. There have been numerous studies of innovators that have begun using patent data and it's to the PTO's credit that they have done work to make this data available but even more could be done to collect and disseminate and federate data about not only demographic traits but socioeconomic traits, and really, I don't think there are other agencies or institutions that can do as good a job, so that puts more pressure on the PTO to continue to try to improve what we know and what we don't know to try to fill the gaps on what we don't know about the trades of inventors.

I'd also call on the PTO to do what only it can do, which is to experiment and test for implicit bias as has been suggested in the literature a little bit.

And, finally, I'd want to call upon companies that may be here or involved in this conversation to work with the PTO, as it's called by the SUCCESS Act, to uncover practices that work, that can actually increase inclusion and diversity by supporting survey work and research and try to think about how the regional offices contribute to that, so I'll talk a little bit about that.

So I'll provide brief testimony separately, so I won't go through all the different sources, but if the PTO has specific

questions or others come up, the comments here below -- comments that I'm going to mention draw from several research projects. Again, as I mentioned, a multi-year project on the use of patent data to advance innovators, and in that work, I have looked at patent data but also innovation data in publications and LinkedIn and other databases, and so I can speak to the comparative strengths and weaknesses of patent data relative to these.

Another project is on rigorous policy highlights, article of the same name that's forthcoming in the Iowa Law Review, and it talks about this kind of process of iterative experimentation and evaluation by government agencies, including the use as PTO to deploy, develop and test and continuously approve policy and prevention. So, again, some of the things I want to talk about involve iteration and going back and forth and just as we're here in Silicon Valley where agile product development is widely used, you know, on a frequent basis, I think we can employ those same tactics to develop the policies that we're going to apply for at this very important set of issues.

So I first want to go to my first point around the use of the patent system to advance innovators because we typically think of the purpose of the patent system, if we go back to the Constitution, is really to promote the progress of science in the

useful arts, but I would also -- it put before that it's been fundamental to our U.S. patent system that we think about having -- advancing innovators -- think about advancing innovators as part of that.

So if you look back in the history, to the early patent system, there were many distinctive features that were meant to encourage participation and inclusion in inventing. So unlike the British system, we had a system that was based on merits and on patronage, the ability to accept applicants by mail, and so it wasn't -- you didn't have to actually go to the office and have that relationship. We also had low fees.

So these were all features that we're going towards at the very foundation of the system, the ability to include low income, rural inventors, inventors with good ideas, not only good connections. Decades later, we have had this commitment to inclusive inventing come through as Congress has introduced fees for small and non-profit and individual inventors, and then in 2011, with the America Invents Act, introduced the micro entity inventor status level, and at even lower rate and creating regional offices for -- in Detroit, Dallas, Denver, and here to offer services to make sure they weren't just on the coast but disseminated around the country.

So I believe, you know, the work that's being done here is very important, and if there are interventions that are working, I believe, Congress is going to be very receptive and interested in what they're about.

So I wanted to just provide that backdrop to place today's SUCCESS Act hearings as this ongoing partnership and thinking about how to close the gap.

So this brings me to the second question of, well, how can USPTO in particular play a role and what has been its role historically. Here, I want to point to you the important and comparative advantage the USPTO has as aggregating information, and that means collecting and disseminating and federating information. And I want to commend the Office of Chief Economist in particular for its efforts thus far as applying a rich and detailed view of innovators of that patent.

So when you look at a patent, though, you have not only the information about technology that's inside the patent but on the front page, many, many details about the setting of the patent, where it was created. When you go into the patent record and look at the fees that were paid, you can see what the entity status is of the assignee, you can look at the setting. And so, with this, you have a lot of rich information about innovators,

not just about innovation.

But for many years about this data, although it was being collected, has been locked up because it was dirty. It wasn't able to be accessed electronically. Also, you have people using different names when they sign up for patents, and so that hasn't been allowed for comparisons across time.

But thanks to the work of the chief economist as well as in a set funding, there has been a lot of work to put that together, and that gives the patent data just a level of richness that is not available when you're thinking about survey data, which is some sort of episodic and ask different sets of questions. When you think about publication data, new product data, all of these different sets are generally in different types of silos of information, different forums. They're not uniformly reported in the same way that patents are, and this provides a lot of richness that is not available in other ways.

But this also puts a greater burden on the PTO to make sure that the information that is provided is accurate, and also, I think, can be connected to other types of information, just not on innovation, because when people talk about patent, they say, Well, the problem with that is that most innovation is not patented, it doesn't capture a lot of information that's out

there, and it's also not connected to commercial activity necessarily. You can apply for a patent, do nothing with it, or you can apply for a patent and it could become disseminated widely, and both are reflected in the same way in the patent system.

So I think the patent office should continue to think about how to situate its information, make it leveraged more broadly by, for example, trying to encourage people to draw ties between patent data and other data, to understand what kind of discount rate or what kind of way can we think about patent data in context.

And then also to think about how we can overcome certain deficiencies that we think are still there and prevent the full use of the patent data.

So I want to talk about, first, entity-size data. We talked earlier in this hearing already for comments made about socioeconomic status, and right now, the PTO does have little silos of information, but they're not put together, they're not available, and so this entity-size data that could be a rich source is, per the report, is not consistently available, and I don't think, as a result, it's being used as widely as it could be.

So right now, you have different-sized entities: Micro, small, and large. That information exists in the maintenance fee and the patent office has put that -- made that available through Patent View but it's not easily available. It's not consistently available. I have tried to use it many times. It's not necessarily there in the applications data. There was not a single snapshot that's easy to access.

So I encourage the Patent View field of entity data to be made available and also made available over time so that it can be traced.

A small entity category also includes the smallest inventors to the largest universities, so you have, unfortunately, in that entity a tag -- some noisiness, so I was encourage, again, the PTO to take some of the other data that's collected on whether the data came out of a company or came out of a non-profit or a government. And I know that work has been done before by the PTO in terms of collecting entity type. I encourage that data to be made of high quality. I have seen that there are some inconsistencies in it but also federated within the data so we can actually get a full picture of what -- who exactly is patenting where.

And there are independent researcher efforts to do that

type federation, but if the PTO does it, it's a lot more accessible, it's widely available to everybody who wants to do the work, not just the researchers who have the most resources, who may or may not share the information and would encourage that to be collected in a more uniform and meaningful way.

Here, also, it's really encouraging to see the SBA work with the PTO because the SBA has a lot of rich information and other data available around, you know, the demography of the actual entity itself, if it's a business -- minority-owned business or what its income or revenue might be.

And so I would encourage -- I know that there has been efforts behind-the-scenes in the office of each economist to have PTO data sort of connected with NET's (ph) data and other data, and I would encourage -- I think researchers are very interested, I think, in looking at that data and would encourage the PTO to look at arrangements made by the census or other groups to create data-sharing agreements with researchers so that they can get access to information and they can see their questions and see if there are ways that there can be collaboration.

I think the addition of gender data is extremely helpful. I'm really happy to see the PTO not only making the report but then also immediately making the data available to the

federated and to the assignee database. It allows for some of this tracking that was carried out -- Project Conclude was referred to earlier, I believe.

But this could also be improved because the foreign names are often not profiled in a way that -- with a high level of confidence. And so, here, what I found useful in my own efforts to try to profile better names and match it to gender more conclusively is to actually use the native language and to go back to the patent filing that is in the home country and is filed in the native language. And so I have been able to overcome some of these challenges by having native readers read native names. And so if that were possible in the ADS to actually report names, not in an Anglicized name but actually in, you know, Chinese or in Arabic or some other language that is the home language, that could improve the data that we capture, and therefore, the inferences that can be made.

Race data is extremely challenging, especially with respect to particularly African-American and White names, so, you know, I think that we need more effort needs to be done to try to think about this, in Lisa Coke's (ph) work, in creating databases of African-American inventors and others, I think, can be brought to bear. There have been independent research efforts. So I

think the PTO can -- has a great convening power in bringing together some of these efforts and putting that and making that available in the record.

I know my time is almost over, so I'm going to just take another minute or two to mention that I think there are certain things that the patent office can do that the private sector cannot. One is around testing for implicit bias in patenting, and this perception of reality that there is a lower grant rate to women, which might be explainable by different factors, but the work by Jensen and others from Yale has suggested this is this gap, and the PTO has done efforts to try to understand how much of that is due to external factors due to where the, you know, filing in certain classes which have a lower grant rate, etc.

But I think, at the end of the day, the patent office is in a much better position than the private sector to try to really get at the bottom of this. And the way I would suggest that it do so is by using a blind study, a randomized control trial. And I just, last Wednesday, held a -- or Thursday -- held a workshop with federal agencies across the government that were involved and engaged in rigorous piloting and doing randomized experiments.

So I would encourage -- even though it seems like a strange thing to do -- the idea of having a single application

with two different names on it and seeing if there's a difference in treatment would be an important first step and low cost relative to other interventions with higher-quality data to get at this issue of implicit bias. I'm happy to talk more about that.

The final thing I want to say is that there are areas of success in innovators that are participating, in companies who achieved a higher rate in sectors. You talked about companies that are at the top. They're really calling on the PTO to work with those stakeholders to ask them what has contributed to their success. Again, you have a different convening power of bringing them together and asking them to share information, which otherwise might be seen as something they want to keep proprietary or something that they, themselves -- you know, it's working for them individually, but they don't understand what the value to them would be of sharing that more broadly.

But we do have this, I think, shared interest, and I think just having -- calling upon companies to share information, participate in research, I think, could go a long way. Thank you very much.

MR. CABECA: Thank you, Colleen.

Okay. So, amazingly, we are ahead of the schedule. But since all of our other testimony is scheduled, we have an extra 15

minutes. So I thought I would offer, because the other unscheduled public testimony, the open floor, is scheduled for later this afternoon, I thought I would take this extra 12 minutes that we have to see if there is anyone that is not currently scheduled on the agenda that would like to provide any remarks. Otherwise, we'll have a little bit longer of a break.

So if there's anyone that would like to provide open floor unscheduled testimony, come up to the -- yes, thank you. And please recognize yourself for our court reporter into the microphone. Thank you very much. And 12 minutes or so.

MS. WESLEY: Kimberly Wesley. I'm a registered nurse at Valley Nurses Association, and I have a patent pending for a chemical composition that would be utilized as a sleep aid. I did benefit from the micro entity program that was. That was excellent. But one recommendation I might make is that support and access to laboratory equipment, we have Stanford and Berkeley and a lot of universities in the Bay Area, but small inventors like myself, we don't have access to those laboratories and that support and those resources.

So if the Government could develop an incubation laboratory on the level of Stanford or Berkeley, it would be good for us independent inventors. So that's all I had to say.

MR. CABECA: All right. Thank you very much.

Okay. With that, let's go ahead and take our break. We'll convene back here about five minutes to 11 if that's okay, 10:55. Thank you. And, again, if you need to use the restroom, please see a guard for a pass so you can get back in. We'll reconvene at 10:55.

(A brief recess was taken.)

MR. CABECA: Okay. Returning from our break, thank you, everybody. It's my pleasure to introduce our next presenter and to provide his testimony and -- so we have four speakers coming up over the next hour, and then we will break for lunch for an hour. Lunch is, unfortunately, not being provided but there's a lot of places nearby. Also, if you would like to grab your lunch and come back, you know, we have room in the lobby, and then there's also a little conference room where we can sit around and informally speak during lunch. So, again, it's on your own, but you would like to bring it back here, we welcome that as well.

Okay. Moving on to our next testimony, Sheng Tai "Ted" Tsao will -- he's the president of STT WebOS, Incorporated, and will be providing his remarks. Thank you.

MR. TSAO: Thank you, everyone. I'm Sheng Tai Tsao; you can call me Ted. I'm a Chinese minority, U.S. citizen. I have a

master degree in computer science from Cal Poly at Pomona in 1988. Since -- from 1988 to 2002, I worked as software engineer in Silicon Valley for many -- several high-tech company, and so my story is, since March 2002, I have funded in my own start-up company called STT WebOS, Inc., and also in this year, I have solved, you know, web browser blocking problem, so that actually achieved the web multitasking.

So, in August, I had filed first patent application for the -- this technology. Starting from 2008, I have received that numerous patent for this technology, along with the other patents for other technology. And of course STT would like to license the advanced technology, so this journey is a study from 2002. November 2002, I have sent several letters to multiple high, you know, tech giants and introduces web multitasking technology.

And so SBA for looking for partnership or investment or licensing opportunity, and on December, I fortunately got response from first tech giants, and so -- but the response investigates finally reject, you know, that kind of intention -- good intention.

Now, I still feel warm about it because at least I got a response, while other tech giants even never bother to response. So, from 2005, that's the first several years, Silicon Valley

companies studied the -- called Ejects (ph) technology (indiscernible). So then, in 2008, I just -- you know, sent an email to the first tech giants telling them, say, okay, look, yeah, this is Ejects system, major issue is solved with, you know, web multitasking problem -- I mean, solving the web browser blocking problem. Web blocking means, when you interact with your web browser, no response. You (indiscernible) create no response, and you have to wait. After a while, then response.

And I tell them, they said since, you know, they try to, you know, give me a warm response, introduce some internal staff, and actually, they are still no way to move to that licensing board in a good intention even without purchasing. Right?

So nothing each -- you know, so what are we planning to do. Now, from 2015, an attorney who attend the STT for licensing activity, this time, you know, we captured many chem giant. Same because they said chem giant to first -- for first tech giants in U.S. and China. And so this chem giant also send it to the first tech giants. Yeah.

Now, in 2016, after one year long discussing and a challenging conversations a meeting, there are second tech giants in Silicon Valley, finally, you know, license our technology. That's about more than 40 patents in different area, including the

web and multitasking. And this is the first one and there's the only one licensing (indiscernible) since 2002.

So, in 2016, of course other multiple tech giants, first in China and in the U.S., including the first tech giants to study the serious conversation with attorney. And, unfortunately, in September 2017, four patents, among more than 40 patents, have been embedded in the case by district court on a (indiscernible) B 6. And that means without claim construction, they got a quick, invalidate.

So after that invalidation, all tech giants, you know, they are all suddenly started a conversation with the attorney. So since -- in 2002 and in 2018, STT came out January any revenue from, you know, licensing.

So up to this point, STT still working hard to try to licensing its -- you know, the advance of technology and also wondering when the first tech giants would take step toward licensing. And we are not looking for skyrocket, you know, in any for licensing fee. It's very modern. It's -- even, you know, penniless, you know, price for putting license, you know, use of contact. This is like a fraction of a penny. You know, I don't know. If they are sued, the tech giants where the licensing our technology.

So my question is -- first question is, can the four patent be recovered from session first invalidation because, since the 2018, federal circuit has issued that multiple and new case law for preventing first invalidating the patents. Also PTO has a new guideline for examining for the patent invalidation, so -- and this is new case law and the new guideline, you know, the four -- the four patents can never be unvalidated.

So the second question is why is long established innovative technology, such as web multitasking, from a small inventor or individual inventor has extreme -- tough time for licensing to tech giants? Now, the question is: Can our legislation, our judicial system, or PTO help small inventor or individual inventor to licensing their patented technology for much easily to the tech giants. Yes, that's all I wish to say.

MR. CABECA: Thank you.

MS. MYERS: Britten Sessions from Lincoln Law School of San Jose, associate dean of intellectual property and director and founder of an intellectual property clinic.

MR. SESSIONS: Thank you very much for the opportunity to testify today in relation to the SUCCESS Act. Director Iancu indicated in, I believe about one year ago, that our patent system is at a crossroads, and I agree very much with this statement.

This is a question, I think, hypothetically we could pose ourselves as a nation, as a patent market, continue our legacy of building upon fundamental patent rights or, on the other hand, will we potentially remove such rights for Patent Owners?

The SUCCESS Act fits squarely into this focus of ensuring that we are continuing to build upon such patent rights by evaluating whether individuals and entities, with a particular emphasis on women, veterans, and minorities -- have effective access to the patent system. This emphasis, effective access to the patent system, is also in alignment with many other USPTO initiatives, including the pro bono patent program, as well as the law school clinic certification program.

Both programs were introduced roughly in the 2008 time frame. Both take a distinct and different approach to answering the essential question how can they do as PTO says with providing greater resources to those who would otherwise be financially estopped from receiving such services.

The pro bono patent program is a nationwide network of independently operated academic and non-profit organizations. The endeavor to match volunteer patent practitioners with financially underresourced inventors seeking patent protection.

Additionally, my clinic, which is part of the law school

of clinic certification program, train students who, in turn, provide the patent services under the guidance, mentoring, and ultimately approval of a licensed practitioner to those in our community for free. The legal services have no legal cost.

It is a literal win-win situation where the students can get experience while they are students, and the community benefits from having high-quality patent services without any legal expense. Over the years, it has been my experience of what the SUCCESS Act is presently evaluating coincides with the types of two-fold and entities -- namely, women, minorities, and veterans -- that come to such USPTO-approved clinics. It is precisely, therefore, at this perspective; namely, my dealings and representations of and interactions with these types of inventors that I feel compelled to speak on behalf of today.

I have segmented my remarks into two main categories. First, indications of success, and two, actual feedback from inventors, including potential avenues for further development. First, with respect to indications of success, the initiatives put forth by the USPTO, I believe, are assisting with improving effective access to the patent system. For example, with respect to the pro bono program, during the first three-quarters of fiscal year 2018, the program actually assisted underresourced inventors

and small businesses with filing 205 patent applications and actually fielded 1,757 public inquiries and matched 432 underresourced inventors with qualified patent practitioners.

Additionally, with respect to the clinic program, over 875 patent applications have been filed since the beginning of the program, and for fiscal years 2017 and '18, there were over 4,100 clients engaged by clinics in the program. Therefore, clearly, the numbers alone speak for themselves. These initiatives are providing services to those who would generally not otherwise receive these types of services.

In short, when I look over the impact that my level of clinic alone has provided, I'm not only encouraged by the number of results alone but also by the ways in which these inventors have literally been granted effective access to the patent system. Suffice it to say that the many thank-you notes my clinic has received all indicate a similar theme. First, an immense appreciation for the services we have provided, and secondly, relief that they finally found a financially viable channel to the patent system.

All of this, in my mind, shows the success of these initiatives in that women, veterans, and minorities are being granted more effective access to the patent system than before.

However, the universal adage that all things can be improved, I believe, applies to even our currently improving patent system as well, which leads me to my second category and that is actual feedback from inventors and avenues for development.

Rather than solely speak for inventors, I wanted to give many of these inventors a chance to speak for themselves, and to that end, at a recent inventor conference, I interviewed them, including some of my own clients from the clinic, asking them what issues they are facing in today's patent market. Their frank responses have concluded, professed on the best instruction on the issue these inventors face in today's patent market. I have organized their lengthy input all leading to a few categories followed by my recommendations on how to potentially resolve these issues.

Category No. 1: My patents can easily die. And this is a thing that we have heard from even a number of people today. Quote 1, "There is a risk in working with a large company. If one goes and presents intellectual property to them, the company may look at it in a different way. For example, they may consider simply going ahead and infringing the rights and then appealing it to the PTAB, which has a high chance of invalidating the patent."

Second quote: "Due to how easy patent invalidation has

become, companies do not feel a need to license. Instead of licensing it and being more economical to infringe and invalidate the patent."

It is startling to me to receive repeated feedback from many inventors that companies blatantly will disregard patent rights because, quote, "It is cheaper to kill a patent than it is to license one."

If Patent Owners cannot rely on a granted patent protection as a basis for a protection and if the risk for invalidation is high, then this causes the inventors to wonder why they went through the time and expense to even get a patent in the first place, which leads me to my first recommendation, which is to provide greater stability for 101. Again, it's a recurrent theme here today.

The past seven years, I think, at a minimum, has taught us that many are a bit confused on how to deal with or even rule on 101 issues in patents. The Supreme Court in the Alice decision left open much of the implementation of 101 construction to the courts, which subsequently created a fragmented landscape with often conflicting opinions.

The USPTO has repeatedly recognized this issue and sought to provide greater consistency of analysis relating to 101

by issuing several guidelines. They even appointed individuals to eliminate inconsistencies in the interpretation and implementation of the Alice test among different branches of the USPTO. This is very much a monumental task and one that, in my opinion, deserves some of our greatest attention. I applaud the USPTO for their attempts to rectify this issue. However, USPTO guidance and policies do not extend to other courts nor are the USPTO's recent guidelines a permanent fix. For example, the next director may modify the burn (ph) guidelines.

Thus, in order to effect a lasting change and not just at the USPTO level but nationwide, in each PTAB hearing and federal court, Congress needs to come together to more fully implement rules that bring stability to a very volatile subject. I acknowledge that Congress currently has a number of proposals, and even in both the House and the Senate, relating to patent reform. Narrowly, all of these proposals includes some provisions relating to subject matter eligibility. At a minimum, we need to know everything so that Congress recognizes the importance of stability for patent subject matter eligibility and implements policies that allow courts to act in a consistent manner.

Category No. 2: "I can't find financial backing to assert my rights." First quote, "If you do not have millions of

dollars at your disposal, you will need a contingency attorney or investors, both of which are now in short supply. Without these resources, patent holders are defenseless and incapable of licensing."

Second quote: "The effects of the PTAB analysis decision made me unable to defend my patent rights and caused my investors to leave." The risk of the patent market has caused contingency arrangements, which was the primary manner in which inventors historically had effective access to the courts, to vanish. Litigation is expensive, and without a financial way to represent these smaller entity inventors, including women, veterans, and minorities, they are effectively prevented from being able to assert their rights.

Further, the increased risk has caused inventors to close their pockets, which leads me to my recommendation No. 2: Reduce the risk. Now, to simply indicate to reduce the risk is an easy conclusion to say but rather hard to implement. For example, one of the main goals of them are the America Invents Act and subsequent court direction for them was to eliminate trolls and bad patents. I believe all in the patent marketplace would agree that assertions without merit and bad patents should be removed.

However, as Director Iancu recently indicated, "In our

zeal to eliminate trolls and the bad patents, we have overcorrected and risked throwing out the baby with the bath water."

Bringing balance to our system must include some way for Patent Owners to have a financially viable option to assert their rights, both with respect to contingency options and funders. I agree with Director Iancu, who indicated, "Let's work together to find narrowly tailored measures to eliminate only the faults in the system while promoting the vast amounts of amazing innovation America is capable of."

So what narrow measures can we consider? I have a few here. First, we can support Congress in bringing greater clarity to subject matter eligibility, as I have indicated. We can grant the USPTO greater autonomy of the money it collects. We can restore injunctive relief. Patent rights allow for a right to exclude, and yet, under the current standards set forth by eBay, the right to exclude is greatly restricted.

We can minimize multiple proceedings or serial filings to dispute the validity of a patent. Large corporations can weather -- can finance multiple proceedings; inventors, including women, veterans, minorities, often simply cannot. We can deter efficient infringers, which is a new term here in Silicon Valley,

which actually, I think, came from New York, which may those who prefer to purposely infringe a patent and dispute its validity rather than to have a license by enforcing -- and we can deter this by enforcing willful infringement provisions or, as some have even hypothesized, levy criminal sanctions similar to other forms of IP, particularly in relation to trademark and copyright penalties.

We can assure that PTAB judges are properly appointed per the appointments clause of the Constitution and that they comply with the judicial rules or codes of conduct consistent with other federal court judges to rule on patent-related issues.

Category 3: Should I simply pursue protection outside of the U.S.? Quote, "I am considering no longer patenting in the U.S. I can get better protection in China. As a veteran, I do not want to move my creations elsewhere but feel that, in view of the current market conditions, I do not have any choice."

Inventors feel that foreign jurisdictions currently offer more stability for asserting patent rights than what the U.S. provides. This is also consistent with the fact that investors generally are pushing dollars to other jurisdictions to pursue Patent Owner protection and assertions, which leads me to my last recommendation and that is, let us learn from history.

The Diamond versus Chakrabarty case, for example, allow for a living subject matter to be patent eligible. As a direct result, the U.S. became woefully dominant in the biotech industry for more than a generation. Currently, the U.S. has fallen behind on many other up-and-coming industries. For example, China is leading with respect to artificial intelligence investment. Investors follow the money, innovation follows the investors, and economic growth follows the innovation. As such, having a census in place consistent with the measures I have previously indicated will ensure that the U.S. remains on the forefront of economic growth, innovation, and investment.

Now, to conclude, we, indeed, do stand at crossroads. I stand with Director Iancu again who stated, "Born of the Constitution as steeped in our glorious history, the American patent system is a crown jewel: A gold standard." Let's take action now to ensure that inventors -- and particularly women, veterans, and minorities -- have not only effective access getting the patent but also effective access to the courts in enforcing their rights as well. Thank you.

MR. CABECA: Okay. Next -- thank you. Next, I'd like to call up to the podium Professor Robin Feldman, who is at the University of California Hastings College of the Law.

PROFESSOR FELDMAN: Director Cabeca, Director Clowes, Deputy Myers, and other distinguished members of the USPTO, I'm honored to be here today to address an important issue: Maximizing our nation's innovative potential by turning our attention to women founders and inventors.

I'm Robin Feldman, the Arthur J. Goldberg distinguished processor of law and director of the Center for Innovation at the University of California, Hastings Law. At the Center for Innovation, I'm privileged to lead 12 team members who engage in research on issues related to science and technology. We also engage in programming that provides on-the-ground support for innovators, our flagship program, the Start-up Legal Garage, provides free legal services to roughly 50 early-stage technology and life science companies every year, and our focus is on women and minorities.

The work is supervised entirely for free by outside lawyers, and I do mean entirely for free. We do not allow deferred compensation or any other payment mechanism. It's a system that we've guarded fiercely for a very long time.

In addition to Start-up Legal Garage, the center has now launched Lex Lab, which includes an accelerator for legal tech start-ups. In short, our team at the Center for Innovation has

the opportunity to see entrepreneurship both from an academic research perspective and on the ground.

So, today, I would like to talk to you about both the successes and the challenges for women in technology, invention, and entrepreneurship. In recent years, women's involvement in entrepreneurial activities has sky-rocketed, providing a significant increase in opportunities for female leaders. Women entrepreneurs not only diversify the innovation space, they also generate new ideas, inventions, businesses that would not have existed otherwise. So between 2017 and 2018 alone, women created more than 1500 net new businesses every day. Over the past decade, the number of women-owned firms increased by 58 percent, far outpacing the national percentage growth of 12 percent. And furthermore, recent studies have even found that women-founded businesses bring in more revenue, are more innovative, and are more sustainable than those without women.

Research suggests, however, that women inventors and their potential remains highly underutilized. For example, even though women are catalyzing growth in entrepreneurial sectors, they're still underrepresented and underfunded in the start-up and tech industries. Every year, from 2012 to 2017, only 17 percent of inventor-backed start-ups were women founded, stagnating over

the last five-year period. In other words, we're not moving forward. We're staying right where we were.

So consider technology leaders such as Google, Facebook, despite considerable efforts to increase diversity at Google, women still make up less than a third of its employees and only about a quarter of its leaders. Moreover, the roles that women play in technology companies may leave them more on the periphery and less in positions perceived as being at the core of the company's power, and that is a problem.

At Facebook, in 2018, for example, women occupied just 22 percent of technical roles and 30 percent of the senior leadership roles. And across several major tech companies, women occupy similarly low percentages of technology in leadership positions, often facing discrimination along the way.

Now, the patent system can be central for changing this landscape. In our spectacular and valued patent system, the power of invention and inventorship confers strength both in terms of signally technological jobs and in terms of conveying bargaining power.

Ensure that women have access to those avenues of strength is an important part of securing the science and technology pathway for women, along with the economic benefits for

society for all of us as a whole, and thus, it is critical that women gain exposure and access to the patent system and that we eliminate barriers along the way.

In the entrepreneurial space, I have to say the numbers are not encouraging. Women continue to struggle to obtain funding for their businesses, particularly in the start-up environment. Last year, female-founded start-ups received $1.9 billion in venture capital. That was wonderful to see, but that funding is out of a total of 85 billion overall, a mere 2.2 percent of all VC dollars. In contrast, all-male teams secure roughly 79 percent of the VC dollars.

And a study by the National Women's Business Council found that, among the founders of the most successful companies, women were able to launch their start-ups using -- I'm sorry, men were able to their start-ups using six times as much capital as women. That's a tough place to start from.

And, in 2017, women accounted for only 8 percent of the investing partners in the top 100 venture firms. These early struggles in funding discrepancies pulls long-term challenges for the economic stability of female founders and their ventures, and we know from research that the ability to have patents plays an important role in this process.

Consequently, any legislative policy that seeks to remedy these inequities must be crafted with a thorough understanding of women founders and business leaders, their funding and revenue streams, and quite frankly, their networks. As the USPTO profile of limited ventures progress and potential notes, women accounted for only 12 percent of all inventors who secured patents in 2016.

Questions surrounding women in inventorship per se are understudied. Nevertheless, there are tantalizing hints of leakage in the pipeline; that is, ways in which women we would expect to see in the invention space seem to be left out or left behind, and that is where I believe we have the most potential to make a difference.

On the simplest level, how can women inventors build and lead teams to support their innovations if they are faced with significant challenges in securing patents for those inventions in the first place? And beyond that, if we want women to have the opportunity to climb the soaring heights of Silicon Valley where we now sit, the foundation must be strong, and the patent system is key to that foundation.

Now, the SUCCESS Act acknowledges the extraordinary potential of women inventors and the processes it has set in

motion, hopefully, will be instrumental in encouraging women to apply for patents and in fostering their entrepreneurial growth. In particular, what I find so hopeful about the SUCCESS Act is that it provides an opportunity not only to highlight key factors that help women entrepreneurs succeed; it also allows us to shine light on the roadblocks that currently hinder their creative efforts.

I want to take a moment to be completely candid with you-all. I have been troubled of late by what I perceive as fatigue on the topic of women, technology, and entrepreneurship. The sense I get is something like the following: We all know there's a problem, it's not clear anything will make a difference, why should we keep looking at this? We have heard it before.

As an academic, I continue to believe that we haven't found a solution. Perhaps we don't understand the problem fully as we think we do, and perhaps we haven't looked in the right places.

So let me share with you a study we are attempting to undertake along these lines. The University of California Hastings Center for Innovation has access to a dataset of more than 750 start-ups. The dataset consists of start-ups founded by those who are university affiliates, including graduate students,

post docs, faculty, and others who have licensed technologies from their home campuses. We are fortunate that it is a wonderfully robust dataset with information, including industry, revenue, venture funding status, numerous other characteristics. It also has the advantages of coming from campuses that vary in size, resource levels, and location, and we have already sorted for gender information.

Now, universities are a particularly important part of the innovation pipeline because it's there that future science and technology innovators find their training, develop mentorship, and more importantly, begin to create the networks that will support them down the road and that we are beginning to understand are so critical. Our hope is to use this extraordinary dataset not just to look at where women are not adequately represented along the way but to see what has worked for women so that we can try to expand and replicate.

And although we can learn much from mining the data itself, we also hope to look in depth at the experiences of the women and the sample, including their experiences with patenting and in invention. My own experience in looking for support for this endeavor reflects what I described before as fatigue on the topic of women in technology and entrepreneurship. And I will

tell you that, having been privileged to receive tremendously generous support for projects in a wide range of areas, from privacy to patent licensing to healthcare innovation, it is striking to me that, while Silicon Valley speaks about issues related to women in technology and entrepreneurship, it can be remarkably challenging to inspire their support.

I am hopeful that the SUCCESS Act will help reenergize this area, encouraging Silicon Valley to keep looking and keep striving for answers and solutions. Thank you very much for allowing me to speak today.

MS. MYERS: Thank you. Now, I'd like to call Hattie Carwell up to the podium. Ms. Carwell is from the Coalition of Hispanic Advocate and Native Americans for the Next Generation of Scientists and Engineers, CHANGES.

MS. CARWELL: Good morning, everyone. My name is Hattie Carwell, and I am here to provide testimony that identifies a social economic benefit of the SUCCESS Act and to provide concrete ideas to increase the participation of women, the veterans, and minorities in particular in applying and receipt of patents. Thank you for this opportunity to testify.

I heard about this event just a few days ago, and basically, as a result of the dedicated USPTO employee colleague.

I am president and co-founder of the Coalition of Hispanic, African, and Native Americans for the Next Generation of Engineers and Scientists, CHANGES. Also, I am the executive director of the Museum of African-American Technology, MAAT Science Village in Oakland. I am a health physicist by professional training and have worked nationally and internationally for the U.S. Department of Energy and the International Atomic Energy Commission. In 2010 to 2011, I served as president of a National Technical Association founded in 1926.

The vision of CHANGES is to bring to bear the collective influence of Hispanics, African, and American Indians in STEM and architecture, to broaden participation of minorities in STEM and also architecture, especially by encouraging students in technical excellence, fostering workforce development and inclusion, and developing policies and programs that promote workforce diversity in science and engineering.

CHANGES is a coalition of 15 minority technical, professional organizations, and its goals are twofold: To elevate the national visibility and influence of the member organizations in the development of STEM research policy and educational programs; two, to strengthen our member organization's programs and finances in support of the next generation of engineers and

scientists and architects.

The mission of MAAT Science Village, which I also founded, is to make available to the public information about the technical contributions of African-American engineers and scientists. The museum endeavors to make the public aware of the African-American ingenuity and its impact on the economic development of the United States. It conducts minority youth programs to encourage them to prepare for careers in the STEM workforce.

Both CHANGES and MAAT Science Village are not strangers to the USPTO. For ten years, I served on the selection committee, which decides on the induction of inventors into the Inventors Hall of Fame. The USPTO in Alexandria, Virginia, is a major sponsor of this program and houses its Hall of Fame museum. I have nominated minority candidates to receive the presidential national medal of technology of innovation -- and innovation awards. CHANGES has utilized the USPTO meeting space. Also, the USPTO space was used to celebrate the National Technical Association's 90th anniversary where its member inventors were acknowledged and celebrated.

The purpose of my testimony is to express the urgency that the Federal Government needs to respond to, its

responsibility to work with the private sector to close the gaps between a number of patents applied for and obtained by minorities, women, and veterans compared with the rest of patents obtained in the nation.

This is necessary in order to harness is maximum innovation potential of all and to continue to promote the United States leadership in the global economy. Currently, the human capital of women, veterans, and in particular, minorities, is underdeveloped or undeveloped. The U.S. cannot afford to waste technical talent because it threatens our national economic security. It must include organizations like CHANGES to accomplish the goals of the SUCCESS Act.

The inventors of the SUCCESS Act fail -- fails -- I'm sorry -- the objectives of the SUCCESS Act falls within the purview of the organization that are represented in CHANGES. The significance, our involvement, is often overlooked and not solicited until all the planning has been completed. We often find ourselves reacting to and retrofitting ineffective solutions that could have been avoided if we had been at the table in the beginning.

Because only a few days were allotted to prepare my comments, I have chosen not to address all of the issues provided

in the Federal Registry. The issues that I will address are sources available to identify minority inventors to the impact of education and professional circumstances and socioeconomic factors that facilitate or hinder the ability of women, minorities, and veterans to apply for and obtain patents or to pursue entrepreneurial activities, the social and private benefits that result from increasing the number of patents applied for and obtained for the same target group as well as businesses owned by these groups.

I will provide insights on the impact of educational, professional circumstances as well. In addition, I will identify some institutions and entities that should play an active role in promoting the participation of minorities in particular.

Further, my testimony will identify some public policies funding needs to programs that the Federal Government should develop and implement -- should promote the participation of the targeted groups, data available on minorities of interest. The vast majority of information available about minority inventors is spread out in biographies, are listed in tables found in books, presentations, or internet sites. The information has been primarily generated by minorities themselves.

The one historical study commissioned by the USPTO to

determine the number of African-American patentees was researched and published by Henry Baker, an African-American patent examiner, in 1913. It is the only formal study that has been conducted to this date. It is only of late that others, other than minorities themselves, have been interested enough to determine the contributions of African-Americans and their attainment of patents.

There is a diverse number of publications which can be utilized to identify minority inventors, but the information is dispersed among many documents and few contain numerical data like the 1913 study. Such sources require follow up with patent numbers and verification to establish their credibility. Also, the data from the various sources must be consolidated.

Some inventors, however, may have more than 100 patents. For example, Dr. Marian Grove (ph) has over 200 patents, with others pending. She's a great candidate for the induction into the National Inventors Hall of Fame. It is not clear whether the intent of the study is to determine the number of inventors versus the number of inventions. Probably both types of data are needed to make a complete study.

The publication frequencies vary and all issues may not always include information on inventions. Information may only

appear as a featured story. Some publications have been discontinued. Examples of such publications are the U.S. Black Engineer magazine, of which is quarterly; the National Technical Association Journal, which is an annual publication. The National Society of Black Engineers Golden Torch Award is an example of an award program that's held annually. The National Organization for Professional Advanced of Black Engineers, (indiscernible), conducts an annual conference and awards program, to name just a few.

Many minority inventors are members of the 40-plus minority technical societies, and among -- and information about their inventions is attained through regular meetings and annual conferences. Newsletters, hard copy, and electronic are also among the types of publications that include data on African-American engineers.

Also, there is some information that can be gleaned from historically black colleges and universities who record patents obtained from research and development. HTC used especially those who have signed entrepreneurship and innovation programs where graduates on inventions resulting from their research.

The White House initiative on historically black colleges and university programs should be helpful in attaining

the names of the HTC youths that have innovation programs. A 2017 review of 11 HTC youths, which are the Carnegie (ph) classified as R-2 or Class 2 research holders --

MR. CABECA: And that's time, so we can just take a minute to wrap up your comments. Thank you.

MS. CARWELL: I will.

Also, let me just skip down to suggestions for generating the missing data. I consulted a computer scientist who simply verified that you can compare the USPTO database with the census data that's sorted by gender and race and ethnicity. And within a week, you can construct a database identifying minorities and women. The data will be nine years old, but if it's thought to be useful, suggestions to the 2020 census may also be helpful to include questions that provide the data.

The impact of education professional circumstances and also the access to funding, many minorities of first generation college graduates and resources are scarce, to say the least, when they come -- graduate with monumental debt -- college debt. They do not have a nest egg or access to discretionary funding to pursue -- to pursue patents. Assistance is sorely needed. Even other than women have this -- share this same problem.

MR. CABECA: Thank you.

MS. CARWELL: Can I skip to my recommendations?

MR. CABECA: Thank you. If you can just take one minute left.

MS. CARWELL: CHANGES recommends the following: Support for CHANGES, minority, technical organizations, minority serving institutions should be increased so they can join in the work with the federal government as full partners to help motivate and nurture the target population.

Diversifications of positions that fall out from the SUCCESS Act should be stipulated to definitely be diverse. Recommendations that accommodate cultural differences, educational, and economic differences should definitely be a part of the recommendations. Congress should definitely provide adequate funding to achieve the goals of the SUCCESS Act.

Also, the patent process is sometimes daunting, depending on the level of education of those who are curious enough or passionate enough to make a difference in bringing their ideas to fruition.

MR. CABECA: Thank you. Your testimony can be -- your written testimony can be made part of the record for our report, and thank you very much for providing your testimony. I appreciate it.

In the interest of time and keeping us on track for the afternoon program, we're going to take this opportunity now to break for lunch. So, again, lunch is on your own. So there's a variety of different places nearby. And we'll reconvene here just prior to one o'clock to get started, one o'clock sharp.

So if you'd like to grab your lunch and bring it back, as I alluded to earlier, there is a conference room on the opposite side of this floor where you can sit at a table. There's also tables here in the lobby, and we welcome informal discussions with the USPTO and SBA team and all of our presenters and participants here today. So thank you. That concludes the morning session, and we'll reconvene again at one o'clock or just before. Thank you.

(A lunch recess was taken.)

MR. CABECA: Okay. Good afternoon, everyone. This is -- for those on the line, this is John Cabeca, welcoming everyone back to the afternoon session and public testimony for the SUCCESS Act hearings. I'd like to go ahead and get started and introduce our first speaker, Tina Door, who is counsel at Cantor Colburn law firm and also the secretary for the Women in Intellectual Property Committee at the Intellectual Property Owners Association. Tina?

MS. DOOR: Thank you very much. First of all, I want to thank the USPTO for this opportunity to speak today, and I'm honored to be able to contribute to not on an important discussion but a discussion that is near and dear to me as a scientist, as an IP practitioner, and as a diverse woman, as my mother is an immigrant from South Korea and my father is a U.S. Navy veteran.

Everyone's done a great job of setting the stage, talking about the narrative reports, so I won't talk about any of those statistics, but I do want to mention that the institute for women's policy research has predicted that, without the concerted effort to change the course, it will take until nearly the end of the century to reach (indiscernible) in innovation, and that is something that is hard to stomach.

Like many organizations, IPO was alarmed by this data, and they wanted to devote real time and resources to address -- to raising awareness of the issue and also to provide tools for companies or organizations to address the issue.

And so there are real reasons to be concerned, and this is on both sides of the fence, from the inventor's perspective and then also from the corporation's perspective. Concern from an inventor's perspective stems from the fact that, in many technical fields, a patent filing is related in some way to salary increases

and promotions within the organizations. So that means potentially a disparity in salary or level within an organization could be related in some way to patent filing.

And, then, on the other side of the fence, concern from the organization's point of view stems from the fact that, when innovation is left unpatented, economic value is left on the table. And, of course, corporations, organizations all want all of their employees living up to their full potential and contributing their highest value.

So IPO has various committees. I'm a member and secretary for the Women IP committee, and we have a subcommittee called the Women Inventor Subcommittee, and Sandra Nowack, who many of you know, and Michelle Dugby, have done -- have spearheaded a lot of this work, and the subcommittee has looked at this issue. And there are two goals of this subcommittee: One, to raise awareness of the issue, and the second goal is to offer specific tools that corporations and organizations can use to specifically address those issues.

Now, to deliver those goals, the subcommittee has spent the last year or so doing a couple of things: One, public speaking on this topic as much as possible at events like today, at CLEs, but also speaking directly with organizations and

corporations about the issue.

The second thing that I'll touch on today is a toolkit's been developed, and this toolkit will be available. The goal is to launch in September, around the time of the annual meeting. It will be available on the IPO's website, and importantly, in this -- this just demonstrating how important this issue is to IPO, it will be available to not only IPO member organizations but it will be available to all corporations, anyone who wants to access the toolkit.

The toolkit briefly -- and I'll talk about in its current state -- includes four general steps, but it allows organizations and corporations to assess their current state of awareness. It provides the tools to dive deep into the root causes of their issues that they might have, and it provides tools for implementing, monitoring, and assessing the success of those short-term and long-term programs.

Importantly, the toolkit includes four steps, and these steps are intended to be circular rather than linear, so it's a continuous process of these four steps. The first step is to raise awareness -- and I'll talk about each of these a little more -- to raise awareness, the second is to discover root causes, the third is to develop a short-term and long-term program

targeted to those root causes, and the fourth is to launch and monitor the programs.

Now, going back to the first step: Raising awareness. We're all very aware of the issue in this room because we're sort of it in, but I am still surprised at how people may not be as aware as we are. So that's an important part of the toolkit, and this part of the toolkit includes things like a short elevator speech. It took five minutes. Sometimes that's all you have to present your case. And it includes sample slides for executives in leadership. It includes tools for how to get the data to see where your organization currently stands to gather that data, because that's what you need to move forward.

The second step after raising awareness is discovering root causes. And it's no surprise that, when organizations and corporations spend time up front understanding the causes for their particular group, that they are more effective at implementing long-term sustainable change. Examples of different root causes include difference in confidence gaps, differences in accessibility and knowledge of patent filing.

The third step is to -- once you understand those root causes, to develop short-term and long-term programs, and, again, this section is organized by root cause, and it will include

examples of programs that other organizations and corporations have previously found to be effective at addressing those particular root causes.

The last step is launching a monitoring of those programs, and this section includes ideas for successful launch as well as metrics and monitoring activities for assessing the progress and success of those programs because there's no point of continuing with a program if it's not being successful, so this is important, to continuously monitor the progress.

Lastly, this section includes tips for when to go back to step two, because I mentioned before that it's important that these steps are repeated in the cycle. And so, sometimes, you need to -- if something is not working, you need to go back and maybe raise awareness to upper-level management, if there's a change in leadership that you need to address, or maybe there's a new root cause that you need to dive into and further understand.

So that's the toolkit in a nutshell. Another important point about the toolkit is that it's never intended to be finished. Instead, it's intended to be a living document that stores and houses information that's continuously updated, and that's based on feedback from others who are using the toolkit.

And to that end, we are currently working with many

organizations, 425 currently. We're always looking to add more, including Proctor & Gamble, who ranked No. 1 on the PTO's report, Dell, Bristol-Myers Squibb, 3M, and of course we're looking into organizations like the PTO, (indiscernible), and all them.

So, again, a lot of the value comes from input from organizations and corporations who use the toolkit and use it and provide feedback for revisions. So with these concerted efforts to, one, raise awareness and tools that organizations and corporations can use to improve their diversity, we hope that we can move that needle significantly further away from that predicted antonym by the end of the century to reach gender parity in innovation. Thank you very much.

MR. CABECA: Thank you, Tina.

I'd now like to call up Liji Gopalakrishnan to -- from Rambus to come and provide her testimony on behalf of Rambus. Thank you.

MS. GOPALAKRISHNAN: Good afternoon, everyone. I am Liji Gopalakrishnan, director of memory architecture research Rambus Labs. I have been working in the semiconductor industry for over 20 years now, out of which around 14 years have been at Rambus in various roles.

The thing is that since I'm working in this field and --

I mean, I heard inputs from different members of the society here. It was very interesting, and as any inventor, I have about 13 issued patents and a few pending ones and many technical publications and conferences. I thought it was important for me also to come here and share some thoughts on how to improve participation among women, because it is a real problem, and that I can see every day.

Okay. I think, just on the personal side, just to share a little bit about myself, I'm a family person. I have a teenage daughter who is a freshman at college now. And I came to this great country when my daughter was just a baby and went through all the struggles of an immigrant: Adapting to the new culture, trying to raise my kid, find a job, and I mean, try to -- doing my master's in electrical engineering, all while working and raising -- I mean, supporting my family. That's all really hard.

If you don't have mentors or a support structure around you, it's not at all easy, and that's why I can identify with the struggles of many women out there, I mean, really having gone through this process.

And that is one of the reasons why I have been kind of volunteering in many STEM-related activities. I really liked Stephanie's speech, and that was -- I mean, similar things is what

I think we need to encourage women to participate. For many years ago, almost eight years now, I have been leading and at workshops, organized by expanding new horizons and organizations and also volunteering as a judge at Silicon Valley science fair.

I was looking at the list of suggested topics for speakers at this hearing, and one which then I saw was on the social and private benefits of increased patent applications for minorities, women, and veterans. I thought that's an important question but, in my mind, to answer that question, I think we should first consider or examine why innovation is important in general. Okay. That's one part of it, like having a patent benefits the mentor person, for instance, and the other bigger question of how women benefits the society or more as a whole. And I'm just going to focus on the second part in this case.

I think from the age-old days when prehistoric man invented the wheels and hunting weapons and everything like -- the survival human -- humankind has survived and flourished, and I believe not because of their muscle power but because of their brain power. So that supports the main point here.

I mean, all the data that I'm going through the industry of revolution and the rise of the semiconductors where I work and internet and space technology, just to name a few. Right? All

fields like medicine, agriculture, transportation, communication, sports, entertainment, everything has benefitted from all this brain power and ideas and innovations and developments that have happened over the ages.

I think it's only natural, we want to continue this human race to advance. It's not just an individual, personal problem or this one country's problem. Just for the human kindness, it's important for us to increase this innovation process.

Okay. Now, that we have just talked about the general importance of innovation, I think the next question, of course, is about how to -- and creating more of it. And there are many ways, but one of the very simple, straightforward answers: To get more people involved. And that is where, when I look at the statistics, and I think (indiscernible) was discussed, that 50.8 percent of the population -- U.S. population and (indiscernible) of women, how come only 12 percent of them are contributing to practice of innovation? That's a huge opportunity there. And when we add minorities and veterans and other such groups, then the number goes up even more.

The ideas like -- the goal is to get all of these different segments of population to contribute, to solving the

problems that we all face all over the world, I would say, and kind of bring in the diverse perspectives and increase the quality of the solutions and inventions they bring to the table. So I think that that's working, in my mind, is very important.

And now when we -- when we talk about bringing the equality of (indiscernible) to the field, then they gain -- sometimes I've heard questions from people: Why do we say that some special groups need more help and why do they get a special -- we do we talk about them more (indiscernible)? I mean, that's right, but again, I can't speak for all these sections but at least for women, I think there are multiple reasons why they need a little more help. Number one, one thing is they face some unique challenges, like childcare obligations, household responsibilities, a lot of things.

I still remember the anxiety I used to feel when I was taking evening classes for my master's course with my seven-year-old waiting outside the classroom for her mom to finish up. I used to send her to daycare in the mornings and other things so, when there's no school, it was fine, but I could not find childcare in the evening on nights. People have their own life. There was nobody to kind of support or help me out at that time. So either you give up your dream or you can go through some

extreme situations like this. I'm lucky I have a very understanding and nice little sweet little daughter. But now we are through all that. But I can imagine it's not just me. There are other people out there going through probably much worse than that.

Okay. The second one is the lack of information on exclusion (ph). Even, like I said, I came to know about these things much later, and a lot of girls, they don't get heard to hear about the patent process or the opportunities and what it takes to achieve that goal.

And then the other challenge, I think is for those especially is many of these topics don't often come into their discussions. Like regular discussions are not about these kind of things, and this carries on into adulthood. When a bunch of men get together and talk, it's about seven kinds of topics very often, and girls don't get to hear about that. They don't get that same kind of opportunity.

And number three is (indiscernible) of society. Coming to this last week, I was listening to (indiscernible) by Rachel Oshawa. She's the (indiscernible) at Intel. And I thought her story was very funny, so I thought I would share it here. She was talking about when she attended a big Wall Street board meeting,

she walked into the room -- (indiscernible) somebody here -- she walked into a big Wall Street board meeting and sat down on a chair, and the gentleman sitting next to her stood to get him a cup of coffee. Of course the woman, at such a meeting, she must be an admin. What else can she be? So she was very gracious about it in the way she handled it, but the thing is, see, we have a long way to go before society starts seeing men and women as equal in all fields. And that is the experience of somebody at that level, you can just imagine normal, everyday women.

Okay. Now, going forward, it's the lack of normalness. This is another challenge, especially with such a low rate of mentorship among women. The young girls, they don't get to learn from inventors and see live examples of how this innovation process happens, and that play be a big deal. I mean, it's a big thing to be able to see this.

Even in my case, I work in a company which is -- I mean, it was founded by Stanford professor Mark Horowitz and my (indiscernible) to commercialize that foundation and inventions, and the whole company is rooted in innovation and patent licensing and things like that. Even for me, it was very hard to get started. I mean, for example, just to give you an idea about the process. You first have to come up with a good idea, which is

(indiscernible). We are usually self-critical and we are (indiscernible). And then, after that, you submit your idea. Then you have to present it in front of a bigger approval committee, which, as you may guess, consists all of men, and (indiscernible) and then you have to defend it. They all ask so many questions and it's not easy. It can be really intimidating in how you really you want to go out of your comfort zone and do all these things. So it's not easy for -- not only easy for many men, let alone, you know, many women. It's other people -- it can be really tough.

So now, recently, as the only female working member of that committee, it's been a tremendous help. I get to see not only and share of my ideas and things, also about other peoples, what they're doing and how they go about this. It helps. And then you get more ideas, hearing about other people and what they're doing and to get -- I mean, that's how it kind of -- it's a cross-pollination, and it's a positive feedback.

So, finally, when we think about how to increase participation on all these sections, what I think is possibly (indiscernible) on these properties that I just listed. And only then we can kind of make a dent here. And it's all about training and giving the women (indiscernible) the necessary tools,

spreading awareness. And if USPTO could do something like what Stephanie's group was doing, like provide volunteer blank forms where women or minority inventors can come and kind of inspire and mentor (indiscernible), that will go a long way. And especially like, with my STEM activities, I feel that whatever there are hands-on activities, rather than just talking or lecturing, like, kids really get excited. They get to see, okay -- I mean, kids are -- no, not kids. Young women, like whoever -- I mean, is qualified, we should encourage all of these sections to participate and to see the thing for real and kind of having somebody there who has gone through this process to help them. I think that can make a real difference.

And then -- and I'm hearing about all the legal clinics, pro bono clinics. That's really good work that these groups are doing. Thank you.

And then collecting the demographic info (indiscernible) question, I think that's a great idea. It will help us measure progress and treat the programs, right, because we want to ensure the success. I don't think there is any one silver bullet that can solve all this, so it will be to have a collection of efforts by different groups, including the PTO. And it's important to keep (indiscernible) how -- whether we are making a dent or is

there something we need to change so that we can figure it out.

And, automatically, in my mind, it's about our -- about equal opportunity and contribution from all sections of the society towards the progress of mankind, this nation, this world. And I wish USPTO all success with the implementation of the SUCCESS Act. Thank you.

MR. CABECA: Thank you, Liji.

Okay. Next, I'd like to ask Charu Kurani from Facebook.

MS. KURANI: Thank you for your time today. I'm honored to attend the third public hearing of the Study of Underrepresented Classes Chasing Engineering and Science Act signed into law on October 31st, 2018. My name is Charu S. Kurani, and I'm a patent attorney on the legal team at Facebook, and I'm speaking here today on behalf of Facebook.

Diversity and inclusion are very important values at Facebook, and we're committed to taking action that focuses on identifying and improving the underrepresentation of people in the patent system. This issue is also very important to me personally. As a mother to a young daughter, I want to do everything that I can to change what the future looks like for her. If she chooses to go into tech one day, I want to see -- I want her to be able to see other women innovating and

participating in the patent system at the same rate as their male counterparts. I want to her feel like she belongs.

Today, the USPTO is seeking comments from the public on the participation of women, minorities, and veterans in entrepreneurship activities in the patent system. In particular, we note that the USPTO believes businesses, among others, have relevant information on the number of and benefits from patents applied for and obtained by women, minorities, and veterans, as well as small businesses owned by these groups. I'm here today to voice Facebook's support of this initiative and to encourage the USPTO, universities, and other institutions in the patent ecosystem to provide education to participants of the patent system about the issues highlighted by the SUCCESS Act.

I'm also here to describe Facebook's efforts in closing the equity gap in patenting -- in inventing and patenting for women, one of the key aims of the act. Innovation is at the heart of Facebook's mission. We invest a significant portion of revenue in the innovation of products and services to connect the world. In fact, in 2018, Facebook invested over $10 million into research and development, which is almost 20 percent of its revenue. Because the patent system plays a critical role in protecting and facilitating the ability of our engineers to innovate and to

introduce these products and services to the world, Facebook supports a strong but balanced patent system that promotes innovation.

Facebook has been and continues to be an active participant in the patent system, with well over 15,000 patents related to hardware, software, including virtual and augmented reality, infrastructure, connectivity, communication, commerce, and artificial intelligence.

While a robust patent system is necessary to drive growth and stimulate innovation, diverse perspectives are just as critical to fuel research and drive growth. In particular, women, minorities, and veterans bring with them these diverse perspectives in the form of fresh ideas and valuable insights that greatly impact the development of these products and services of the future.

However, since women have -- in particular, have been historically have lower rates of participation in technical roles, businesses have routinely lost out on their diverse perspectives, leading to stymied economic growth and innovation. In fact, in the report entitled "Progress and Potential: A Profile of American Women Inventors on U.S. Patents" recently issued by the USPTO, it suggests that women's innovative potential is being

underutilized and that women can be considered lost (indiscernible) in science, people who would otherwise contribute valuable inventions if they had early exposure to innovation in the inventor roles.

The report further suggests that harnessing women's underexplored talent would be valuable to spurring innovation and tracking growth. At Facebook, we are actively striving for a diverse workforce. The percentage of women in technical roles has increased from 15 percent to 22 percent in 2018, according to Facebook's fifth annual diversity report.

While the number of women at Facebook has increased five times over the last five years and the number of women in technical roles has increased over seven times, we are still actively working to increase the number of women in technical roles so as not to lose out on our lost (indiscernible) science or rather, what we refer to as our lost Marie Curies.

As of February 2019, 24 percent of Facebook's organic patent applications named at least one woman inventor, and we would like to see that number continue to climb. Facebook recently launched an internal diversity initiative specifically aimed at increasing the number of women who make patent applications. The initiative includes a number of efforts

focusing first on increasing access to and visibility of the patent process to women within the company.

The patent team at Facebook is developing programs to provide additional education to women, about patents and the process by which patents are obtained at Facebook. We are also planning to host a career panel with prolific women inventors who will talk about positive impact that patents have had on their careers. Additionally, the patent team is hosting patent harvest sessions for women, led by women. Each of these initiatives is introduced with a specific goal of achieving gender disparity in patenting.

Further, Facebook is not only interested in addressing gender disparity in patenting but is also interested in better understanding the barriers that women face in participating in Facebook's patent program. To that end, Facebook will be collecting feedback from women on their experiences with Facebook's patent program so that we can identify and address these barriers.

While these initiatives are internal to Facebook, we are also interested in advocating for change in the tech industry at large by partnering with the USPTO and other companies and associations. Facebook has committed to using the Intellectual

Property Owners Association's achieving gender disparity in innovation toolkit. In using the toolkit and obtaining results, Facebook is looking to provide feedback to the IPO, as well as to the USPTO, about our barriers and about best practices we have implemented to address these barriers. In doing so, Facebook is hoping to set an example and encourage other businesses to do the same to effect and scale positive change across the industry.

Although we have already kicked off a number of programs focused on diversity among patent applicants, we recognize that it's a complex problem that needs to be addressed wholistically. Studies indicate that's the skilled labor shortage in America could create 85.2 million unfilled jobs by 2030. Facebook is committed to helping reverse the skills gap in America by giving individuals and companies the tools they need to flourish in an increasingly digital economy, which also will increase diversity in jobs that require digital skills, like coding and digital marketing.

Last year, Facebook pledged to train 1 million U.S. small business owners by 2020 and equip more people with digital skills they need to compete in today's workplace. As part of our pledge, we have expanded a digital training program to 50 cities, partnered with over 60 organizations and dozens of community

colleges across the country. We also launched an e-learning program called Facebook Blueprint, which includes classes available in 14 languages with over 80 online courses. Our Blueprint team works with local associations, such as the Small Business Association, America Small Business development centers, and national small business associations to offer free in-person local training events leveraging Blueprint curriculum. Thousands of U.S. small businesses have already been trained using Blueprint, and by 2020, we plan to train an additional 250,000.

Facebook is also committed to doing business with diverse-owned companies because having diverse suppliers helps us build better products for our global community. Facebook supplier diversity connects qualified diverse-owned businesses to our fast-moving community while also helping these companies grow their businesses on our family maps.

In 2017, Facebook spent $233.6 million with U.S. companies certified by both private and public organizations as a majority owned and operated and controlled by racial and ethnic minorities, women, veterans, LGBTQ people and differently-abled entrepreneurs. Of that investment, 145 million went to minority-owned businesses, and 92 million went to women-owned businesses. We believe that our broader efforts to enable small

businesses and promote supplier diversity will contribute to more innovation and greater diversity in the inventor community.

Facebook has contributed to increasing the representation of women in filing patent applications and believes that the USPTO is well positioned to provide the industry at-large with data of women's entrepreneurship and inventorship on patent applications. Facebook is excited to support this initiative both internally and across the industry, and we're grateful to partner with the USPTO on this important effort. Thank you.

MR. CABECA: Thank you very much.

So that concludes our scheduled public testimonies. I just want to take a moment to thank everybody for their testimonies thus far and appreciate everyone for taking their time out of their busy days to participate in this important effort in partnership with the SBA.

And I want to take the opportunity now to open the floor for anyone that would like to make public comment that has not already been recognized.

Okay. I always heard wait five seconds.

All right. So, then, since there is no additional open-floor testimony, unscheduled testimony, other than the one we had earlier this morning, I'd like to move towards our closing

remarks and close up the program.

I thought it would be important, in closing, to talk about next steps so that you have an understanding of what we're going to do with all of this wonderful information. So we have -- as we mentioned before, we have one more public session, one more day of testimony we'll actually be doing in our regional office located in Detroit, Michigan, on June 18th. After that, the team plans to digest and deconstruct all the public comments and transcripts from the three roundtables -- from the three testimonies and to start identifying where there's overlaps and where there's some key take-aways that can actually translate into concrete steps that the USPTO, in partnership with the SBA, can fold into the report in a recommendation going forward to Congress.

So we plan to work with the SBA very closely in that process as well as with other -- our Department of Commerce agencies and other federal agencies as well to help build a comprehensive cross-functional report that will support minorities, women, and veterans in the patenting and -- in promoting patenting and entrepreneurial activities.

So according to the SUCCESS Act, it charged that the USPTO and the SBA to conclude the report within one year, so we're

being a very date-driven agency -- we don't like to turn anything in late; what know what that means to our stakeholders too -- so you can fully expect that the report will be out in the public by the end of October 2019.

Again, I just want to thank everybody for participating today at headquarters and Julie from yesterday for spending the day with us as well and to all of you. And if there's anything additional that we can do to help support this effort, please continue to share your thoughts and ideas and perspectives.

With that, again, thank you very much, and have a great rest of your day.

(At 2:59 p.m., the above hearing concluded.)

CERTIFICATE OF TRANSCRIBER

I, Bobbi J. Fisher, do hereby certify that the foregoing transcript is a true and correct record of the recorded proceedings; that said proceedings were transcribed to the best of my ability from the audio recording and supporting information; and that I am neither counsel for, related to, nor employed by any of the parties to this case, and I have no interest, financial or otherwise, in its outcome.

_____

Bobbi J. Fisher, NCRA Registered Professional Reporter/Transcriber

June 9, 2019

January 14, 2020

The Honorable Nydia Velazquez
Chairwoman for the Committee on Small Business
United States House of Representatives

Subject: Our Testimony at the USPTO SUCCESS Act Hearings

Dear Chairwoman Velazquez:

Thank you for your leadership on the important issue of innovation equality, and for seeking to increase participation in the patent system by underrepresented individuals.

We are 20 of the women, minority, and veteran inventors who testified at USPTO hearings held in summer 2019 in Alexandria, Detroit, and San Jose. The purpose of the hearings was to "gather information on the participation of women, minorities, and veterans in entrepreneurship activities and the patent system for purposes of preparing a study on the subject as required by the Study of Underrepresented Classes Chasing Engineering and Science (SUCCESS) Act." See 84 FR 17809.

However, the USPTO excluded our testimony from the report that the agency issued to Congress on October 31, 2019. While it is disappointing that the USPTO silenced our voices, we are nevertheless hopeful that you and other Members of Congress will consider our views and experience going forward.

An overwhelming majority of the inventors who testified identified **difficulty with enforcing our patents, risk of PTAB invalidations, and efficient infringement as obstacles to participating in the patent system.** As one witness put it, "what good is a patent if one cannot defend it?" We have attached samples along with copies of our testimony with this letter. We respectfully ask that this letter and attachments be submitted for the record of the hearing to be held on January 15, 2020 – Enhancing Patent Diversity for America's Innovators.

The report that the USPTO issued to Congress on October 31, 2019 did not include any Legislative recommendation to address these problems we raised. To add insult to injury, the USTPO instead recommended that Congress could "issue a commemorative series of quarters and postage stamps...featuring American inventors from a variety of backgrounds, including those from underrepresented groups." We asked for reliable patents and the USPTO recommended postage stamps! Some of the other recommendations by the USPTO may prove useful, but we are the underrepresented inventors and entrepreneurs you seek to help, and we can tell you precisely how to accomplish the SUCCESS Act objectives.

Women, minorities, and veterans must be encouraged to innovate, and the patent system must be repaired so it is actually "securing to [women, minority, and veteran] inventors the exclusive right to their discoveries". Article I Section 8 of the Constitution. This includes preventing the USPTO from double-crossing inventors by revoking our issued patents at the request of corporate infringers, and providing tougher penalties for stealing inventions.

The best way for Congress to accomplish this is to pass H.R. 5478 The Inventor Rights Act. This bill was introduced by Representatives Danny K. Davis (D-IL) and Paul A. Gosar DDS (R-AZ) on December 18, 2019. This legislation provides narrowly targeted relief only to inventors (like many of us) that own and control our own patents. It would permit inventors to opt for regular court instead of the PTAB in disputes over previously issued patents. It would disgorge all profits attributed to infringement of a valid inventor-owned patent. And it would provide other benefits for inventors including injunctions to prohibit unauthorized use of the invention, the right to file suit in their home district, and recovery of attorney fees that substantially exceed the amount of damages awarded.

Once we can rely on patents to stop large well-heeled corporations from stealing our inventions, then minorities, women, and veterans will be able to pursue more patent and entrepreneurship activities. Increased diversity and innovation will benefit all of society.

We truly appreciate your work on this important issue, and are available to work with the Small Business Committee going forward. For questions or follow up please contact Carrie Hafeman at carrie@frontdoor software.com or (303) 570-3654.

Sincerely,



Peter Antros | Shelly Conte | Paul Morinville | Thomas Riederer

Brian Aumiller | Kip Azzoni Doyle | Paula Murgia | Tesia Thomas

Arnold Beal | Patricia Duran | Laura Myers | Ted Tsao

Darcy Bisker | Robert Granadino | Martin Nguyen | Marjerie Weir

Deja Castro | Carrie Hafeman | Robert Ratmiroff | Ronald Zhang

Cc:

U.S. Representative Hank Johnson
U.S. Representative Jerry Nadler
U.S. Representative Hakeem Jeffries
U.S. Representative Alma Adams
U.S. Representative David Cicilline
U.S. Representative Abby Finkenauer
U.S. Representative Jared Golden
U.S. Representative Andy Kim
U.S. Representative Jason Crow
U.S. Representative Sharice Davids
U.S. Representative Judy Chu
U.S. Representative Marc Veasey
U.S. Representative Dwight Evans
U.S. Representative Brad Schneider
U.S. Representative Adriano Espaillat
U.S. Representative Antonio Delgado
U.S. Representative Chrissy Houlahan
U.S. Representative Angie Craig
U.S. Representative Steve Chabot
U.S. Representative Aumua Amata Coleman Radewagen
U.S. Representative Troy Balderson
U.S. Representative Kevin Hern
U.S. Representative Jim Hagedorn
U.S. Representative Pete Stauber
U.S. Representative Tim Burchett
U.S. Representative Ross Spano
U.S. Representative John Joyce
U.S. Representative Dan Bishop

APPENDIX

Selected Public Comments From SUCCESS Act Hearings

The following are selected comments from the witnesses that testified at the public hearings in Alexandria, VA, San Jose, CA, and Detriot, MI over the summer of 2019. Complete transcripts and written testimony are accessible at https://www.usinventor.org/2020/01/14/inventor-letter-to-nydia-velazques-re-success-act/.

What good is a patent if one cannot feasibly defend it?

With the current state of patent law in the United States, independent inventors and small businesses cannot adequately license the patents they receive with larger, financially-abled entities – the "represented" class – nor can they enforce their patents against this class when their patents are stolen. This is because this represented class can simply bleed the underrepresented class dry legally and financially by taking advantage of today's current patent laws.

So, although pursuing equal opportunity with women, minorities, and veterans in obtaining a patent is a valuable effort, if it does not coincide with equal outcome in one's ability to utilize the patent once received, regardless of the person's financial state, telling women, minorities, and veterans that they stand to benefit from a patent will simply be false doctrine.

- Patricia Duran

For a single post-grant review, a patent holder – the independent inventor – will need just shy of half a million dollars. And with stats showing the kill rate for patents at the PTAB between 75-85%, no attorney will take this on contingency, especially when there are no damages on mere success at the Patent Office. This cost is on the inventor's dime. And this is just to reach the same state of reliance that previously existed on the day a patent was granted before the AIA went into effect. In other words, if you don't have half a million dollars to spare for a single patent challenge at the Patent Office, you will not find representation if you ever want to license your patent.

Does a patent give women, minorities, or veterans any real benefit, or all independent inventors or small businesses, for that matter? With a patent system like this, the question that arises if you were to encourage these groups to get more patents is not "what are you doing for them?", but "what are you getting them into?" because they have no idea.

- Jeff Hardin

I would like to know that there is a level playing field for me as an individual inventor. After getting my patent issued and going through the process, I learned right away the patent is only valuable if you can defend it.

Again, getting the patent is the easy part. Protecting is the hard part. It could cost tens to hundreds of thousands of dollars and years to complete. I've read stories on products on Kickstarter of being knocked off in China and being sold and delivered to the US before the Kickstarter project has even finished regardless of if they had IP or not. If that don't kill the business, I don't know what will. I feel the larger companies don't honor this and they label us patent trolls to defending our patents. And they use the courts to take advantage of us knowing full well that we can't do anything to beat them.

I also feel that needs to be more accountability with those companies that do prey on people as well. I would also like to add that securing a patent helps with getting money and investment. I will keep moving forward and I can with this process. And I will keep hoping changes will be coming from Congress. And on a side note, I don't have $400,000. That's it.

- Brian Aumiller

My patent was very widely accepted and utilized, produced, sold, manufactured and made by everyone. When something is successful, big companies come in.

So while there was nothing in this field and then suddenly a multi-hundred billion dollar — million dollar industry that is now in the billions, sold by News Corp., sold by 3M, sold by Hewlett Packard, infringing products all around. I lost the money that I put in, that I could've been generating more business.

Because the patent was not respected by commercial businesses, by the large corporations, and not by the court, I have to question, is The United States Patent and Trademark Office issuing valid patents? And if so, why are they not being upheld in the judiciary?

- Darcy Bisker

I didn't even know that Debtors Anonymous existed until I tried to pick my life back up after October. That's when I was invalidated in the US court, in the Southern District of New York.

I personally experienced being shunned, scolded, and lectured whenever I mentioned being a patented inventor in the digital technology industry. I would do everything that was by the book. I had people laugh at me. Oh, you think a cartoon character is going to encourage someone to stay healthy? Get out of here. Yeah, and by 2005 Nintendo had launched Wii fit. I had a former senior executive from Activision just blatantly tell me you are the problem. You are not the solution. My self-esteem has really taken a lot of blows.

So it's my continued optimism that my own dreams to appeal my status as being invalidated and to have that be realized, crazy as it may seem, and I'm really motivated just to be with this group of inventors and to meet you all personally to share these stories.

- Paula Murgia

Rather than solely speak for inventors, I wanted to give many of these inventors a chance to speak for themselves, and to that end, at a recent inventor conference, I interviewed them, including some of my own clients from the clinic, asking them what issues they are facing in today's patent market.

> *"There is a risk in working with a large company. If one goes and presents intellectual property to them, the company may look at it in a different way. For example, they may consider simply going ahead and infringing the rights and then appealing it to the PTAB, which has a high chance of invalidating the patent."*
>
> *"Due to how easy patent invalidation has become, companies do not feel a need to license. Instead of licensing it and being more economical to infringe and invalidate the patent."*

> *"The effects of the PTAB analysis decision made me unable to defend my patent rights and caused my investors to leave."*
>
> *"I am considering no longer patenting in the U.S. I can get better protection in China. As a veteran, I do not want to move my creations elsewhere but feel that, in view of the current market conditions, I do not have any choice."*

It is startling to me to receive repeated feedback from many inventors that companies blatantly will disregard patent rights because, quote, "It is cheaper to kill a patent than it is to license one."

- Britten Sessions

Without these safeguards, I don't think that asking women, minorities, independent inventors, veterans to get involved in the patent process makes a lot of sense because it can be very risky financially to go down this road. Part of it is the excitement, of course, of inventing, but the other part of it is really defending your invention when it's infringed, and that could be quite a daunting process.

Typically what will happen is that the other side will say that a patent is invalid, and it shouldn't have been issued. And this whole process that occurs here with these typical validity challenges can go on for years, and without adequate funding from an independent inventor, you really don't have much of a chance standing up against some of these big dogs in the marketplace. And what I mean by that is simply that the typical strategy of a large infringer will be to run the independent inventor out of money. You're looking at years, hundreds of thousands, millions of dollars.

If USPTO wants to get independent inventors involved — women, minorities, veterans — you're going to have to take a look at this validity process.

- Robert Granadino

If patents can't be defended, big tech just steals them, and using their huge markets and deep markets, massively commercializes them

The USPTO set up the PTAB skewed to invalidate huge percentages of the very same patents that it just granted....These are the patents that inventors have put their trust in, betting their careers and sometimes their entire life savings to commercialize or license them, only to have that trust betrayed, and then to lose everything.

We all want women, minorities, and veterans to climb the social and economic ladders, but to do that, we must have a patent must be capable of attracting investment. It must be presumed valid, exclusive right, and can't cost so much to obtain and defend that nobody can do it as it does today.

- Paul Morinville

I don't expect to participate in the US patent system any further unless the financial disparity is addressed. The USPTO should eliminate the IPR process for all of the patents initially filed by a small entity, a micro entity, and for inventor-owned and/or -controlled companies. When large corporations undergo the IPR process, they utilize less than 1% of their resources. When my peers and myself of limited financial means have to undergo the IPR process, then we face business and personal bankruptcy just to afford to defend ourselves. If we cannot scrounge up half a million dollars for attorney fees, then we cannot defend our

patents, and there is nothing to gain even by a successful defense. We will end up spending half a million dollars just to maintain the status quo and then still face business and personal bankruptcy.

- Tesia Thomas

Please fix the America Invents Act, things have changed lately, and it's had a devastating effect, I think, on individual patent owners currently. So either you get a patent or you don't. You get a patent and then six, seven years later, oh, maybe we made a mistake, and then they just take it away....I mean, there's an 85 percent clobber rate with the PTAB. So basically you have a patent, and that's great, but you only have a 15 percent chance of keeping it, and you have to spend another $450,000 to prove to keep it. I do have a lot of other ideas, but I'm not going to invent and patent right now unless this gets fixed.

- Carrie Hafeman

Every woman I talk to feels like it is something worth doing. But it's hard to find venture capital...investment when we have a PTAB that will take away the rights to your patent...once it does matter. Because our patent system is becoming so weak, knock-offs are allowed all over the place. That's where the patent office needs to put all of its energies.

- Marjorie Weir

The challenges that underrepresented populations face tend to be less related to USPTO, and more related to access to capital, lack of appropriate mentors and role models, and the costs of attorney fees associated with obtaining and defending a patent.

- Dr. Rory Cooper

Unfortunately...four patents...have been invalidated in the case by district court on a Rule 12(b)(6)...that means without claim construction, they got a quick invalidation.

- Ted Tsao

It is virtually impossible for an inventor of something truly valuable to 1) stop the theft of it, 2) stop the invalidation of his or her patent(s), or 3) stop him or herself from being rendered penniless and summarily defeated in legitimate efforts to stop the theft of the invention.

- Peter Antros

Thanks to the PTAB and lack of strong enforcement in court, patents cost inventors far more than is ever returned. Patents are just liabilities.

- Arnold Beal

Certainly if a family member of yours had their patent revoked or copied without recourse, you would care. Our country was built on many things and the ability to feel safe with a patent you have issued is one of them. It's time to change the usual and customary practices which have a blatant disregard for the United States patent holder.

- Valerie Carbone

It is crucial that we concurrently increase the enforceability of those patents. Patents have become liabilities for independent inventors thanks to the PTAB and lack of strong enforcement in court.

- Deja Castro

I thought patents were my insurance plan to protect me. My invention was stolen and they made millions and our product is still selling.

- Shelly Conte

To seek more patent applications from anyone, let alone the groups this survey targets to help, without addressing the problem surrounding the PTAB is nothing more than, dare I say, [redacted].

- Travis Creighton

The present system affords no benefit, and no likelihood of success to women, minorities, veterans, or other independent inventors who attain patents. I strongly support legislative and rule changes to address the gross inequities in the present system which are the product of well-funded lobbyists who get the laws and rules they want regardless of how unfair and unreasonable they are. Make no mistake, the current IPR and CBM laws were not written by Congressmen, they were written by lobbyists for corporate infringers. It is high time to remedy these stunning examples of corporate excesses.

- John D'Agostino

Patents have become liabilities for independent inventors thanks to the PTAB and lack of strong enforcement in court. If the recommended legislation does not include increased protection of patents, we will end up destroying the lives of the very individuals we intend to help.

- Kip Azzoni

However the subsequent risk of, after having paid and worked to obtain a patent reviewed by a qualified patent examiner, only to have struck down arbitrarily by the PTAB at the whim of a large financially rich corporate entity unwilling to pay the lawful royalties that the patent is supposed to award the inventor, is too great.

- Keir Finlow-Bates

I truly believe that we are slowing down progress by making easier for big companies to monopolize on someone else's invention by simply outspending and exhausting the small inventors resources in litigation.

- Curt Flowers

Independent inventors risk thousands of dollars in developing and patenting their products only to find that the greatest liability is to have a product reach success in the marketplace. Under our current weakened patent system, large corporations with deep pockets and teams of attorneys can easily infringe on a small, independent inventor's product, swamping the inventor with litigation costs and extreme financial stress in trying to protect their own USPTO issued patent.

- Laura Myers

If a product is successful, large companies come in and steal the idea and force the patent owner to start a lawsuit that they rarely can afford. Then, even if the inventor can pay the enormous legal fees, if the infringer chooses to take the patent to the PTAB, the inventor has almost no chance of surviving.

- Martin Nguyen

The initiation of the process litigation, makes a dent on the cash flow potential of the to be startup, or person, money that is tight, or money that have to borrow to defend themselves from people who claim that the patent needs to be invalidated, given expert advice from lawyers, in general.

- Alberto Ratmiroff

The estimated mean legal fees of an IPR proceeding through appeal runs nearly half a million dollars. If a patent is challenged and the patent owner loses, his patent is invalidated and his investment is lost. If he wins, he effectively "wins" nothing, since he still has a patent but there is no consequence to the challenger, often a large infringing company. A business such as mine could be ruined by a single IPR.

- Thomas Riederer

101 objections were just an excuse to give Google and the other big tech companies what they paid for lobbying Congress and me, I am just a dumb schmuck who thought I would get the chance to plead my case in front of a jury of my peers — how stupid am I to expect that kind of fairness from my own government. You have no idea how this AIA feels to inventors — none.

- Name Withheld

Yes the cost is high to litigate to protect your patent claims against infringers and yes the cost is high to fight against big companies who label you trolls and invalidate your patent. These companies know that you do not have the resources to fight back because you cannot hire honest attorneys for a reasonable fee or on a contingency.

- Darrell Thompson

These days, however, the risks and costs taken on by a patent holder can outweigh the advantages. With extremely high PTAB invalidation rates, patents offer little protection to the inventor. Many independent inventors, particularly those from underrepresented classes, are unable to pay to defend a patent in an IPR, which has been estimated by the AIPLA at $450,000. Patents only have value if they are a dependable right without the risk of being so easily revoked.

- Bob Zeidman

However, after the controversial Supreme Court Rulings on Alice, and the PTAB's practice in invaliding a huge number of software related patents, my patent portfolio is now valued for less than 10% of its original value, which is way below my cost of obtaining the patents plus the maintenance fees paid to USPTO. I am heavily in debt. My patents have relegated my socioeconomic status to economic distress. Businesses cannot be built on false promises of exclusive right and patent enforceability.

- Ronald Zhang

