TESTIMONY OF DANNY BRIERE, CHIEF ENTREPRENEURSHIP OFFICER OF THE HENRY FORD AND GLOBAL DIRECTOR OF INVENTION CONVENTION WORLDWIDE ON THE SUCCESS ACT OF 2018

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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 Entrepreneurship Officer for The Henry Ford in Dearborn, MI, and 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 helped shape America. It is 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 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 market. 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 project-based personalized learning undertaken by educators and neuroscientists who understand the benefits of undefined/ill-defined problem solving on brain development. You can find invention conventions in schools in 48 U.S. states, and formal large scale Henry Ford Invention Convention affiliate programs in 21 states and 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 innovative potential and continue to promote United States Leadership in the global economy."

The SUCCESS Act 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 the future of American innovation and global economic power, we need to start in K-12. If we start in K-12, the adult participation of women, minorities, and veterans will naturally increase – at a greater rate than other Classes because of 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 – designed to try to coax would-be entrepreneurs to leave their jobs and start companies or to become entrepreneurs during and after college, we need yet more entrepreneurs to power the growth of local ecosystems. Trying to change mindsets of adults is 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 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, lawyer or 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, a good number take their products to market. We do this largely in-school, alongside Math, Science, History, and other core coursework, and we train the teachers how to teach invention and entrepreneurship education.

We're doing it all across America with more than 120,000 students annually, and we're rapidly growing.

At our recently concluded 2019 Invention Convention U.S. Nationals, The Henry Ford hosted a student inventor pool that was 58% Female, 31% Non-White Ethnic Minority, 10% English as Second Language, 27% Financially Underserved (communities with 2.5x or less the Federal poverty rate), and 51% Below Median Household Income in the U.S.

We are already helping solve the problem Congress has asked the USPTO to solve under the SUCCESS Act.

We are graduating into the local communities a diverse student workforce specifically trained to be inventive, innovative, and entrepreneurial. Some of our schools, like the Charles H. Barrows STEM Academy in North Windham, CT, are doing this every single year; I know several young serial inventors who have been inventing for seven or eight years straight. Emma Ruccio from Southington, CT and the Connecticut Invention Convention program, is a six-time serial inventor who has created, among other inventions, a means to help students with scoliosis track the success of their physical therapy. She's in the ninth grade now, and in the workforce in eight.

So let's talk about what sort of impact this approach could have on a community. We are designing a new urban community initiative that will involve all the students in our partner city's surrounding metro area – some 600,000 students in the local K-12 school systems. All the students will receive Invention Education in grades K-5, Innovation Education in 6-8, and Entrepreneurship Education in 9-12 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 for this top 50 city, and, importantly, the population/demographics of the people behind new products, companies, patents. Imagine: that is 50,000 Emma Ruccio's.

Now, suppose we did that all across America.

So when it comes to trying to encourage women, minorities, our 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, and this fundamental community-wide approach 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 changemakers 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-12. That will grow and sustain American innovation for all Classes.

Now we need to make sure we can protect these student inventors' intellectual property.

When the USPTO moved from First to Invent to First to File, 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 anyone else. But for someone to undertake the time and expense of patenting their invention, they generally need to have confidence that their invention is worthy of that investment. That takes time too.

A challenge for the Underrepresented Classes we are discussing is that they often do not have the confidence, time, and resources to make that assessment.

Consider the typical K-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 is really unique and substantive. It is highly typical that this student will present his/her invention at their school's science fair, invention convention, STEM fair, entrepreneurship expo, pitch competition, or other public events. Many of these events are competitions and select the most promising student inventions for recognition and ascension to higher competitive levels, like National and Global Competitions.

It is this recognition and acclaim that sparks the idea that "Hey, I might be onto 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 that while these are great solutions for a few of the topmost student inventions, nationally, more than 120,000 students also created inventions this year. All of these inventions, largely, are not protected by any patent applications. Some of these are indeed patentable and even ready for market (or to be commercialized).

What's more bad news, because they are displaying logbooks about how their inventions were created and prototyped, with posterboards 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 is needed is a more accessible, Provisional Patent process. That requires funds, which some women, minorities, veterans, and K-college students don't have. 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 6-12 months of first disclosing their invention. We at The Henry Ford would propose that the USPTO, together with Congress, consider the 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 the full non-provisional patent application process.

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 65 years of age or more to advance the timeframes for the 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-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 logbook to document and protect their inventions 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 have an impact both here and outside the U.S., and protect them from intellectual property thieves at the public events.

For the 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. Even at its lowest cost – $70 – this still too much 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 Classes analysis, alongside Gender, Race/Ethnicity, and Military Service History. And with Age, we're not only talking about K-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 is not unusual to find development planners talking about, "K-though-Grey" which represents their focus across the whole age spectrum – from Kindergarten 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 we 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 seen this

with our programs. Recall our invention engineering programs have 58% female participation!

We recognize we need to craft specific policies and programs to help these 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 the 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 anyone else in these regards: equal capability and equal opportunity.

Finally, our researchers need to be able to have 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 its 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 to present our thoughts today. We believe that while short-term policies, like reduced fees, will help, it is the long-term approach of basic and sustained education in invention, innovation, and entrepreneurship for K-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-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.

We look forward to hearing great news from the outcome of your work on the SUCCESS Act. Thank you.

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