

# Inventors

JANUARY 2018 Volume 34 Issue 01

DIGEST

## INVENTIVE WOMEN

THEIR ROLE IN INNOVATION  
Successes • History • Challenges

### U.S. Trade Show Calendar, 2018

MAJOR U.S. EVENTS  
OF INTEREST TO INVENTORS

### Protests at Supreme Court

ORGANIZERS DECRY  
EROSION OF PATENT RIGHTS

### Yahoo/Facebook Case Lessons

TIPS TO PROTECT AGAINST  
PATENT TROLLS, INFRINGEMENT

**Dr. Stephanie Couch**  
EXECUTIVE DIRECTOR,  
LEMELSON-MIT PROGRAM

\$5.95

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## Change the Culture to Bridge This Gap

"Check this out," the subject header said.

A couple of my loyal friends and work contacts emailed me with a link to the latest study on race and gender inequality in innovation. By the time I finished reading, I was even more enthusiastic about this month's issue of *Inventors Digest* featuring women in inventing.

On December 5, Vox Media released "groundbreaking empirical research" by economists from the Equality of Opportunity Project. While noting small gains in the number of female inventors over the years, the study said that at their current pace of involvement in innovation, it would take 118 years to reach gender parity.

One particularly interesting aspect was the impact of geography. The study indicated that female inventors are "especially likely to innovate in a category where female inventors were prevalent in the metro area where they grew up, suggesting that the specific ability to personally identify with older women in the field is playing an important role here."

Few, if any, know these kinds of numbers better than Dr. Stephanie Couch. The executive director of the Lemelson-MIT Program and our featured cover subject this month, Dr. Couch has spent her professional life working to bridge gender gap issues. She says that achieving parity will require communities to promote the proper environment and opportunities for invention.

"Equal representation is a start," she said in her interview, "but the cultural conditions must also support the diversity of knowledge, insights and expertise."

Minority and disadvantaged children share many of the same obstacles to inventing. The study said that because economically disadvantaged children have limited exposure to a culture of invention, even high-scoring black and Hispanic kids go into innovation at "incredibly low rates," said Raj Chetty, a Stanford economist who led the Equality of Opportunity Project research team.

The team calculated that if women, minorities and children from low- and middle-income families invented 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. Chetty lamented the "many lost Einsteins" among the underrepresented.

At *Inventors Digest*, we are committed to inspiring as many future Einsteins as possible—both young and old, female and male. Along those lines, this month's issue includes our 2018 Trade Show Calendar, an essential resource to grow your networking, fact-finding and dreams. Here's hoping you find the first issue of our 34th calendar year to be full of useful information of all kinds.

—Reid  
(reid.creager@inventorsdigest.com)

# INGENUITY IS AMERICA'S MOST VALUABLE RESOURCE.

**DON'T TREAT IT LIKE A CHEAP COMMODITY.**

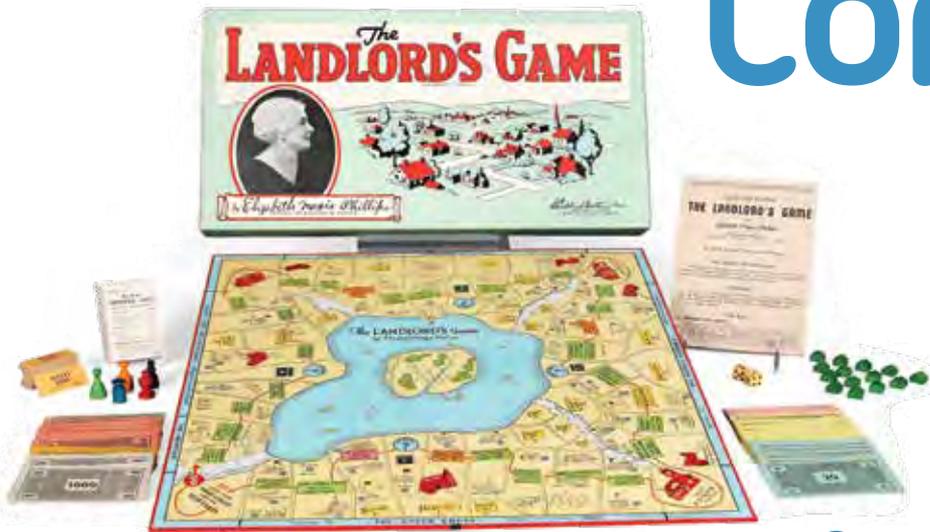
Our strong patent system has kept America the leader in innovation for over 200 years. Efforts to weaken the system will undermine our inventors who rely on patents to protect their intellectual property and fund their research and development. Weaker patents means fewer ideas brought to market, fewer jobs and a weaker economy. We can't maintain our global competitive edge by detouring American innovation.

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AMERICAN  
INVENTOR**

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Dr. Stephanie Couch,  
executive director,  
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photo by Mark Ostow.



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# BRIGHT IDEAS

## RECOVR Blanket

### CALMING WEIGHTED BLANKET

[recovrblankets.com](http://recovrblankets.com)

Billed as the largest weighted blanket on the market, RECOVR features Deep Touch Pressure Simulation that mimics the effects of a calming hug for a more restful night's sleep.

Tailored to be 10 percent of the user's body weight, the blanket is available in 10 lbs., 15 lbs., 20 lbs. and 25 lbs. Weighted blankets have long been used to fight depression, anxiety, PTSD, autism, aggression and in sports recovery. Using polymer pellets for the weighted component, RECOVR gently distributes deep pressure across the body to help it relax.

Shipping is set for February, with a retail price of \$299.



“No individual has any right to come into the world and go out of it without leaving behind him distinct and legitimate reasons for having passed through it.”

—GEORGE WASHINGTON CARVER



## DipClip

### IN-CAR SAUCE HOLDER

[milkmen.design](http://milkmen.design)

“How to Practice Safe Sauce” is the title of a promotional video for DipClip, a no-tech device designed to make driving safer and more convenient for the many people who eat in their cars. The clip, which attaches to any vent in your car, holds sauces and keeps the condiment container off your lap or other places where it's prone to spilling.

The clip holds almost all sauces from all major food chains. It comes with a Ramekin tub that fits the clip and has a 1.3 fluid oz. capacity (about five ketchup packets). The universal mount rotates and locks into 16 positions at different vent angles.

DipClip, which almost quintupled its \$10,000 Kickstarter goal, will retail for an estimated \$15 with a shipping timetable of March for crowdfunding backers.

## Vinci 2.0

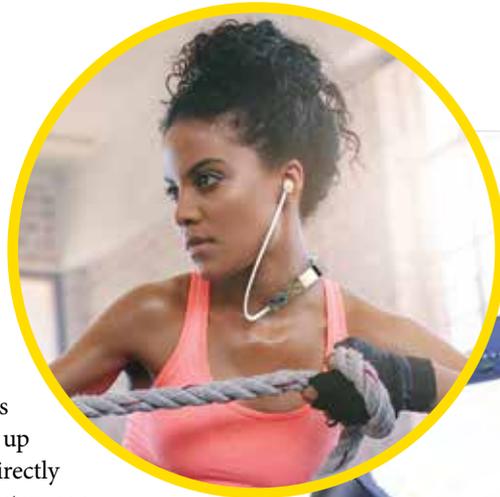
### STANDALONE SMART WIRELESS HEADPHONES

[en.vinci.im/2.0/](http://en.vinci.im/2.0/)

With Vinci 2.0, voice-controlled AI lets you make calls, send messages, look up information and gather information directly from your headphones so you can stay connected without a phone. It also has fitness trackers for your workout.

Vinci 2.0 is a standalone computing device with a Quad-Core ARM Cortex A-7 processor and WiFi, 3G cellular and Bluetooth connectivity. Its AI learns from your music listening habits and physical statistics to make music recommendations, and uses natural language processing algorithms to recognize your words and understand your intentions even in noisy environments.

Vinci 2.0 Lite (March delivery for backers) will retail for \$149, Vinci 2 Pro (April) for \$289.



## QUARTZ Bottle

### WATER PURIFICATION IN A SELF-CLEANING BOTTLE

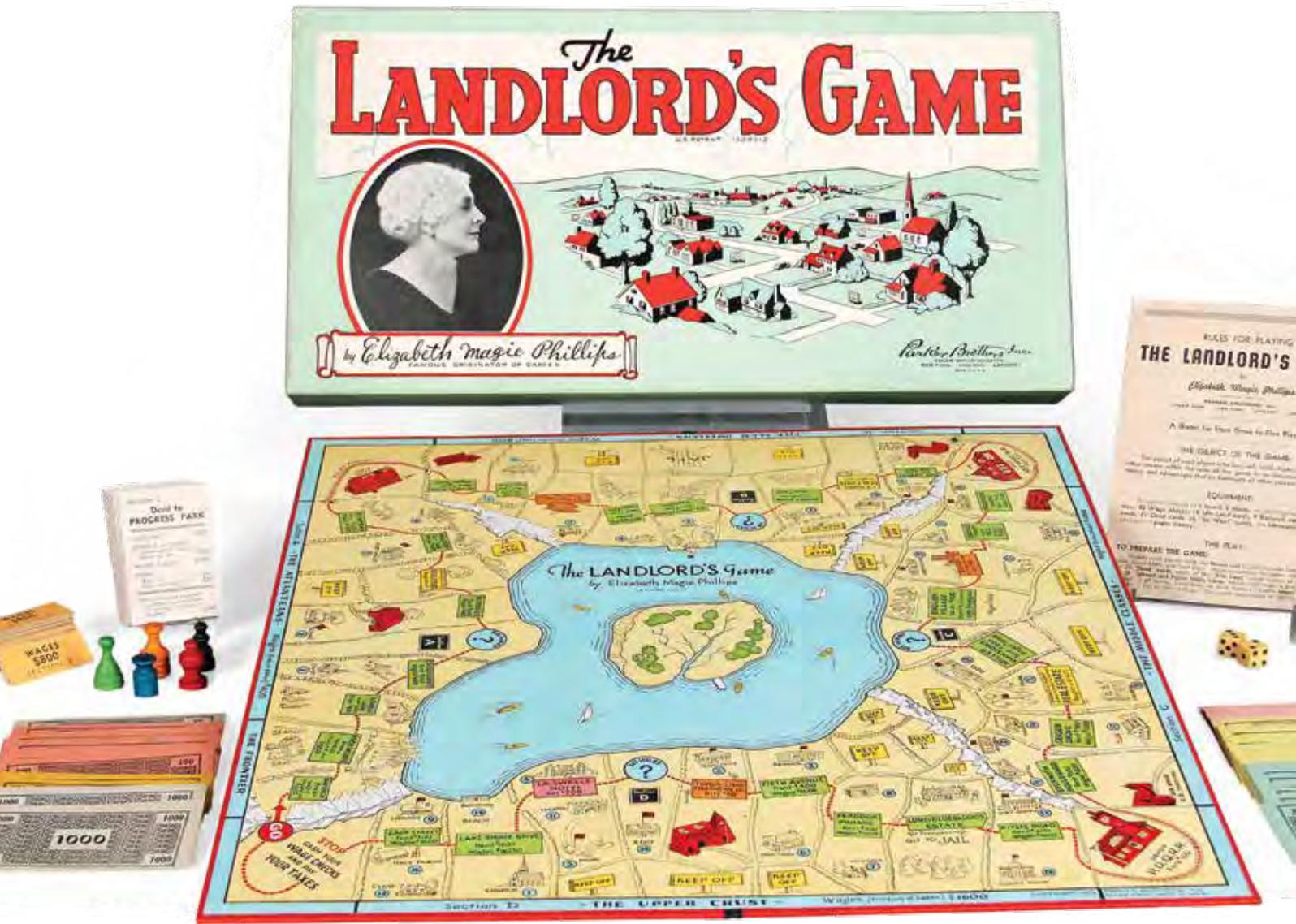
[clearlyquartz.com](http://clearlyquartz.com)

A reusable, rechargeable, insulated water bottle, QUARTZ works on digital purification from UV-C light at the touch of a button. The light neutralizes up to 99.9999 percent of harmful, odor-causing germs and reduces the waste of plastic bottles.

The purifying light activates every 4 hours, so the bottle is self-cleaning. QUARTZ's double-insulated construction keeps water cold for 24 hours or hot for 12.

The bottle will retail for \$99, with shipping in March and/or April. A working demo, not the final product, was built for the crowdfunding campaign. This may affect shipping times.





# Whose ‘Monopoly’ is it, Anyway?

ANTI-MONOPOLIST HAD PATENTED FORERUNNER TO ICONIC U.S. GAME **BY REID CREAGER**

Lizzie Magie's third version of her game, published by Parker Brothers in 1939, was short-lived. Her original version was patented in 1904.

**A**ll Lizzie Magie wanted was to make a statement criticizing the inequities of wealth. But she inadvertently ended up laying the groundwork for a historically popular game that in many ways celebrates that very premise.

Anyone who has ever played “Monopoly”—and that is millions of us—knows its goal is to accumulate more land and wealth than your opponents, or to bankrupt them out

of the game. So Magie’s “The Landlord’s Game,” first patented in 1904 and an unmistakable forerunner to the Parker Brothers classic, not only fell short of its mission but led to the modified, more commercialized version that made its owners millions of dollars.

For decades, Magie didn’t even get credit for her role in establishing the game and arguably being its principal inventor. That has changed.

PHOTO COURTESY OF THE STRONG, ROCHESTER, NEW YORK

## Lizzie Magie sold the patent for her game to Parker Brothers for \$500 and no royalties.

### Talented, outspoken

Elizabeth “Lizzie” Magie was born to be political. In 1858—eight years before her birth—her father, James Magie, accompanied Abraham Lincoln as the latter traveled throughout Illinois debating politics with Stephen Douglas. James Magie later worked as a newspaper editor, further exposing his daughter to an intellectual and political atmosphere.

Lizzie Magie moved to the Washington, D.C., area in the 1880s and worked as a stenographer and typist at the Dead Letter Office. But she wasn’t just another anonymous employee, and certainly no shrinking violet: In protest of her low wages of \$10 a week, the staunch feminist garnered national headlines by taking out an advertisement and offering herself for sale to the highest bidder as a “young American woman slave.”

Her talents were many. Magie was an actress, poet and writer of short stories whose works echoed her recurring themes of romance, pain and unfairness. She was also a female inventor with a patent by age 26—unheard of in 19th-century America—after coming up with a “type writing machine” in 1893 that facilitated paper moving through typewriter rollers.

Her most influential patent was yet to come. Having been introduced by her father to the writings of politician, economist and anti-monopolist Henry George, she hungered to demonstrate the evils of accumulating great wealth at the expense of others. George was an advocate of the single-tax theory, which essentially is that governments should tax land and only land.

Both Magie’s commitment to George’s principles and the resemblance to the latter-day “Monopoly” are obvious in “The Landlord’s Game,” for which she received a patent in 1904. Per [henrygeorge.org](http://henrygeorge.org), she wanted the game to be a “practical demonstration of the present system of land-grabbing with all its usual outcomes and consequences.”

U.S. Patent No. 748,626 shows the game’s main elements: a board with a square pathway, with players



### JANUARY 11, 1955

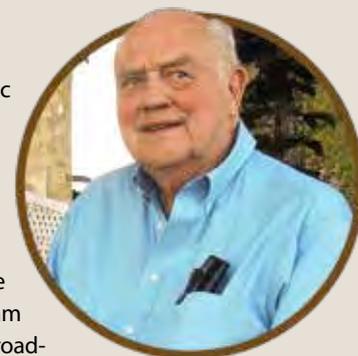
Lloyd Conover got a patent for the antibiotic tetracycline. Within three years, it was the most prescribed broad-spectrum antibiotic in America.

Conover originally planned to be a professor but joined the chemical research department at Pfizer after getting his PhD from the University of Rochester in 1950. As his team explored the molecular properties of the broad-spectrum antibiotics terramycin and aureomycin, it realized that it was possible to chemically alter an antibiotic in order to produce other antibiotics that could treat other issues.

He developed tetracycline in 1952—the first antibiotic made by chemically modifying a naturally produced drug. Since its patent was issued in 1955, tetracycline has been one of the most frequently prescribed antibiotics in the United States for treating bacterial infections.

In 1972, Conover and co-inventors W.C. Austin and J.W. McFarland patented the anthelmintic drugs pyrantel and morantel. Pyrantel is a leading drug for the treatment of most human intestinal worm parasites. Both drugs are important in controlling parasites in farm and companion animals.

Conover was inducted into the National Inventors Hall of Fame in 1992.



### JANUARY 21, 1939

Harold Arlen and E.Y. (Yip) Harburg’s song “Over the Rainbow” was copyrighted. Arlen wrote the music, Harburg the lyrics for the song that was written for the movie “The Wizard of Oz,” starring Judy Garland.

The song was initially deleted from the film. According to Parade, producers wanted to cut the 2-hour movie to 100 minutes and decided the song was

expendable. Other reports say that MGM chief executive Louis B. Mayer felt the song was too sad; others in charge said the song slowed the pace of the movie and questioned the use of a song sung in a barnyard. Associate producer Arthur Freed lobbied hard to keep the song and was eventually accommodated.

The ballad, sung by Garland about 5 minutes into the film, was the song of the century in a list compiled by the Recording Industry Association of America and the National Endowment for the Arts. The American Film Institute ranked it the greatest movie song ever.

Big band singer Bea Wain was the first person to record the song, but MGM prohibited its release until the movie came out.



starting on a corner featuring a map of the world with the phrase “Labor upon Mother Earth produces wages.” Players roll dice, advancing to spaces where they pay for taxes, properties, railroads and utilities; the second corner shows “absolute necessity” coal taxes. The third corner has a Poor House and Public Park. The fourth corner is a property owned by “Lord Blueblood” of London, England. If you land on it, you go to jail.

**How the game evolved**

Magie married Albert Phillips in 1910, four years after she moved to Chicago. They eventually moved back to the D.C. area and got a patent for a new version of Magie’s game in 1924 (U.S. Patent No. 1,509,312). The updated version included named streets and other changes to the board, most notably the new name “The Landlord’s Game and Prosperity.”

The anti-monopolist mission remained, as evidenced by her patent application: “The object of the game is not only to afford amusement to the players, but to illustrate to them how under the present or prevailing system of land tenure, the landlord has an advantage over other enterprises and also how the single tax would discourage land speculation.”

By the late 1920s and early 1930s, the game had caught on at colleges and small communities in the Northeast and Mid-Atlantic regions, having evolved from Magie’s design and usually referred to as “Monopoly.” According to henrygeorge.org, a woman named Ruth Hoskins who lived in New Jersey created the version with Atlantic City street names.

Through a series of people connected to Hoskins, the game was introduced to a salesman named Charles Darrow, who got a copyright for his modification of the game in 1933. He was granted a patent for the game in 1935 by a U.S. Patent Office that was seemingly unaware of its

forerunner. Magie sold her patent to Parker Brothers for \$500 and no royalties.

*Smithsonian* magazine reported that Magie was “initially thrilled that her tool for teaching about economic inequality would finally reach the masses.” “Monopoly” sold 278,000 copies in its first year, 1,750,000 the next. Meanwhile, Darrow—by then widely acknowledged as the game’s inventor—was lauded as a storybook American success story: a man who created the game in his basement to support his family during the Depression. He and Parker Brothers became incredibly wealthy thanks to perhaps the most popular board game of all time.



Charles Darrow got his “Monopoly” patent in 1935.

**Unintended consequences**

In early 1936, the Washington Evening Star printed a story about Magie and noted her game’s resemblance to the board game that had quickly become a national phenomenon. She reportedly was somewhat critical of Parker Brothers, which agreed to publish two more of her games—“Bargain Day” and “King’s Men” in 1937—and a third version of “The Landlord’s Game” in 1939, which henrygeorge.org says Parker Brothers “did nothing to promote. In fact, the game was almost immediately recalled from stores and almost every unsold copy destroyed. Today, very few copies survive.”

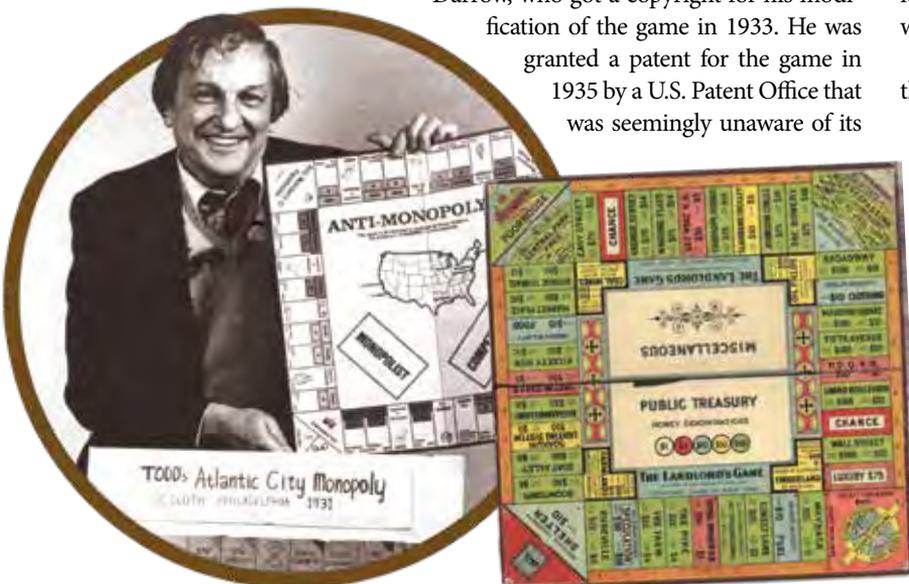
Magie said the wealth she missed out on was fine with her “so long as the Henry George single-tax idea was spread to people of the country.” She died a widow in 1948.

It’s safe to stay that the George premise was lost on the vast majority of the millions who have played the game. Worse, Magie got little to no credit for her role in inventing the game—until San Francisco State University professor Ralph Anspach designed a game called “Anti-Monopoly” in 1973.

General Mills (successor to Parker Brothers) filed a lawsuit against Anspach for alleged patent infringement. During a decade-long legal battle, Anspach presented evidence involving the true origins of the game. Mary Pilon shed further light in her 2015 book “The Monopolists: Obsession, Fury, and the Scandal Behind the World’s Favorite Board Game.”

“Her game, ironically enough, was to teach people about the evils of monopoly for 30 years before Parker Brothers stepped into the picture,” Pilon said in an ABC interview. ☺

During the patent infringement battle that resulted from his “Anti-Monopoly” game in the 1970s, Ralph Anspach provided evidence of the origins of “Monopoly.” The original “The Landlord’s Game” (bottom right) was released in 1903.



ANSPACH ARCHIVES/COURTESY OF BLOOMSBURY AND THE STRONG, ROCHESTER, NEW YORK

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# Yahoo-Facebook Case Has Lessons for All

SOCIAL MEDIA COMPANIES AREN'T IMMUNE TO PATENT TROLLS OR INFRINGEMENT **BY ELIZABETH BREEDLOVE**



**I**n March 2012, Yahoo filed a lawsuit against Facebook claiming infringement on patents surrounding technologies that Yahoo claimed were the foundation of its business. These patents reportedly surrounded a range of technologies for advertising, privacy, social networking, messaging and UX customization.

Yahoo initially asked Facebook to pay licensing fees for at least 10 patents, but the companies could not reach an agreement. That resulted in Yahoo's decision to file a case in federal court.

The suit was filed about a month after Facebook filed for an initial public offering, leading many to question whether Yahoo was acting like a "patent troll." A few weeks later, Facebook filed counterclaims against Yahoo for allegedly breaching 10 of Facebook's patents. By July, the companies announced they had settled the lawsuit in a strategic deal that included no cash but involved new opportunities for partnership and collaboration.

This saga raises the issue of how inventors can protect themselves from patent trolls, patent infringement suits and other intellectual property issues. So, below are some fundamental questions associated with that (some of which *Inventors Digest* has covered in the past).

It's important to note that I am not an attorney or an intellectual property expert and that this article is intended to provide legal information, not legal advice. Always consult an attorney about intellectual property questions and issues.

**What are patents, and why should an inventor file a patent application?** Patents are a type of intellectual property designed to protect new product designs or new processes. They grant the patent holder exclusive rights to the product or process for up to 20 years. The U.S. Patent and Trademark Office grants two main types of patents: design patents, which protect the appearance of a product or invention, and utility patents, which protect the functional aspects of an invention or product.

In 2011, the America Invents Act changed the United States from a "first-to-invent" to a "first-to-file" patent system, meaning the right to patent an invention goes to the first person to file the application, despite who first created the product. This can be a problem for some inventors because once you file a patent, the countdown begins on your 20-year protection. For this reason, if you are pursuing an idea and want to file a patent before you start to develop a product (which you should always do in a first-to-file system), you should begin by filing a provisional patent application.

A provisional patent application makes it easier for inventors to be the first to file for a patent for their idea without beginning the 20-year timeframe under which their idea is protected. In other words, a provisional patent application allows inventors to describe their inventions as "patent pending" for up to one year.

Filing a provisional patent application establishes your effective filing date—which means that if another inventor takes a nearly identical product to market before you, you can prove that your product invention came first and that you should hold the rights to the intellectual property.

## “Having patent protection for products you are selling can be used as a sword in a lawsuit.”

— VINCENT LOTEMPIO, INTELLECTUAL PROPERTY ATTORNEY



As you iterate and improve on your design, you can file additional provisional patent applications to continue to protect your product, including new developments. However, you must file a non-provisional patent application within the one-year provisional period established by the first provisional patent application to benefit from the early effective filing date.

Another reason to consider filing a provisional patent application if you are inventing a new product: Provisional patents are much easier and less expensive to file than a regular patent application, which can cost thousands of dollars.

**What are patent trolls?** The definition of a patent troll is subjective.

According to intellectual property attorney Vincent LoTempio, “The term patent troll itself on its face is derogatory, and it is usually a label put on someone who owns or purchases issued patents for the purpose of starting a lawsuit against an entity selling a product that is allegedly infringing on a patent. Of course, the owners of the patents don’t consider themselves trolls, but the person being sued considers the aggressor a patent troll.”

Most agree that the phrase “patent troll” generally refers to a person or company using aggressive legal tactics to attempt to enforce patent rights against accused patent infringers in order to make a profit. However, patent trolls typically do not offer products or services that use the patents in question.

Instead, patent trolls may sue another company, claiming that it is infringing on a previously purchased patent; enforce patents against infringers with no intention of actually using the patent to manufacture a good or supply a service; or focus their efforts strictly on enforcing patent rights, among other things.

LoTempio adds: “Patent lawsuits are so expensive that (with patent trolls), the case doesn’t get settled based upon the strength of the patent but the cost of the lawsuit.”

**How can inventors protect themselves from patent trolls?** Unfortunately, the strategies that companies can use to protect themselves against legitimate

competition aren’t typically useful against patent trolls. The most important thing that inventors can do to protect themselves from both legitimate patent infringement and from patent trolls is to have an experienced intellectual property attorney on retainer. Intellectual property and patent infringement cases can be quite nuanced, and an IP attorney can provide guidance both during and after the inventing and product development process.

LoTempio has more tips: “Understand what is patentable subject matter. Prior to launching a product, have a ‘freedom to operate’ search performed by a patent attorney. Find out who are the competitors in the field and what patents they own, and do those patents cover the product you are going to sell. Make a determination as to whether or not those patent owners are litigious.”

Additionally, he suggests making sure you have intellectual property insurance to cover infringement lawsuits. He also advises inventors to contact their attorney immediately if they receive a cease-and-desist letter.

**What else can inventors learn from this case?** The dispute between Facebook and Yahoo reiterates the importance of researching and protecting your intellectual property—whether you’re a social media giant, an internet services powerhouse, a product development company or a hobby inventor.

“Having patent protection for products you are selling can be used as a sword in a lawsuit,” adds LoTempio. “At the end of the day, the Yahoo/Facebook case was settled because Facebook was able to put Yahoo at risk by alleging that Yahoo violated 10 of Facebook’s patents. Thus, both parties would have been at risk if the case was actually put in front of a jury.”

**Elizabeth Breedlove** is content marketing manager at Eventys Partners, a product development, crowdfunding and inbound marketing agency. She has helped start-ups and small businesses launch new products and inventions via social media, blogging, email marketing and more.



# Towel Innovation Holding up Well

L.A. WOMAN FIXED A PROBLEM FOR HERSELF  
AND MANY OTHERS **BY EDITH G. TOLCHIN**

**I**n my work with inventors since 1997, more often than not the inventor has been a man. The same is true regarding my interview subjects in *Inventors Digest*. So for me it's refreshing to learn about products invented by women, which are often baby products.

Here we have a novel idea for a product by a woman, for women—and it is not a baby product. Erin Robertson of Los Angeles, inventor of the Ta-Ta Towel, explains her creation.

**Edith G. Tolchin (EGT): How did your invention come about?**

**Erin Robertson (ER):** I do not have a background in fashion and/or design. I am just your typical everyday woman who saw a problem and sought to fix it. Whenever I got out of the shower, I'd do the same routine of wrapping my towel around the top of my breasts to keep them in place. This proved to be annoying because it would always fall off. During the times it stayed put, I'd be sweating underneath my breasts and around my neck as I tried getting ready. I couldn't stand blow-drying my hair and putting makeup on.

I was tired of being reminded by my towel every morning that I am a bit “top heavy.” Not only was the towel an annoying reminder of “big-girl problems,” it would also “smoosh” my breasts down, leading to under-boob sweat, and I felt that something had to be done.

The Ta-Ta Towel is a patented towel solution that's made out of terrycloth fabric on one side and a super soft liner on the other. The garment absorbs moisture from underneath the breasts and behind the neck, keeping bacteria at bay.

Originally, it was meant to absorb the sweat that beads up while women get ready after their shower (during hair blow dries, putting on makeup, and so on). Since (idea) conception, the towel has been a solution for a variety of other reasons as well.

The Ta-Ta Towel is useful for pregnant and postpartum women, all of whom find the towel offers alleviation from breast pain and tenderness. For breastfeeding

mothers, it also provides easy access for nursing. The garment can be worn to lounge around the house, right after a gym or spa session, or while doing household chores. Women who are recovering from open heart surgery or are going through radiation for breast cancer have also found solace in their Ta-Ta Towels. This is also true of the elderly, who feel better wearing a Ta-Ta Towel than they do a constricting bra.

**EGT: Had you invented anything before the Ta-Ta Towel?**

**ER:** This is the first invention for me. I've always thought of myself as a problem solver, but I never thought I'd actually invent something that would be sought after by many people. I created this for myself because I was solving a problem I personally had. I'm truly humbled by the demand.

**EGT: Based on photos I've seen from your website, it appears the size range is from C-cup through H-cup. What about others?**

**ER:** Ta-Ta Towel customers vary from big-breasted women, pregnant and postpartum women, women recovering from C-sections, breastfeeding women, those going through radiation and other breast cancer treatments, and also elderly women who cannot handle the constricting bra. The demand for Ta-Ta Towels has been incredible. Even though there's currently a 4-6-week wait period, that is not slowing down the orders that are coming in, including requests for orders from other countries. Women of all shapes and sizes—and the men who love them—want to buy Ta-Ta Towels.

I hate to leave the smaller cup sizes out on the first round, but I wasn't getting the same “Oh, my gosh, this is the best invention ever” response from the smaller-busted ladies. The design of the Ta-Ta Towel is such that it has to have enough under-breast to hook onto, so I started with my larger ladies first and worked my way down to a C cup. I've had a lot of requests from ladies who have smaller breasts *and* larger breasts, so I'm working on prototypes to accommodate every woman.

**The Ta-Ta Towel was designed to absorb moisture from underneath the breasts and behind the neck, keeping bacteria at bay. But it has myriad other uses.**

**EGT: How many prototypes did you make until you had the final product?**

**ER:** I made about five prototypes before taking it to get patented. I still have every single one before the final. It's a nice memory. Plus, I like to show my friends and family members where it all started—or, as I like to call it, “Taking a walk down mammary lane.”

**EGT: Have you run any crowdfunding campaigns?**

**ER:** No, I have done this all on my own. As a writer, I sold my first TV show to a production company for \$5,000 and put that money into getting my patent. A few days before Ta-Ta Towels went “viral,” I was looking for a job!

**EGT: Where is the Ta-Ta Towel manufactured? What type of fabric is used?**

**ER:** I am proud to say that Ta-Ta Towels are made here in the USA. As for fabric, one side of the towel is terry-cloth, and the other is made of the softest cotton blend fabric available on the market.

**EGT: Is the product patented?**

**ER:** Yes, it is, and it was the best money ever spent!

**EGT: By which means are you selling the Ta-Ta Towel?**

**ER:** The only place to buy a Ta-Ta Towel is on my website at TaTaTowel.com, soon to be TaTaTowels.com. I would be open to selling on Amazon in the future, but right now I'm just focused on catching up with all the orders that have been coming in. There have been a lot of knock-offs, and that's very frustrating.

**EGT: Any plans to add other products?**

**ER:** Oh, yes! I am so excited for a couple new products coming out. In addition to the smaller and larger sizes, I have a new design I'm working on specifically for breastfeeding mothers. I also have accessories and gift packs coming out.

**EGT: Have you encountered any challenges in developing the Ta-Ta Towel?**



Erin Robertson's first invention resulted in about five prototypes. She says she was looking for a job a few days before Ta-Ta Towels went viral.

**ER:** My biggest challenge currently is going from a small, one-person enterprise into a rapidly viral-expanding business. Scaling and managing the skyrocketing growth is an exciting challenge. The second challenge, not so exciting, has been protecting my patent from the many people trying to knock off my product. Knowing I am patent protected, I was surprised by the number of people who ignore the patent and try to scam my invention.

**EGT: Do you have any encouragement for inventors with first-time products?**

**ER:** I would like to say to them what a close friend made me promise in the very early stages of my prototype phase: “Don't ever give up... promise me that you will never give up, no matter how hard it gets or how defeated you might feel.” So those would be my words of encouragement. Also, keep going! 🍀

Books by **Edie Tolchin** (egt@edietolchin.com) include “Fanny on Fire” (fannyonfire.com) and “Secrets of Successful Inventing.” She has written for *Inventors Digest* since 2000. Edie has owned EGT Global Trading since 1997, assisting inventors with product safety issues and China manufacturing.



# A STRONG VOICE FOR DIVERSITY

LEMELSON-MIT PROGRAM LEADER SEEKS EQUALITY IN PATENTS, INVENTOR EDUCATION, STEM CAREERS **BY REID CREAGER**

**D**r. **Stephanie Couch's** resumé teems with the kinds of honors that suggest an obvious role model for young people, and for young women in particular. She was chosen as one of San Francisco Business Times' Most Influential Women in Bay Area Business for 2016; was inducted into the Alameda County Women's Hall of Fame in the education category; and received the 2015 Biotechnology Educator of the Year Award from the California Life Sciences Association.

But the executive director of the Lemelson-MIT Program has a farther-reaching purpose in mind.

"I would love for young women to see me as a role model, but it is likely that they will be more inspired by near peers," says Dr. Couch, appointed to the position in May 2016. "An important part of my job is to make sure that we are identifying female inventors who can be role models for others and then making sure their stories are visible through press, social media and other venues.

"One of the biggest contributions I feel that I can make is to be a strong voice for more diversity among patent holders and leading innovators, and to conduct proper research studies to understand how it is that young women and others from underrepresented backgrounds learn to invent. We need to understand

what works, why and under what conditions, and then enact policies and grow and scale programs that reflect this knowledge."

## Rewards and research

Dr. Couch is undaunted by these major challenges—foremost among them working to achieve diversity among patent holders. A July 2016 briefing paper by the Institute for Women's Policy Research showed that women still hold an extremely small share of patents; at the current rate, gender equity in this area would be about 75 years away. Only 18.8 percent of all patents had at least one female inventor in 2010, the latest timeframe for which data were available.

As executive director, her responsibilities of overseeing the development and growth of partnerships—while guiding Lemelson-MIT's prestigious invention awards and grant programs that include the \$500,000 Lemelson-MIT Prize, the Lemelson-MIT Student Prize and the program's InvenTeam initiative for school-age students—are part of the fact-finding mission that has helped define her professional life. She says InvenTeam "is a perfect site of study, given its 14-year history of helping young women develop as inventors while in high school."

PHOTO BY MARK OSTOW



Among Dr. Stephanie Couch's responsibilities are guiding Lemelson-MIT's prestigious invention awards and grant programs that include the \$500,000 Lemelson-MIT Prize, the Lemelson-MIT Student Prize and the program's InvenTeam initiative for school-age students.

This past fall, Dr. Couch and colleagues conducted research that utilized information from Lemelson-MIT's national InvenTeams grant initiative, much of it based on self-reporting of the teams' high school participants. "Early findings suggest that young women join the InvenTeam to learn new things and to help people in their local community," she says. "Many female InvenTeam participants discover an interest in STEM, develop self-confidence in their ability to solve problems, and some who were not originally interested in STEM go on to pursue STEM college and career pathways.

"This suggests that the application of STEM knowledge and skills to solving a problem viewed as important in the eyes of a young person can help with attracting young women into a STEM college and career pathway. Some of the underrepresentation of women in STEM careers may be explained by the limited opportunities women have for developing STEM knowledge and skills through working on a project that is meaningful and relevant to their daily lives."

She says the limited STEM opportunities—not just for women but also for children from underrepresented backgrounds and those from low-income families—are a malady that begins in the early school years and continues into high school: "America needs educators, parents, members of the business community, elected officials, nonprofit entities and foundations to work together to leverage community assets that can help bridge these gaps in educational opportunities. Local efforts must be informed by research and data if they are to be effective."

## No detail too small

Dr. Couch acknowledges her substantial responsibility of learning every aspect of inventor education, even embracing it.

She says that while growing up, she was inspired by "The Agony and the Ecstasy"—"a book about Michelangelo that helped me see the importance of learning about education from every possible angle. Those lessons helped me create new policies and programs that spoke to the strengths and cultural conditions present in California's different education segments."

Much of that work took place as interim associate vice president at California State University, East Bay. She also helped design and launch the California STEM Learning Network.

Despite the lack of women in STEM careers, Dr. Couch is encouraged by the growth in regional STEM education networks across the U.S. that are working to expand those learning opportunities, "including the newly launched STEAM Advisory Committee for young

people in Cambridge, Massachusetts, where I live. I am an appointee and will be doing my part in my own local community, building on what I learned while leading a regional STEM education network in California."

However, she adds that inventing requires knowledge and skills from a wide variety of disciplines, not just STEM.

"One does not need to hold a STEM degree or be in a STEM occupation to develop and patent an invention. One of the greatest challenges I see is that women are not given opportunities to learn ways of thinking as an inventor and are not taught how to navigate the patenting process.

"There is some evidence to suggest that the ways of thinking and ways of securing a patent are passed down from fathers to sons in the same ways that mothers pass down secret family recipes to daughters. ... This suggests the need to offer young women opportunities to develop as inventors over time as they move from cradle to career. I don't think one learns how to think and create as an inventor through a single, short-term program.

"We also need to think about the cultural conditions that exist within research and development teams. Focused efforts to ensure diverse representation on InvenTeams has contributed to larger numbers of women in high schools who learn to invent. A similar effort by private sector companies would likely yield similar positive results."

## Change schools' thinking?

As someone who examines inventor education from all angles, Dr. Couch sees a basic problem in schools: Too often, invention-related programs are thought of as extra or after-school initiatives.

"Our greatest challenge is finding ways for invention education efforts to be embedded within the regular school day. As of now, access to that programming is often limited to middle and high school students who can participate in after-school programs. After 14 years of work with more than 2,215 high school students (mostly grades 10-12), we have ample evidence that young people from diverse backgrounds can develop inventions with proper support. In fact, several teams have received patents for their work. We also have end-of-year survey results over a 14-year period from students that prove team-based experiences change students' lives and educational aspirations."

Businesses can play a key role in narrowing the invention education disparity, she says. "If we start from the premise that women are as capable as men when it comes to having a good idea for a solution to a

Opposite page:  
Dr. Stephanie  
Couch works with  
middle and high  
school invention  
educators at  
the Lemelson-MIT  
Program's summer  
Professional  
Development  
workshop in  
Irvine, California.



**“One of the greatest challenges I see is that women are not given opportunities to learn ways of thinking as an inventor and are not taught how to navigate the patenting process.”** —DR. STEPHANIE COUCH

problem, then what women need is the ability to connect with experts who can support them as they develop their invention, and funders who can cover their initial costs of developing and launching a business to make their solution available to others.

“Businesses can help by making employees available to young women as mentors and coaches, by investing in invention education programs, and by investing in the early stages of development and deployment of new innovations created by women. They can also help by ensuring that research and development teams are comprised of individuals from diverse backgrounds. ... Equal representation is a start, but the cultural conditions must also support the diversity of knowledge, insights and expertise.”

Dr. Couch has personally benefited from many strong mentors in her career. When she interned in the California state capitol as a college student, she recalls that David Takishima, who was chief of staff to then-Assembly Member Steve Peace, provided her with many opportunities to develop expertise in the legislative process. “This resulted in a job opportunity with a lobbying firm that specialized in education. My career was launched!

“I’ve benefited from many fantastic mentors from the private sector and dedicated educators within the California Community College and the University of California (Davis and Santa Barbara) systems. I’m

especially grateful to Dr. Judith Green of U-C Santa Barbara, who helped me grow and develop as a researcher in education specializing in interactional ethnography.”

### Building greatness

Dr. Couch says the technology behind the World Wide Web is her favorite invention because of all of the instant information it makes available. Despite the information revolution that has taken place since the mid-1990s, she doesn't see any big difference in the potential of young people today.

“I don't think that the potential of young minds has changed,” she says. “We have always had great minds and untapped potential. I start from the premise that what people come to know and be able to do is a result of both working with our hands and minds to construct something and, at the same time, generating new knowledge through conversations and joint efforts with others.”

That said, the world-shrinking nature of the internet and now social media have been of great benefit for securing invaluable information connections and publicizing successes of the Lemelson-MIT prize winners and InvenTeam grantees.

“Our 15 high school InvenTeams receive grants from our program to cover the costs of their inventions, but they must raise funds to bring their inventions to a culminating event at MIT called EurekaFest,” Dr. Couch explains. “Thanks to social media, most teams are able to gain visibility and generate funding for the cost of their travel. This speaks volumes to the charitable

orientation of the many people in this world who want to support the success of young people who are willing to help themselves and their communities.”

Fundraising is a never-ending proposition at Lemelson-MIT, which seeks to expand the program's annual budget from \$3.4 million to \$5 million during a current five-year expansion plan. The organization seeks partners to co-sponsor the Lemelson-MIT student prize at the college level for both graduates and undergraduates.

So many who have been helped by the program are giving back.

“As the Lemelson-MIT Program worked through our strategic planning process, we found that the 213 former grantees across the nation who have engaged in our invention education grant program are eager to be part of a larger national effort to expand invention education opportunities for young people,” Dr. Couch says. “This led to our new fee-based professional development program and the creation of an online professional learning community that will enable invention educators to learn from one another. We have also developed partnerships and have collaborated on grant proposals with other organizations that share our desire to prepare young people for top-notch jobs in the innovation economy.

“We are now working to expand our programs through earned revenues, grants from federal and state governments, grants from other foundations, and through donations from private companies.”

Last year's Lemelson-MIT Cure It! graduate winner Katy Olesnavage, who invented a method to design a better prosthetic foot, demonstrates for a group of InvenTeam students at EurekaFest 2017.



PHOTO COURTESY OF LEMELSON-MIT

# A HISTORY OF Extra OBSTACLES

WOMEN HAVE HAD TO FIGHT TO BE CREDITED WITH INVENTIONS, AND SOMETIMES NEVER GET IT **BY JACK LANDER**

**B**efore women in America got the vote in 1920, my German grandmother said their role was “kinder, kirche und kochen” (children, church and cooking)—which was considered proper and preferred by most men of that era.

It is also claimed that men regularly took credit for their wives’ inventions. For example, Susan Hibbard invented the turkey feather duster in 1874, and her husband tried to patent it. She took her case to the patent court, claiming the patent should be issued to her. Details of the case are vague, but the story is that when he was asked by the court to define the novel feature of the invention, he failed.

Patent number 177,939—Improvement in feather dusters—was issued to Susan Hibbard on May 30, 1876.

## Cotton gin’s inspiration

Another example in which a woman did not receive proper credit for innovating is the cotton gin, the inventor of which is still argued today. In 1792, Catharine Greene, the widow of Continental Army Gen. Nathanael Greene, met Yale graduate Eli Whitney and hired him to tutor her children. Whitney patented the cotton gin in 1794.

Details of how the gin was invented vary and are therefore unclear, but according to the Lemelson Center for the Study of Invention and Innovation, National Museum of American History and the Smithsonian Institution, Catharine and her slaves participated in the invention.

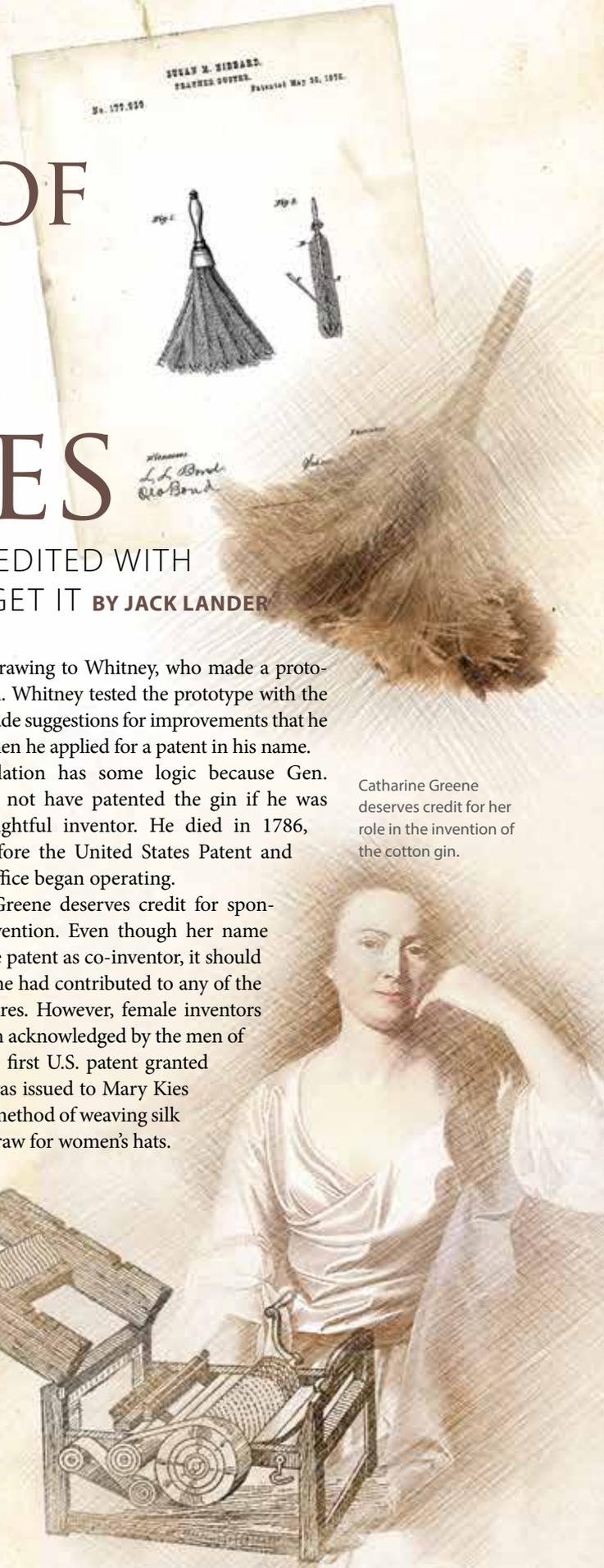
No sound factual evidence exists, but the rumor is that Catharine had a drawing of the gin that may have been made by her husband before his death. She

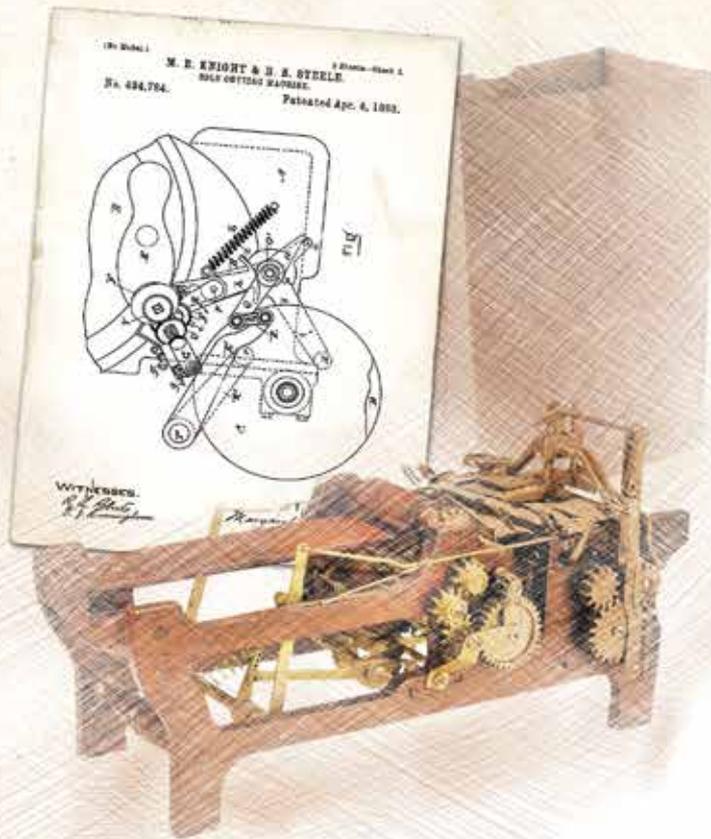
revealed the drawing to Whitney, who made a prototype of the gin. Whitney tested the prototype with the slaves, who made suggestions for improvements that he carried out. Then he applied for a patent in his name.

This speculation has some logic because Gen. Greene could not have patented the gin if he was indeed the rightful inventor. He died in 1786, four years before the United States Patent and Trademark Office began operating.

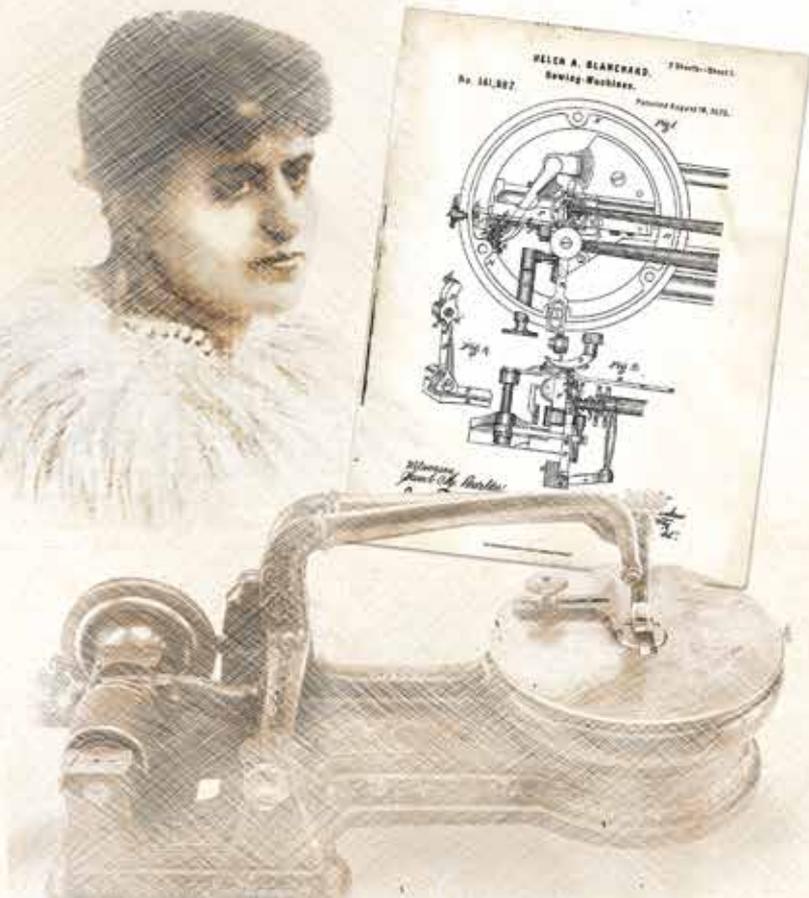
Catharine Greene deserves credit for sponsoring the invention. Even though her name was not on the patent as co-inventor, it should have been if she had contributed to any of the patented features. However, female inventors were not much acknowledged by the men of that time. The first U.S. patent granted to a woman was issued to Mary Kies in 1809, for a method of weaving silk thread with straw for women’s hats.

Catharine Greene deserves credit for her role in the invention of the cotton gin.





The long list of female inventors in U.S. history begins in 1809 and includes independent innovators from all walks of life.



## 'Lady Edison' prevails

Margaret Knight's first invention, at age 12, was a safety device that would stop a textile machine if something got caught in it. By the time she was a teenager, the invention was in general use in the mills.

She is also known for inventing the first machine to make the flat- or square-bottomed grocery bag. Knight designed the machine that produced the complicated series of folds still used in principle today. When we view her patents (Nos. 116,842 and 220,925, issued in 1871 and 1879), we see machines that any robotics engineer would be proud to claim today. They are truly remarkable.

But claiming credit for her invention was not without a struggle. A man named Charles Annan was aware of the prototype being built for her and filed a patent on it. Knight was not about to yield to this villain and took him to court. He contended that no woman could develop a machine as complex as the one he claimed was his.

Knight demonstrated how her machine was developed and how it worked, and the court dismissed Annan as a fraud. It granted Knight her patent. She went on to patent 18 more of her 100 or so inventions, including a rotary engine, before dying in 1914 at age 76.

Knight, whose story was detailed in the April 2016 *Inventors Digest*, has been dubbed "Lady Edison" and is in the National Inventors Hall of Fame.

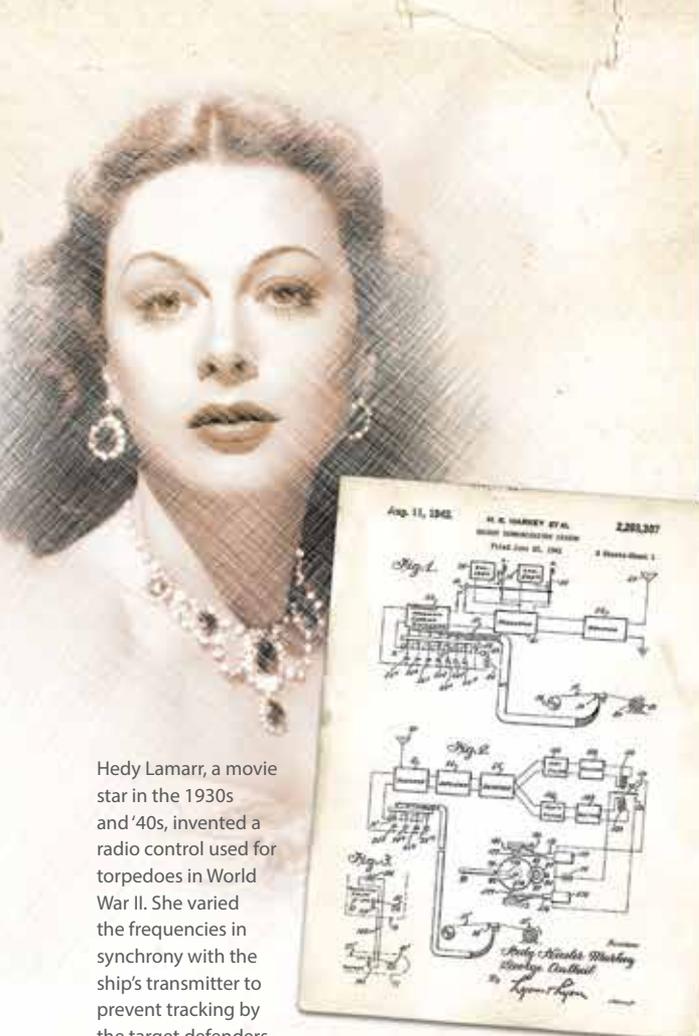
## A diverse, long list

During my research for this article, I came upon 56 female inventors. My quandary was which subjects to choose. One of my criteria was that the inventor had to be independent—that is, not working as an employee, etc., for a company other than her own. Engineers, physicists and the like, whose jobs are in research and development, are often granted a large number of patents because their work is cutting edge. They aren't up against prior art.

Though I don't begrudge any inventor getting credit for inventions that are sponsored by a business, I believe the stories of independent inventors are more to the point for those of us who invent as a sideline and have to pay big bucks for our patents out of our savings.

Helen Blanchard was granted 28 patents, mainly for sewing-related items. Her invention of a sewing machine (U.S. Patent No. 141,987) is another remarkable example of complexity and elegance. She also invented a hat-sewing machine, (No. 860,123), several sewing needles, surgical needles, and methods of holding and feeding components to be sewn. She died in 1922 at age 82.

Beulah Louise Henry, a descendant of Patrick Henry, is best known for her invention of the bobbin-less sewing machine. Although she began as an independent



Hedy Lamarr, a movie star in the 1930s and '40s, invented a radio control used for torpedoes in World War II. She varied the frequencies in synchrony with the ship's transmitter to prevent tracking by the target defenders.

inventor, she eventually worked as an inventor and consultant for hire. Beulah Henry was granted 49 patents and produced 110 inventions that covered a wide range of technology. She died in 1973 at age 86.

It's hard to know who to leave out of this fascinating list. Hedy Lamarr, the movie star, invented a radio control for torpedoes used in World War II. She varied the frequencies in synchrony with the ship's transmitter to prevent tracking by the target defenders. Her story was told in the October 2015 *Inventors Digest*.

Bette Nesmith Graham—mother of musician Michael Nesmith of Monkees fame—invented Liquid Paper for the correction of typos. It's still popular, even though the typewriter has gone the way of the telephone booth.

Today, inventing is at least becoming closer to an equal-opportunity venture. *Inventors Digest* does an excellent job of publicizing women's inventions and their stories. 📖

**Jack Lander**, a near legend in the inventing community, has been writing for *Inventors Digest* for 21 years. His latest book is *Marketing Your Invention—A Complete Guide to Licensing, Producing and Selling Your Invention*. You can reach him at [jack@inventor-mentor.com](mailto:jack@inventor-mentor.com).



## THE FIRST PATENT FOR A WOMAN

**Mary Dixon Kies**, who on May 5, 1809 became the first woman to receive a U.S. patent for her method of weaving straw with silk or thread, made a key contribution to the hat industry during a time when the U.S. economy struggled. Her invention drew praise from first lady Dolley Madison.

Her patent came 19 years after the U.S. Patent Act of 1790. Before then, patents could only be issued to men. At that time, in many states women could not legally own property independent of their husbands, so female inventors did not patent their inventions.

Her patent number is unknown because the file was destroyed in a U.S. Patent Office fire in 1836. Samples of the straw fabric covered by her patent and woven by Kies are on display at the Wadsworth Athenaeum in Hartford, Connecticut.

According to reports, she did not profit from her invention and died penniless at 85 in 1837.



PHOTO COURTESY OF MUSEUM OF FINE ARTS, BOSTON

## HEDY COMPANY

Big-screen actress Hedy Lamarr's accomplishments as an inventor have been well chronicled on these pages. Her 1940s wireless communications innovation led to today's Wi-Fi, GPS and Bluetooth. Other well-known actress/inventors include:

**Christie Brinkley**—The supermodel came up with an educational toy (U.S. Patent 4,998,883 on March 12, 1991) that encourages children to build letters from various shapes.



**Jamie Lee Curtis**—Her Infant Garment (Patent 4,753,647 on June 28, 1988) details a diaper with a built-in pocket for moist wipes. This would prevent the person changing the diaper from having to carry the wipes separately or scramble to find the wipes after an accident.



**Julie Newmar**—Best known as Catwoman in the 1960s "Batman" TV show, Newmar has Patent 4,003,094 for pantyhose called The Cheeky Derriere Relief. The product, patented on Jan. 18, 1977, is designed to "make your derriere look like an apple instead of a ham sandwich," she said.



# UNIQUE Bib WAS A LONG TIME COMING

MOM, CAREER WOMAN WHO BEGAN PROJECT 9 YEARS AGO SEES DREAM REALIZED **BY EDITH G. TOLCHIN**



**I love working with baby products.** Often, there are challenges that inventors are totally unaware of when they contact me—such as the Consumer Product Safety Improvement Act of 2008 that resulted from unsafe children’s products being made globally (no, manufacturing in the United States is not exempt) and the resulting slew of product recalls.

Lisa Pullen first contacted me about nine years ago when her first child was a toddler; she had a great idea for a unique baby bib. As they say, “Life happened,” and we finally started working on the project again a few years ago. In the meantime, Pullen married, became a pharmacist and had a second child. I admire her for never giving up.

**Edith G. Tolchin (EGT): How did the idea for the Bib-be-Down™ come about?**

**Lisa Pullen (LP):** My first child was born in 2007, and I essentially raised her by myself. I was working full-time and finishing up my MBA, so I had very little time for inefficient products and processes.

That said, I always struggled when it came to my daughter’s feeding time. She would grab the bottom of her bib and tug at it, and also pull it up onto her face. I felt that I needed three hands to feed her—one to hold the jar, one to hold the spoon, and one to hold her bib down. That’s when I started searching for a bib that couldn’t be pulled up, but I never found one. Then, with my very novice sewing skills, I decided to make the bibs myself. When my daughter used them in public places I was often asked where I found a bib like that. That’s when I felt I was onto something.

**EGT: What are the bib’s special features?**

**LP:** Bib-be-Down features two straps that attach behind the back so the baby cannot twist the bib around

or pull it up onto his or her face. These straps are adjustable so the bib will grow with the child. The bib also features one long neck strap so it can be attached with one hand. Bib-be-Down looks similar to a vest and can be worn throughout the day. With a cotton-polyester front and terrycloth back, this bib is thick enough to prevent food from leaking through to the baby’s clothes.

**EGT: How did the bib’s development get put on the back burner for several years?**

**LP:** When I came up with the idea for Bib-be-Down, I simply didn’t have the money to fund the project. So I had to abandon the idea with the hope that I would be able to begin again later. Eventually, I went back to school full-time and became a pharmacist. I got married and had another baby. So the motivation to complete this project resurfaced, and I had the financial and emotional support to move forward.

**EGT: How did you create the prototype? What were the various versions of the bib?**

**LP:** Many years ago, I hired a company to create a professional prototype based on the version I had sewn myself. The current design isn’t much different from the original. When I re-started the project, I experimented with different materials, snaps versus hook-loop, and different sizes and placement of the hook-loop. The final design was definitely influenced by the Consumer Product Safety Improvement Act.

**EGT: Refresh my memory on how we started to work together on this project.**

**LP:** I first contacted EGT Global Trading in 2009. EGT has guided me through every step of this complicated manufacturing process, introducing me to the CPSIA and its implications on children’s products. My design

was limited in certain ways due to safety issues; for instance, I wanted to use snaps instead of hook-loop, but that would have complicated the process even more due to concerns about babies choking on snaps.

**EGT:** Tell us what you learned working with Josh Wallace (*Inventors Digest*, "Packaging 101," February 2016) on packaging design.

**LP:** Packaging design is such an important component of inventing. A packaging misstep can sabotage your product's success, so this step of the manufacturing process shouldn't be taken lightly. I hired Josh Wallace to design my packaging, and he did a great job! He was challenged with coming up with a package that properly showed the product, that was appealing to the eye, and that met all CPSIA requirements. This was no easy task, and I am very pleased with his final result.

**EGT:** Then what?

**LP:** Once the design of the prototype and the packaging were complete, Bib-be-Down was submitted to various Chinese factories for quotes. The selected factory sent back a counter-sample for approval.

Once the counter-samples were approved, the factory proceeded with pre-production samples. This process was fairly simple, thanks to having EGT as a middleman. Samples had to be sent off for CPSIA testing before being prepared for mass production. Once the mass production samples were approved, the factory completed sewing the bibs, packaged the order, and we scheduled an inspection by a third party before shipping them to the United States.

**EGT:** What obstacles did you encounter while developing your product?

**LP:** Fortunately, I have not encountered any major problems. Besides the language barrier with the factory in China, the biggest obstacle I faced involved the size of the hook-loop on the bibs.

The hook-loop on the counter-sample was considerably larger than on the pre-production and mass-production samples. The hook-loop got smaller with each sample I received, but I did not notice the difference until I received the mass-production samples and compared the samples from all three stages. However, when we asked the factory to fix the problem, they said it was too late because the hook-loop had already been sewn on. I decided to take the chance that the bibs would still be big enough to grow with each baby.

**Lisa Pullen learned much about tough global safety regulations for children's products, and manufacturing abroad.**

In order to protect myself from any future surprises, I included the hook-loop size requirements in the inspection criteria for the final product.

**EGT:** What would you change if you could?

**LP:** I regret that it took me so long to complete this project. I wish that I could have had a finished product many years ago, but I have to appreciate that everything happens for a reason. I am so grateful to have the opportunity to see this process through to the end.

**EGT:** What have you learned about manufacturing a baby product in China?

**LP:** I was surprised by the time involved. I struggled to find the time to devote to the manufacturing process because of the hours I work and my obligations to my family. An inventor must be able to balance his or her responsibilities.

**EGT:** You are about to receive your first shipment of Bib-be-Down. What's next? What are your goals?

**LP:** I cannot wait to receive my first shipment of Bib-be-Down, because I will finally have something tangible to share with people. Now that the manufacturing process is coming to an end, I am shifting my focus to marketing my product.

Initially, I plan to sell directly to consumers via the internet and consumer shows, but my ultimate goal is to see my product on retail shelves. Although I am extremely proud to have come this far, I would love nothing more than to have other parents use my product and tell me that Bib-be-Down has made feeding their child so much easier. 🍷

**18.8%**

The percentage of patents with at least one female inventor named in 2010, according to a 2016 report by the Institute for Women's Policy Research.

**8%**

The percentage of patents with a woman as the primary inventor, according to that same IWPR study.



Lisa Pullen invented the Bib-be-Down after struggling to keep her daughter from pulling on her bib and moving it during feeding time.



# RUNNER/ INVENTOR SEES THE

TRACKPACER, AN LED STRING FOR TRACKS, HELPS RUNNERS TRAIN

BY JEREMY  
LOSAN

**L**ike so many successful runners, Alexandra Kline kept going even when others in her group did not. Now she's the force behind a training device that can help runners max out their results in an increasingly competitive sport where the margin of victory is often razor thin.

Kline developed a product called TrackPacer, a "digital track rabbit" that provides constant feedback to help runners reach their desired pace while training. Her goal is to change the way recreational and elite athletes train.

TrackPacer is an LED string, installed around the inner perimeter of athletic training tracks, that pulses bands of light at a prescribed speed around the track. Athletes run alongside the light bands to ensure they are controlling the pace of their run.

The system, typically installed on 400m athletic tracks, comes with an app to set the pace and switch between different training modes. The weatherproof system can be installed in just 30 minutes and is pre-selling for \$27,600 for a 400m system, which includes the app.

## The starting block

The TrackPacer was born in an entrepreneurship class at California Polytechnic State University, where Kline was a student. She was working on a group project with the task of creating a new product; one of the members was a runner on the track team. The group came up with the idea of using LEDs to pace a runner.

To vet the idea, she and her group built a small prototype. They got a 5m length of LEDs and hooked them up to an Arduino (an open-source platform for building electronics projects). They strung the lights around her living room and wrote a program for them to make the LEDs flash along the length to simulate a pacer bar. The prototype worked, but it was far too small to be useful for a runner.

After graduation, Kline was the only one in her entrepreneurship group who wanted to continue the LED pacer project. But she continued to develop the product. The next step was to create a full track-length prototype.

## First obstacle

She contacted a friend at a product development firm in Boulder, Colorado, called Viget, and they decided to partner on the project. Kline found a Chinese supplier for the LEDs and ordered 400m of them—but making the system work was not as easy as simply plugging in more LEDs.

"The problem we ran into was a lot of signal degradation issues," she recalls. "The lights just couldn't be controlled if you tried to just plug them in (longer than 50m). ... We had to figure out all sorts of engineering problems to make the 400 meters work."

They reconfigured the electronics to have one master controller with a series of slaves to control the 1,200 lights in the string. They ran high data-rate ethernet cables along the light strands to keep the timing of the

Alexandra Kline's invention is a "digital track rabbit" that helps runners reach their desired pace while training. TrackPacer pulses bands of light at a prescribed speed around the track.

PHOTOS COURTESY OF TRACK PACER



# Light

The system, typically installed on 400-meter athletic tracks, comes with an app to set the pace and switch between training modes.

pacers bars accurate. This brought the system to life and made it ready for testing.

## Testing and evolution

The first installation of the TrackPacer was at the 200m indoor track at the University of Colorado Boulder. This gave the team a shorter install distance and a controlled environment to do the initial testing. The testing went well; the feedback was positive. The athletes loved having a correctly timed pacer to run with.

Then the system was installed outside on the 400m track for the full install. The system worked well and provided additional insights for improvements. They found that the lights were hard to see in full sun, and the light track was too fragile and susceptible to water damage. It was not quite ready for regular use.

Development of the product continued. Viget developed an app to support the device; new modes were added. Ski lift mode illuminates multiple pacer bars all around the track so users can hop on and off a target pace without having to wait for it to come all the way around the track. The pace-trainer mode was also added, which hides the pacer bar and displays it only intermittently to help runners learn to pace themselves.

During development, Princeton University requested a demo of the tech. "A researcher there was thinking of an idea and was looking around online to see if anyone had done it," Kline says. "We got to show it off to some of their coaches, and they were pretty excited about it."

While the app and programming were being worked on, Kline started to work on the mechanical and electrical challenges. She found a manufacturer in New Zealand that worked on LED signage for the Rio Olympics to help with LED development. They were able to upgrade the LEDs and hardware to be easier to see in the daylight. They have also worked to make the light ropes waterproof and allow for permanent and semi-permanent installations.

## Ready for market, more

TrackPacer is now available for pre-sale and looking for customers to install the product on their tracks. Systems are available in 200m, 300m and 400m lengths to fit most athletic tracks. Orders will be shipped around the second quarter of 2018.

Meanwhile, Kline is working on upgrades for future versions. She is planning to add a reel system to roll up the LEDs for easy assembly, and is looking to add radio-frequency identification beacons to provide lap time feedback to runners as well. 📶

**Jeremy Losaw** is a freelance writer and engineering manager for Enventys. He was the 1994 Searles Middle School Geography Bee Champion. He blogs at [blog.edisonnation.com/category/prototyping/](http://blog.edisonnation.com/category/prototyping/).



# 6.7%

The percentage of women graduating with STEM degrees compared with 17% of men, according to the U.S. Department of Commerce.

# 25%

The approximate percentage of women in STEM jobs, according to the U.S. Department of Commerce.

# 2018 U.S. Trade Show Calendar

## OUR TOP EVENTS OF INVENTOR INTEREST

International Consumer Electronics Show



Global Pet Expo



## JANUARY

### January 9-11 International Builders' Show (IBS)

*Light-construction  
building industry*  
Orange County  
Convention Center  
Orlando, Fla.  
800-368-5242, Ext. 8184  
buildersshow.com

### January 9-12 International Consumer Electronics Show (CES)

*Technology*  
Las Vegas Convention Center  
866-233-7968.  
ces.tech

### January 23-26 PGA Merchandise Show

Orange County Convention  
Center  
Orlando, Fla.  
800-840-5628  
pgashow.com

### January 27-February 1 SPIE Photonics West (Society of Photographic Instrumentation Engineers)

*Biophotonics for brain  
research and health care;  
lasers; core optical compo-  
nents for consumer products*  
Moscone Center  
San Francisco  
888-504-8171  
spie.org

## FEBRUARY

### February 6-8 Medical Design Manufacturing West (MDM West)

*Medical technology,  
from prototyping  
to full-scale manufacturing*  
Anaheim (Calif.) Convention  
Center  
310-445-4200  
mdmwest.mddionline.com

### February 12-14 MAGIC Marketplace

*Fashion apparel,  
accessories, resources*  
Las Vegas Convention Center.  
Fall show Aug. 13-15.  
877- 554-4834  
ubmfashion.com

### February 13-16 ITEXPO

*Telcom, IT professionals*  
Broward County  
Convention Center  
Fort Lauderdale, Fla.  
203-852-6800  
itexpo.tmcnet.com

### February 17-20 American International Toy Fair

Jacob K. Javits Convention  
Center  
New York City  
212-675-1141  
toyfairny.com

## MARCH

**March 5-9**  
**HIMSS Annual Conference and Exhibition (Healthcare Information and Management Systems Society)**  
*Health care IT*  
Venetian-Palazzo  
Sands Expo Center  
Las Vegas  
855-326-8342  
himssconference.org

**March 5-9**  
**International Wireless Communications Expo (IWCE)**  
Orange County  
Convention Center  
Orlando, Fla.  
800-927-5007  
iwceexpo.com

**March 10-13**  
**International Home and Housewares Show (IHA)**  
McCormick Place, Chicago  
847-292-4200  
housewares.org

**March 11-15**  
**OFC (Optical Fiber Communication Conference and Exhibition)**  
San Diego  
Convention Center  
855-326-8341  
ofconference.org

**March 19-23**  
**Game Developers Conference (GDC)**  
*Video games*  
Moscone Convention Center  
San Francisco  
415-947-6926  
gdconf.com

**March 21-23**  
**Global Pet Expo**  
Orange County  
Convention Center  
Orlando, Fla.  
No phone contact for show  
Submit form online  
globalpetexpo.org

## APRIL

**April 30-May 3**  
**Interop ITX**  
*For tech leaders. Business technology event consisting of five individual comprehensive IT conference and expos around the world*  
The Mirage, Las Vegas  
866-535-8992  
interop.com

## MAY

**May 7-11**  
**International Plastics Showcase (NPE)**  
*From emerging technologies to utility for inventors*  
Orange County  
Convention Center  
Orlando, Fla.  
No phone contact for show  
Submit form online  
npe.org

**May 8-10**  
**National Hardware Show**  
Las Vegas Convention Center  
First-time exhibitors:  
203-840-5363  
nationalhardwareshow.com

**May 22-24**  
**Licensing International Expo**  
Mandalay Bay  
Convention Center  
Las Vegas  
888-644-2022  
licensingexpo.com

**May 22-24**  
**Society for information Display (SID)**  
*For products such as televisions and computer monitors*  
Los Angeles  
Convention Center  
800-350-0111  
sid.org

Licensing Internacional Expo



## JUNE

**June 4-7**  
**BIO International Convention**  
*Biotechnology.*  
Boston Convention & Exhibition Center.  
No phone contact for show  
convention@bio.org  
convention.bio.org

**June 10-14**  
**Cisco Live**  
*Technology*  
Orange County Convention Center  
Orlando, Fla.  
650-416-8768  
cicolive.com

**June 12-14**  
**Electronic Entertainment Expo (E3)**  
*Computer and video games*  
Los Angeles Convention Center  
No phone contact for show  
Submit form online  
e3expo.com

**June 26-28**  
**SuperZoo Show**  
*Pet industry*  
Mandalay Bay, Las Vegas  
626-447-2222  
superzoo.org

## JULY

**July 15-18**  
**IFT18 Food Expo (Institute of Food Technologists)**  
*Food science professionals, processes, packaging suppliers*  
McCormick Place, Chicago  
Registration: info@ift.org.  
iftevent.org

**July 29-August 2**  
**AACC Clinical Lab Expo (American Association for Clinical Chemistry)**  
*Laboratory medicine, technology*  
McCormick Place, Chicago  
703-631-6200  
aacc.org

## AUGUST

**August 22-25**  
**International Woodworking Fair**  
*Material processing and design*  
Georgia World Congress Center  
404-693-8333  
iwfatlanta.com

ABC Kids Expo



## SEPTEMBER

**September 12-14**  
**GSMA Mobile World Congress Americas**  
*Core mobile technologies, consumer and industrial applications in the Internet of Things, more*  
Los Angeles Convention Center  
No phone contact for show  
Submit form online  
mwcamericas.com

**September 24-27**  
**Solar Power International (SPI)**  
Anaheim Convention Center  
703-738-9460  
solarpowerinternational.com

## OCTOBER

**October 9-11**  
**ABC Kids Expo**  
*Products for juveniles*  
Las Vegas Convention Center  
gregory@theabcshow.com  
theabcshow.com

**October 14-17**  
**PACK EXPO International/ Healthcare Packaging Expo**  
*Packaging, pharma production*  
McCormick Place, Chicago  
571-612-3200  
packexpointernational.com

**October 9-11**  
**Global Gaming Expo (G2E)**  
Sands Expo, Las Vegas  
888-314-1378  
globalgamingexpo.com

*No major events in November or December.*

*Note: Some events are not open to the general public. Contact shows for details.*



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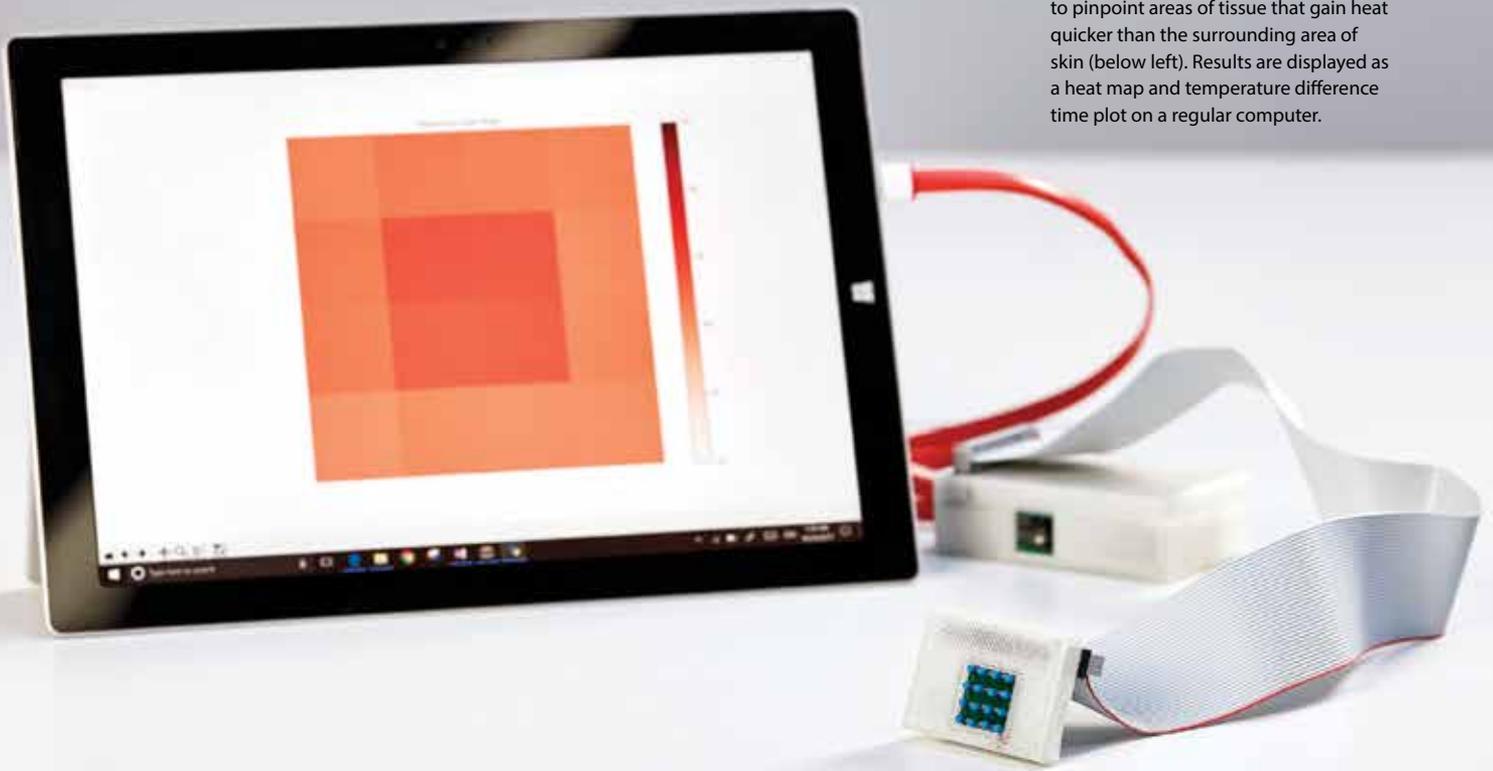


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The sKan uses accurate and inexpensive temperature sensors called thermistors to pinpoint areas of tissue that gain heat quicker than the surrounding area of skin (below left). Results are displayed as a heat map and temperature difference time plot on a regular computer.

# DYSON AWARD

## Helps Boost Melanoma Detection Device

CANADIAN STUDENT TEAM WINNERS AIM FOR CLINICAL TESTING OF sKAN

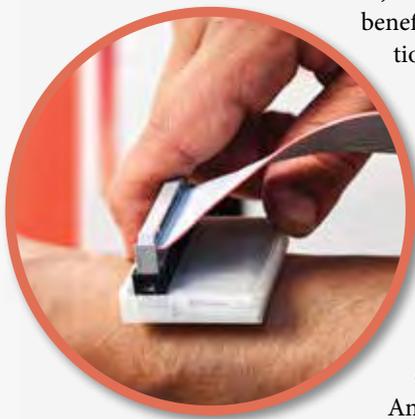
**The prestige** and attention connected to the international James Dyson Award is having immediate benefits for the 2017 winners, not to mention their ground-breaking pursuit.

A team of medical and bioengineering undergraduates from McMaster University in Hamilton, Ontario, Canada, designed the sKan—a low-cost, non-invasive, handheld device to detect melanoma. Rotimi Fadiya, 22, and 23-year-olds Prateek Mathur, Michael Takla and Shivad Bhavsar won a \$50,000 prize to develop the device and put it through clinical testing. And they're already getting offers to help.

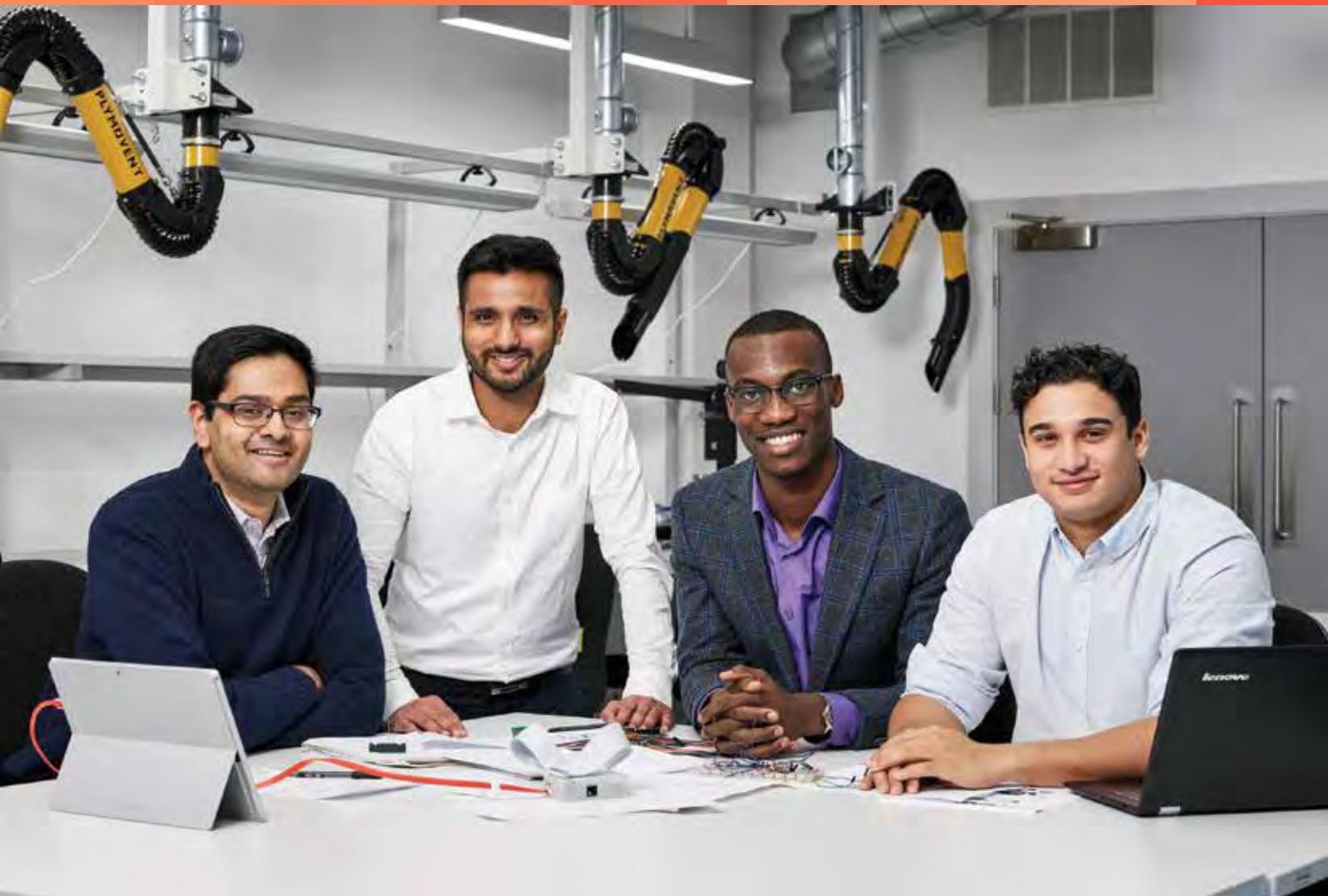
“Since winning the award, we have received an overwhelming amount of interest and support,” Takla said. “Many groups and individuals have reached out to congratulate us on winning the award. Some have even offered services to support the device development, either technically, financially or otherwise.

“We are truly grateful to the James Dyson Foundation for this award, and for all the connections we have had the pleasure to make.”

More than 87,000 new cases of melanoma skin cancer are diagnosed every year, but melanoma is almost always curable if detected early. However, diagnostic tools are usually expensive, so the team wanted to invent a device that could be used in a general practitioner's office.



PHOTOS COURTESY OF DYSON



Many thermal imaging diagnostics cost more than \$26,000. The sKan costs less than \$1,000.

The team discovered research showing that cancerous tissue recovers faster from being cooled when compared to normal tissue. “That was unique to us,” Fadiya said. “We said that this is really interesting; is there something we can do with this?”

sKan uses temperature-sensitive resistors called thermistors to detect melanoma. The sensors are put on the lesion to provide a thermal map of that area as the skin heats back up to a normal temperature. The reading shows how the temperature ranges in that area.

“By using widely available and inexpensive components, the sKan allows for melanoma skin cancer detection to be readily accessible to the many,” Dyson founder James Dyson said in making the November 9 announcement. “It’s a very clever device with the potential to save lives around the world.”

Runners-up for the award were: Atropos, a 6-axis, 3D printing robotic arm that uses continuous fiber composites material to produce high-performance objects; and Twistlight, which uses LED lights to make veins appear highly contrasted within their surrounding dermal tissue. The light can be used to easily insert needles and catheters into a patient’s skin. 📱



Above: (From left) Prateek Mathur, Shivad Bhavsar, Rotimi Fadiya and Michael Takla, bioengineering undergraduates from McMaster University in Hamilton, Ontario, Canada, designed the sKan. Their \$50,000 prize will help develop the device and put it through clinical testing.



Left: Mathur and Bhavsar plot the device’s mechanics.

Bottom left: Dyson Ltd. founder James Dyson (fourth from left) checks results with (from left) Takla, Bhavsar, Fadiya and Mathur (right).

PART 1 OF 2

# A Soft Spot for Soft Goods

PROTOTYPING TOOL HAS MANY FORMS, PROPERTIES AND USES (THANKS, MOM) BY JEREMY LOSAW

**M**y first exposure to prototyping with fabric was via my mom.

Every autumn, she would take my sister and I to Jo-Ann Fabrics in Pittsfield, Massachusetts, to choose our Halloween costumes. We would parse through bins of different pattern packs and search for one that we wanted. My mom would read the pattern package and pick out materials she needed.

The costume packs were about an inch thick, with thin paper patterns inside to aid the cut and sew of the costume. I watched my mom skillfully lay out the patterns, cut the fabric and run the panels through the sewing machines. After a few weeks, voila!—I was a shark, ready to crush trick or treat. Little did I know that the same techniques my mom used for making my costumes would be relevant to my career many years later.

In the first of this two-part series, I am going to review some basics about soft goods and how they are used and characterized. In Part 2, I will reveal some prototyping techniques that you can use on your next soft goods prototype.

A soft good is any non-rigid, non-durable material—i.e., fabrics, textiles, rubbers and papers. As the name suggests, many are soft to the touch; however, there are plenty, such as paper and Scotch-Brite pads, that are far from comfy to the skin. The properties of soft goods are immensely diverse and can be deployed a number of different ways in a product.

The most common reason to use a fabric or textile in a product is when it needs comfort or flexibility. Clothing is obviously one of the most common soft goods, requiring comfort and flexibility to move with our bodies. Even wearable products that have hard plastic components often use fabric liners for comfort: the interior lining of a soccer shin guard or the padded liner of a baby car seat.

Porous soft goods are great for applications that require absorption or fluid transfer, such as sponges or filters. Other types of soft goods can be used as a barrier layer to keep moisture from the structure of houses, such as Tyvek housewrap. The uses are as diverse as the material properties.

## Categories

The two broad categories of soft goods are wovens and nonwovens. These names are derived from how the material is processed, and either type can be made with natural or manmade materials.

**Wovens** are made from weaving strands together in an interleaved pattern; cotton, wool and nylon are examples. The material is processed into thread before it is woven together into sheets or finished goods.

**Nonwovens** are formed by mechanical, chemical, heat or other treatments to create a cohesive substrate. Fleece, leather, foam padding and even dryer sheets are examples of nonwoven materials.

In general, woven fabrics are stronger because the threads are mechanically locked together in overlapping chains. However, they can require complicated machinery to weave them. Nonwovens are often less expensive to make because they do not need to be formed into thread, thus saving a manufacturing step.

Unlike wovens, nonwovens can be processed with cutting equipment such as die cutters or Gerber machines without the edges fraying and unraveling. This makes them inexpensive to make and gives them applications in disposable products such as diapers and filters.

## Characteristics

Surely, you have noticed that the tags of your clothing state the makeup of the garment by percentage of different material. This is great information and gives us a clue about its characteristics, but it is not the complete picture. Primary properties or characteristics that are considered for fabrics and textiles in consumer products include stretch, wear resistance, breathability, absorption, denier, special properties, and sustainability.



Above: A woven soccer scarf.

Below: An air filter for a car made from a nonwoven.



## A soft good is any non-rigid, non-durable material—i.e., fabrics, textiles, rubbers and papers.

This race car driver's suit is made from fire-retardant materials such as Nomex.



The soft goods used to make a sneaker need to have high abrasion resistance.

The amount of **stretch** is important in applications where the material has to fit over something, as with clothing. Yoga pants and socks, which need to fit snugly over curvy parts of the body, are made with materials that have good elongation. Materials also can have little to no stretch (dryer sheets, fleece); two-way stretch, in which the material is stiff in one direction and stretchy in the other; and four-way stretch, where the material elongates in all directions.

In applications whereby a soft good is exposed to the environment or being used as a friction surface, it is important to have good **wear resistance**. Because the material on the exterior of running sneakers will come in contact with branches, rocks and other abrasive surfaces, the outers are made with tough synthetic materials that will not easily rip or shred.

**Breathability** is an important characteristic for materials that come in contact with skin, which needs access to air to regulate temperature and dissipate sweat. Materials without any air transfer are uncomfortable, especially for performance wear. Breathability in the form of porosity is an important characteristic for materials used for filtration, because they need to let fluid pass while trapping solid particles. Filtration materials are often given a size rating based on how big of a particle can pass through it, typically quoted in microns. Filters for fish tanks are a great example.



The material of this jacket does not absorb water, to keep the wearer dry.

**Absorption** is the amount of liquid a soft good can absorb. The outer layer of a jacket must have very little absorption so it keeps rain and snow from penetrating the interior insulating layers. A sponge or towel needs to have as much absorption as possible to soak up water and stains.

For woven materials, the density of a fabric is often expressed in units called **denier**—the weight in grams of 9,000m of fiber. Denier uses silk as its natural reference, which is 1 denier. Pantyhose have a low denier (10-30) and look sheer, while tights (~80 denier) are heavier and look more opaque. The higher the denier, the heavier, thicker and more durable a material will be.

Some products require **special properties** based on their use scenario. A common special property is flame retardance, found in fire suits for race car drivers and firefighters; this often features a material called Nomex. Kids' pajamas and household goods such as curtains are often made from flame-retardant materials or coated with a flame-retardant additive.

**Sustainability** is also a major concern for many products. Consumers increasingly want green materials in their products, including cotton and bamboo.

The world of fabrics and textiles is enormous, which can be overwhelming. Knowing some of these basic concepts will help you explore and describe soft goods in a more meaningful way and help you choose the right family for your prototyping needs. 📦



The tags inside clothing reveal a little bit about the properties, but not everything.

# The Secret to the 'Wow Factor'

UNDERSTAND THE CRITERIA; LEARN FROM PAST EXAMPLES

BY JOHN G. RAU

**P**erhaps you have read on these pages that according to general estimates, fewer than 3 percent of patented new products ever generate money for the inventor. Mike Marks sums this up in his Invention City blog: "Inventing is a pursuit of failure marked by occasional success."

To overcome these odds, you need a product that stands out or has a "wow factor"—defined by Cambridge Dictionary as "a quality or feature of something that makes people feel great excitement or admiration." In a 2014 blog, product introduction specialist Edward Ayres discusses "the snap, crackle, pop of a new product."

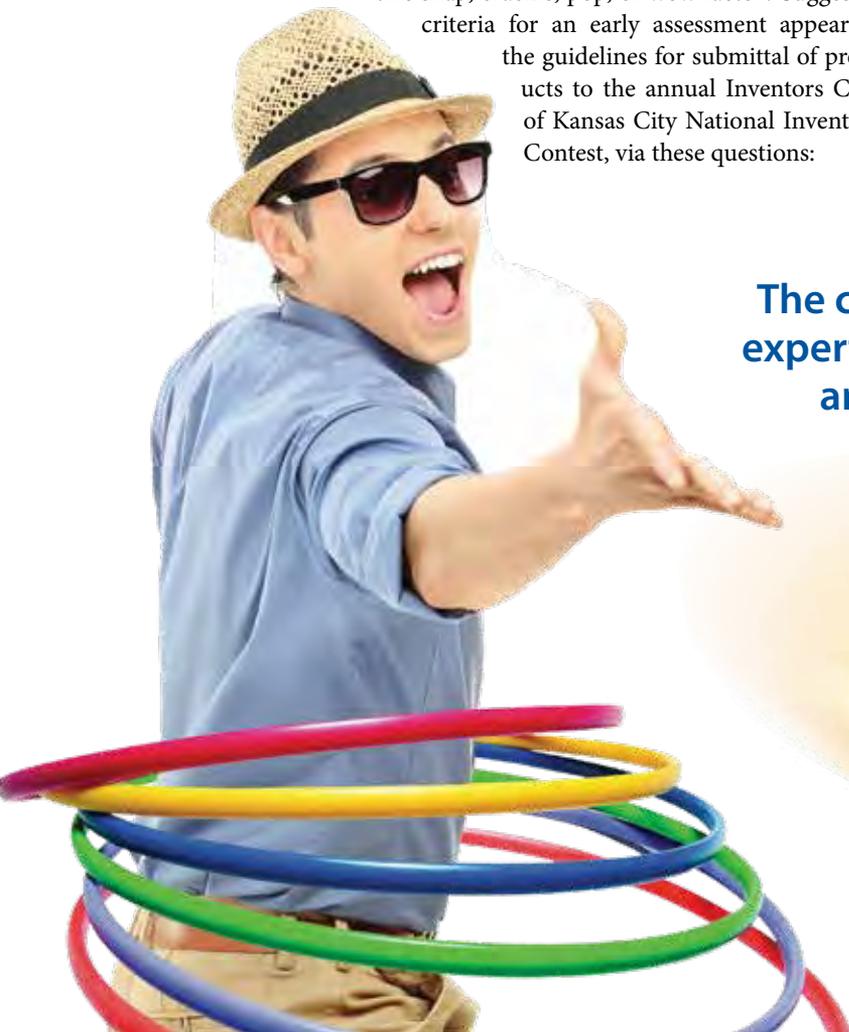
## 'Wow' checklist

So how do you determine whether your invention has this snap, crackle, pop, or wow factor? Suggested criteria for an early assessment appear in the guidelines for submittal of products to the annual Inventors Club of Kansas City National Invention Contest, via these questions:

- Does your new product have a unique selling advantage? In other words, does it stand apart from other similar types of products that claim to solve the same problem your product is addressing?
- Does your new product appeal to the masses? If so, you may have a winner.
- How demonstrable is your product? The better the visual demonstration of the product, the greater the chance for success. You should be able to impress your audience with the wow factor features.
- Will people believe that your product will work? The bigger or more common the problem solved, the more the product sells.
- Is your product easily explained? Consumers must be able to understand what the product does in a relatively short period of time. Albert Einstein is quoted as saying that "If you can't explain it simply, then you don't understand it well enough. You do not really understand something unless you can explain it to your grandmother."

In his Inventors Spot blog, Ashton Audall says you should not despair if your product doesn't get a wow from people in general—that if your product offers an obvious,

**The co-founders of Wham-O, Inc., were experts at deriving their own version of an object and creating a buzz for it.**



substantial improvement over existing products, it will be tough for people to ignore it. “Your product may not ‘wow’ everyone, but if it ‘wows’ a juicy enough market, then that’s all you need.”

### Case study: Hula Hoop

The Hula Hoop exemplifies the development of a product that had a significant wow factor. Although people have played with hoops throughout history, the modern version was invented by Richard Knerr and Arthur Melin. In 1948, they co-founded Wham-O, Inc.—the maker of the Hula Hoop, Frisbee, Superball, Slip-N-Slide, Water Wiggle and Silly String.

As the story goes, Knerr and Melin heard about a bamboo ring used for exercise in Australia but derived their own version without seeing the original. What they did with the Hula Hoop is a good illustration of the way to create a wow factor for a new invention: They created something that people could evaluate, thus building the case for the wow factor.

They ran an early test of the product in 1958 at a Pasadena, California, elementary school and enticed their test subjects by telling them that they could keep the hoops if they mastered them. They “seeded the market,” giving away hoops in neighborhoods to create a buzz, and even required Wham-O executives to take hoops with them on planes so people would ask about them.

Soon, Wham-O was producing 20,000 hoops a day at plants in at least seven countries. Within four months of introduction into the marketplace, 25 million hoops were sold. Talk about a wow factor! In his 1985 book “American Fads,” Richard A. Johnson wrote that “no sensation has ever swept the country like Hula Hoop.”

### Making the Frisbee soar

Knerr and Melin had a similar wow factor experience when they observed people playing on the beach with a product called the “Pluto Platter.” They bought the rights, modified it and renamed it in 1958. You know it now as the Frisbee.

Initially, Frisbees were marketed by word of mouth on college campuses. A professional model went on sale in the 1960s, and the team sport known as Ultimate Frisbee was soon played on campuses. The Frisbee Dog World Championships were started in 1975; Wham-O sold more than 100 million units by 1977.

Knerr probably should be credited with initially defining wow factor, especially as it related to his firm’s toys. He said it was the moment when “you’re...showing it off and everybody says, ‘What’s that? What’s that?’”

He was fond of saying, “You can’t tell whether the fish will bite if you don’t drop a line in the water”—your most likely first step to determine whether your invention has the wow factor. 🐟

**John G. Rau**, president/CEO of Ultra-Research Inc., has more than 25 years’ experience conducting market research for ideas, inventions and other forms of intellectual property. He can be reached at (714) 281-0150 or [ultraresch@cs.com](mailto:ultraresch@cs.com).



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# Pro-Patent Voices Turn Up the Volume

RECENT FORUMS REFLECT A CALL TO SAVE AMERICAN INNOVATION **BY LOUIS CARBONNEAU**

**I** already feel like we live in a slightly different world than the one I described last month. So much has taken place in such a short period, and the IP community is holding its breath speculating as to how the U.S. Supreme Court will come down on the seminal *Oil States* case it heard on November 27. But let's approach this chronologically.

Two very interesting events took place almost back-to-back recently. **IAM's 3rd Patent Law and Policy Summit**, in Washington, D.C., was the perfect forum for airing grievances with the current state of affairs in the U.S. patent system. This year, the pro-patent side felt a bit more emboldened than in the past. We are finally seeing a more balanced narrative emerge in Congress.

This event fell on the heels of a string of recent articles supporting a stronger patent system by well-respected *Financial Times* associate editor Rana Foroohar and by former Republican Senator Jon Kyl of Arizona in *The Hill*. Along with U.S. Sens. Chris Coons (D-Del.) and Tom Cotton (R-Ark.), who sponsored the STRONGER Patent Act, others in Congress have finally come to terms with the fact that there has been structural damage to the U.S. innovation engine as a result of the patent

"reform" (mostly inter partes reviews) and court decisions (mostly the landmark 2014 *Alice* case that was a blow to software patents). To save U.S. innovation, something must be done before it is too late.

A few days later, I had the pleasure of again attending the **2017 IP Dealmakers Forum**. The New York City event focuses less on policy

and more on the business side of the IP market, with participants from the corporate world, legal community, investment banking and patent litigation financing.

Although the tone was definitely more businesslike, the overall consensus was remarkably consistent with the previous event. But the various panels also were more focused on how to make things work in the current environment.

Many discussions touched on the recent tactical moves to use Native American tribes' sovereign immunity as a way to obviate the much-maligned Patent Trial and Appeal Board—the same way a heart surgeon would use a bypass procedure. As the so-called rent-a-tribe tactic was denounced by some and immediately spurred a proposed bill to kill this new move in the womb, U.S. universities appear to be on a stronger legal footing. So it would not be surprising to see similar deals being reported soon, starting with one rumored to involve the University of Kentucky.

Compared to last year's event, the overall tone was more upbeat despite a consensus that patent valuations are still in the doldrums. Various panelists emphasized the need for more diversification in their portfolio (what else do you expect investment specialists to say?) between U.S. and foreign assets.

## **Oil States stirs passion**

As great as these exchanges were, what really stole the show was the looming presence of the upcoming oral arguments before the Supreme Court in *Oil States Energy Services v. Greene's Energy Group*. The constitutionality of the PTAB's inter partes review proceedings was at stake. Patent cases rarely ignite emotions, but this was different; there were even protesters outside the Supreme Court Building with signs that read: "The PTAB killed my startup." (See photos, page 41.)

Before the case was heard, most pundits predicted SCOTUS would maintain the status quo and we'd see another of those unanimous decisions. The oral arguments turned out to be a lot more heated than expected, with Chief Justice John Roberts and newly appointed Justice Neil Gorsuch leading the charge to call in due process and property rights arguments.

**In the buildup to the Supreme Court hearing oral arguments in *Oil States*, protesters outside the building held signs that read: "The PTAB killed my startup."**



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Brown Rudnick Partner Fred Fabricant (left) moderated an IP market roundup during the 2017 IP Dealmakers Forum.

After the hearing, IP Watchdog asked several of us to make new predictions and it was surprisingly close, with most experts still predicting that IPRs will remain constitutional but expecting a much more divided bench (5-4 or 6-3). Although a closer-than-expected decision would not actually change the outcome of the case, a series of strong dissents could send a powerful message to Congress that it needs to fix the monster it created.

However, putting one's faith on the U.S. Congress to help patent owners may feel a lot like a fool's errand. Congress recently released a tax plan that was voted in by both the House a few weeks ago and the Senate on December 2, actually introducing a new provision that would tax patent transactions as income (they have historically been taxed—at a much lower rate—as a capital gain). The last thing the IP market needs at this stage is another reason not to do deals.

### Sign of hope with Iancu

USPTO Director nominee Andrei Iancu had his day on Capitol Hill for his confirmation process, with the goal of determining where his allegiances lie. It turns out the seasoned litigator kept things close to the vest, and those hoping for a quick change of tone at the United States Patent and Trademark Office were left waiting.

Nevertheless, he acknowledged the current malaise with the PTAB and that inventors had been hurt by the current system, which is encouraging.

### Around the world

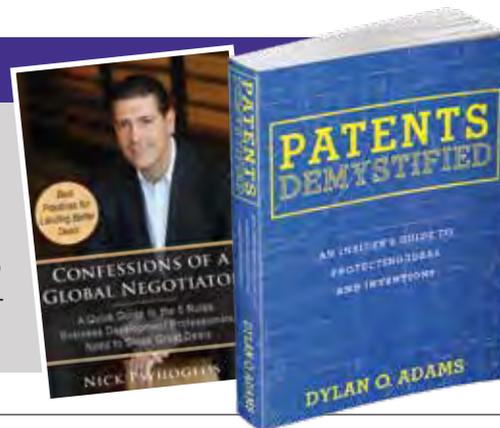
Japan backed off a controversial alternative dispute resolution proposal that would have forced parties involved in Standard Essential Patent negotiations out of the courts. Singapore's patent office announced that it will expand its Global Innovation Alliance to Beijing to help Singapore tech companies access opportunities in China. IP rights were atop China's legislative agenda. In Europe, the European Commission released its long-awaited communication on the licensing of Standard Essential Patents, and patent owners should be relatively pleased; however, in Germany, recent decisions signaled the possibility of more compulsory licensing, definitely a development of concern. 🌐

**Louis Carbonneau** is the founder & CEO of Tangible IP, a leading IP strategic advisory and patent brokerage firm, with more than 2,500 patents sold. He is also an attorney who has been voted as one of the world's leading IP strategists for the past seven years. He writes a regular column read by more than 12,000 IP professionals.



### What to read

You can find suggestions for nice winter reading from good friend Bruce Berman at IP CloseUp ([ipcloseup.com/books-2/](http://ipcloseup.com/books-2/)). Other books of interest: **"Patents Demystified"** by patent attorney Dylan O. Adams; **"Bold Ideas: The Inventor's Guide to Patents"** by fellow patent attorney J.D. Houvener; and, for those who have the goods but need help cutting deals, **"Confessions of a Global Negotiator"** by my former colleague at Microsoft, Nick Psyhogeos.



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# Inventors Demand Patent Fairness

A group of dedicated inventors recently took to the steps of the United States Supreme Court in order to protest the Patent Trial and Appeal Board of the United States Patent and Trademark Office. As the Supreme Court heard oral arguments in *Oil States Energy Services, LLC v. Green's Energy Group, LLC*, and *SAS Institute Inc. v. Iancu*, the inventors' protest focused on the erosion of patent rights and the need for patents to be considered property rights.

"The erosion of patent rights that we have experienced in recent years must be stopped now," wrote Randy Landreneau in advance of the November 27 protest. "The greatest cause of our time is the correction of the American patent system—the return to a system that provides an actual intellectual property right, signified by a U.S. patent, to any inventor regardless of income status." —Gene Quinn

The protest at the Supreme Court Building was coordinated by Paul Morinville, the director of US Inventor (wearing hat at right). Josh Malone (below right), who has been involved in a patent infringement battle over his invention Bunch O Balloons, also attended.





# No Clear Leaning by SCOTUS on Oil States

JUSTICES SEEM SPLIT ON CONSTITUTIONALITY CHALLENGE TO IPR PROCEEDINGS **BY GENE QUINN**



While hearing arguments on November 27, some of the nine Supreme Court justices asked questions that were consistent with their past positions. Others asked difficult questions, making it hard to predict how they might rule, or they remained silent.

**N**ow that the United States Supreme Court has heard oral arguments in *Oil States Energy Services, LLC v. Green's Energy Group, LLC*, speculation has begun on how the court will rule.

The potentially landmark case will require the Supreme Court to determine whether inter partes review proceedings before an executive agency tribunal are constitutional, or whether the adjudication of patent validity must take place in Article III federal courts. (IPR is a trial proceeding conducted at the Patent Trial and Appeal Board to review the patentability of one or more claims in a patent only on a ground that could be raised under U.S. Patent Act Sections 102 or 103, and only on the basis of prior art consisting of patents or printed publications.) SCOTUS heard arguments on November 27.

Although it is always difficult and sometimes impossible to predict the outcome of Supreme Court cases based only on the oral argument transcript, a review of the transcript in *Oil States* suggests the Supreme Court is split on what to do with IPR proceedings. Leading up to the oral arguments, Joe Matal, acting director of the United States Patent and Trademark Office, has been on record as predicting a 9-0 ruling by the Supreme Court in favor of the constitutionality of IPR proceedings. But this seems quite unlikely.

## Questions offer clues

Based on his questions, Justice Neil Gorsuch seems the most likely to support the petitioner's position that there is a constitutional infirmity surrounding IPR proceedings. Chief Justice John Roberts also seemed to have substantial concerns with respect to IPR proceedings. Perhaps somewhat predictably, Justice Stephen Breyer—and to a lesser extent, Justices Sonia Sotomayor and Elena Kagan—seemed through their questions to view IPR proceedings as just another opportunity for the patent office to ensure the correct determination has been reached at the time the patent was granted by the office.

Justice Anthony Kennedy overall seemed more in line with the thinking of the liberals on the court; Justice Ruth Bader Ginsberg asked difficult questions, making it hard to predict how she might rule. Justice Clarence Thomas characteristically remained silent, although his judicial philosophy would be typically in line with Justice Gorsuch. Justice Samuel Alito asked only a few questions of the petitioner's counsel, Allyson Ho, which focused on whether the U.S. Constitution requires a patent act and whether Congress could put limitations on the grant of "these monopolies."

Each of those before the Supreme Court fielded difficult questions. Some themes emerged throughout the questioning. One peculiar aspect of the day seemed to be that the Department of Justice continues to take patent positions that are perfectly simpatico with Obama-era policies. Not much has changed on patent policy under President Trump, despite the great hopes of many in the patent owner community.

Questions for Ho, representing Oil States, tended to focus on the differences between re-examination and inter partes review. She explained that re-examination is "fundamentally examinational" in contrast to IPR proceedings, which are adjudicatory and the type of "cases that have been adjudicated in courts for centuries ..."

Questions for Christopher Kise, representing the respondent Greene's Energy Group, tended to focus on three different aspects: If a patent owner has spent millions or billions of dollars in reliance on the patent

PHOTOGRAPH BY FRANZ JANTZEN, COLLECTION OF THE SUPREME COURT OF THE UNITED STATES

## The Department of Justice continues to take patent positions that indicate not much has changed on patent policy under President Trump.

over a period of many years, do rights ever vest; whether there is an opportunity to review the agency determination in an Article III tribunal; whether patents are a private right.

With respect to the first issue, which continued to come up repeatedly once raised by Justice Breyer, it seemed to trouble the court that there is no period of time in which a patent vests and patent owners can meaningfully rely on the patent having vested. Although Justice Breyer raised the question, which was picked up on by Chief Justice Roberts and Justice Gorsuch, Breyer later showed his contempt for a vested rights theory. He said that such a theory was popular in the 19th century and held sway with then-Justice Joseph Story in earlier cases, “but in fact has happily sunk from sight.” Still, Justices Roberts and Gorsuch seemed concerned with the issue of vested rights.

Questions reserved for Malcolm Stewart, who argued on behalf of the federal government, tended to focus on the difference between patents and land—specifically, the extent to which the patent office could constitutionally be involved in deciding infringement issues, and the impact on panel stacking at the PTAB in order to achieve the result desired by the director.

### On panel stacking

As for the patent office deciding infringement issues, Stewart seemed to paint himself into a bit of a corner when he distinguished an executive tribunal such as the PTAB deciding infringement issues, because there is no precedent in common law or elsewhere to support damages being awarded by an agency in a dispute between parties. This led Justices Sotomayor and Gorsuch to ask whether it would be constitutional for the patent office, or the director specifically, to render decisions in patent infringement matters if no damages were sought.

This led Justice Gorsuch to ask: “So a declaration of non-infringement could be issued by the director, for example, right?” Stewart explained that would be harder to defend because making such decisions is “not part of the PTO’s traditional work.” This caused Justice Gorsuch to question how long it does take to make a tradition. This was in reference to Kise and Stewart arguing that for the past 40 years, re-examination has been a procedure offered by the PTO, while Ho had argued that for 400 years courts have been responsible for adjudicating patents.

In rebuttal, Ho picked up on the line of questioning relating to panel stacking as being problematic, a recurring theme during the oral arguments: “[T]he existence of panel stacking shows precisely the danger of judges, of decision-makers, who are subject to executive political influence.”

It seemed that no one seriously defended panel stacking, although it was minimized as not having happened very much. This led Justice Kennedy to ask Kise to assume panel stacking was rampant. Kise again said that it is not rampant, but “that the Administrative Procedures Act and other provisions of the Constitution would deal with infirmities in a particular case on an as-applied basis...”

Whatever the case’s ultimate outcome, one thing seems certain: The thoughts of Neal Solomon in his series were eerily on point.

Solomon wrote an eight-part series on the constitutionality of the PTAB under the public rights doctrine, which was front and center throughout the questioning. He predicted that cases such as *Crowell v. Benson* (1932), *Northern Pipeline Construction v. Marathon Pipe Line* (1982), *Commodity Futures Trading Commission v. Schor* (1986) and *Stern v. Marshall* (2011) would all be relevant to the court’s determination, and each of those cases were raised in questioning by the justices. ☞

**Gene Quinn** is a patent attorney, founder of IPWatchdog.com and a principal lecturer in the top patent bar review course in the nation. Strategic patent consulting, patent application drafting and patent prosecution are his specialties. Quinn also works with independent inventors and start-up businesses in the technology field.



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# Tax ‘Cuts’ Act Would Further Cripple Inventors

HR 1 PASSED BY HOUSE IS ANOTHER BLOW TO PATENT RIGHTS

BY PAUL MORINVILLE AND GENE QUINN

**H**R 1, the **Tax Cuts and Jobs Act** that was recently passed by the House of Representatives on a 227-205 vote, has an ominous provision to change laws that address the way patents are treated from a tax perspective.

Currently, patents are treated like other property in that when a patent is sold, profit from the sale is taxed at a long-term capital gains rate. In effect, shifts in patent tax treatment contained within HR 1 change the nature of a patent into something other than a property right—so that when a patent is sold, it will be considered income for tax purposes. This proposed change would dramatically increase taxes paid to the government, perhaps doubling it.

The November 16 vote is another blow in a long string of incredible damage to patent rights and investment in the earliest stages of commercializing new technologies. This proposed change to U.S. tax law will prove devastating to independent investors and start-ups seeking investment, which means it will unquestionably harm job creation.

The Tax Cut and Jobs Act is another wildly misnamed act, much like the Orwellian-named America Invents

Act that devastated inventing in America through the creation of the Patent Trial and Appeal Board.

On a broader level, the act signals a continuing approach toward patent rights as not being a property right, which contradicts the U.S. Patent Act and centuries of precedent. The government’s destruction of the once-great U.S. patent system is built upon a simple yet scary philosophy: Where it matters, no one in government actually considers a patent to be a property right.

If a patent is not a property right, a patent can be treated however the political winds blow (or political money flows). And that is exactly what has happened. So why not tax it more?

## Adding even more risk

Independent inventors and start-ups rely on the benefits of current tax treatment of long-term capital gains to help justify the financial risks they take when bringing inventions to market, or when licensing to others the use of their new technologies. Internal Revenue Code sections 1221, 1231 and 1235 accomplish this by providing long-term capital gain tax treatment for the patents of inventors and their investors. Why would Congress want to change this and further make an already risky endeavor even more risky and less financially rewarding?

Changing these regulations to treat patent sales as income will significantly devalue patents on both ends of early-stage innovation. It increases the cost of inventing by taxing the fruits of inventing activity.

Although market sizes for inventions vary depending on the invention, the market value for any particular invention is finite. That means that any given patent only has one value. Increasing tax on the patent directly lowers the profit potential for the inventor. Lowering profit has the effect of increasing the risk that the invention will not bring enough profit to become worthwhile, which will cause many inventors to walk away and investors to discriminate even more than they already are doing.

Can America afford to further discourage inventors and investors? With China doing the exact opposite, the prospect of Congress enacting further disincentives is surreal.



## Bad domino effects

But that's not all of the damage. The finite value of the market for a patent does not change when the patent is sold. The market value is the same, so increasing the tax means that investors who buy the patent will receive less profit because the profit is eaten by higher taxes. So the purchasing investor must overcome lower profit due to higher taxes by driving down the purchase price of the patent.

That means the inventor and the inventor's investors will receive even less money, negatively affecting the profit/risk equation from the onset of the inventing cycle. This means there will be less inventing.

## HR 1 would change the nature of a patent into something other than a property right—so that when a patent is sold, it would be considered income for tax purposes.

All three branches of government have made significant changes to the patent system that make it difficult, if not almost impossible, to earn a living solely as an inventor. This philosophically flies in the face of the purpose of the patent system and the choices made by the Founding Fathers, who consciously chose to have a patent system affordable by real people, not just large corporations. Today it seems that our leaders are doing whatever they can to disadvantage individuals, pursuing a policy fundamentally and diametrically opposed to the choices made early in our country's history and pursued until very recently.

Congress is poised to deal another blow by removing one of the most important financial incentives: the incentive to even try in the first place. To do so would further devalue U.S. patents, and further change the corresponding risk-reward calculus, to the point of making the "business of inventing" in the United States untenable for individual inventors from a financial perspective.

The good news is that the Senate's tax legislation, passed on December 2, does not include this same provision. So there is hope that when the bills are reconciled, the House's changes to Sections 1221, 1231 and 1235 may not make it into the final bill. As this plays out, we will see whether Congress wants to levy another blow to our nation's start-up and job creation engine. ☺

**Paul Morinville** is managing director of US Inventor, Inc., an inventor organization working in Washington, D.C., and around the United States to advocate for strong patent protection for inventors and start-ups. He is an independent inventor with dozens of patents and pending patent applications in enterprise software.



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**IoT Corner**

The 21 semifinalists for the **Anu & Naveen Jain Women’s Safety XPRIZE** were recently announced. The competition is run by the XPRIZE Innovation Engine, which offers large cash rewards for innovations that benefit humanity. Teams from the United States, Germany, Switzerland, India, Spain and the United Arab Emirates were chosen to continue to the next round.

The mainly IoT-based projects range from safety buttons that can create a panic alert based on emotional threat level to camouflaged fashion accessories that can send hands-free SOS alerts.

To win the grand prize, the innovation must cost no more than \$40 to manufacture and “autonomously and inconspicuously trigger an emergency alert while transmitting information to a network of community responders, all within 90 seconds.” The winner will be announced in June. —*Jeremy Losaw*

**Wunderkinds**

**Stephane Hatgis-Kessell** began working on an inexpensive prosthetic hand for amputees when he was in sixth grade. Now a sophomore at the Dwight School in New York City, his 3D-printed Hephaestus Hand cost only \$300 to make. Others of its ilk can cost \$65,000. The school said that most of the device’s parts are made from the same plastic as Legos; the hand operates via a motor and sensor that picks up muscle signals. His next plans are to begin testing for users, as well as refinements that include making the hand smaller. He wants to add a functional rotating wrist that would be a first for a 3D prosthetic hand.



**What IS that?**

If you’re single and your love life is wanting, the obvious solution is to run out and buy a fake severed finger. **Tinda Finger** is a robotic device that gives your tired fingers (thumbs?) a break while swiping through Tinder profiles. Simply insert the blue or pink plug into your smartphone and watch it swipe away—more than 100 revolutions per minute, or 6,000 swipes an hour. It’s available for both iPhone and Android. Tinda Finger’s September Kickstarter campaign was a thumbs-up, raising £5,001 (\$6,726 U.S.), after an initial goal of £2,000 (\$2,691).

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**\$140,000**

The reported amount that the NFL’s Seattle Seahawks is paying Texas A&M to use the university’s trademarked “**12th man**” slogan, a reference to their fans’ support. Under the five-year licensing deal, reached in 2016, the Seahawks can’t use the term on social media. The NFL team has recently trademarked “12,” “12s,” and “We are 12s.”



**WHAT DO YOU KNOW?**

- 1** The first ice skates were made from:
  - A) Shaved logs
  - B) The leg bones of large animals
  - C) Table legs
  - D) None of the above
- 2** True or false: The widely acknowledged first published rules for both hockey and basketball were written by alumni of Magill University in Montreal.
- 3** Which invention came first—the blender, or the electric toaster?
- 4** True or false: The NFL forbids church groups to show the Super Bowl on large-screen TVs, citing trademark violations.
- 5** A Jan. 6, 1925 U.S. patent, “Cosmetic and process for producing the same,” was granted to:
  - A) Beulah Louise Henry
  - B) Marjorie Joyner
  - C) Albert Einstein
  - D) George Washington Carver

**ANSWERS:** 1. B. Ice skating dates back 3,000-5,000 years in southern Finland. 2. True. James C.A. Creighton is credited with the first published rules of ice hockey in 1877; James Naismith’s 13 basketball rules were published in the Springfield (Mass.) College newspaper in January 1892. 3. The electric toaster was invented in 1893 by Alan MacMasters in Scotland, the blender in 1922 by Stephen Poplawski. 4. False, although the league sent cease-and-desist letters to those organizations before softening rules involving them in 2008. 5. D. The cosmetic was a cream made from peanuts. The botanist, agronomist, chemist and inventor created or disseminated about 100 products made from peanuts.

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