Inventors DIGEST

APRIL 2016 Volume 32 Issue 4

StandUp Walker

RISING STAR IN THE HOME HEALTHCARE INDUSTRY

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Jack Andraka
DISCOVERS A DEVICE TO DETECT PANCREATIC CANCER

Total Tie Keep
NO MORE BLOWIN' IN THE WIND

3D Printers
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The Next BIG Thing

This month's cover story should be of interest to inventors looking for the next big thing. While over the past decade numerous products have been developed for tech-savvy, time-conscious millenials, at the opposite end of the spectrum are aging baby boomers, who are creating multiple marketing opportunities. As their numbers continue to increase, so does the potential for product development.

Ken Paulus' company, URise Products, is on the cutting-edge of what has been coined the "silver tsunami." According to the Pew Research Center, 10,000 boomers will turn 65 today, and 10,000 more will turn 65 every day for the next 19 years. That's a lot of knees and hips in need of repair. It's also an enormous number of people searching for ways to maintain their health, mobility, independence and quality of life, which is of concern to Paulus and his company. He recently brought the StandUp Walker—a cross between a traditional walker and a stand-assist device—to market, with the goal of helping people maintain their independence.

The development of the StandUp Walker has all the elements of a great detective novel—minus the crime and ensuing chase. Actually, it's an all-encompassing inventor story that involves universities, senior projects, tech transfer, professors, patents, licensing, prototyping, manufacturing and distribution. Throw in timing and luck, and you've got a best seller.

The StandUp Walker was initially conceived by mechanical engineering students at MIT. Howard Liles, one of the students involved, was assigned the project by his classmates at the end of senior year. MIT was not interested in the device, so the project was transferred to Georgia Tech when Liles enrolled in grad school there. Paulus, who was the vice president of business development for Edison Nation Medical at the time, discovered the project at MIT, tracked it to Georgia Tech, and the rest, you can read for yourself, beginning on page 26.

Healthcare will continue to be an open field for innovation for many years to come—and you don't necessarily have to be a doctor, scientist or engineer to take advantage of it. At age 15, while still in high school, Jack Andraka developed a simple test to detect pancreatic, ovarian and breast cancers. Andraka made headlines around the world when his idea first hit the scientific and medical communities, but you'll be astonished when you read this account of how Andraka initiated and developed his idea. While most kids are reading comic books or checking their cell phones behind the pages of the book their teachers are discussing, Andraka was reading an article about carbon nanotubes behind his.

Of course, not everyone is drawn to such complex issues. Dwight Littlejohn, a Special Agent in Washington, D.C., for 20 years, noticed how difficult it was to keep a necktie looking neat all day in the line of duty. Most people assume a tie has certain properties, one of which is the tendency to move around in response to the wearer's motions, but Littlejohn saw an opportunity. He came up with the Total Tie Keep, which eliminates unkempt ties and keeps wearers looking professional all day, even when chasing bad guys.

Whether you're contemplating the solution to a simple or complicated problem, the key is in the execution. Remember, no matter how good your idea may be, unless you can convert it to a viable product and take it to market, it will remain just that—an idea—and ideas are a dime a dozen. Experts say: Go beyond your perceived limitations but be realistic about your expectations. Do your research. Understand your market and its potential for growth. Study the competition, as well as production costs, packaging and distribution. If all else fails, consider licensing. It worked for Howard Liles.

—Cama

INGENUITY IS AMERICA'S MOST VALUABLE RESOURCE.

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America has been on the cutting edge of innovation for over 200 years because of a strong patent system. If Congress passes harmful patent legislation, it will devalue the system that has helped turn America's best thinking into our nation's #1 export. That will mean fewer new ideas brought to market, fewer jobs and a weaker economy. We can't maintain our global competitive edge by undercutting our greatest asset.

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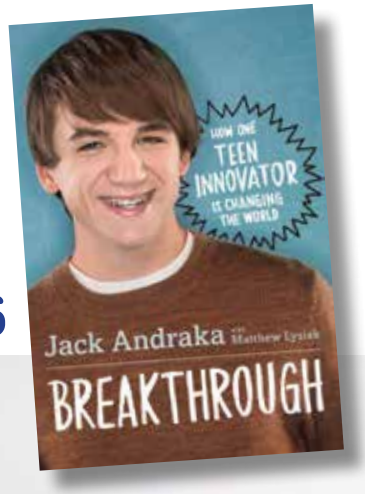

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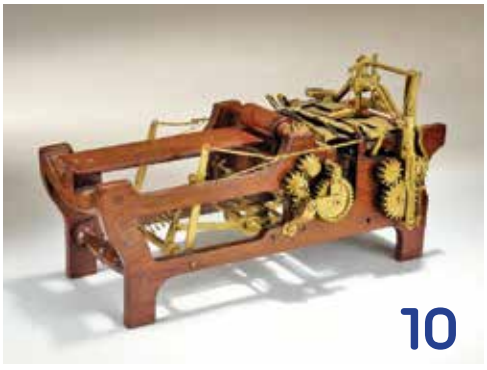

ON THE COVER
URise Products' StandUp Walker; photograph by Larry DeLeon.

Feature

American Inventors

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Bright Ideas

Compiled by Eleanor Merrell

Prepd Pack

LUNCHBOXES FOR FINE DINING

getprepd.com

For those who earn their daily bread at a nine-to-five job, lunch offers a conundrum. Eating at a restaurant or picking up a take-out order can be expensive or unhealthy, and using a paper bag neither preserves food well nor does favors for the environment. Enter: Prepd Pack.

Prepd Pack is a stylish lunchbox that includes magnetic cutlery and a selection of food-safe containers. The containers perfectly fit the Prepd Pack case and can be fashioned into different arrangements. The Prepd Pack has a complementary app that provides perfectly proportioned recipes, nutritional information and shopping lists, making healthy lunch preparation easier than ever. The app also has a social function that enables users to share recipes and tips with other Prepd Pack owners. Optional features include a cooling sleeve for ice packs and extra sets of containers that can be used to prepare lunches in advance.

Prepd Pack is available on Indiegogo and is expected to ship June 2016. Prices begin at $55.

"I do not think there is any thrill that can go through the human heart like that felt by the inventor as he sees some creation of the brain unfolding to success." —NIKOLA TESLA

EvaDrop

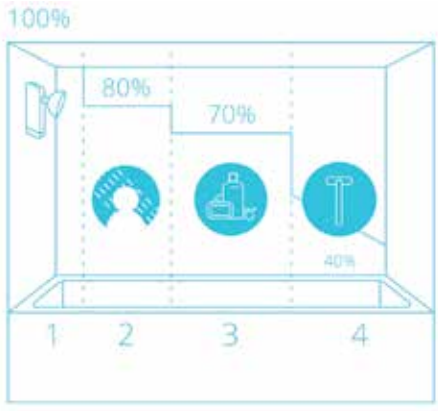
TAKE A SMART SHOWER

evadrop.com

Homeowners who use the onset of spring as an opportunity to spiff up their homes should consider installing EvaDrop Smart Shower. EvaDrop mounts between the wall and the showerhead, and detects where someone is standing in the shower. Based on the shower taker's proximity to the showerhead, EvaDrop increases or decreases water flow. For example, if the person moves close to the showerhead, such as while rinsing her hair, EvaDrop increases water flow. When the person moves away from the showerhead to lather soap or shave her legs, EvaDrop decreases water flow.

EvaDrop can be programmed to sound an alert after someone has spent a certain amount of time in the shower. It can also measure water temperature as the shower heats up and be programmed to shut off the water once a desired temperature is reached. EvaDrop's settings can be adjusted using a free smartphone app that also enables users to monitor and compare their water usage, as well as access water usage statistics.

EvaDrop can cut water use in the shower in half. As a result, its creators calculate that those who purchase EvaDrop can regain the cost of the product within one year. More important, EvaDrop enables customers to take a small step toward a more sustainable lifestyle. EvaDrop costs $99 and is available on the company's website.



Zone DPMX

METER YOUR RACING POWER

brimbrothers.com

Serious cyclists more often than not have multiple bicycles, including training bicycles and racing bicycles. After all, different bikes have various purposes and features. However, most bikes are not furnished with one of the most important pieces of equipment cyclists need: a power meter. As a result, switching bicycles means remembering to move your power meter from bike to bike. Fortunately, Brim Brothers Ltd. has designed a power meter that straps onto the rider's shoe rather than the handlebars.

Zone DPMX relies on two pods, one below the cleat and one above it. Together, these pods collect the necessary information to estimate cadence, power and power balance. These calculations are then transmitted to the rider's ANT+ bike computer or smartphone, where they can be displayed or recorded.

The basic Zone DPMX package includes one pod, a sensor and a base, a charging dock and USB wall charger, a Torque screwdriver and a user guide. The device is available on Kickstarter for May 2016 shipments. Prices begin at $484.

"The true sign of intelligence is not knowledge but imagination." —ALBERT EINSTEIN

JmGO View Projector

MOVIES TO GO

jmgo-view.com

The JmGO projector might be the best smart, mobile projector around. It projects an image up to 180 inches wide in HD, produces surround sound using Dolby Digital Plus speakers and is even equipped with 3D technology. Use JmGo to watch movies or television, play video games, check out your Dropbox or even listen to music.

The JmGO projector has both a USB and HDMI port. It supports dual band WIFI, which means users can easily stream videos online or access the Web through a laptop, PC or TV. Navigating through presentations or adjusting the projector's features is easy, since it uses Android OS and has a complementary app that enables users to manage the projector from their smartphones. JmGO features an LED projector with 1280/720 HD display and gets two-and-half to three hours of play time when fully charged.

JmGo's smart operating system even allows users to download apps from the Google Play Store and start streaming. The projector has a protective aluminum exterior, weighs only one kilogram and is less than 230 millimeters long, so you can take it camping, too.

The JmGo projector is available on Indiegogo for $385 and ships May 2016.

UsBidi

TAKE CHARGE OF YOUR DEVICES

usbidicharge.com

Smartphones have made life easier, yet the process of acquiring a new phone is a chore. There are providers to contend with, sales talk rivaled only by car vendors and, often, enormous expenses. Fortunately, five Australians have invented a charger that will limit the number of trips to your cell service provider's store by prolonging the life of your smartphone or tablet.

There are two main detriments to the health of phone batteries: overheating and charge cycles that occur when a phone charges from zero to 100 percent in one sitting. The UsBidi addresses both of these problems by terminating the transfer of power to the phone once it has reached a target charge. The UsBidi also charges phones that are plugged into a computer twice as quickly as traditional chargers through a feature that allows cell phone owners to halt data syncing, a process that delays the transfer of power.

The UsBidi is compatible with both Android and iOS phones and tablets. Based on its connector type, a MFi certified Lightning version is available for Apple devices, and Android/Windows devices connect with a Micro USB. UsBidi is enclosed in a durable braided sheath that is available in a variety of colors.

UsBidi is available on Indiegogo for $25. It is expected to begin shipping this month.

Margaret Knight

AKA LADY EDISON

BY ELEANOR MERRELL

Margaret Knight, inventor of the paper bag machine, held 27 patents on 89 of her inventions.

PATENT MODEL: SMITHSONIAN NATIONAL MUSEUM OF AMERICAN HISTORY; ILLUSTRATION BY DAVID PARKINS FOR *IN THE BAG* BY MONICA KULLING

Some products are so ingrained in our daily lives that it's easy to forget there was a time those products did not exist. Take flat-bottom paper bags, for example. They're such familiar sights in grocery and clothing stores, bakeries and fast-food restaurants that we simply fill them up and continue on our way, but every shopper on the planet owes an expression of gratitude to Margaret Knight—the inventor of the paper bag machine. In fact, we are indebted to her for so much more. Knight was awarded 27 patents during her lifetime, which led to the nickname "Lady Edison."

Born in Maine in 1838, throughout her childhood, Knight showed an interest in innovation. While other children played with toys, Knight sought amusement in woodworking tools, building kites and tinkering with machinery. "I couldn't see the sense in coddling bits of porcelain with senseless faces. I was fascinated with jackknives, wood and tools," she said.

> **"I couldn't see the sense in coddling bits of porcelain with senseless faces. I was fascinated with jackknives, wood and tools."** —MARGARET KNIGHT

Following the death of their father, Knight's brothers found jobs at a cotton mill in New Hampshire, where Knight visited them from time to time. During one visit, she witnessed a grisly accident that left a young boy seriously injured. Immediately, Knight set to work designing a stop-motion safety device that was quickly adopted by textile mills across the northeast. At the time, she was only 12 years old.

Distinguished Bag Lady

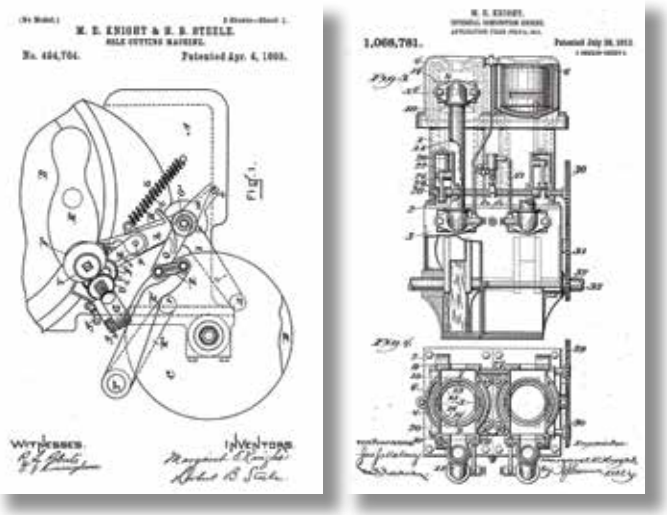
In the late 1860s, Knight began working at the Columbia Paper Bag Company in Massachusetts, which produced envelope-type bags. Although flat-bottom bags were occasionally found in stores, they were not widely used because each bag had to be created by hand. Knight recognized the utility of flat-bottom bags and determined to discover a mechanized way to generate them. Within a month, she had designed a machine that folded and glued the bottoms of the bags. Within six months, she had built a wooden, crank-powered model of her design that could produce 1,000 bags a day.

Shortly thereafter, Knight took her wooden model to a local machinist, who helped her create an iron prototype. She then moved to Boston and hired two additional machinists, hoping that they could help her create a sturdier, smoother version of her prototype. One of the machinists received a visit from a colleague named Charles Annan. With Knight's permission, Annan was allowed to enter the shop and take a peek at Knight's machine.

Patent Treachery

In 1870, months after Annan's visit, Knight applied for a patent for her flat-bottom paper bag production machine. To her surprise, her patent request was denied. Further review revealed that a patent for the same device had already been granted to Annan.

Infuriated, Knight took to the courts to prove that the



invention was in fact hers. She procured years' worth of designs and drawings, and both machinists vouched for her originality and Annan's treachery. Finally, in July 1871, at age 30, Knight prevailed and received U.S. Patent No. 116,842 for "improvement in paper bag machines." With a patent finally in hand, Knight co-founded the Eastern Paper Bag Company in Hartford, Conn. That same year, Queen Victoria awarded Knight the Decoration of the Royal Legion of Honor.

The real winners in the paper bag battle, however, were the owners of the New York department stores Macy's and Lord & Taylor, who realized that instead of wrapping each customer's package with paper and twine, it could be dropped into a bag, which saved time and money—not to mention the quantity of merchandise a bag could hold. The basics of Knight's design can be found in paper bag production today. More than 7,000 machines across the world continue to produce flat-bottom paper bags at a rate of 250 to 600 per minute.

Knight's Legacy

Throughout her life, Knight continued to invent machinery and make design improvements to existing devices, such as the rotary engine. She also invented a dress and skirt shield, the pronged spit, a window and sash, a numbering machine, a paper-feeding machine and a shoe sole-cutting machine, among others. Knight was working 20 hours a day on her 89th invention at the end of her life in 1914, according to a *New York Times* article.

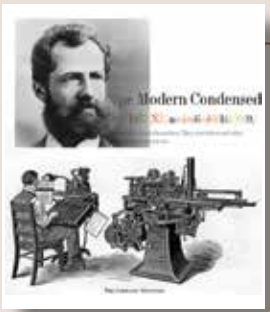
While the proliferation of machinery during the Industrial Revolution created many opportunities for inventors to flourish, Knight may have been able to contribute more emphatically to society during a different era: "I'm only sorry I couldn't have had as good a chance as a boy and have been put to my trade regularly," she said.

As one of the first women in America to obtain a patent, Knight improved the world in countless ways, not only through her inventions but also through her determination to succeed in a male-dominated field, paving the road for future female inventors. As a sign of respect, in 2006, Knight was inducted into the National Inventors Hall of Fame.

INVENTOR ARCHIVES: April

April 2, 1889

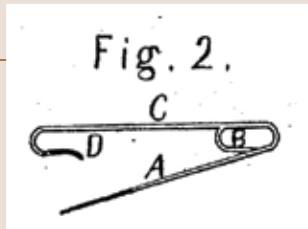
U.S. Patent No. 400,666 was granted to Charles Hall for reducing aluminum from its fluoride salts through electrolysis. At the time, pure aluminum was so rare it was considered a precious metal, but this inexpensive production method brought the metal into wide commercial use. The process, which was discovered at nearly the same time by Frenchman Paul Héroult, is known as the Hall-Héroult process.



April 7, 1896

U.S. Patent No. 557,994 was granted to Tolbert Lanston for the monotype printing press. This machine used hot metal to form individual letters and allowed spelling mistakes to be corrected by adding or removing individual letters, rather than complete lines of type in one bar, as did a Linotype press.

April 10, 1849



U.S. Patent No. 6,281 was granted to Walter Hunt for the safety pin. Hunt invented the device in three hours to pay off a $15 debt he owed to a friend. He used a piece of brass wire that was about 8 inches long and made a coil in the center of the wire so it would open up when released. The clasp at one end was devised in order to shield the sharp edge from the user—hence the name safety pin. Hall sold his patent for $400 to W.R. Grace & Company, which made millions of dollars from the iconic pin.

January 11, 1955

Frederic Ives was granted U.S. Patent No. 495,341 for an improved half-tone printing plate. Newspapers and other print media at the time were not able to find a way to translate finely shaded pictures, such as photographs, onto plates. While in charge of the photographic laboratory at Cornell University, Ives hit upon the idea of breaking down photographs into dots of various sizes to convey shades, or "halftones." His process largely replaced the use of hand-engraved wood block and steel-plate illustrations.

April 25, 1961

Computer industry pioneer and Intel cofounder Robert Noyce was granted U.S. Patent No. 2,981,877 for a silicon-based integrated circuit, otherwise known as the microchip.

ALL PHOTOS: WIKIMEDIA COMMONS

The Business of Inventing

DO YOU HAVE WHAT IT TAKES?

BY JOHN G. RAU

Are you an inventor, an entrepreneur or both? Inventors typically design and develop new product ideas, whereas entrepreneurs recognize the commercial opportunities that might arise from new ideas and products and take the risks of starting new businesses. If, instead of licensing your new product, you opt to become an entrepreneur and commercialize its development yourself, then you need to understand what lies ahead.

According to Wikipedia, an "entrepreneur is an individual who organizes and operates a business or businesses, taking on financial risk to do so." Are you ready (1) to organize a business (or businesses), (2) to operate a business and (3) to take on the financial risk to do so?

The Small Business Administration's website suggests that you need to possess the following characteristics and skills to become a successful entrepreneur:

- **Comfortable taking risks:** Entrepreneurship involves uncertainty. Do you avoid uncertainty in life at all costs? If the answer is "yes," then entrepreneurship may not be the best fit for you. Do you enjoy the thrill of taking calculated risks? Then read on.
- **Independent:** Being your own boss also means you're the one making tough decisions. If you find you can trust your instincts and you're not afraid of rejection every now and then, you could be on your way to entrepreneurship.
- **Persuasive:** You may have the greatest idea in the world, but if you cannot persuade customers, employees and potential lenders or partners, you may find entrepreneurship to be challenging. If you enjoy public speaking, engage new people with ease and can make compelling arguments, it's likely you're poised to make your business idea succeed.
- **Able to negotiate:** As a small business owner, you will need to negotiate everything from leases to contract terms to rates. Polished negotiation skills will help you save money and keep your business running smoothly.
- **Creative:** Are you able to think of new ideas? Can you imagine new ways to solve problems? If you have insights on how to take advantage of new opportunities, entrepreneurship may be a good fit.

If you enjoy public speaking, engage new people with ease and can make compelling arguments, it's likely you're poised to make your business idea succeed.

- **Supported by others:** Before you start a business, it's important to have a strong support system in place. This is especially significant in the first months, when you'll have to make many important decisions. If you do not have a support network to help you, consider finding a business mentor—someone who is experienced, successful and willing to provide advice and guidance. Your local SBA's SCORE office is a good place to begin.

Qualities for Entrepreneurial Success

In addition, the Bizcoach website notes the qualities necessary for entrepreneurial success and offers the following advice:

- **You must have a clear vision.** Entrepreneurs are able to visualize exactly what an idea is going to look like when it's brought to fruition. Keeping the end result in mind is critical in creating a path to reaching it.
- **You must be proactive.** Entrepreneurs recognize a need and have the ability to take action. They tend to make things happen and are impatient with indecision.
- **You must have tenacity.** Entrepreneurs are not easily discouraged and will persist despite obstacles. In fact, entrepreneurs enjoy the risk of failure and accept challenges readily.
- **You must be able to multi-task,** which is required to run the various aspects of any successful business.
- **You must believe in customer service.** Provide extra care and your customers will return.
- **You must be competitive** and view competition as a way to improve your business.
- **You must set and achieve goals** on a regular basis.
- **You must believe in yourself** and know that you can perform any task in spite of the risks and potential obstacles.
- **You must have a passion** and zeal for what you do.

Questions to Ask Yourself

Research of successful entrepreneurs has documented that successful small-business owners share certain characteristics. The following checklist, developed by SCORE, won't enable you to predict success, but it can give you an idea of whether you will have a head start or a handicap with which to work. Ask yourself the following questions:

- Can you persevere through tough times?
- Do you have a strong desire to be your own boss?
- Do the judgments you make in life regularly turn out well?
- Do you have the ability to conceptualize the entirety of a business?
- Do you possess the high level of energy, sustainable over long hours, to make a business successful?
- Do you have significant specialized business experience?

While not every successful business owner answers all of the questions "yes," three or four "nos" and undecided answers should make you think twice about going it alone. All the same, don't be discouraged. Seek extra training and support from a skilled team of business advisors, such as accountants, bankers, attorneys and SBA/SCORE counselors.

Commercializing a new invention and becoming an entrepreneur is not for everyone. With it comes a certain level of stress and strained financial resources. There is no simple formula or set of instructions that will teach you how to become an entrepreneur, but possessing the characteristics and skills cited above will help you on your path.

Although Thomas Edison, with more than 1,000 patents, is remembered as an inventor, he thought of himself as an entrepreneur. "My main purpose in life is to make enough money to create ever more inventions," he said. Maybe Edison can best be remembered as an entrepreneurial inventor. What's in your future?

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.

Almost Perfect

A PLAN FOR PROFITING FROM YOUR INVENTION

BY JACK LANDER

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A **"one-size-fits-all" plan** for profiting from your invention doesn't exist. There are too many variables to be able to prescribe an exact plan, but by examining these variables and options, you will be better able to formulate a plan that suits your invention, along with its obstacles and opportunities.

Formulating a plan depends on the degree of competition your invention is up against. Competition can be assessed easily by reviewing issued patents and published patent applications and searching existing products on the market.

Google has made patent searches easy. Go to google.com/patents and enter a name for your invention. Know that one or more effective names usually will emerge. Re-enter the more appropriate names you come across until you begin finding patents that serve the same function as your invention. Although your ultimate goal is to determine how many patents and published applications exist that may impact your ability to get a patent, your objective at this point is only to determine existing products that are similar to yours.

Do Your Research

Finding nothing is not always a cause to rejoice. Most often it means that you are either scratching a place that doesn't itch or your invention is ahead of its time.

Moderate competition is the best category for success. If you find 10 or more patents and a few published applications, your timing might be just right. But don't take the number 10 as a definitive number. It might be three patents, or it could be 30, depending on the type of invention.

Heavy competition may mean that the invention has been on the market in some form—not necessarily the one you devised—for several years, and consumer demand has reached its peak. Use caution in attempting to penetrate this market, although there may be room for a novel approach that offers superior benefits over existing patents. Be sure that your invention is not just another means to solve the same problem. Novelty and superiority are not necessarily one and the same.

Even saturated markets may have room to absorb a product. I have searched inventions for which I discovered more than 100 patents. Certain garden tools have patents that date to the mid-1800s; yet, changes in gardening techniques allow for improvements. Similarly, water shortages in California invite new methods and tools to conserve water.

What You Get for Your Money

If the results of your preliminary search look promising, your next step should be to hire a professional to generate a patent search. The cost of a professional search and opinion is around $1,000, plus or minus $200, but if you did not find any similar patents or applications during your own search, you may decide on a less expensive option. The difference between a $1,000 search and a $250 search is that the $1,000 search will explain why you probably can or cannot get a patent. The main reason not to gamble on

A provisional patent application is the better choice unless the field is abundant with similar inventions and your patentability opinion does not indicate a high probability of being issued a patent.

the more expensive search is that your invention may not have a market. In every case, however, the $1,000 search is the better approach if you can afford it.

Suppose your search and opinion are favorable, even though there is significant competition. What then? You could file for a non-provisional utility patent, but the cost typically is around $10,000. A provisional patent application is the better choice unless the field is abundant with similar inventions and your patentability opinion does not indicate a high probability of being issued a patent. Your PPA may cost half as much as a non-provisional patent application, depending on how similar the writing is to a full utility patent. Discuss this with your patent attorney. The more formally the PPA is written, the more it can form the basis for the follow-on, non-provisional patent and significantly cut its cost.

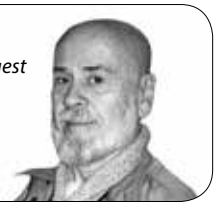
Similar thinking applies to whether to create a physical prototype or a virtual prototype. A virtual prototype, also known as a sell sheet, is a prototype on paper. Essentially, it is the résumé of your invention as depicted by a graphic artist to resemble the finished product. Done well, a sell sheet "photo" will look like a photograph of a real product or prototype. Only an expert can detect that it is a virtual image.

Applying for a non-provisional (full utility) patent follows under two conditions: You have either had very encouraging feedback from your virtual prototype or your PPA is approaching the end of its useful life, and you are convinced that your patent has significant potential for licensing or producing. Do not incur the expenses of a search for a licensee until you have filed for a PPA and have an explanatory search opinion that encourages filing a non-provisional patent application.

Throughout this process, consider participating in a trade show. Trade shows offer opportunities for direct contact with high-level marketing personnel. You can obtain names for future contact and personally deliver sell sheets. Mail or email to a company's decision makers without this preliminary personal contact is far less effective.

The $1,000 estimate in the chart below covers travel, lodging and food expenses for attending a trade show. The table is not intended to define accurate costs for your venture; it is a means to help you understand the costs and their relationship to the state of competition that your invention and patent will face. Each figure is an approximation. The main point is to evaluate your ability to obtain a patent, as well as the competition your patent invention will encounter, and determine if the required investment is in balance with the potential payback.

Jack Lander, a near legend in the inventing community, has been writing for *Inventors Digest* for 19 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.



TASK	HEAVY COMPETITION	MODERATE COMPETITION	ZERO COMPETITION
Patent Search Plus Patent-Ability Opinion	Explanatory Search[1] $1,000	Explanatory Search[1] $1,000	Non-Explanatory Search[2] $250
PPA (Provisional Patent Application)	$0 to $5,000[3]	$1,000 to $5,000[4]	$0 to $5,000[3]
Virtual Prototype:	$1,000 to $1,500[5]	$1,000 to $1,500[5]	$1,000 to $1,500[5]
Physical Prototype:	$0 to $3,000[6]	$0 to $3,000[6]	$0 to $3,000[6]
Utility Patent Application	$0 to $12,000[3]	$0 to $12,000[3]	$0 to $12,000[3]
Search for Licensee	$0 to $10,000[3]	$1,000 to $5,000[4]	$0 to $10,000[3]

(1) An explanatory search provides an explanation for why filing is or is not recommended. (2) A non-explanatory search recommends filing or not filing, but does not explain why. (3) Assumes that filing probability is less than 50-50. (4) Assumes that filing probability is at least 50-50. (5) Assumes that a virtual prototype will be used to assess licenseability. (6) Assumes that no professional prototype will need to be made unless a prospective licensee requests it.

Put to the Test

JACK ANDRAKA DISCOVERS A DEVICE TO DETECT PANCREATIC CANCER

BY JEREMY LOSAW

High school students are innovative when it comes to things like skipping class, winning video games, posting on Facebook and even writing college-entrance essays. Rarely do teenagers use that same spirit for the good of humanity. Every so often, however, a light shines through the milieu, showing the true potential of the teenage mind. At age 15, Jack Andraka stunned the scientific community by inventing an inexpensive and highly sensitive test to detect pancreatic, ovarian and lung cancers. This miraculous breakthrough, which has the potential to save hundreds of thousands of lives, launched Andraka not only onto the scientific radar but also into inventor stardom.

The catalyst for Andraka's research was the loss of a family member to pancreatic cancer in 2011. Pancreatic cancer is known for its high mortality rate, yet, at the time of the tragedy, Andraka was not all that familiar with how the pancreas functioned, let alone aware of the deadly reputation of the cancer that affects this endocrine organ. In the months following the death of his relative, Andraka, a science geek, devoted his spare time to studying the brutal disease, which is

At age 15, Jack Andraka invented a test to detect pancreatic, ovarian and lung cancers.

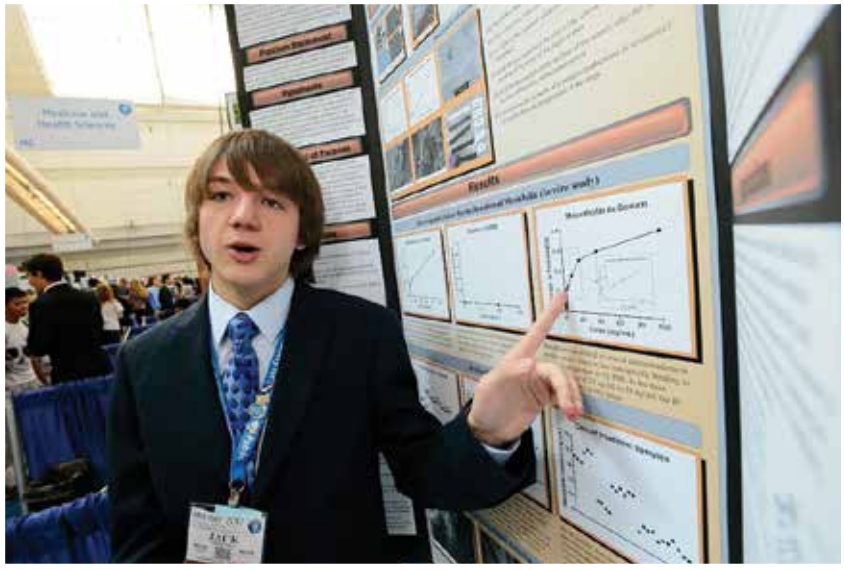
PHOTO BY MARK TUCKER

"My mom kinda put the kibosh on my experiments when I started culturing cholera where we made sandwiches in the morning." —JACK ANDRAKA

typically diagnosed only when the cancer has reached full maturity and the chance of survival is low. Andraka felt that his uncle might still be alive if he had been diagnosed earlier, and he set out to find a better pancreatic cancer detection method.

Although at the time, Andraka was only a sophomore in high school, he was already a seasoned scientist. His mother, Jane, is an anesthetist, and his father, Steve, is a civil engineer. Both parents encouraged Andraka and his brother, Luke, to experiment and allowed them to set up a laboratory in the basement of their home.

Andraka attended a charter school that had no athletics but did have a math team and a science fair. "They had a 'Hunger Games'-style science fair where everyone had to participate and whoever won got a laptop," recalls Andraka. "So, of course, I was like I have to have the best project."



After winning first place at the 2012 Intel International Science and Engineering Fair for his patent-pending pancreatic cancer detector, Jack Andraka teamed up with other high school scientists to compete in the $10 million Qualcomm Tricorder X Prize.

A kayaking enthusiast, Andraka designed an apparatus to study the fluid dynamics of low head dams, which are deadly hazards for kayakers. By studying this small-scale river, he came up with a way to retrofit the dams to make them safer. Andraka won the science fair and took home the laptop. He then moved on to other projects, including culturing bioluminescent bacteria to detect water contaminants and studying the effect of the release of nanoparticles into the environment. With a solid research background, Andraka felt confident he could take on the challenge of cancer detection.

Searching for a Biomarker

Like many people looking for answers to burning problems, Andraka took to the Internet. He used Google and Wikipedia to learn all he could about the pancreas and pancreatic cancer. He then came up with six criteria for a good cancer sensor. It needed to be inexpensive, simple, sensitive, selective, rapid and noninvasive. Based on these factors, he began looking for a biomarker that would indicate when cancer was present.

With approximately 8,000 proteins present in the bloodstream, Andraka needed to figure out which ones were found in mass quantities in the earliest stages of cancer but not in healthy patients. Using publicly available gene libraries, he began searching. One by one, Andraka analyzed the concentrations of each of the 8,000 proteins in healthy people and those with cancer. Finally, after analyzing the 4,000th protein, he found a marker called mesothelin.

Andraka then focused his energy on creating a way to detect the mesothelin. One day in biology class, his teacher was discussing how antibodies react with specific types of protein. Andraka was sneakily reading a scientific journal about carbon nanotubes and was halfway listening to his teacher, when it suddenly occurred to him to combine what his teacher was saying with what he was reading. He could mix nanotubes with antibodies to create a mesothelin detector. The electrically conductive carbon nanotubes mixed with the right antibody would create a network that would, in turn, react to a specific protein and change its electrical properties in a measurable way. It would be possible to detect mesothelin as a positive indicator for pancreatic cancer.

Proving Himself

It was a valid idea, but Andraka needed to prove its efficacy. Unfortunately, the young scientist had worn out his welcome at his home-based lab and had to find a new space to conduct his research. "My mom kinda put the kibosh on my experiments when I started culturing cholera where we made sandwiches in the morning," Andraka says.

Jack Andraka said the Internet and computing technologies made it possible for him to discover a new way of detecting pancreatic cancer in his talk at the TEDx SanJose event in December 2012.

When dipped in urine or blood, the mesothelin adheres to the antibodies and is detectable by predictable changes in the nanotubes' electrical conductivity.

Andraka's home in Maryland was close to Johns Hopkins University and the National Institutes of Health, so he approached 200 professors and researchers at these institutions with a budget and a plan to develop his idea. Andraka assumed finding a partner would be a slam dunk, but to his surprise, he received 199 rejections and one "maybe" from Anirban Maitra, M.B.B.S., a professor of pathology and oncology at Johns Hopkins University School of Medicine.

Andraka pleaded with Maitra to at least meet and review his idea. After Maitra and his colleagues questioned Andraka, trying to poke holes in his theory, Maitra agreed to provide Andraka with lab space. Seven months later, Andraka met success. He used inexpensive strips of filter embedded with carbon nanotubes and antibodies sensitive to mesothelin. When dipped in urine or blood, the mesothelin adheres to the antibodies and is detectable by predictable changes in the nanotubes' electrical conductivity. The strips can detect the presence of pancreatic, lung and ovarian cancers.

Producing the test strips is easy and inexpensive. They cost only 3 cents each, and the results are ready in five minutes. Andraka claims the test is 168 times faster, 26,000 times less expensive and 400 times more sensitive than existing test methods. Even better, studies have indicated the test strips are 100 percent accurate.

Winning Ways

Andraka's breakthrough has garnered worldwide attention. He entered his test strips in the 2012 Intel International Science and Engineering Fair and came away with the Gordon Moore Award for the best project. Andraka's list of accolades has since snowballed. He is one of National Geographic's 2014 Emerging Explorers, and he has won a plethora of other scientific research honors. He is a TED speaker, the subject of a short film, *You Don't Know Jack*, by Morgan Spurlock, and he was a personal guest of Michelle Obama at the 2013 State of the Union address. Although he has been alive less than two decades, Andraka's memoir, *Breakthrough*, was published in 2015.

In the meantime, the test strips are slowly making their way from concept to product. Patents were filed early in the process, and Andraka is negotiating with a few biomedical companies to get the product licensed. The strips are also going through clinical trials but have another five to 10 years before being approved. Andraka reveals that he didn't hoard a secret stash of test strips for his family's use because that would have been unethical.

A current freshman at Stanford, and yes, he had to apply, Andraka is by no means riding the coattails of his success. He is studying nano robots and biosensors and is pushing to break through barriers in these fields. His advice to budding inventors: "Always believe in your ideas. I know it is a bit cheesy, but it only takes one 'yes' to have a breakthrough and change the world."

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/.

Total Tie Keep

NO MORE BLOWIN' IN THE WIND

BY EDITH G. TOLCHIN

I specialize in the manufacture of textile inventions and was quite interested when industry peer Andrea Hence Evans brought the Total Tie Keep to my attention. Inventor Dwight A. Littlejohn's website states: "The Total Tie Keep™ corrects, straightens and controls the entire necktie by loosely attaching the necktie to the shirt using the shirt's buttons." Littlejohn claims the Tie Keep stabilizes the necktie while allowing a natural flow that "provides just enough restraint to keep the user from looking unkempt and disheveled."

So, what's so special about the Total Tie Keep? Why not simply use a tie tack or tuck your tie into your shirt when dining? And how did this invention make it to ABC's *Shark Tank* competition? We spoke with Littlejohn to find out.

Note: Interview was edited for clarity.

Edith G. Tolchin: Please tell us about your background and how you came about inventing the Total Tie Keep.

Dwight Littlejohn: I have been a Special Agent with the United States Capitol Police for almost 20 years. In my profession, I am required to wear a suit and tie just about every day. I have always had difficulty trying to keep my tie neat and straight because I'm constantly on the move. Classics like tie bars and tie tacks never appealed to me, so I thought about a device that could discreetly control the tie and allow the tie to be the uninterrupted focal point. I came up with the idea of attaching an "anchor" to the shirt's buttons to hold the tie down.

The need to control the tail end of the tie was an issue, as well. I noticed that taller men had to tussle with that problem pretty consistently. The aha moment hit me one morning when I was putting on my belt. That's when I decided to sew loops on my device to control every component of the necktie. I knew the loops would be the one thing that separated my device from all the others.

Dwight Littlejohn's Total Tie Keep ensures that ties stay neat and professional looking.

PHOTOS COURTESY OF DWIGHT LITTLEJOHN

The Total Tie Keep works better than tucking a tie in a shirt because you don't have to worry about the wrinkle factor—nor about forgetting what you did and walking around looking ridiculous.

EGT: How does the Tie Keep work?

DL: The user attaches the Tie Keep to a shirt using the recommended shirt button. The Tie Keep has two loops that control the tail, which is tucked into the upper loop and pulled through until it lays flat. The Tie Keep, with the tucked tie tail, is then pulled through the loop on the back of the tie. Once that's done, the Tie Keep's remaining button holes align with two other shirt buttons. All that's left to do is give the lower edge of the Tie Keep a slight pull down to make sure it's neat and streamlined.

EGT: Why not use a tie tack or tie clip? Why is the Tie Keep better than tucking a tie in a shirt when dining?

DL: I feel like those devices are a little outdated. They also take away from the design of the tie, stiffening it and inhibiting the natural flow that a necktie is designed to have. Tie tacks can even damage a tie.

The Total Tie Keep works better than tucking a tie in a shirt because you don't have to worry about the wrinkle factor—nor about forgetting what you did and walking around looking ridiculous. The Total Tie Keep minimizes movement, thereby reducing the chances of soiling your tie.

The Total Tie Keep comes in four colors to blend with an assortment of ties.

EGT: How did you create your first prototype, and how many versions did you experiment with before you knew you had a sure thing?

DL: I actually used an old shirt to make the first prototype. I cut a strip of two buttons holes, folded and sewed the edges, then trimmed the excess. It was later, when I did my patent search, that I realized that version already existed. When I wore my first prototype, at times I found that the tie loop blocked a button from cleanly attaching, or a button attached in the case caused the tie to snag or buckle when moving. That's when I made the second prototype, a three-button device. This gave me more room to cover the tie loop. Later, I came up with the idea to sew loops on the device. I tried that out for a while and it worked perfectly. That's when I knew I had something.

EGT: Have you begun to manufacture the product? If so, are you manufacturing domestically or overseas?

DL: We began manufacturing in 2012. Our first two orders were done overseas to keep our initial costs down. At some point, we will begin looking for domestic producers to keep our money here in America and to reduce lead times. Overall, the manufacturing experience was great because I learned a lot. Some of those lessons were financially painful, like mistakes in packaging that were missed, and fees associated with delivery and customs that I didn't understand.

EGT: How is the product packaged?

DL: I designed two types of packaging to give customers a variety. Our basic four-pack includes a white, blue, gray and black Tie Keep presented in a small rectangular box with an instruction sheet. The box has a very eye-catching design. I chose the colors of the Tie Keep based on a survey I took of 100 men to determine the most popular shirt and necktie colors. The second package I created is a flat box that's designed to hold up to two Tie Keeps, with an instruction sheet in each. This is a very durable package and it's great for mailing.

EGT: What is your target market for this product?

DL: The market is pretty vast. It's easy to say anyone who wants to look good in a necktie. More specific markets include businessmen, doctors, attorneys and people in

Dwight Littlejohn demonstrates the Total Tie Keep on *Shark Tank*.

the hospitality industry, such as catering and wait staff, and law enforcement officers and professional limo drivers. The list goes on and on. I was pleasantly surprised to see that about 60 percent of my customers are women.

EGT: Is the Total Tie Keep patented? If so, what type of patent was issued?
DL: Yes, the Total Tie Keep is patented. It's a utility patent that is very broad and covers the wide range of Tie Keeps that I can manufacture.

EGT: What led you to try out for *Shark Tank,* and how did you actually make it to the show? What were the results, and what did you learn from the experience?
DL: My co-worker and investor, Michelle Gonzales, sent me an email about participating on the show. My experience as a participant was pretty fulfilling, and I gained a lot of knowledge about the business. I won't get into the specifics, but I will say the *Shark Tank* staff was amazing. They were very professional and accommodating, and they did a lot to calm my nerves. To my disappointment, I did not get a deal, but I understand why they had their reservations. Nonetheless, I have started to act on some of the wonderful advice that Damon John gave me. My career, coupled with the fact that I was able to go before the Sharks, has taken my confidence to speak to anyone to another level. The fact that they liked my product has also made me believe in the Total Tie Keep even more— especially since two of the Sharks said they would use it.

EGT: What are your plans now that the *Shark Tank* experience is behind you?
DL: I intend to grow my business and improve in the areas that I had previously neglected, like marketing. I have started to put a system in place that I hope will ultimately put the Total Tie Keep in stores across America. I am learning as I go, but every lesson is valuable in the sense that it is a part of my growth that will strengthen my abilities and knowledge.

EGT: What obstacles, if any, have you encountered during any of the phases of product development?
DL: The biggest obstacle at every phase is time. My career as a federal agent keeps me very busy. I love what I do, and I am pretty close to retirement, so I won't consider resigning to run a business full time. That seemed to be an issue with the Sharks. After I began selling the Total Tie Keep, showing how wonderful and versatile it is became a challenge. There are so many different things it can do, and some people, unless they know exactly what they are looking for in a product, don't have the patience to hear about it.

EGT: Have you invented any other products, or do you have any add-ons for your existing product?
DL: I do have a few different versions of the Tie Keep in the prototyping phase. I have one that works better for slim-fit ties and another that can fit odd-button, patterned shirts. There's also an extra-long version for extremely tall guys. Within the scope of theses variations are different materials and designs that can make a Tie Keep a little more stylish. Although Tie Keeps are made to be hidden, some people may like to peel the tie back to show off a stylish Tie Keep that complements their attire.

EGT: Do you have any advice you'd like to offer readers of *Inventors Digest*?
DL: Persistence and patience are key. There are going to be times when you think your invention is not worthy. Then, there will be times when you feel like it can't miss. You have to find your truth somewhere in the middle, work from there and try not to get too discouraged. The truth is, not everyone will find your invention or product useful. Set your goals, accomplish them one step at a time and before you know it, you're there. If you hit a road block, think back to previous road blocks, remember how you overcame them and use that recognition to overcome the road block you're presently facing.

For information, visit www.totaltiekeep.com.

Edie Tolchin has contributed to *Inventors Digest* since 2000. She is the author of *Secrets of Successful Inventing* and owner of EGT Global Trading, which for more than 25 years has helped inventors with product safety issues, sourcing and China manufacturing. Contact Edie at egt@egtglobaltrading.com.

Why Patent Searches Are Always a Good Idea

BY GENE QUINN

Inventors often ask me why they need a patent search. The question most often goes like this: "I've done a search of the market and there is nothing like my invention available for purchase." This inability to buy a product often gives inventors a false sense of security, but just because a product isn't on the market doesn't mean there are no patents related to the invention. While surveying the market is a wise first step that absolutely must be taken, for a variety of reasons, patents that have not been used to develop commercial products still lurk, which makes patent searches critically important.

Each year, more than 400,000 new patent applications are filed, with well over one million patent applications pending, and many hundreds of thousands, if not millions, of patent applications that have been abandoned.

One common reason a patent may exist but the product can't be bought is because the previous inventor was simply unsuccessful in taking the patent to the market. Maybe the product was ahead of its time, or the inventor ran out of funds and the project was abandoned. Perhaps the inventor did not have the right connections or stamina necessary to see the project to conclusion.

Inventors also tell me that they have done their own patent search and have found nothing. While doing your own patent search is a very good idea, and perhaps is much easier now than ever thanks to advances made with Google Patent Search, patent searching is an art that requires enormous practice. I always encourage inventors to start by doing their own patent search for two reasons. First, if you can find something yourself then you save a lot of time and the cost of hiring a professional to conduct a patent search. Second, the more patents you read in the area in which you are inventing, the better. The more you know, the more you understand.

Beware of relying on your own patent search to the point you convince yourself it makes sense to spend years working on the project and the tens of thousands of dollars you will need to invest to invent, patent and ultimately monetize your invention through licensing or manufacturing. If you are not familiar with advanced search strategies, it is not surprising that you won't find much of anything.

Rest assured, you will always find similar patents. As of this writing, there are more than 9,270,000 issued U.S. patents. Each year, more than 400,000 new patent applications are filed, with well over one million patent applications pending, and many hundreds of thousands, if not millions, of patent applications that have been abandoned. That is a lot of prior art. It would be extraordinarily rare to come up completely empty and not find references that are relevant in at least some way during a patent search.

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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Don't Miss Your Chance

TO NOMINATE THE IPOEF INVENTOR OF THE YEAR

Hugh Herr, Ph.D.

IPOEF'S 2014 INVENTOR OF THE YEAR

The following interview was originally posted on Innovator Insights *December 4, 2014.*

He might have been a rock- and ice-climbing prodigy by the age of 17, but Dr. Hugh Herr's business cards once read "Inventor." These days, he is an associate professor of Media Arts and Sciences and heads the Biomechatronics research group at the MIT Media Lab, but innovation is still a core part of his career and his passion. "A lot of my identity is around invention," said Dr. Herr in 2014, the year he became the IPO Education Foundation's 41st Inventor of the Year.

Most of us have come upon an invention at some point in our lives that truly impresses us for the benefit it brings to society, the way it solves a previously complex or frustrating problem, or its sheer technological genius. If this rings a bell, the IPO Education Foundation (IPOEF) would like to hear from you. The IPOEF's Inventor of the Year award honors inventors whose creations have made a significant impact on national economies or quality of life. The Foundation is now seeking nominations for its 43rd Inventor of the Year, who can be an inventor from any country. Nominations can be made directly through the Inventor of the Year page of the IPOEF website (www.ipoef.org/ioy) or by tweeting suggestions to @IPOFoundation.

The deadline for submissions is April 15, 2016.

Last year's award was presented to Priceline.com founder Jay Walker, whose interview on IPOEF's blog, *Innovator Insights*, was featured in the January 2016 issue of *Inventor's Digest*. The year before, the award went to Dr. Hugh Herr, who sat down with Innovator Insights in 2014 to share his thoughts on inventing, patents and what being dubbed Inventor of the Year meant to him.

A double amputee, Dr. Herr's advanced bionic prostheses have helped Boston Marathon bombing victims, such as Adrianne Haslet-Davis, U.S. veterans and other amputees to return to life as usual. He has been heralded by *Time* magazine as a "game changer" and has received numerous awards, including the Smithsonian American Ingenuity Award in Technology and the 13th Annual Heinz Award for Technology, the Economy and Employment.

Dr. Herr discussed with *Innovator Insights* the role of patents in the extensive process of developing and commercializing his devices and what the Inventor of the Year award meant to him.

> **"It's absolutely delightful to receive this award. I'm humbled when I look at previous award recipients; it's quite an impressive list."**
>
> —HUGH HERR, PH.D.

II: Will you describe your research and technology?

Dr. Hugh Herr: From a very high level, what makes my research group [at MIT] unusual, I suppose, is that we combine science and technology. In a single group we are doing projects that discover the underpinnings and principles of how humans move, from a morphological and neural control aspect. At the same time, we build regenerative and mechatronic structures that emulate that biological capability, so our designs are very motivated by nature. By doing that we are able to develop systems that more seamlessly interact with the human user.

For example, with respect to the BiOM prosthesis that has now been commercialized by the company BiOM Inc. of Bedford, Mass., clinicians fitting the bionic limb have reported instances where the prosthesis is fitted to the patient in a matter of minutes. In minutes the patient makes comments such as "I have my life back. I have my limb back."

II: Why are patents important to what you do?

HH: I have a story: A professor that I knew years and years ago invented a prosthetic joint. It was a great design—very functional, very needed in the world clinically. He didn't patent the device. He published papers and his students submitted theses describing the device, so because it was publicly disclosed and enough time had gone by, it wasn't possible to patent anymore. When he tried to make this knee available to patients, potential manufacturers were very excited because it was a highly functional knee. But the moment they discovered there was no IP, the meeting ended in about 30 seconds. And the reason is that those manufacturers would have had to invest $20 million to commercialize what was a prototype system, and there was no way they could justify that to their board of directors without protection in the marketplace. So, especially with a medical device, it is very problematic to translate technology and actually make it available to patients without IP. In the medical device industry, because of reimbursement and regulatory hurdles, it is exceedingly expensive to launch a commercial product. It is therefore essential—a requirement, a necessary condition—for a company making such profound investments to acquire and maintain IP.

II: What would you say to those who are critical of the patent system?

HH: For technology and industries that move slowly, such as the medical device industry, innovation is very, very expensive, creating a critical need for patents. As long as for-profits are required to produce products, sustainability requires product patent protection, particularly for slow-moving industries.

II: What does the award from IPO mean to you?

HH: It's absolutely delightful to receive this award. I'm humbled when I look at previous award recipients; it's quite an impressive list. When I was younger, my business card actually read "Inventor." A lot of my identity is around invention, so in that regard, this is the greatest award I've ever received.

The StandUp Walker

A RISING STAR IN HOME HEALTHCARE BY CAMA MCNAMARA

Timing is often a critical component of successful ventures in life, and it couldn't have been more so for the players in this story: the inventor, Howard Liles, his grandmother Ada Mae Smoot and future URise Products CEO Ken Paulus. All three came together in a fortuitous series of circumstances that led to the development of the URise StandUp Walker.

As senior mechanical engineering students at MIT in 2010, Howard Liles and his classmates were challenged with designing a device that would improve mobility. To gather information to complete their project, they talked to residents of nursing homes, where they heard again and again: "I want to maintain as much independence as possible." One of the major challenges to maintaining independence was being able to sit and stand without help while getting in and out of a chair or bed, or using the bathroom.

In response to the comments they heard, Liles and his team envisioned the concept for a walker—the iXa—that also aided users in their struggle to stand or sit independently. At the end of the semester, Liles' team assigned the stand-assist walker project to him, but caught up in the excitement of graduation, he quickly abandoned the idea. The project, however, was archived through MIT's Technology Licensing Office.

The next fall, Liles enrolled at Georgia Tech, where he began studies on a master's degree in mechanical engineering. That same year, his elderly but very active grandmother took a fall that required surgery. Liles was in the hospital room the first time Ada Mae tried to get out of bed. The soft mattress prevented her from pushing up, and the bed rail was no help, either. She even tried to pull herself up by grabbing the rolling IV pole.

As Liles watched his grandmother struggle to get out of bed, he remembered his senior project. What his grandmother really needed was the stand-assist walker.

Once back in class, Liles engaged the university's Mobility Rehabilitation Engineering Research Center. He discussed his idea with engineering professor Stephen Sprigle, Ph.D., P.T., and the two began working on a prototype based on the original MIT design. It incorporated the features of a traditional walker with those necessary in a stand-assist device. The rickety apparatus had

URise Products CEO Ken Paulus demonstrates the StandUp Walker.

rough-hewn wooden handles stuck into the front legs of a traditional walker, combined with salvaged, curved rear legs, which would barely support the weight of a child. However, the device did feature the all-important 13-piece hinged joint, cobbled together with a variety of plastic and metal parts.

"The hinged joint makes it easy for users to propel themselves from a sitting to a standing position," says Liles. "Once standing, the device locks securely into place for walking."

During the development process, Liles says that he and Sprigle "had a series of fortunate breaks, including receiving a federal grant for the initial prototype" from the National Institute on Disability, Independent Living and Rehabilitation. Liles and Sprigle were also fortunate to cross paths with Ken Paulus.

A Licensing Deal

At the time, Paulus was the executive vice president of business development for Edison Nation Medical. He and then-Edison Nation Medical President Bobby Grajewski were actively seeking technology through tech transfer offices, which serve as licensing agents for university-owned patents. "The average consumer doesn't invent medical devices," explains Paulus. After searching projects at MIT, he and Grajewski came across the IXA Walker, complete with sketches, CAD and a business plan.

The next step was a call to MIT, where they discovered the project had been transferred to Georgia Tech. After canvasing the university's engineering department, Paulus and Grajewski were put in touch with Sprigle, who was more than willing to take the prototype to Edison Nation Medical in Charlotte, N.C., to demonstrate the invention. The Edison Nation team was so impressed with the stand-assist device, they immediately offered to pursue a licensing deal. "We knew the product would be a real game changer in the home health-care industry," says Paulus.

Licensing deal sealed, Paulus needed to locate a manufacturer that also had the engineering ability to continue the product's development. "We originally went to walker manufacturers," says Paulus, "and they all said 'yes,' but they also wanted to position the product as a low-cost item, which we didn't agree with for two reasons. First, we thought the stand-up walker could replace

PHOTOS BY LARRY DELEON

Inventor Tips from Howard Liles

- If you have an idea, pursue it with passion.
- You will always have setbacks. Meet them with patience and persistence.
- Network with other inventors. It's hard to push through on your own.
- It takes work. Don't get discouraged.

as many as five devices that could add up to thousands of dollars in a home, and second, the royalties would be too small and we wouldn't make any money. Pricing and positioning in the market were extremely important."

In July 2015, Paulus decided to leave Edison Nation Medical and pursue the stand-up walker on his own. "From the very first time I saw Howard's thesis, I thought it was an extraordinary idea," says Paulus. "The first time I saw the prototype, I was amazed. I knew it would fundamentally change the industry."

Paulus formed a company, aptly named URise Products, recruited a business partner, Gary Kabot, purchased the licensing agreement from Edison Nation Medical and continued the process of designing a functional consumer-driven product. Through research, he discovered a manufacturing firm based in Charlotte with a factory in Goldston, N.C., that also had the required engineering capabilities. With input from the engineers and feedback from occupational and rehabilitation therapists and their patients, 11 different prototypes were designed before Paulus and Kabot were satisfied with the StandUp Walker's performance.

Design Challenges

The single biggest challenge was the hinge, which acts as a fulcrum and allows the device's front legs on wheels to move forward as the stabilizing legs slide back. The hinges in the first prototypes couldn't withstand much weight and bent when the user tried to push himself upright. "It worked fine in the Y shape for walking but was unreliable in the X shape for standing," says Kabot.

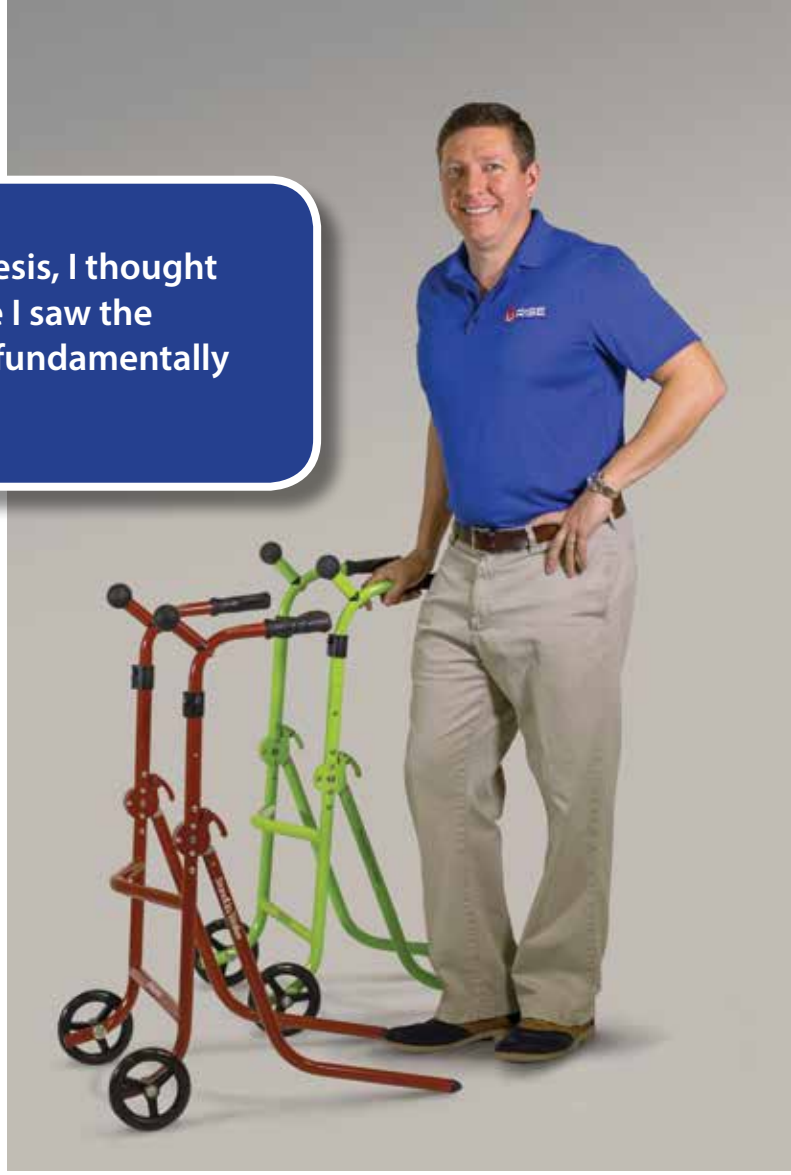
"The alpha prototype was for showcase purposes only," adds Paulus, revealing that when the walker debuted at a medical convention in Atlanta, each time it was demonstrated, he had to take it off the show floor and replace the hinge before the next person could try it. The engineering team solved that problem by designing a single-part hinge, which not only functioned better but was cheaper to produce.

Through product trials and consumer commentary, Paulus understood that to make the StandUp Walker as easy to use and effective as possible, the handles also needed alterations. The original wooden prototype handles were transformed into shepherd-like crooks, which worked fine for sitting but not for pulling oneself upright, before the team came up with the idea for the fourth-generation handles—an iteration of which is used on the current model. The handles feature an ergonomically designed Pistol Grip for walking and an extended, padded ball grip that the user can push down on to help thrust the body to a standing position. Paulus says the premium grip mechanism is extremely important for user satisfaction.

"The majority of falls happen in the middle of the night, with people trying to get out of bed. Their weight is off center, and as they try to push themselves up, they are either propelled sideways and fall forward, or they try to pull themselves up and fall backward. The ergonomics of the handles give the device leverage where you need it," Paulus says, cautioning that upper body strength is required. "Users must have the strength to push themselves out of a chair or the bed."

The original walker, developed in the 1960s, had undergone few changes until Ken Paulus developed the StandUp Walker. Shown here are three iterations.

> **"From the very first time I saw Howard's thesis, I thought it was an extraordinary idea. The first time I saw the prototype, I was amazed. I knew it would fundamentally change the industry."** — KEN PAULUS



The ski-type rear legs, which extend as the user lowers himself into a seated position, also created problems. "They got caught on carpet and bumped into chair legs when users sat down," says Paulus. The solution: a bullet-designed cap that eliminated drag issues and skirted around furniture legs.

The single greatest advantage of the URise StandUp Walker, according to Paulus, is its ability to take the place of as many as five products in a home: walkers, electric chair risers and extension bars on toilets, in more than one room. "Most products are static and do one or the other," says Paulus, noting that the StandUp Walker is a great return on investment.

Although the StandUp Walker was designed with the elderly in mind, they are not the only potential users. Paulus says that injured athletes, those suffering from MS, and hip or knee replacement patients are candidates for the StandUp Walker.

Ready to Go

So far, Paulus and Kabot have invested one-half million dollars in the project. Although the StandUp Walker was going into a short production run ("in case something goes wrong") in late March, customer feedback is still important. Trials are being conducted in Ohio, California, North Carolina and Florida.

"The therapists and patients who are using it love it," says Liles. "They appreciate how simple and easy it is to use, while also providing support and mobility."

As opposed to traditional walkers, which usually have a chrome finish, URise StandUp Walkers are available in three vibrant colors: cobalt, bright red and emerald green, not only to stand out but also to provide users with an element of fun. Paulus is currently negotiating with distributors to sell the product, which will retail for $299. He hopes to produce 2,000 units a month in the near future.

Paulus is also working with his team on upgrades and improvements. Although the current walker can withstand the weight of 400 pounds, a larger model is being developed for bariatric patients, as is a version more suited for outdoor use. A line of accessories, such as cup holders and trays, is also in the works.

To protect his IP, Paulus filed a non-provisional utility patent that has three independent claims. He also filed an international patent under the Patent Cooperation Treaty. The primary IP is on the hinge, he says, which has four different parts: an inner and outer case, a pin and a latch. The claims cover the arms, the grips and the ski-type legs. The patent is pending, and Paulus doesn't know if he'll have to file new patents on each independent claim.

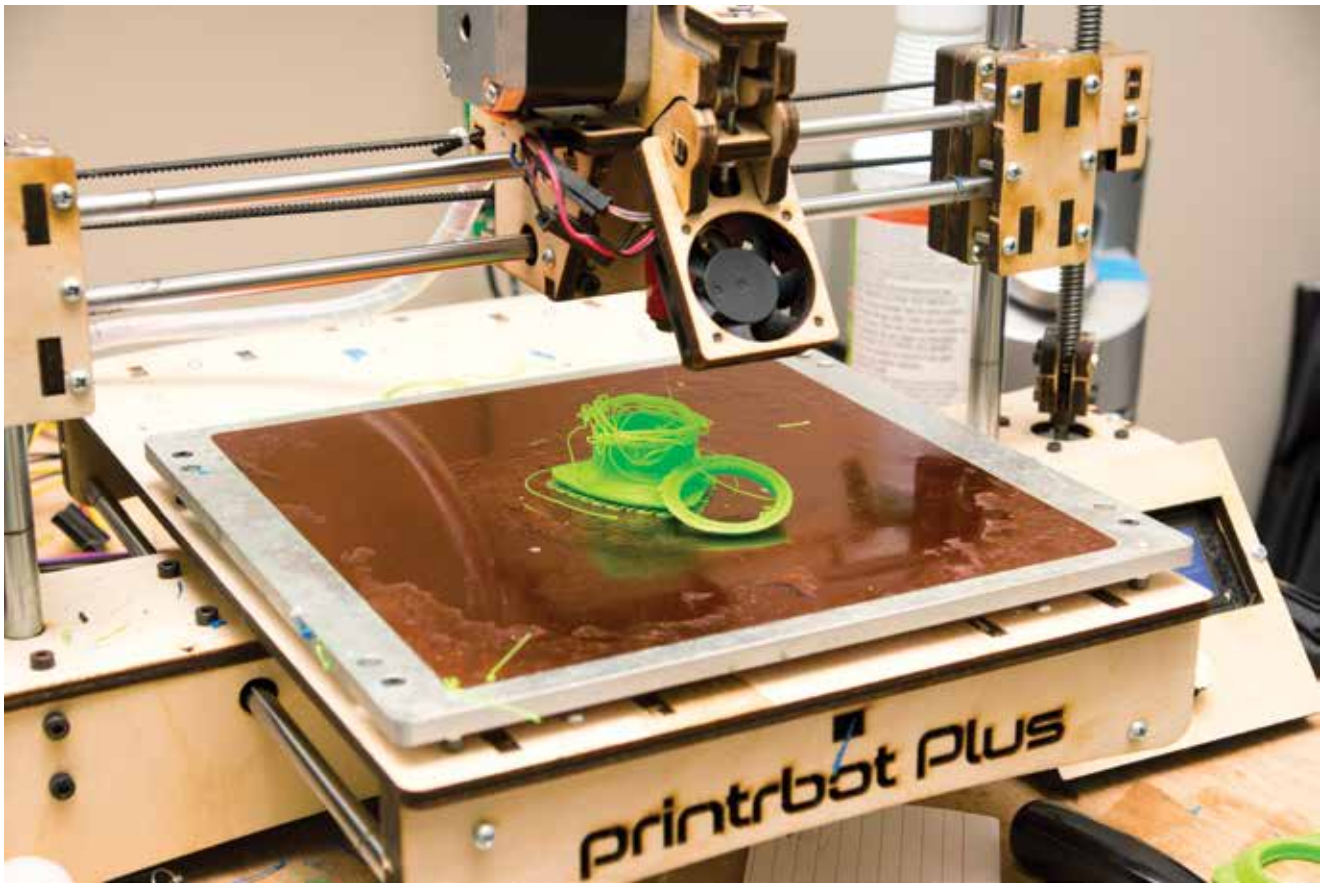
Opportunities for Innovation

Another important element of timing, Paulus says that 20 years ago, the StandUp Walker may not have been as relevant as it is today. "Ten thousand people in the United States turn 65 each day," he says. "This aging boomer population is much more conscious of healthcare spending and the desire to remain independent. Assisted living costs, which average $43,000 per year, are soaring, making it more important than ever for people to be able to live independently." Known as the "silver tsunami," it is estimated that by 2060, 100 million people in this country will be age 65 and older.

Both Liles and Paulus say opportunities for inventions in the boomer market are waiting to be discovered. Greater numbers of an aging population will continue to face more challenges each year. "Inventors need to address these," says Liles. "We need to help the population remain mobile. It's all about quality of life."

Liles says to meet this demand, "Talk to people who need help. Ask them what they struggle with. Let your imagination go wild. When you let go and get out of the box is when you get creative."

"Innovation is about personal experience," says Paulus. "I've been lucky enough to be healthy all my life, but when I was 25 I had surgery on both knees and know what it's like to be immobile. Everybody's got great ideas; it's how you execute them that counts."



A failed print on the Printrbot.

3D Printers

ARE THEY WORTH THE INVESTMENT?

BY JEREMY LOSAW

Two years ago, I bought a 3D printer to use at home, and I am not sure it was a good idea. I bought the Printrbot Plus, a build-your-own model made from laser-cut wood. I chose the Printrbot Plus because it had a big build volume, could print both ABS and PLA materials and, at the time, was one of the least expensive models available. It cost around $900 for the unassembled kit and $1,000 for the assembled unit. I love building kits so getting the unassembled version was a no-brainer.

For two straight days, I shirked most of my parental duties, took over my kids play area and assembled the printer on the linoleum floor. It took a while but was not difficult to assemble. Bit by bit the printer took shape. The bigger challenge was keeping my daughter Harper from raiding the piles of pieces and hiding them in one of her purses. I lost only one screw. Total victory.

Jeremy Losaw and his daughter Harper assemble the Printrbot.

After about 13 hours, I had assembled the printer, but there was still plenty of work to get it to print. The printer bed had to be leveled, each of the three axes had to be homed to prevent driving the print head into the bed, and the software had to be downloaded and installed. After another few hours it was ready go. To repay Harper for her help, the first thing I printed were some gold doubloons like those in the cartoon *Jake and the Neverland Pirates* using the sample length of beige PLA that was included for the printer setup. Harper immediately painted and covered the doubloons with glitter.

PHOTOS BY JEREMY LOSAW

A part that fits in your hand usually takes three to six hours. This makes it possible to design a part in the morning, print it in the afternoon and test it before dinner.

Since then, the printer has been sitting idle, with the exception of islands of heavy use. I used it to make parts for ill-fated inventions and R/C cars, as well as a few orchid and bonsai pots, but I often find myself asking the same question I did before I bought it. "What am I going to use it for?"

Three-dimensional printing is an amazing product-development tool that accelerates prototyping timelines, which helps bring products to market quickly with better design. However, having a 3D printer at home may not be as beneficial as it seems. There are plenty of 3D service bureaus that can print parts quickly and inexpensively, making them a better fit for many inventors. Before buying a 3D printer, take a look at the pros and cons of printing at home or leaving your printing needs to a professional service.

In-House Printers

One of the most compelling reasons to have a 3D printer in your arsenal of tools is speed. Product development is a race, and the faster you can iterate and converge upon a design, the better the chance of capturing a market or getting a licensing deal. Print time is largely dependent on the size of the part being printed and the volume of material being used. Every printer is a little bit different, but a part that fits in your hand usually takes three to six hours. This makes it possible to design a part in the morning, print it in the afternoon and test it before dinner.

Three-dimensional printing services are fast but still have lead times that range from a couple of days to two weeks or more. Each day lost is an iteration or two that you fall behind.

Doubloons, covered with paint and glitter, were child's play.

Service	Cost Per Piece
Printrbot	$1.20
Cube3	$3.25
Quickparts.com (White ABS)	$200
Shapeways.com (White Plastic)	$31.16

Another benefit of having an in-house printer is that the cost per print is low. Most PLA and ABS filament spools cost about $30 per kilogram. However, if your printer requires the use of proprietary material cartridges, like the 3D Systems Cube 3 does, the material cost is slightly more expensive.

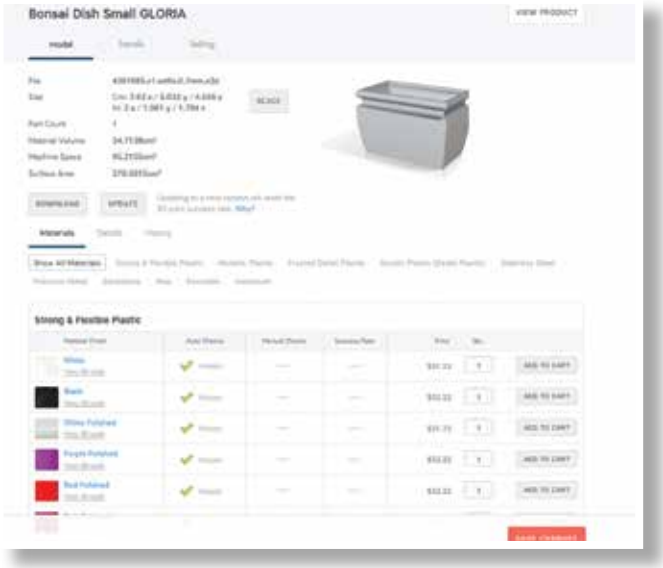
For the purposes of illustration, I ran this bonsai tree pot, which is three inches on its longest side, on my Printrbot Plus. I also had it quoted through a couple of 3D printing services. The cost savings per part is significant.

My final argument for having a 3D printer at home is pure whimsy. I enjoy gardening, and I cultivate plants in the windowsills and in a small greenhouse. One day, a ceramic pot that contained a small jade fell off the windowsill and smashed into a million pieces. Bonsai pots can be pricey and hard to find. Instead of buying one, I downloaded a 3D model, modified the dimensions and printed one—all before the end of the day. There is no way I would have bothered to have a pot made by a service.

3D Service Companies

A multitude of 3D printing services can be found on the Web. The most common service for makers and shade tree inventors is Shapeways (shapeways.com), as it is inexpensive and the material choices are easy to understand. There are others, such as Protolabs, Quickparts and Stratysys Direct, which cater more toward professionals but are viable options for inventors, too. Many UPS and Staples locations offer in-house 3D printing services, and some public libraries have machines, too. Each service has its strengths and weaknesses, but they all have similar upsides.

One of the best reasons to use a 3D-printing service is the range of available materials. Commercial-grade printers are usually limited to PLA and ABS plastic filament, but printing services such as Shapeways offer a multitude of materials. Plastics in assorted colors, metals such as aluminum, stainless steel, silver



Shapeways offers inexpensive prices, and the materials are easy to understand.

and gold, and ceramic are a few of the options. Most advantageous is that you do not need to change your CAD file to print the same design in multiple materials.

Another reason to use a printing service is when you need large parts or a large quantity of parts. Most commercial-grade 3D printers have build volumes that are 12 inches in any direction, but many are less than eight inches. This is fine for most inventors' needs, but some innovations have parts that are much bigger than that. Depending on the process and material, it is possible to get prints that are more than two feet long and two feet wide.

There is only a marginal increase in the build time for multiple parts, which results in significant quantity discounts and faster turnarounds than you can make on your own.

The larger machines at these facilities also make it more economical and often faster to run large quantities of small parts. Commercial 3D printers have to trace the entire path of each part, so twice the parts takes twice the time. However, the build time of industrial machines that use lasers to solidify the material is primarily height dependent. There is only a marginal increase in the build time for multiple parts, which results in significant quantity discounts and faster turnarounds than you can make on your own.

Although 3D printing is an essential tool in product development, and the technology has scaled down to affordable units, 3D printers are not for everyone. A learning curve is necessary to get up to speed with the technology, and the materials and build volumes are limited. You need to assess your needs and the costs involved before making the decision to purchase a printer or use a service.

This prototype of the Joy Mangano Miracle Mop bucket was outsourced to a 3D printing group with a large format printer.

Unsung Heroes

INVENTING THE WORLD OF TOMORROW BY LAWRENCE J. UDELL

Over my 60-plus years of helping thousands of inventors with their brilliant creations, I have learned the good, the bad and the ugly of what it takes to turn an inventor into a successful entrepreneur. The ingredients become a recipe that, if followed, either transform the dream into reality or create a disaster that lives for years to come.

As I helped start nearly 50 companies over the past few decades, I witnessed both the pathway to success and the road to miserable failure. They run parallel and often cross, like railroad tracks with two ways of reaching one destination.

Consider that Henry Ford went bankrupt three times before designing the Model T, and Thomas Edison conducted over 10,000 experiments on the light bulb before finally perfecting his invention. How about Margaret Mitchell, who received 25 rejection letters before a publisher accepted *Gone with the Wind*, and Winston Churchill, who took three years to complete the eighth grade? Did you know that Michael Jordan was rejected twice by his high school basketball coach before he finally made the team? How embarrassed was a grammar school student named Albert Einstein when he flunked math class? These are a few examples of unique individuals who could have been discouraged to the point of giving up–but didn't.

When you find little reason to continue exploring your brainchild from concept to product, think about the famous inventors and entrepreneurs who could have quit: the Bill Gates and Steve Jobs of the world; or Bill Hewlett and his partner, David Packard, sitting in a cold garage, who could have looked at each other and agreed that what they were doing was a waste of time. Everyone admires Babe Ruth's home-run statistics, but no one talks about the 1,330 times he struck out. So are you going to hit a homerun or strike out with your brainchild?

Elements of Success

In basements and garages across this great nation are half-finished product ideas that will never see a store shelf because their creators were discouraged. In my opinion, there is no greater time than now to develop new ideas. Just look at the thousands of successful products introduced each year. We, as human beings, are individually gifted with creativity, and our great nation was founded on the concepts of finding better ways to do things.

In 2015, the USPTO received 580,217 applications and issued 296,000 utility patents. That is more than 11,000 patent filings every week. This is a perfect example of the value of not only our 226-year-old patent system but also the equally important numbers of people, whether independent or corporate employees, who are creating the world of tomorrow—today.

Over the decades, I have discouraged as many, or more, inventors than I encouraged. It's hard to look into the eyes of men, women and children and tell them, "In my opinion, you are wasting your time. Go invent something else," but it was obvious that they had not done their research. They had not studied similar products or the advantages of theirs. They had not researched the market, production costs, packaging or distribution, which are vital when considering investing time and money in your invention.

Successful inventors have several things in common. Among them is their ability to be realistic. They know that their invention has little chance for success. With this in mind, they begin the task of discovering why. They compare similar products, explore the size of the market and determine which companies dominate it and why.

Successful inventing is defined as earning more money from an idea than you invest in it. Investments can go into thousands of dollars, not only with patents, trademarks and copyrights, but also with developing prototypes, packaging and distribution channels.

There are only a few ways for any of us to become independently wealthy, among them inheriting money, winning the lottery or inventing a product. Countless numbers of inventors, not all of whom are famous, have become wealthy by inventing a new product.

My advice is: Don't get overly excited because you may start to make irrational decisions. Stay away from organizations that promise you wealth but want you to pay up front for their services. Remember a fool and his money are soon parted.

Yes, the world may be waiting for your great new idea, but unless you do serious homework, devoting untold hours to research, your dream is going to die, and along with it, your desire to be a successful inventor or entrepreneur. Don't lose sight of your goal.

From Your Mind to the Market

SILICON VALLEY MEETS WALL STREET

New Mexico Tech is hosting the first Inventors and Entrepreneurs Workshop April 15 and 16, 2016 on the university campus. Meet Marty Cooper, inventor of the cell phone, Bill Seidel, CEO of America Invents, Nola Masterson, CEO of Science Futures, Inc., Bob Parker, holder of 80 patents ranging from the mood ring to the Duracell battery tester, and many other outstanding presenters. Topics include inventing for fun and profit, licensing vs. new venture, taking inventions to market and ingredients for successful investing.

Hours are 10:30 a.m. to 8:30 p.m. Friday and 7:30 a.m. to 2:30 p.m. Saturday. Registration is $100; $25 for seniors over 65, students and those with special needs, and includes a cocktail reception, barbecue dinner, continental breakfast, box lunch and a wealth of life-changing information.

For details, visit http://management.nmt.edu/invent. Call Larry Udell 510.914.8449 or Peter Anselmo 575.835.5438, or email ludell@nmt.edu or anselmo@nmtedu.

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PTAB Has Gone Rogue

ON COVERED BUSINESS METHODS BY GENE QUINN

The Patent Trial and Appeal Board at the United States Patent and Trademark Office recently instituted a covered business method review on a non-business method patent with a clear and unambiguous technological aspect in CBM2015-00161. This institution decision is in direct contravention of the statute, which, by its express terms, prevents CBM review from anything with a technical aspect. Only covered business methods that are financially related business method patents are supposed to be subject to this special form of post-grant review. Even more troubling, the patent in question is directed to technological improvements by both the European Patent Office and the United States Federal District Court for the Northern District of Illinois. Nevertheless, the PTAB still instituted a CBM.

U.S. Patent No. 6,766,304 is the patent in question. The '304 patent claims the structure, makeup and features of an improved graphical user interface tool that can be used for electronic trading. The claims of the patent are in no way directed to a business method or to a method for data processing.

The decision implicates an important technological field of innovation—GUIs. A GUI "is an interface through which a user interacts with electronic devices such as computers, hand-held devices and other appliances." For all practical purposes, GUIs transform computing devices into different tools. For example, depending upon what GUI is being run, an iPhone can be a phone, a calculator, a compass, a flashlight, a game, a carpenter's level or virtually any other tool.

Classification in 705 can be a USPTO kiss of death for a variety of reasons.

PTAB Overreach

According to Section 18 of the America Invents Act, the USPTO may institute a transitional proceeding only for a covered business method patent, which is defined as a patent that claims a method for performing data processing or other operations used in the practice, administration or management of a financial product or service. Specifically excluded from the definition of covered business method patents are those that relate to technological inventions. (See 37 C.F.R. 42.301(a).) To determine whether a patent is for a technological invention, the PTAB is supposed to consider whether the claimed subject matter recites a technological feature that is novel and unobvious over the prior art and solves a technical problem using a technical solution. (See 37 C.F.R. 42.301(b).)

While it is true that not all graphical user interfaces are considered to embrace a technological invention, the evidence that the '304 patent is directed to a technological improvement is overwhelming.

Arbitrary Classifications

First, graphical user interfaces are usually placed by the USPTO in Class 345, which covers computer graphics processing and selective visual display systems. For reasons that seem completely arbitrary, if the GUI relates in any way to financial services, it is not placed in Class 345; rather, it is placed in Class 705.

This arbitrary reclassification may seem harmless, but classification in 705 can be a USPTO kiss of death for a variety of reasons.

Not only is Class 705 known to have a low allowance rate, but the PTAB relied to at least some extent on classification in 705 as justification for finding the invention claimed in the '304 patent to be a covered business method. Clearly, there is no rhyme or reason to the USPTO classification system that warrants any deference, particularly when patent applications that should be classified in Class 345 are arbitrarily assigned to Class 705 when they relate to financial services.

"Using Class 705 as a justification for a finding of a finance service or product under Section 18 is inappropriate," explains Robert Sachs, author of the widely read Bilski Blog and a partner at Fenwick & West. "Class 705 is much broader than that and includes many subclasses that may be business related, without being specifically financial products or services. For example, there are subclasses that deal with scales and meters used in generating fees or prices, such as parking meters, postage meters, and taximeters. Congress did not likely intend taxi meters and butcher's scales to be subject to CBM review."

The lack of deference that should be paid to classification into Class 705 is further bolstered by how the USPTO moves cases from other Art Units in and out of Class 705 to more evenly distribute examination duties. The USPTO has always redistributed cases to different Art Units for a variety of reasons, some of which have nothing to do with the underlying characteristics of the claimed inventions. For example, Sachs recently did an analysis of more than 29,000 applications that had Office actions in December and found that 65 applications that had been primarily classified into Class 705 at the time of publication were moved out of Class 705 by the time of the first Office action. Similarly, some 45 applications that had been previously classified outside of Class 705 were moved into Class 705.

Obviously, classification in Class 705 is not probative. Therefore, relying on classification of an application into Class 705 by the PTAB is misplaced.

History Shows GUIs Were Not for CBM

Second, legislative history confirms that the entire point of the law was to provide an extraordinary post-grant review proceeding for business method patents because Congress believed that the USPTO was ill-equipped in the late 1900s and early 2000s to examine this type of patent application. Every example of a CBM provided in the legislative history claims, at some level, a business method or data processing technique. Moreover, the legislative history specifically states that patents claiming GUIs for trading, as opposed to patents claiming a trading strategy, are not CBMs. In particular, the bill's sponsor, Sen. Chuck Schumer, agreed with Sen. Dick Durbin that a patent claiming "software tools and graphical user interfaces that have been widely commercialized and used within the electronic trading industry to implement trading and asset allocation strategies" was not a CBM.

'304 Patent Declared Technical

Third, on February 24, 2015, in concurrent federal district court litigation, Judge Sharon Johnson Coleman concluded that the '304 patent is "directed to a technological improvement of GUIs" and "is not directed to an abstract idea. …" Coleman further concluded that "the claims recite an inventive concept." (See *Trading Technologies International, Inc., v. CQG, Inc.* (Case No. 05-cv-4811).) The institution decision ignores the substance of the opinion and makes no attempt to explain what is wrong or at all unpersuasive about Coleman's reasoning.

What Europe Thinks

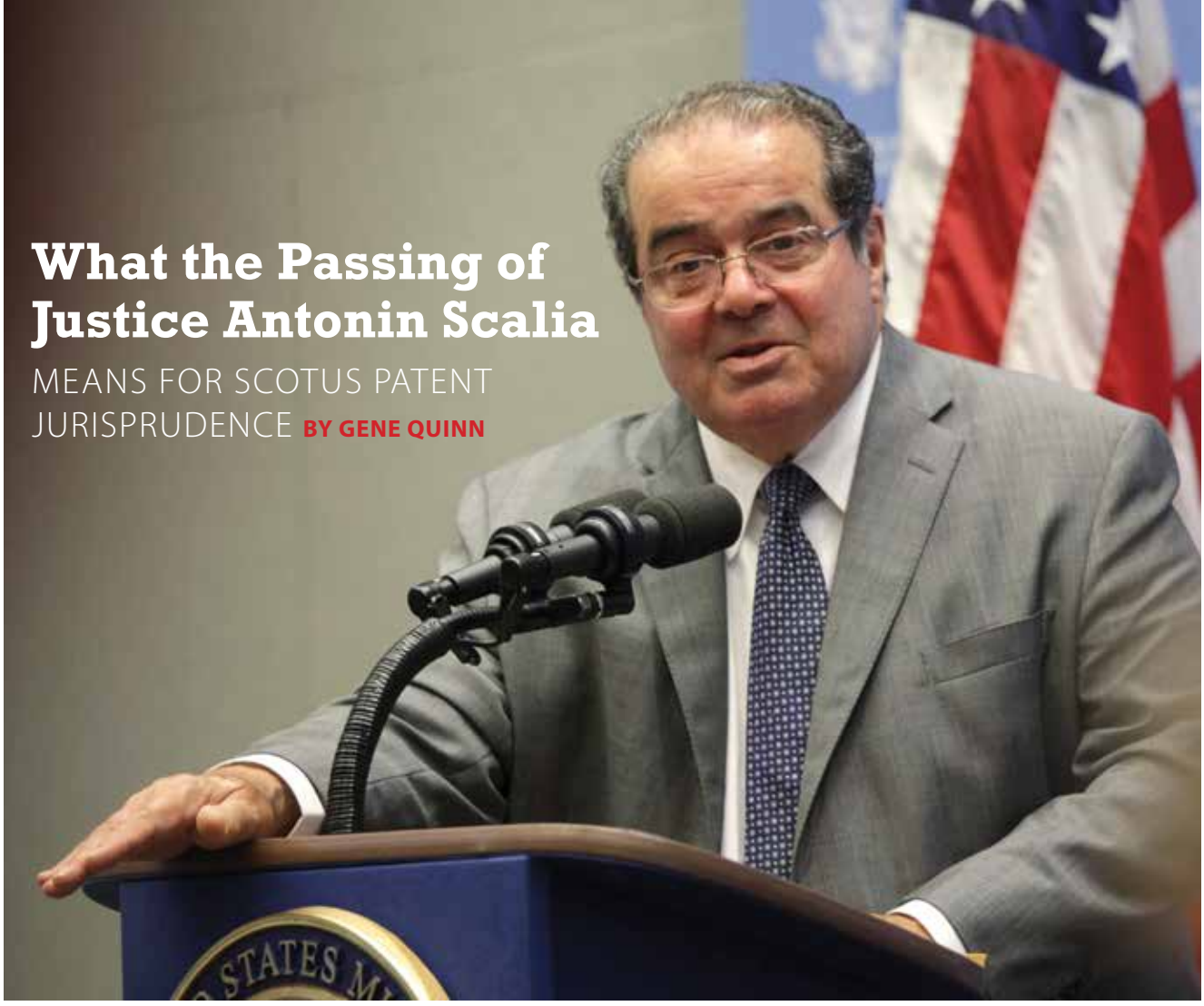
Finally, in Europe there is a strict prohibition against the patentability of business methods. Graphical user interfaces are not patentable in Europe because such interfaces do not ordinarily have a technical effect. Patent examiners at the European Patent Office are still instructed to consider whether there are features of a graphical user interface that contribute to achieving a particular technical effect. If there is a technical effect, even a graphical user interface can be patented in Europe. Significantly, the same technological innovation now being reviewed by the PTAB has been patented in Europe.

Anyone with GUI-related patents, whether in the financial, medical, gaming or consumer electronics sectors, should be concerned and follow how this matter unfolds.

Conclusion

How can the PTAB ignore a decision of a federal court and still find that the '304 patent is nothing more than a business method without any technological aspect? How can the PTAB ignore the 101 guidelines of the examiners who issued the patent? How can the PTAB ignore the United Kingdom and the European Patent Office? The answer is easy. Decisions to institute a CBM are not appealable (see 35 U.S.C. 324(e)), so the PTAB can do whatever it wants with virtual impunity.

Anyone with GUI-related patents, whether in the financial, medical, gaming or consumer electronics sectors, should be concerned and follow how this matter unfolds. If this case continues, patent owners must ask themselves how safe their patent portfolio is from the death grip of CBM at the hands of the PTAB. If a patent that has been adjudged to be related to a technological invention, both in federal district court and in Europe, can be reeled into a CBM proceeding meant only for pure business methods of a financial nature, it seems that no patent is truly safe.



What the Passing of Justice Antonin Scalia

MEANS FOR SCOTUS PATENT JURISPRUDENCE

BY GENE QUINN

On February 13, 2016, Justice Antonin Scalia of the United States Supreme Court passed away. Confirmed on September 17, 1986, Scalia served on the Supreme Court for nearly 30 years.

Scalia is best known for his conservative philosophy and desire to strictly construe the Constitution. Scalia told reporter Leslie Stahl in a 2008 interview that he was fundamentally opposed to treating the Constitution as a living document, although he explained that he was not trying to defend the Constitution as a dead document, either. "It's what did the words mean to the people who ratified the Bill of Rights or who ratified the Constitution," Scalia explained.

Scalia was also ardently opposed to the use of legislative history to interpret statutes, again preferring a strict textual construction. Scalia's opposition to the use of legislative history was perhaps most apparent in a concurring opinion in *Zedner v. United States*, a 2006 case relating to the Speedy Trial Act of 1974, which requires a federal criminal trial to begin within 70 days after a defendant is charged or makes an initial court appearance. In his brief concurrence, Scalia explained several of the reasons he did not believe legislative history to be an appropriate tool for the courts to use. He simply concluded: "Because the use of legislative history is illegitimate and ill advised in the interpretation of any statute—and especially a statute that is clear on its face—I do not join this portion of the Court's opinion."

The Impact of Scalia's Passing on Patent Law

Many people are questioning how his absence on the Court will affect intellectual property decisions. Not much will change as the Supreme Court moves forward to consider a number of patent and intellectual property cases.

While Scalia served on the Supreme Court for nearly three decades, his contributions to the area of intellectual property law were quite limited, although Scalia famously referred to patents as "gobbledegook" during the *KSR v. Teleflex* oral arguments. Scalia was the only Justice not to sign onto an opinion in *Bilski v. Kappos*, which would have recognized that at least some software is patent eligible, and he did not author any of the major patent decisions considered by the Court during his tenure. Furthermore, the major patent and trademark decisions considered by the Supreme Court over the last generation have, for the most part, been unanimous or near-unanimous decisions. Intellectual property is not an area in which the Court divides ideologically, so there rarely are the 5-4 splits that are seen in many other areas of law.

For example, the three recent patent-eligibility cases that have thrown the industry into something of a tailspin were all unanimous decisions—*Mayo Collaborative Services v. Prometheus Laboratories, Inc.* (2012); *Association for Molecular Pathology v. Myriad Genetics* (2013); and *Alice Corporation v. CLS Bank* (2014). The Supreme Court also reached unanimous decisions in *eBay, Inc. v. MercExchange, LLC* (2006), ruling that a victorious

It is not likely that Justice Scalia's passing will impact intellectual property cases, particularly patent cases, although it may impact arguments related to legislative history.

patent owner does not have a right to a permanent injunction and that the Court must consider the four-factor injunction test despite the fact that a patent grants an exclusionary right to the patentee; and *KSR International v. Teleflex, Inc.* (2007), which fundamentally changed the obviousness inquiry by ruling that teaching, suggestion and motivation are not the only rationale used to support an obviousness rejection.

Although not all Justices agreed on the reason, all of the Justices participating in *Microsoft Corp. v. i4i Limited Partnership* (2011) agreed that the presumption of validity bestowed upon a patent by 35 U.S.C. 282 requires an invalidity defense to be proved by clear and convincing evidence. Finally, in *Octane Fitness, LLC v. ICON Health & Fitness, Inc.* (2014), a unanimous Supreme Court ruled that the rigid framework crafted by the Federal Circuit to authorize the awarding of attorneys' fees was inconsistent with the statutory text and that district courts should be given broad discretion to award attorneys' fees pursuant to 35 U.S.C. 285. Of note in *Octane Fitness*: The decision was not completely unanimous because Scalia did not join in footnotes one through three, which related to discussions of legislative history.

Legislative History

Thus, it is not likely that Scalia's passing will impact intellectual property cases, particularly patent cases, although it may impact arguments related to legislative history. Legislative history could become more relevant than anyone could have anticipated when the Supreme Court considers *Cuozzo Speed Technologies v. Lee* this term. At issue are post-grant procedures authorized by the AIA and conducted by the Patent Trial and Appeal Board. Post-grant procedures are characterized as alternatives to district court litigation on the issue of validity, but the Patent Office applies different standards than a district court, including no presumption of validity. With Scalia's absence, arguments of the petitioner tied to legislative history may get greater consideration.

Finjan Wins BIG PATENT VICTORY

USPTO DENIES INSTITUTION ON SIX SYMANTEC IPR PETITIONS

BY GENE QUINN

Finjan Holdings, Inc., the parent of wholly owned subsidiary Finjan, Inc., recently announced that the Patent Trial and Appeal Board for the United States Patent and Trademark Office denied six of Symantec Corporation's petitions for *inter partes* review of Finjan patents. "This is an unprecedented response by the U.S. Patent Office, today denying the institution of six IPRs and all challenged claims filed by Symantec in response to our lawsuit filed against it in 2014," stated Phil Hartstein, president and CEO of Finjan, upon learning of the decision.

The word "unprecedented" gets thrown around too frequently, but the use of the word here is entirely appropriate. It seems an extraordinary long shot that Finjan would prevail in six separate IPR institution decisions relating to the same patent litigation. This speaks volumes both about the relative strength of the Finjan patents and the relative weakness of the Symantec invalidity case against these patents. If the PTAB wasn't willing to take another look in a proceeding that is hopelessly stacked against the patent owner, these patents are about as rock solid from a validity standpoint as they could possibly be.

This past January, Judge Pauline Newman of the United States Court of Appeals for the Federal Circuit, in a dissenting opinion in *Ethicon Endo-Surgery, Inc. v. Covidien LP*, pointed out that the statutory design of the IPR process is completely one-sided at the initiation decision point and is, by design, set up to force affirmative institution decisions. She wrote: "The Director's institution decision carries a different burden of persuasion, is decided on limited submissions before trial, and is barred from appeal. In its implementing regulations, the Office excludes all substantive evidence from the patent owner's preliminary response, including expert declarations or other rebuttal evidence (37 C.F.R. § 42.107(c)). Thus, the statutory structure favors institution, for the overarching purpose is to provide a forum for early, expeditious review of granted patents."

Reasonable Likelihood Threshold

This critique of the IPR initiation process is perfectly on point. It is exactly why there have been so many decisions to institute IPRs against patent owners since the post-grant challenge procedure became available in September 2012. The USPTO has only three months to determine whether to institute an IPR proceeding and will do so if the petitioner can demonstrate that there is a reasonable likelihood that at least one of the challenged claims is not

PHOTO COURTESY OF GENE QUINN

patentable. The reasonable likelihood threshold is a particularly easy one to satisfy since the patent owner is not allowed to submit substantive evidence in a patent owner preliminary response. (See 37 C.F.R. 42.107(c).) That means Finjan was able to defeat the Symantec IPR petitions without the benefit of testimonial evidence, which they will be allowed to introduce should Symantec continue to challenge the validity of these patents at trial.

The patents Symantec challenged were:

- U.S. Patent No. 7,756,996, titled "Embedding management data within HTTP messages," which relates to the efficient delivery of management data between a network management server and multiple client computers.
- U.S. Patent No. 7,757,289, titled "System and method for inspecting dynamically generated executable code," which relates, in general, to computer security, and more specifically to protection against malicious code, such as computer viruses.
- U.S. Patent No. 7,930,299, titled "System and method for appending security information to search engine results," which relates to a system and method for combining the operation of a search engine with the operation of a content security filter in order to provide security assessments for Web pages and media content located by the search engine.
- U.S. Patent No. 8,015,182, which, like the 7,930,299 patent, is titled "System and method for appending security information to search engine results," which similarly relates to a system and method for combining the operation of a search engine with the operation of a content security filter. Both the '299 and '182 patents share a common priority claim to a provisional patent application filed on November 30, 2015.
- U.S. Patent No. 8,141,154, titled "System and method for inspecting dynamically generated executable code," which, similarly to the '289 patent, relates to protection against malicious code, such as a computer virus.

Will the Lawsuit Proceed?

At this point it is unclear whether the lawsuit filed by Finjan in the United States Federal District Court for the Northern District of California will proceed. The patent lawsuit filed by Finjan in July of 2014 (CAND-3-14-cv-02998) against Symantec alleged infringement of eight U.S. patents—the five patents mentioned above and U.S. Patent Nos. 6,154,844, 7,613,926 and 8,677,494. Federal District Court Judge Haywood Gilliam had ordered the case stayed pending the decision on the first five petitions, with the three remaining IPR petitions expected to be decided this month. The parties are now to submit a joint report to the court so Judge Gilliam can decide whether it makes sense to keep the stay in place or allow the case to proceed.

"Our patents are strong, and we are really focused on winning on the merits," said Julie Mar-Spinola, chief intellectual property officer, vice president of legal operations and a member of the newly formed Finjan Mobile, Inc. Board of Directors. "All the credit goes to Michael Kim and our outside counsel team at Kramer Levin."

Mar-Spinola also attributes this success to Finjan's recognition of the value of filing the patent owner's preliminary responses, a tool that surprisingly seems underutilized, even if it is procedurally not fair. "We have used a patent owner's preliminary response since our first challenges, and I think, generally speaking, it helps the PTAB judges to have the patent owners perspective when they are trying to determine whether or not to grant institution," she said.

"This is an unprecedented response by the U.S. Patent Office, today denying the institution of six IPRs and all challenged claims filed by Symantec in response to our lawsuit filed against it in 2014."

—PHIL HARTSTEIN, FINJAN HOLDINGS, INC. PRESIDENT AND CEO OF FINJAN

Patent owners are at a severe disadvantage at the institution decision stage of an *inter partes* review challenge. While a preliminary response can be filed, no testimonial evidence can be supplied by the patent owner for the PTAB to consider. That and the other monumental procedural hurdles facing the patent owner are obviously not insurmountable. Based on Finjan's success, it seems that patent owners should be making aggressive use of the patent owner's preliminary response. If you have good patents and take the IPR petition seriously, you clearly have a chance to persuade the PTAB not to institute, which will, no doubt, pay great dividends in any subsequent patent litigation.

Senate Small Business Committee Hearing

FOCUSES ON PROTECTING PATENT OWNERS' RIGHTS

BY STEPHEN BRACHMANN

On February 25, 2016, the U.S. Senate Committee on Small Business and Entrepreneurship held a hearing that focused on the effects of recent changes to the U.S. patent system on small businesses and patent owners. Testimony and remarks during questioning zeroed in on the need to make targeted reforms rather than overly broad changes to the country's system of intellectual property protection.

Committee Chair Sen. David Vitter spoke about the importance of a strong patent system to small businesses across America, as well as the importance of those businesses to the U.S. economy. Vitter remarked that small businesses have provided two-thirds of all net new jobs since the 1970s, and they produce 16.5 times more patents per employee than larger enterprises. Recent legislation that caused major changes in the country's patent system, including the America Invents Act, have made it more difficult to enforce patent rights, he noted. "It's essential to remember that many legitimate owners of intellectual property do not manufacture anything but nonetheless have legitimate claims of patent infringement against other parties," Vitter said. He was also wary of the "staggering rate" of decline in patent value during recent years, stating that during the past four years, patent values have dropped by as much as 80 percent.

Sen. Jeanne Shaheen, the committee's ranking Democrat, remarked that patents from small businesses are typically of higher quality and are more than twice as likely to be cited in technical literature.

Small Businesses Left in the Lurch

Robert L. Stoll, partner of the intellectual property group at Drinker Biddle & Reath and a nearly 30-year employee of the U.S. Patent and Trademark Office before his retirement in 2011, said that without the strong ability to enforce upon patent rights, small businesses are left without the incentive and flexibility to take risks for breakthrough innovations—risks that are typically unacceptable for larger, established entities. "Many large, successful companies throughout history started from meager beginnings," Stoll said, citing the example of Hewlett-Packard getting its start in a garage.

Stoll noted that Supreme Court decisions in *Myriad*, *Mayo* and *Alice* have presented challenges to the lower courts, which have applied those rulings in ways that have limited the availability of patents in core areas of technology, such as computer-implemented programs, personalized medicine and diagnostic methods. "These are the very fields in which the United States leads the world," Stoll said. This narrowing of patent-eligible subject matter limits the ability of innovators to provide value to customers, Stoll said, further noting that Europe and China both have broader subject-matter eligibility than the United States. Stoll was also critical of the Patent Trial and Appeal Board, which he likened to"a killing field of patents."

The Great Equalizer

The U.S. patent system, when it allows innovators to protect their intellectual property, is the "great equalizer" said Brian O'Shaughnessy, chairman-elect of the Licensing Executives Society. "Properly balanced, it enables the nimble innovator, regardless of size or resources, to disrupt and bring forth product. Those who would deprive inventors of their property rights derogate principles on which this country was built." O'Shaughnessy noted how patents turn intellectual properties into tradable assets, allowing inventors to specialize in inventing rather than expending time and energy commercializing products.

O'Shaughnessy also spoke about the economic uncertainty of small businesses posed by changes to the patent system and the global economic downturn, noting that the birth rate of American startups was below the death rate for the first time in 40 years. He called the AIA "well-intentioned but catastrophic" because of new procedures at the USPTO that give an infringer more tools for bleeding a patent owner dry through delays and legal costs. O'Shaughnessy said that a near 20-year low in patent valuation was causing many businesses to turn to trade secrets, which reduces the common store of knowledge in our society

"Recent legislation that caused major changes in the country's patent system, including the America Invents Act, have made it more difficult to enforce patent rights."

— SEN. DAVID VITTER

and drives innovation underground at a time when the knowledge-based economy is growing. He also testified that proposed legislation S.1137, the PATENT Act, and H.R.9, the Innovation Act, impose burdens on patent owners that do not exist for other property owners. He noted that LES was working on an initiative to bring together various parties in the intellectual property community to develop standards for ethical behavior in IP transactions. "Industry self-regulation is preferable to the blunt instrument of legislation," O'Shaughnessy said.

Colleges and universities have had similar concerns about how proposed patent-reform legislation could affect their regular research activities. Their voice was represented at this hearing by Neil Veloso, executive director of tech transfer at Johns Hopkins Technology Ventures. "Since Bayh-Dole in 1980, patenting and technology transfer have joined teaching and publication as another means by which knowledge at the university can be brought to the public," Veloso said. His department at Johns Hopkins has raised more than $250 million in the past five years, which Veloso called "a really good response" from the market.

"A patent system that's effective makes our group more efficient," Veloso said. Universities have to balance their costs and time commitment involved in pursuing patents, which could pull resources away from research activities leading to innovations. He noted that targeted legislation would be most effective in combating abusive patent practices while maintaining a college's ability to fully license its technologies.

Defending American Principles

O'Shaughnessy discussed how our country's patent system was different from Britain's because it was dedicated to the advancement of the useful arts and had a low fee rate structure. "The Founding Fathers understood it was important for innovation to take hold for America to become a player on the industrial stage," he said. By contrast, O'Shaughnessy remarked that today's system does a better job of favoring well-entrenched businesses that already have a market advantage.

Enacting more changes to our country's system of intellectual property protection is inadvisable given the short amount of time that has elapsed since the AIA took effect. O'Shaughnessy said that it could take as many as 10 years for the consequences of that piece of legislation to fully mature. "To further implement a broad approach would be a tremendous mistake," he said, pointing out how the AIA's attempt to bridge the American "first to invent" system with "first to file" patent systems used across the rest of the globe is the first such attempt by any nation, and it would take time to see the results.

If any legislation on patent reform is to be passed, support from the witness panel and members of the House small business committee must shift toward S.632, the STRONG Patents Act. STRONG sponsor Sen. Chris Coons talked about how the Act charts a new legislative course to curb abusive behaviors related to demand letters, also known as patent trolling. He said that the STRONG Patents Act would create streamlined pleading requirements and give the Federal Trade Commission considerable powers in taking on abusers of demand letters or post-grant procedural processes.

Without the strong ability to enforce upon patent rights, small businesses are left without the incentive and flexibility to take risks for breakthrough innovations—risks that are typically unacceptable for larger, established entities.

"When a hedge fund can erase millions of investor capital by simply filing a post-grant challenge and short the stock, it's time for Congress to act, Coons said, referencing alleged abuses of the PTAB's *inter partes* review and other processes.

O'Shaughnessy's response covered why he felt the IPR process was counterproductive to small companies that are forced to defend a patent that has already been issued by the USPTO. "For universities and start up companies, they simply don't have the resources, extensive litigation budgets or personnel to combat the changes of patent reform," O'Shaughnessy concluded.

Has the Patent System Reached a Turning Point?

BY GENE QUINN

Patent law has always swung like a pendulum, alternating between more restrictive regimes in which patent owners have few meaningful rights and looser regimes in which patent owners enjoy strong property rights. These pendulum swings generally occur slowly over a generation, but over the past 10 years, the pendulum has swung wildly, with increasing speed and in a decidedly anti-patent direction. A Supreme Court that has been uncharacteristically interested in patents has caused much of the disorder in the patent system. However, the near-constant disintegration of patent rights in modern times may be about to come to an end—or at least reach a pivotal turning point.

The United States Supreme Court heard oral arguments on February 23, 2016 in two consolidated patent cases: *Halo Electronics, Inc. v. Pulse Electronics, Inc.* (14-1513) and *Stryker Corporation v. Zimmer, Inc.* (14-1520). These cases will force the Court to dive headfirst into one of the thorniest political patent issues of our time—that of enhanced damages for willful patent infringement. The outcome could give district court judges broad discretion to enhance damages, which would be a significant win for patent owners.

Also on the docket for the Supreme Court this term is the consideration of *inter partes* review in *Cuozzo Speed Technologies, Inc. v. Lee*. This case will require the Court to consider whether post-grant challenges to patents should employ the same claim construction standards as a district court. It is conceivable, also, that the Supreme Court could more broadly discuss certain procedural aspects of *inter partes* review and even discuss the presumption of validity. A reversal of the Federal Circuit's judgement in this case, which is anticipated whenever the Supreme Court takes a Federal Circuit case for review, would also be seen as a significant win for patent owners. The Supreme Court historically has taken patent appeals from the Federal Circuit for the purpose of reversing rulings, including *eBay v. MercExchange*, *KSR v. Teleflex*, *AMP v. Myriad Genetics*, *Teva v. Sandoz*, *Nauitlis v. Biosig Instruments*, and *Limelight Networks v. Akamai Technologies*, to name a few. Even when the Supreme Court has agreed with the outcome reached by the Federal Circuit, the reasoning and holdings have been significantly modified. (See *Bilski v. Kappos*.)

The Federal Circuit is the only Court of Appeals to handle patent appeals, which means there is no risk of a split among the Circuits. A split among the Circuits and the knowledge that laws are being applied differently across the country are two of the primary reasons the Supreme Court will take a case.

Increase in Patent Litigation

Meanwhile, 2015 patent litigation statistics are on the increase, according to recently released data from Lex Machina. Although the

number of cases filed in 2015 was greater than the number of cases filed in 2014 (5,830 vs. 5,070), the number of patent cases filed in 2015 was lower than the number of cases filed in 2013 (5,830 vs. 6,114). The Eastern District of Texas continues to lead the way with 2,540 cases filed in 2015, which represents 43.6 percent of all patent infringement case filings.

One can only hypothesize why patent litigation is increasing again, but the short answer may be as simple as this: Patent owners have weathered the worst of the storm. The second anniversary of the monumental Supreme Court decision in *Alice v. CLS Bank* is approaching, which means either that those patents that remain viable today are not so easily challenged or have been found to pass muster.

It also has been three-and-a-half years since the dawn of the post-grant challenge era. While the most recent data shows that the PTAB is instituting 80 percent of *inter partes* review petitions, there is anecdotal evidence that during recent months (for which data is difficult to come by) the institution rate my have slipped into the 65 percent range. Finjan Holdings, for example, has scored a series of impressive wins at the institution stage, which could either be because their patents are quite strong, the challenges were quite weak, or the PTAB is finally starting to do a more judicious job of anticipating the likely rebuke from the Supreme Court.

Sense of Optimism

There is also a sense of optimism in the patent market. At the end of 2014, people on the business side of the industry involved with buying, selling and licensing patents were starting to whisper about the possibility that things would start to look up. By the end of 2015, private whispers had turned into public discussions, but regardless of whether the bottom has been reached, it is time to selectively start buying.

Another consideration is that the conventional wisdom within much of the patent community is that patent reform is dead, at least for the 114th Congress. The thinking goes that there is no way that patent reform, which famously stalled in 2015, could possibly restart and gain momentum in 2016. That may be an overly exaggerated or optimistic view, but the truth is that 2016 is well under way, and, so far, there has been no momentum toward renewed patent reform efforts.

In fact, if anything, there continues to be push back on reform efforts. Just recently, the Senate Committee on Small Business and Entrepreneurship held a hearing that focused on the effects recent patent law changes have had on small businesses and patent owners.

There is reason to be cautiously optimistic that the next several months could bring good news for inventors, start-ups and small businesses that rely on innovation. I have a suspicion in years to come we may look back at this time as the moment the tide truly began to turn.

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www.inventny.org

Inventors & Entrepreneurs of Suffolk County, Inc.
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Puerto Rico

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Every effort has been made to list all inventor groups accurately. Please email Carrie Boyd at cboyd33@carolina.rr.com if any changes need to be made to your group's listing.

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