

Inventors

A man's back is shown from the side, with various technical sketches and diagrams drawn on it, including a lightbulb, a heart, and a gear. A glowing, fiery robotic arm is visible on the left side of the cover.

JUNE 2017 Volume 33 Issue 06

DIGEST

BRUISED, NOT BEATEN

INVENTING THRIVES
DESPITE BLOWS TO PATENTS

Social Media for Innovators

NEW THIS MONTH:
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An App Developer's Saga

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\$5.95

PRINT STANDARD
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FULTON, MO

SAY HELLO TO INNOVATION

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ENVENTYS
PARTNERS

Inventors

DIGEST

EDITOR-IN-CHIEF

REID CREAGER

ART DIRECTOR

CARRIE BOYD

CONTRIBUTORS

ELIZABETH BREEDLOVE

DON DEBELAK

JACK LANDER

JEREMY LOSAW

GENE QUINN

JOHN G. RAU

EDIE TOLCHIN

GRAPHIC DESIGNER

JORGE ZEGARRA

INVENTORS DIGEST LLC

PUBLISHER

LOUIS FOREMAN

VICE PRESIDENT, INTERACTIVE AND WEB

VINCENT AMMIRATO

FINANCIAL CONTROLLER

DEBBIE MUENCH

SUBSCRIPTIONS

LOURDES RODRIGUEZ

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Ad rates, subscriptions & editorial content:

520 Elliot Street

Charlotte, NC 28202

info@InventorsDigest.com www.InventorsDigest.com

reid.creager@inventorsdigest.com

Inventing Is Forever Young



First of all, it's doubtful that George Bernard Shaw or Oscar Wilde ever said "Youth is wasted on the young"—though that adage has been indirectly attributed to both. According to quoteinvestigator.com, the quote attributed to Shaw mentioned not the young but children, and there is no "substantive support" for Wilde's link to that statement. In December 1931, this declaration appeared in the Springfield (Mass.) Union: "What a pity it is that so much youth is wasted on young people, who don't know by experience how to make the best use of it."

Second, the quote's premise is all wrong anyway. The statement was dubious then, and it's more inaccurate than ever now.

Many young people are making the best use of their youth in ways that continually inspire and amaze. Every month in *Inventiveness* on our back page, we provide a glimpse of the accomplishments of young inventors. And every month, we could fill a magazine with those accomplishments.

Of all the excitement and buzz surrounding inventing these days, the contributions of young people offer the most hope. So while our featured "state of inventing" package this month acknowledges uncertainty and concern in the industry in the aftermath of some troubling patent rulings and a government system that's rife with problems, we would be remiss—even negligent—to ignore the growing infusion of energy and creativity by young inventors that is truly changing the world.

Massachusetts Institute of Technology recently announced the winners of the 2017 Lemelson-MIT Student Prize, honoring promising collegiate inventors around the country. Tony Tao, a PhD student, led the development of a small electric unmanned aerial vehicle that folds to the size of a dollar bill and can be deployed from aircrafts by the dozens or even hundreds. Such technology was once thought impossible.

Among the other honorees were students Matthew Rooda and J. Abraham Espinoza, who formed a company in 2015 to commercialize a product that is essentially a FitBit for pigs. SmartGuard tracks data such as efficient piglet growth, individualized feeding and the health of the mother pig. Most important, it helps combat the growing problem of piglet mortality by alerting the mother pig with a gentle vibration when it detects piglet squeals, to prevent crushing.

Innovation like this abounds throughout this country and the world—much of it from teenagers and even children. Universities, governments and major corporations routinely honor and reward the best and brightest that young people have to offer. School curriculums increasingly emphasize inventing-related programs and subjects as the STEM movement grows.

Youth isn't wasted on the young. It's wasted when we ignore what the young can accomplish.

—Reid

(reid.creager@inventorsdigest.com)

INGENUITY IS AMERICA'S MOST VALUABLE RESOURCE.

DON'T TREAT IT LIKE A CHEAP COMMODITY.

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

**SAVE THE
AMERICAN
INVENTOR**

TAKE ACTION AT SAVETHEINVENTOR.COM

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Focus on the Fun and Fascinating

BRIGHT IDEAS

“There is no innovation and creativity without failure. Period.” —BRENE BROWN

ShapeScale

3D BODY SCANNER

shapescale.com

Billed as more than a fitness product, ShapeScale is intended to be an all-purpose body platform for applications that could use more accurate information on body shapes.

ShapeScale measures your weight and scans your entire body in less than a minute. The body scanner comes with sensors that gather data on the user's body to create a 3D avatar that can be saved for later comparison. The system also has a heat map that indicates the location of fat or muscles, as well as localized metrics to help track muscle development and tone.

The results are meant to give you a better understanding of the impact of your diet and lifestyle. The system includes visual goal tracking to establish personal targets and track progress.

Set to launch in May 2017, ShapeScale was to have a retail price of \$849.



MOKURU

DESK TOY

mokuru.com

MOKURU calls itself as a toy with endless possibilities that will test your creativity and dexterity.

Crafted with quality beech wood, the 3.6-inch-long toy—with its simple design shaped like a cross between a finger and a miniature barrel—is suitable for individual or group play. Do it for fun, or sharpen your skills and style. The way you play with it can evolve as your hand-to-eye coordination skills improve. Roll more than one; use both hands; roll it to “draw” shapes; play “desk catch” with a group.

Created in 2010 by Tokyo-born Masakazu Node, MOKURU was scheduled for shipping to Kickstarter Rewards buyers in April. It will retail for \$15.



Pillsy

SMART PILL BOTTLE

pillsy.com

A smart pill bottle, the Pillsy tracks dosages to help ensure patient compliance and maintain health.

After the patient puts his or her medication into the bottle and enters the dosage schedule into the app, the system triggers the cap to beep and flash when it is time for a dose. The system also sends reminders, tracks pills taken, and sends dosage notifications to assigned contacts.

The system consists of a standard-sized pill bottle and the Pillsy smart cap, which communicates wirelessly with a paired smartphone.

The estimated retail price is \$75; shipping was to begin in late May.



Decco

TODDLER MONITOR

toddlermonitor.com

A post-infant stage monitor, Decco is a motion sensor device made to safeguard children who are often on the move. Hang it on a door-knob, where it detects whether the child leaves a safe space—be it his or her room or the home—and triggers an alert on a paired device. Download the toddler monitor app from the App Store or Google Play and follow the instructions.

Makers of Decco said they saw market research that shows a strong interest in this type of product from parents and caregivers of children with special needs, such as autism and Down syndrome. The company has partnered with Changing the Face of Beauty, an organization that encourages the integration of people with disabilities into general advertising and the media. Decco donated \$2 per unit sold on Kickstarter to Changing the Face of Beauty.

The retail price will be about \$65. Shipping (only to certain countries) begins in September.



Painful Path to a Patent

CHARLES GOODYEAR ENDURED POVERTY, POOR HEALTH, PRISON, FAMILY TRAGEDIES IN QUEST TO VULCANIZE RUBBER

BY REID CREAGER

The **vulcanization** of rubber has often been referred to as an accidental invention. Charles Goodyear insisted that characterization stretched the truth.

What cannot be disputed is the unflinching determination of this self-taught chemist and manufacturing engineer that led to one of the most important discoveries of the past 200 years—as well as the poverty, pain and family tragedy that are hallmarks of his story. The first and second halves of Goodyear's life represented such dramatically different fortunes that it's hard to believe they involved the same person.

Promising start

Goodyear was born on Dec. 29, 1800, in New Haven, Connecticut, where the family had been a mainstay for generations. He was a descendant of Stephen Goodyear, one of the founders of New Haven in 1638; his father was a successful businessman.

Although Amasa Goodyear had a first name that would have been better suited for his son—Amasa is a Hebrew name meaning “hardship” or “burden”—he had a knack for recognizing opportunities. After

buying a patent for a manufacturer of buttons and opening a business in nearby Naugatuck, he became the first U.S. manufacturer of pearl buttons in 1807 and supplied the government all of its metal buttons during the War of 1812.

Charles picked up his father's business acumen while helping his dad, and later as a teenage apprentice at a hardware company. He eventually became a partner in the family business; married in 1824; and even thrived on his own in Philadelphia with what was thought to be the first domestic retail hardware store in America.

Business was very good. Life seemed even better. Then came 1829—which, for Goodyear, was tantamount to the Great Depression that ravaged the United States exactly 100 years later and set in motion a litany of personal catastrophes that were interspersed with his historic triumph.

Debt and deaths

Goodyear's hardware buyers in the Mid-Atlantic and South began defaulting on their payments because of the Tariff Act of 1828, which devastated many

The founder of The Goodyear Tire & Rubber Company chose Goodyear's name for the company in tribute to the discovery. Charles Goodyear never had anything to do with the company that bears his name.

INVENTOR ARCHIVES: June

southern businesses. The “Tariff of Abominations,” designed to help northern industries, marked a significant split between the states that ultimately resulted in the Civil War.

Complicating matters was the fact that Goodyear contracted a bad case of dysentery, an infection of the intestines that confined him to his bed and rendered him unable to work. By 1830, he was unable to pay off creditors and landed in debtors’ prison. Between 1831 and 1833, two of his young children passed away; he himself grew sicker. But he had to come up with a way to provide for his family.

Around this time, the rubber industry’s decline mirrored that of Goodyear. In the early 1830s, the new waterproof gum from Brazil skyrocketed in popularity—until it was found to freeze in the winter and turn glue-like in the summer. Goodyear was both disappointed and intrigued: According to a 1958 Reader’s Digest story that was reprinted on the Goodyear website, he said later that “There is probably no other inert substance which so excites the mind.” (Neither Goodyear nor his family was ever connected with the company named in his honor, the Goodyear Tire & Rubber Co.)

He immediately set out to uncover a process that would make rubber stronger and more durable, beginning his experiments while in prison after asking his wife to bring him some raw rubber and a rolling pin. Several times in the middle and late 1830s he appeared on the verge of a breakthrough, only to be disappointed. The U.S. financial crisis of 1836-37 all but eliminated his chances of getting the backing he needed.

He and his family wound up in Woburn, Massachusetts, where local farmers gave his children milk and let them dig up half-grown potatoes for food. At one point his brother-in-law, lecturing him about the need to feed his children, told him that rubber was dead. “I am the man to bring it back,” the story quotes Goodyear as responding. And in 1839, he was.

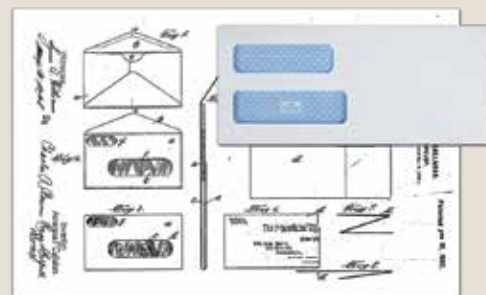
Pyrrhic victory?

Details vary on the exact details that led to the discovery of vulcanization (named after Vulcan, the Roman god of fire). But the one recounted on the Goodyear website says that one day in February 1839, the frail and sickly innovator went into the Woburn general store to show dubious onlookers the merits of his latest formula, which encompassed gum and sulfur.

“Snickers rose from the cracker-barrel forum,” the site reports, “and the usually mild-mannered little inventor got excited, (waving) his sticky fistful of gum in the air. It flew from his fingers and landed on the sizzling-hot potbellied stove. When he bent to scrape it off, he found that instead of melting like molasses, it had charred like leather. And around the charred area

JUNE 10, 1902

Americus F. Callahan was granted a patent for the “window envelope” for business correspondence, in which a see-through panel allows the addressee’s identity to be visible to outside viewers. Callahan applied for a patent for an outlook envelope, the original name for the innovation, in 1901.



Before the 1900s, preparing an invoice or check for mailing was labor intensive: placing the document into a manual typewriter, typing the document, removing it, inserting an envelope into the typewriter, typing the return address, and typing the mailing address. When the window envelope evolved into a double-window envelope—where both the addressee’s and sender’s name could be seen—it saved labor, time, ink, paper and even correction fluid.

The original, traditional envelope was invented by the Chinese around 3500 B.C. as a way of keeping royal communications secret.

JUNE 25, 1929

G.L. Pierce was granted a patent for a basketball, 38 years after James Naismith invented the sport. The original ball used for the game was one that resembled a soccer ball.

According to the book “Basketball” by Ellen Labrecque, Pierce’s ball was an outer shell of brown leather that surrounded a rubber sphere. But the dark color made it hard for fans to follow the ball, so in 1957 Butler University basketball coach Tony Hinkle worked with Spalding Co. to develop an orange ball. It debuted during the 1958 NCAA men’s basketball finals in Louisville, Kentucky, and has remained that way.

Balls generally designated for indoor use are usually made of leather or absorbent composites. All-surface balls are generally made of rubber or durable composites.



JUNE 26, 1951

The children’s game **Candy Land** was trademark registered. The colorful classic game for preschoolers requires no reading, only minimal counting skills, and no strategy; players only have to follow directions from the cards they pick.

Candy Land was designed in 1948 by Eleanor Abbott while she was recovering from polio in a San Diego hospital. When children at the hospital played it, they suggested she submit it to Milton Bradley Co., which first published it in 1949. The game became its best seller, supplanting Uncle Wiggly.

In a December 2005 article in Forbes magazine that analyzed the most popular American toys by decade, Candy Land was the winner for the 1940s. The game was inducted into the National Toy Hall of Fame that year.



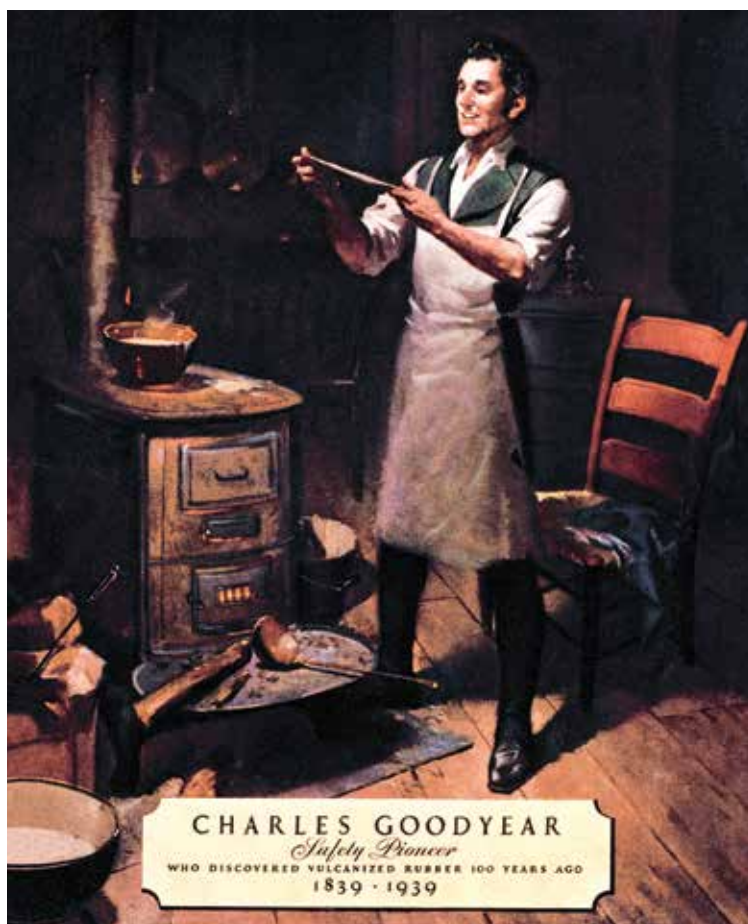
was a dry, springy brown rim—‘gum elastic’ still, but so remarkably altered that it was virtually a new substance.

“He had made weatherproof rubber.”

To this day, some of the most reputable information sources refer to the discovery as an accident. Goodyear scoffed at this, saying he was the one who “applied himself most perseveringly to the subject.”

Regardless, the invention didn’t change his fortunes—not even for the rest of his life. Although he now knew that heat and sulfur made rubber more durable, he didn’t know how much heat, or for how

Although Goodyear now knew that heat and sulfur made rubber more durable, he didn’t know how much heat, or for how long. On crutches, he conducted countless additional experiments and pawned nearly everything in his home as the family’s debt escalated.



long. On crutches, he conducted countless additional experiments and pawned nearly everything in his home as the family’s debt escalated.

He was jailed for failure to pay a \$5 hotel bill, only to return home to find that another of his children had died. (Of the 12 Goodyear children, six died as infants.) He couldn’t afford to pay for a funeral, so he walked the little coffin to the graveyard in a borrowed wagon.

Legal nightmares

Goodyear ultimately arrived at the correct vulcanization formula. He determined that steam under pressure, applied for 4 to 6 hours at about 270 degrees Fahrenheit, produced the most uniform results. On June 15, 1844, he received a patent for vulcanization.

This only led to more problems. Legal challenges by those wanting to cash in on the resurgence of rubber forced him into 32 patent infringement cases that went to the United States Supreme Court.

According to TodayIFoundOut.com, Goodyear also applied for a patent in England in hopes of increasing rubber revenue—only to find he had been beaten to the punch by English rubber pioneer Thomas Hancock, who had applied for a patent weeks earlier. Apparently, Hancock had come into possession of a piece of Goodyear rubber between 1839 and 1843 and figured out a formula for vulcanization that was close to Goodyear’s. Hancock’s camp offered Goodyear a half-share of his patent if he would drop the suit. Goodyear declined, then lost the suit.

One bizarre indignity summed up both his accomplishment and bad luck. Goodyear installed majestic floor-to-roof pavilions built entirely of rubber at the London and Paris world’s fairs of the 1850s. But his French patent was canceled on a technicality, and his French royalties stopped before he could pay his bills. He was hauled off to debtors’ prison yet again—where he received the Cross of the Legion of Honor from Emperor Napoleon III.

In June 1860, Goodyear heard that yet another of his children was dying. He raced to New York to see her but arrived too late. He reportedly collapsed on the spot and died soon after on July 1, 1860, at 59. He was \$200,000 in debt.

Goodyear had long been philosophical about his inability to profit from one of history’s most important inventions. He clearly valued humanity’s greater good over his own welfare.

“I am not disposed to complain that I have planted and others have gathered the fruits,” he said in perhaps his best-known quote. “A man has cause for regret only when he sows and no one reaps.”



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For This Company, Facebook Was Magic

BABY MERLIN'S MAGIC SLEEPSUIT FOUND A HUGE AUDIENCE ON SOCIAL MEDIA **BY ELIZABETH BREEDLOVE**



“Social media allows us to reach many new customers with very little investment of marketing dollars for a broad reach.”

—KELLY BURTON, SOCIAL MEDIA MANAGER

Most successful product launches have at least one thing in common: an active presence on a variety of social networks. In fact, it's almost a requirement to be active on Facebook, Twitter, Instagram or some combination of these networks if you want to reach a new audience and launch an innovative product.

Baby Merlin's Magic Sleepsuit, featured in *Inventors Digest* last July, benefited from social media platforms that helped reach new people and add to sales. I reached out to the company again and spoke with its social media manager, Kelly Burton, to learn more about how the team has used social media to reach a new audience.

Elizabeth Breedlove: When did you begin selling your product online and promoting it with social media?

Kelly Burton: The Magic Sleepsuit is primarily sold online via our site, magicsleepsuit.com, and Amazon. We started selling on our site in 2008 and on the Amazon platform in 2012. We also launched internationally on Amazon UK in late 2015 and are available in select baby boutiques in the U.S. and Canada. Many



of these boutiques offer parenting classes and education behind the products that they carry in their stores.

We have always used Facebook to promote and build our brand. In 2012, we worked with a consultant to launch additional social media outlets and began to use Twitter and Instagram minimally in that time. Our social media marketing efforts have really increased on Twitter, Facebook, Pinterest and Instagram in the last two years.

EB: What prompted you to begin promoting the product or company on social media?

KB: Our marketing strategy included promoting the product on social media to gain additional brand awareness for new parents looking for a swaddle transition solution. Social media allows us to reach many new customers with very little investment of marketing dollars for a broad reach.

EB: What social networks did you start with?

KB: Facebook: The appeal of Facebook is that it is an extension of our organic growth reaching parents on social media.

Twitter: We use Twitter on a limited basis. This avenue is linked to our Facebook page so our message stays the same.

Pinterest: We mainly use Pinterest to post our giveaways and product reviews. This is our most limited avenue of social media marketing.

Instagram: Instagram has truly bloomed for us in the last two years. We spend a lot of our time connecting with Instagram parents to help with our organic growth.

EB: You built a great audience on all four of your platforms. Which came easiest?

KB: Facebook allows us to have more of a community feel with different posts/blogs/reviews/pictures, so in general it gives our customers the better platform to communicate with one another. It is a slower process gaining the “likes” on our page, but our loyal customers love the forum it provides them.

EB: With which social network have you seen the most success? Where have you seen the biggest return on investment?

KB: ROI-wise, Facebook has been the most successful. We have had the Shop Now link on this site the longest, enabling our customers to convert to a sale right from Facebook. Last year we did launch an Instagram Shop that has been doing very well, allowing our customers to purchase directly from Instagram. Instagram has also allowed us to reach a wider audience than Facebook, so we foresee this having a greater ROI in the future.

EB: What did the first 6 months to a year look like for your social accounts? How did you grow your platforms?

KB: We initially were using our email list of family and friends and requested our friends to Like our page and Share it with their friends. As we gained followers and loyal customers, we began to ask for reviews and testimonials—which then led to more growth of our platforms. We offered (and still do) a Facebook discount code to users who Like our Facebook page and customers who share their successes.

EB: What advice would you have for someone else looking to use social media to promote a baby product or product for parents?

KB: Our best advice would be to find the influencers in their product space. We have built a loyal following of parents by connecting with moms and bloggers that share their success with the Magic Sleepsuit with others, which fueled our growth. 📱

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



One Platform at a Time

If you're feeling inspired by the social media success of Baby Merlin's Magic Sleepsuit and want to begin promoting your invention through social media, it's best to do as that company did and start with one platform.

Facebook is an excellent platform to begin with if you're testing the waters and trying to promote your product with social media, if for no other reason than its versatility. Facebook allows you to post to your page regularly and include pictures, links, text and video in the content you are publishing. Your followers can interact with the content you publish; they can also post to your page, leave reviews, share pictures, find out more information about your product or company, message you and even shop directly from the page.

If you are interested in taking your Facebook usage a bit further to promote your product, you can use the Facebook Ads platform to pay for advertising. Facebook's advertising platform allows you to target people based on interests, location, demographics and much more, meaning you can easily reach your exact target audience at a low cost.

Once you get the hang of Facebook, you can begin to evaluate other social media platforms and determine if they are a good fit for you. Before you know it, you'll have an entire group of new customers that you've built up with social media.





Connecting With the Elusive Licensee

BY MAIL OR IN PERSON, THESE SMART STEPS INCREASE YOUR CHANCES **BY JACK LANDER**

We begin with the assumption that you recently filed for a utility patent. The next step is deciding whether to license your application or your issued patent.

The disadvantage of attempting to license your application is that no one can say for certain whether claims for the features of your invention that provide significant commercial value will endure the critical examination by the United States Patent and Trademark Office and be issued. Even when they are confident in their filings, patent attorneys can't guarantee that the applied-for claims, which are statements that define your intellectual property, will actually issue. The patent office has the last word.

Thus, you are attempting to license a promise of your application's claims—and that's sort of like saying that you have an old treasure map for sale. Licensing can be accomplished with a carefully prepared contract that has provisions for anticipated deficiencies, but your position is weak compared to having your patent in hand.

However, attempting to license your application has two advantages: First, the lifetime of your patent begins on the date it is filed. It may take between two and three years for your patent to issue. Thus, your application offers its 20-year lifetime to your licensee, as against the foreshortened useful life if you wait for your patent to issue. Second, you can begin your quest to license at a time when your other obligations are known and your enthusiasm is high. Who knows what you will be doing in two or three years?

The advantage of waiting for your patent to issue is, of course, that your patent's claims are definite and your negotiating position is strong. (This assumes that your most important claims will be allowed.)

So, the next step is to connect with potential licensees.

Contacting by mail

A common impulse of the inexperienced inventor is to contact companies by mail. This can be effective if your mail is directed to a specific person by name—preferably, the director of marketing.

If sent to the marketing department (without routing to a specific person), your mail will probably be sent back to you with a statement that your material has not been read and will not be considered until you sign the company's waiver of rights. That waiver will read something like this: You agree that your only rights are those granted by your patent. Most experienced inventors will say that it's OK to sign because you won't get your foot in the door unless you do.

Now, knowing about the waiver demand beforehand, the better tactic is to call the company before submitting anything and ask what its policy is for submitted product ideas. Some companies will tell you flat-out that they do not accept proposals from the outside. Others, especially larger companies, will send you their waiver form to sign.



The next step is to do some research and discover the name and exact title of the marketing director for a medium- to large-sized company, or the president of a small company. These are the two main risk takers in any company. Address your proposal accordingly, and include a copy of your signed waiver so that your mail will be read. You can usually obtain the name of the marketing director by calling and asking for the correct spelling of his or her name.

Mailing a proposal is the easy way to license, but it is not the most effective way. You have no control over who will actually get your mail. In larger companies, it may be received by the marketing director's assistant, and, according to company policy, routed directly to a specialist whose job it is to evaluate such proposals. You have no guarantee that such person is qualified to evaluate your invention's benefits or will handle your proposal expeditiously. I have heard a number of horror stories of mail that was lost or sat on someone's desk for months without processing.

And never send a company a valuable prototype unless you have an understanding about who will be responsible for its handling, and that it will be returned within a specific time. Two weeks is good. The reason, of course, is that you lose your ability to demonstrate your invention to another company when it is tied up. A more subtle reason is that it leaves the impression that you are seeking other potential licensees. There's nothing like a little competition to get a prospect to take action.

Face to face is best

So, what is the more effective way to get your proposal in the hands of the risk-taker? Meet him or her face to face. Most marketing directors can be found in their company's booth at trade shows. If you called unannounced at their office, you'd probably be turned over to a subordinate or maybe told you need an appointment.

But at the trade show, you won't find a gatekeeper. You can introduce yourself, explain your mission, leave your proposal, and walk away with the director's business card. Now you have a name that you can associate with a face, and you have implied permission to contact this person by phone when the show is over. Be sure to have obtained the company's waiver, signed it, and carry several copies with you to the show. The marketing director may refuse to accept your sell-sheet unless you can show that you have complied with the company's policy and procedure on submitting new-product proposals.

Be considerate of the director's time at the trade show. Remember, he/she is there to market the company's products, not to entertain inventors who have patents to license. So, leave at least three sell-sheets—nothing else at this time—and get on your way in less than



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PHOTO BY JEREMY LOSAW

Most marketing directors can be found in their company's booth at trade shows. If you called unannounced at their office, you'd probably be turned over to a subordinate or maybe told you need an appointment.

2 minutes. If your sell-sheet does its job and you are asked for more information, fine. Otherwise, don't attempt a sales pitch—not even a 30 second elevator speech. You're not a sales professional, and that's why you use a professional sell-sheet.

Why leave three sell-sheets? Because they'll end up in a plastic bag or an attaché case with a hundred other papers. It's easier to find three of something than one. More to the point, when the director sorts out the papers back at the office, he or she will have spares to pass on to the boss and second in command.

A few days after the show has closed, call the director and ask what he/she thinks of the product. You'll most likely get through to an administrative assistant or a secretary. I have found that dealing with this person can get excellent results. Years ago, Q. Todd Dickinson, formerly the director of the USPTO, wrote a foreword for my book, "How to Finance Your Invention or Great Idea." His secretary handled the negotiation from the first phone call until I received the foreword.

Final cautions

Your sell-sheet should indicate that your patent is either applied for or is issued. If issued, include the

number so that it is available to the risk-takers and others who may be evaluating your invention. And if your patent has issued, be sure to reevaluate the claims for their significance to potential licensees.

If the novel features of your invention that result in its value to a licensee are not covered by the claims that you applied for, you may not have enough value in your patent to interest a licensee. I've seen many ambitious patent applications end up with only trivial claims. That's a bitter disappointment. But it's better to face it and reevaluate than to get a prospective licensee all excited and have them turn you down because your patent has little value to them.

Great expectations set us up for the possibility of great failures. But I've never heard a born inventor say that he or she was quitting the business. If your patent flops, go on to the next great invention. ☛



Jack Lander, a near legend in the inventing community, has been writing for *Inventors Digest* for 20 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.





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Baby Walker An Instant Idea, and An Instant Hit

JUPPY MEETS PARENTS' NEEDS WHILE SATISFYING SAFETY REQUIREMENTS **BY EDITH G. TOLCHIN**

As a mother of two kids, I tried just about every new baby product on the market in the 1980s. Naturally, my primary concern was their safety.

Of course, since the Consumer Product Safety Improvement Act of 2008, there are even regulations for selling baby products at resale shops and yard sales. Because I develop both baby products as well as consumer products in China and hold a customs broker license, I must be even more cautious.

I learned about the Juppy® Baby Walker in an article in AARP The Magazine. As a manufacturer, I was a bit concerned with the various components of the product. So I read more about it and set out to speak with its inventor, Jeffrey Nash.

Edith G. Tolchin: Please tell us about your background, family and children.

Jeffrey Nash: I grew up in a small town north of Boston: Lynn, Massachusetts. I'm the oldest of 10 children, eight of which were boys. Our mother easily kept us boys in line. I went to high school at Lynn Classical and was the co-captain of my high school basketball team. I also won three New England boxing championships as a young man.

Four years after graduating from high school, I joined the U.S. Marine Corps and was awarded a top-secret security clearance that enabled me to be

appointed to the presidential security team. This team provides security for the president's helicopter. Once I returned from the Marine Corps I wanted to learn the business of clothing sales, and did. I have done very well as a clothing salesman due to the passion that I have for it. I have three children—two boys, one daughter—and six grandchildren and one great-grandson. All my children are productive in their respective fields. I've definitely had a very interesting and fruitful life!

EGT: How did the Juppy Baby Walker come about? Have you ever invented anything before the Juppy?

JN: The idea came in 2008, when I was at a soccer game with my granddaughters and noticed a young mother teaching her baby to walk. I noticed the mother hunching over, and I imagined how uncomfortable it must have been. Watching the young mom pulling on the infant's arms had to be very dangerous, and it ran the risk of injury for both the mom and the baby.

As crazy as it sounds, for some unknown reason, the design for the first Juppy came to me right at that moment. Immediately upon my return to my home in Las Vegas, I had a prototype made based on my own design; after about four attempts, I finally had a model that I believed would be suitable.

That same year, the economy was wreaking havoc and many people seemed paralyzed. I was notified by my employers that I would receive a substantial pay

"The idea came in 2008, when I was at a soccer game with my granddaughters and noticed a young mother teaching her baby to walk. I noticed the mother hunching over, and I imagined how uncomfortable it must have been." —JEFFREY NASH

Jeffrey Nash sought reactions and feedback at the retail store where he worked.



cut due to the lagging economy. All signs pointed to launching my business, so I did.

I started trying out my invention on the children of customers in the retail store where I still worked, to see their reactions and to receive feedback. After making the necessary adjustments, I hired a patent attorney and then connected with a manufacturer that ended up making the first batch of Juppys. Shortly afterward, I took three weeks off in order to find out whether my invention was marketable. I visited stores from Las Vegas to Santa Monica, and at the end of three weeks, I sold \$12,000 worth of Juppys.

EGT: What is the Juppy made of?

JN: The Juppy is made of 99 percent cotton and 1 percent spandex.

EGT: Is the product adjustable for both big and little babies?

JN: We carry the Juppy in two sizes: One is for babies with a waist size of 16 inches to 22 inches. The other is for older children who have challenges when it comes to walking, and that one is (up to) 28 inches at the waist.

EGT: How did you create your first prototype? How many versions did you have before you got it perfect?

JN: I drew what was in my head and then had a tailor sew it. It took four prototypes to get it to where I wanted it to be.

EGT: Are you manufacturing in the USA, or overseas? If overseas, how has your experience been? Any difficulties such as communication problems?

JN: I am manufacturing overseas and mostly communicate via email. I have not encountered any difficulties in seven years.



For his first prototype, Nash drew what was in his head and had a tailor sew it.

EGT: How safe is this product? Does it conform to CPSIA batch testing and regulations?

JN: The Juppy is simplistic and safe, and does conform to CPSIA standards

EGT: Isn't it possible for the baby to get caught in the straps?

JN: The only way the baby could get caught in the straps is if someone intentionally wrapped them around the baby.

EGT: How is your product packaged?

JN: The product is packaged in a clear carrying case with an image of the Juppy. I designed it.

EGT: I see you've been featured in many magazines, including Inc., AARP and Parade. How has the exposure been?

JN: The exposure from magazines has been phenomenal. It has been excellent regarding making parents aware of the Juppy as an alternative to dangerous baby walkers with wheels.

EGT: How is the Juppy available?

JN: I only sell online at thejuppy.com.

EGT: Do you have any advice for readers who might be interested in developing a baby product?

JN: Believe in yourself, and don't allow others to deter you from achieving your dreams. 🍀

Details: thejuppy.com, jeffrey@thejuppy.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.



Add to the Menu: Peace of Mind

GLUTEN SENSOR INVENTED FOR PEOPLE
WITH FOOD ALLERGY **BY JEREMY LOSAW**

In fewer than 3 minutes, the Nima sensor reports whether food is “gluten free” and safe to eat.

Shireen Yates’ decision to attend a wedding in 2012 could lead to a happily-ever-after outcome for a lot of strangers.

Yates loves Persian food but is allergic to gluten. Because she knew that weddings can make for tricky eating for those with gluten sensitivity, she would always pack her own snacks to make it through the night. However, she forgot to do that at this particular wedding and was left frustrated trying to find a gluten-free option.

“What if I could just take a sample of this [food] and just have one additional data point to make a more informed decision before I take that bite?” Yates recalls thinking. “If it is the wrong bite, it can completely ruin my night ... I couldn’t stop thinking about it.”

Yates has plenty of company when it comes to that dilemma. Food allergies limit choices for millions

of people and put their health at risk. The increased awareness of allergies in recent years has caused a number of changes to food labeling requirements and the banning of foods such as peanuts from schools and day care facilities. Celiac disease—a serious genetic autoimmune disorder in which the ingestion of gluten leads to damage in the small intestine—is one of those allergies.

According to the University of Chicago Medicine Celiac Disease Center, 3 million Americans have Celiac disease. That number of people would fill 4,400 Boeing 747 airplanes. More alarming is that 97 percent of those with the inherited disease remain undiagnosed or untreated.

Years later, Yates and fellow inventor Scott Sundvor have invented a way to test restaurant food through a device called the Nima. Paired with an app, it is a powerful tool for those who need to avoid gluten to dine out with peace of mind.

The Nima is a pocket-sized gluten sensor consisting of a single-use test cartridge that fits inside. To run a test, a pea-sized piece of food is broken off and put inside the cartridge. The cartridge is inserted into the sensor, and in fewer than 3 minutes it reports the results. A smiley face on the display indicates a food with less than 20ppm, which is considered “gluten-free” and safe to eat; a wheat icon display warns diners of a higher gluten content.

The device costs \$279 and comes with three single-use cartridges. Additional cartridges are about \$6 each. Nima is also supported by a free app that allows users to upload test results for their favorite restaurants. Even non-Nima users can use the app to see test results

“If it is the wrong bite, it can completely ruin my night ... I couldn’t stop thinking about it.” —SHIREEN YATES, NIMA CEO



PHOTOS COURTESY OF NIMA

Early efforts

After the wedding, Yates began researching different technologies. While studying business at MIT Sloan School of Management, she joined forces with engineer Sundvor through a mutual friend. They started working on a gluten testing solution.

The team spent a year doing market research and prototyping. The concept had a very technical component that needed to be figured out, but it was also a completely new user interaction. “It is equally important to prototype not only the physical product but to also prototype the experience,” Yates notes.

They made form models of the device from clay and foam, and took people out to dinner to test different user scenarios and how long people would wait for a test result. They tested different form factors and had people carry around different shapes in their purses and pockets. All of their testing and research culminated in a pitch at the MIT 100K Accelerate competition, where they won the audience choice award.

After graduation, Yates and Sundvor continued development off campus. It was imperative that the chemical testing process be perfected to have a valid product. They enlisted the help of Dr. Jingqing Zhang, a Ph.D. in chemical engineering.

The first prototype used off-the-shelf chemical testing techniques and was “as big as a light saber,” Yates recalls. With further refinement, they got the typical eight-step gluten test to three steps and were able to shrink their initial prototypes to the small cartridges now found in the product.

After the research and validation of the chemical testing and sample prep, they moved forward with patent filings. Yates and Sundvor worked on the first patent themselves but used legal counsel to help. Yates feels that having intellectual property helps protect her innovations and business while enhancing the credibility of the product.

Funding, manufacturing, more

The initial prototyping was self-funded, but CEO Yates and the team moved quickly to secure venture capital. Lemnos Labs, an early-stage start-up accelerator in Silicon Valley, was one of their early investors. The exposure from working with Lemnos has helped them raise more than \$13 million from a series of VC firms and other investors. This allowed them to expand their San Francisco office and build an engineering and marketing team of 15 people to propel the product forward.

With such a new product, it was difficult to decide when to stop development and start transferring to

manufacturing. It was especially challenging with the Nima, which has both electromechanical and chemical elements. “There will be trade-offs, especially when you are doing a completely new product,” Yates says.

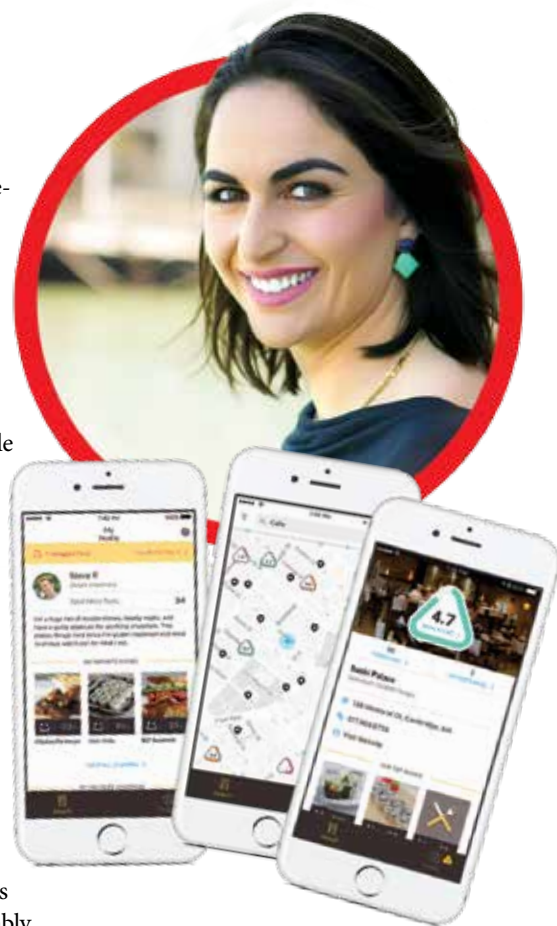
Fortunately, they were able to work through the technical issues before courting manufacturing partners. The Nima team was very deliberate in their selection of factories to manufacture the product. Their initial search got them a list of 30 potential overseas manufacturers. They eventually whittled it down to six and after many meetings and site visits chose one that makes many of the parts, as well as doing the final assembly.

The Nima’s marketing efforts were targeted. Yates and Sundvor eschewed crowdfunding and focused on industry and gluten-free trade shows to display the product and build a following. They built a strong email list and did targeted digital ads to build a portfolio of pre-sales. They wanted to be very hands-on in controlling the language of their campaign and analyzing the cost of customer acquisition. They have even kept tight control on their e-commerce strategy, and to date are only offering the device for sale through their website.

Amid the Nima’s success in the food allergy ecosystem, the team is not stopping with gluten. Next up is a peanut sensor that will be available at the end of this year, with a dairy content sensor to follow. Yates and Sundvor are continuing to push the boundaries of mobile food analysis to help those with allergies enjoy a night out at a restaurant with peace of mind. 🍷

Details: nimasensor.com

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/.



Shireen Yates’ invention is supported by a free app that allows users to upload test results for their favorite restaurants.

App Developers Are Inventors, Too

ARMY VETERAN NAVIGATES A SERIES OF CHALLENGES, INCLUDING PROTOTYPING **BY DON DEBELAK**

Breakfast is the most important meal of the day, and Theresa Piasta would be devastated without her Waffles. An Army veteran who suffers from Post-Traumatic Stress Disorder, she relies on her service dog, a Cavapoo, to calm her during panic attacks. “Battling PTSD was my Everest,” she recalls.

When she takes Waffles out with her, Piasta prefers to dress her dog in complementary accessories. It didn’t take long for her to discover that finding stylish dog accessories in the United States was challenging. That’s when her entrepreneurial spirit kicked in, and she imagined a product line that crafted a stylish, cohesive look for both the dog mom and her pup.

She sought out advice. “Throughout my Stanford Graduate School of Business Ignite program, we learned important entrepreneurial strategies, including design thinking and lean methodology,” she says. “Through this education, I learned how important it was to talk to as many dog moms as I could, to discover their true pain points before building my product.” So she did.

Piasta began talking with women while walking around her neighborhood in San Francisco and found that many were just as passionate about their dogs as she. Moreover, she learned that many, like her, also received important benefits from canine therapy. She began looking for more detailed information and branched out to Instagram dog mom communities such as #furbaby.

Target audience confirmed

She began her action plan. “I wrote to each woman individually, asking for three sentences about how their dogs had changed their lives,” she says. Piasta was floored by the response: “I received over 300 stories back—not just two or three sentences, but with long, deeply personal, entire stories.”

It helped that their stories fit with her love of Waffles. “She comforted me when I needed it most, and she never failed to put a smile on my face,” she says.

From that, Piasta created the website Puppy Mama. Starting as a platform for women to share their stories on social media, it grew to more than 10,000 followers on several social media sites, led by Instagram. Based on input from the posts, Piasta started to get an idea of how the site could become more than just social meeting sites for sharing and become a portal where people could find “dog-friendly” businesses for women traveling with their dogs.

Her concept was that the site could generate revenue from ads from pet-friendly businesses. The mobile app would initially pick up the longitude and latitude of users and send ads and locations of nearby “dog-friendly” businesses that could be provided by the worldwide contributors to the Puppy Mama site. Besides a listing of businesses, Puppy Mama would include a meet-ups feature to allow users to meet other women with dogs while traveling.

New inventing steps

This is where Piasta crossed over to inventorship. For a long time, inventions were seen as a physical object. But times have changed. For an inventor to be granted a patent, the idea must be useful, concrete, produce a tangible result as well as involve equipment—which, in the case of apps, is a computer or cell phone.

Piasta met this standard but wasn’t home-free yet. She still needed to develop the website and mobile apps; create her apps’ own social media features; and create the software and interface with social media sites that would make the application work.





Theresa Piasta's website Puppy Mama evolved into a portal where people could find "dog-friendly" businesses for women traveling with their dogs.

Typically, prototyping a web or mobile app is done in steps—first an outline of what needs to be on each screen; the flow of the app; a digital mockup, and finally using an app prototyping tool such as Sketch and inVision.

She had already covered the first steps of inventing: finding a customer need that is large enough to cover the cost of developing the invention, and researching the market to clearly identify what customers want. But the second step was, in effect, prototyping a web or mobile app. Typically, this is done in steps—first an outline of what needs to be on each screen; the flow of the app; a digital mockup focusing on User Experience and User Interface (“UX/UI”), and finally using an app prototyping tool such as Sketch and inVision.

With a prototype, inventors are able to do what programmers call iteration—building something, playing with it and refining it. The prototype process could also include things such as social Share buttons and Follow buttons. As with all prototypes, inventors need to think through the product they want or have to spend lots of extra money getting the desired prototype.

Piasta talks about networking to find her software developer. “Since I was unfamiliar with the full-stack development talent pool, I talked to some of my technical contacts in Silicon Valley to acquire advice regarding finding skilled nearshore development teams that could help build our Minimum Viable Product.

“One of my friends recommended teams in South America, to include the team I ultimately selected in Uruguay. Our Uruguayan development team is wonderful and has worked with us throughout the entire app development process. I’ve been able to get much closer to my vision because they are a highly skilled team charging an affordable rate; they have also been an integral part of our forming company culture and are very dedicated to help Puppy Mama grow and succeed.”

A 21st-century challenge

Inventors must visualize the product they've invented to guide them through the process of going from prototyping to the final product. This process can be much more difficult with an app.

Piasta wanted a responsive web app with much of the same features as social media sites such as Yelp, Twitter, Facebook and Instagram for a very targeted market—women who like to go places with their dogs. She wanted a community where members could share information and set up meetings with other members but still access a database of dog-friendly businesses. For example, Facebook allows you to set up a database of interested parties on its site or can do it for you with a friends list, but you can't set up a database of businesses there. So, intertwining the social media sites with a web or mobile app became important.

The roll-out for an application occurs in stages. Today, the app picks up longitude and latitude, and gives users ads along with a list of dog-friendly businesses in the area. And a recent updated version of the app allows dog lovers to search for places by city name, as well.

Roll-outs require careful planning if you are pursuing a patent. You may not have future plans developed to the point where you can get a patent, but you should try to tie in the roll-out improvements to your initial patent filing date. Piasta didn't apply for a patent because she wanted to use the resources she had to dominate the market niche.

Many patent professionals recommend that people developing a web or mobile app visit a patent attorney or agent early in the process to plot a strategy—although that isn't necessarily the case in Silicon Valley. (Many patent professionals will give you a free initial consultation so you have an idea of what steps you can take to protect your idea.)

With her responsive web app up and running and her legion of more than 10,000 social media followers—a finely targeted audience—Piasta is on the cusp of receiving advertising revenue that will help generate more money she needs to keep developing her brand and market awareness. Her following should grow as the Share buttons she has on her site, more or less mimicking social media sites, generate a buzz with women who love their dogs. 🐾

Details: PuppyMama.com

Web app direct link: app.puppymama.com/login

Don Debelak is the founder of One Stop Invention Shop, which offers marketing and patenting assistance to inventors. He is also the author of several marketing books, including Entrepreneur magazine's *Bringing Your Product to Market*. Debelak can be reached at (612) 414-4118 or dondebelak34@msn.com.



4 KEY POINTS FOR APP PATENTS

1 Patents require full disclosure, meaning someone skilled in the art can make use of the invention without undue effort. Mobile and web apps typically include software. Because inventors don't want to reveal their software coding, they instead use flow charts to detail the process they are patenting. Inventors also should detail the steps a programmer needs to take to create a working version and meet the full disclosure requirement.

2 Patents require that all people involved in an invention's conception be listed on a patent. In a web or mobile app, many feel the inventorship goes to the people who develop the design specification. Then people who put the design into practice do not need to be listed on the patent. If you are working on a patent, be sure to have a design spec document to avoid any conflicts.

3 Patent law states that an invention cannot be patented if it was described in a printed publication, or in public use, on sale, or otherwise available to the public before the effective filing date. Being first to file is not enough to receive a patent; you must be the first to expose the idea to the public. So filing early is important to get ahead of all potential competitors.

4 Inventors of web and mobile apps often roll out new features as time goes by. If these were covered in the original patent's specification, inventors can file continuation patents and keep their priority date. If they add new information, they need to do a continuation-in-part patent, which has a later priority date. A continuation-in-part patent, if filed after one year, may have the original patent cited as prior art. Avoid problems by starting the patent process for new features before the one-year period of your original runs out.

2 Critical Steps to getting your NEW PRODUCT "out there"

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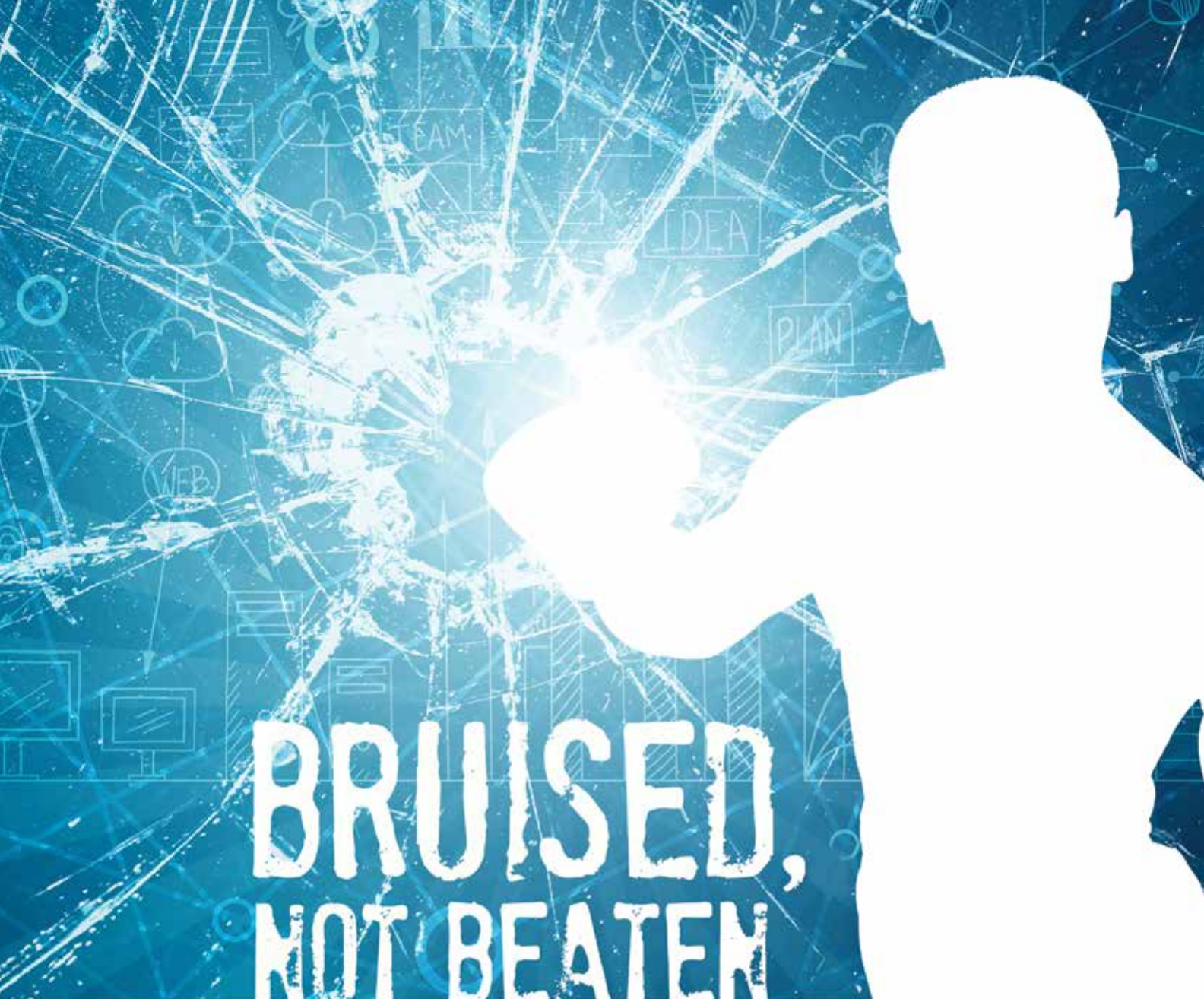
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INVENTING THRIVES DESPITE BLOWS TO PATENTS **BY REID CREAGER**

The U.S. inventing landscape is replete with festering land mines:

- Major patent rulings that can border on the patently absurd, often enabling infringers and leading to endless litigation for the independent innovator;
- A 2011 America Invents Act that many claim has done more harm than good, including the creation of a Patent Trial and Appeal Board that has arguably harassed patent owners;
- The landmark 2014 *Alice Corp. v. CLS Bank International* case that significantly hindered patents for computer-related inventions, particularly software, by creating a rigid new subject matter eligibility test;
- Last year, patent examiners' integrity and their bosses' oversight came into question via the disclosure that hundreds of them appeared to have cheated

on their time cards but were still rated as above-average employees, with some even given bonuses by the U.S. Patent and Trademark Office.

The damage done by recent court rulings, legislation and government agencies is subjective. But America's plummeting ranking in patent system strength is a point of fact: The 2017 U.S. Chamber of Commerce Global IP Index marked the first time America has not ranked first in patent system strength. It is now ranked 10th.

China, which in 2015 passed the United States in patents granted per year, is emerging as a preferred venue for patent owners seeking to resolve matters of alleged infringement. Little wonder that Paul Michel, retired chief judge of the United States Court of Appeals for the Federal Circuit, said during a March keynote address: "Today, we are facing a crisis."

Let's Reverse 3 Recent Bad Decisions

HISTORY SHOWS OUR PATENT SYSTEM CAN RECOVER, BUT CURRENT LEADERS LACK VISION **BY GENE QUINN**

In many parts of the world on April 26, there was reason to celebrate World Intellectual Property Day. In the United States, there should be less celebration and more reflection on how elected leaders, appointed officials and learned jurists are allowing the engine of U.S. economic dominance to be disassembled. However, there could be much to celebrate in America if a few decisions in the past 11 years are reversed to put the United States on exceptionally solid footing.

Positive signs

Though the U.S. patent system is not in a good place, some identifiable moments have started to move things in a positive direction in recent years. The United States Court of Appeals for the Federal Circuit has found software to be patent eligible a number of times, and in several important life sciences cases it has seemed to move in a more positive pro-innovation direction. Increasingly, those walking the halls of the Capitol are finding a better reception in more offices, with more representatives and senators interested in patents, innovation and the national security issues and economic issues tied to these important matters.

Many of the biggest problems facing the patent system have been felt most directly by innovative start-up companies, and research and development companies operating in computer software and life sciences. Independent inventors have also been hit hard, but that has largely been as an indirect result of patents becoming devalued across the board—also due to the ease with which patents can now be challenged at the Patent Trial and Appeal Board.

For many independent inventors, the problems that plague so many high-tech innovators are not an issue. Patent eligibility rejections are not generally a problem for anything that has a tangible manifestation—so if you invent something that might be sold on QVC, for example, you should not encounter the same uphill climb at the United States Patent and Trademark Office that is faced by others. Statistics show that the USPTO technology centers dealing with mechanical inventions, electrical inventions, products, and designs, all areas where many independent inventors operate, are operating largely unchanged over the last several years.

So before throwing away your patent dream, it is worth thoughtful consideration about the state of the industry with respect to the type of invention you have, and where the industry will likely head in coming years. A rising tide will lift all boats—so as the patent system improves for the most beleaguered high-tech software and life sciences companies, it will become better for all.

If Congress wants to resurrect the U.S. patent system, the following three decisions must be overturned. As long as these decisions remain in force, the U.S. patent system will continue to suffer and will undoubtedly lose its precarious No. 1 IP worldwide ranking next year.



Countering these body blows to inventors is a force of comparable or greater strength—a dynamic dynamic that is the spirit of American innovation. The compelling creative and entrepreneurial aspects of inventing have seldom, if ever, been more in the public eye, producing a powerful draw for millions.

In the past decade, television shows from “Everyday Edisons” to current ratings blockbuster “Shark Tank” have shone a spotlight on innovation processes, as well as the business aspects of inventing and its potential riches. The reality show format of “Shark Tank” has attracted younger people, furthering the infusion of youth into the invention culture.

With the help of technology, options for bringing products to market have never been so varied, often in a more affordable way than in the past. And as

CONTINUED ON PAGE 29



60%

The estimated rate (maximum) at which U.S. patent values have decreased in the past five years.

technological gains increase the possibility of inventions with widespread appeal and utility, companies are becoming more open to accepting outside licensing submissions.

Even the latest developments in the courts show signs of hope. Outside of the USPTO's e-commerce art units, which show almost 100 percent rejections under Section 101 of the Patent Act, patent applications largely have reasonable to strong chances for approval. And three 2016 rulings could prove a turning point for software patents.

Lawrence J. Udell, executive director of both the California Invention Center and Intellectual Property International, Ltd., says inventors' possibilities are greater than ever—and ever expanding.

"The internet has created untold opportunities for creativity without discrimination. Young people from teenagers on up are creating apps that are making them rich and famous. There is no need to adapt to a company's policy, with outside creativity and potential value.

We have seen new and brilliant technology being created in every facet of industry—from computers to autonomous vehicles, from medical diagnostics to general wellness and from cell phones to virtual reality. This does not even take in solar and gene therapy."

Courts: Uncertainty, hope

Certain rulings by the Supreme Court and the federal circuit predictably elicit "anti-patent" cries from patent attorneys and the inventing community in general. But few actions have been so roundly criticized as a recent PTAB ruling that declared an MRI machine an abstract idea—and therefore patent ineligible under the *Alice/Mayo* framework.

These kinds of decisions spark more than outrage; they promote a sense of uncertainty. "Right now is a great time to be an inventor," says Louis Foreman, a prolific inventor who is founder and chief executive of Enventys Partners, an integrated product design and

engineering firm in Charlotte, North Carolina. He is also CEO of Edison Nation and Edison Nation Medical. "But I think the fact that there's so much uncertainty and a high level of concern over what's going to happen to patents in general has people a little bit concerned.

"Patents still are the greatest way to protect an invention. It's the only real way to protect an invention. In many respects, a patent is an incentive that an inventor is counting on to go out and risk putting up their capital, investing their time, borrowing money from friends and family to pursue their invention idea. I still have a great deal of hope that lawmakers won't mess with the system too much to eliminate or reduce that incentive. But the volatility that we see in the market is definitely a problem."

Part of the uncertainty involves fuzzy boundaries that accompanied the *Alice* verdict. When the Supreme Court declared that abstract ideas implemented using a computer are not patent eligible under the Patent Act, it raised the question: What is an abstract idea? The PTAB ruling on the MRI machine further muddied the waters.

But three verdicts within a six-month span last year—*Enfish LLC v. Microsoft*, *McRO v. Bandai Namco Games America*, and *Amdocs v. Openet Telecom*—offered renewed hope after federal circuit judges ruled

"The buzz that small inventors cannot obtain patent protection for their innovations is greatly exaggerated."

—MARK PLAGER, FOUNDER OF LAW OFFICE PLAGER SHACK LLP



that software patents were wrongly invalidated. An attorney at Fish & Richardson, the nation's largest IP law firm, wrote that the *Enfish* decision was "like a ray of light at the end of a long, dark tunnel."

The AIA

The America Invents Act triggered myriad revolutionary changes to U.S. patent law, most notably switching the system from "first to invent" to "first to file." That move was widely criticized—but perhaps the AIA's most impactful stipulations were post-grant review processes that allow any entity to ask that the USPTO initiate a review of a valid, issued U.S. patent. The goal was to eliminate low-quality patents and create a stronger environment for American inventors.

The result was a deluge of invalidated patents—led by the newly formed PTAB—and prompting criticism that the AIA had done the opposite of what it intended. Two years ago, Richard Baker, president of New England Intellectual Property, LLC, estimated that the AIA cost the U.S. economy more than \$1 trillion.

AIA supporters such as thehill.com wrote that "While no one was looking, the AIA's programs have been steadily cleaning up America's patent system, getting rid of low-quality patents and fueling innovation and growth across the U.S. The AIA is creating a better environment for American inventors—one less threatened by patent trolls."

While not commenting specifically on the AIA, Mark Plager, founder of law office Plager Shack LLP in Huntington Beach, California, says: "The buzz that small inventors cannot obtain patent protection for their innovations is greatly exaggerated."

"While the disclosed and claimed technology for the award of a patent has advanced, the standards for patentability remain the same as they have for the last decade, with the exception of evolving case law defining patentable subject matter in the realm of computers and computer driven apparatuses. To obtain a patent, the invention must comprise patentable subject matter, be novel, useful, and nonobvious."

Charlie Sauer, who works on Capitol Hill as an economist and policy specialist, told *Inventors Digest* in January that the AIA "is the worst piece of legislation that they could have passed." He said it was counterintuitive that the act was designed to harmonize U.S. innovation systems with the rest of the world: "So you take the most innovative economy in the world and you pull it back to the least innovative economies in the world. The idea of that doesn't make sense on a barroom napkin; it shouldn't have made sense in Congress."

CONTINUED FROM PAGE 27



1. eBay v. MercExchange (2006)

The Supreme Court's decision related to the issuance of injunctions to victorious patent owners upon successful completion of patent litigation. Prior to May 15, 2006, when a patent owner prevailed on the merits in a patent infringement lawsuit, there was a well-established general rule that an injunction should issue absent the presence of a sound reason for denying it. That makes perfect sense, given that the patent is an exclusionary right (i.e., the patent grant by its nature demands that no one engage in making, using, selling, offering for sale or importing).

Now, in order to receive a permanent injunction in a patent litigation, the victorious plaintiff needs to demonstrate: (1) that it has suffered an irreparable injury; (2) that remedies available at law, such as monetary damages, are inadequate to compensate for that injury; (3) that, considering the balance of hardships between the plaintiff and defendant, a remedy in equity is warranted; and (4) that the public interest would not be disserved by a permanent injunction.

Ironically, patent owners are better off before they are victorious and have withstood all challenges. At least prior to a verdict they have the illusion of an exclusionary right that is akin to an injunction. But once they have prevailed, they cannot get a permanent injunction, which is bizarre. All that a permanent injunction would do differently from the terms of the patent grant already awarded would be to continue to allow the district court to maintain jurisdiction to punish recalcitrant defendants who refused to follow the court's order.

The eBay decision largely removes the possibility of an injunction—which turns the patent system into a compulsory licensing regime at best. The infringer bears no risk of being told to stop infringing. This significantly tilted negotiating power, value and minimized opportunity for settlement, which maximized the likelihood that patent owners would have to sue. Most patent professionals point to this decision as the most harmful recent event.



2. Mayo v. Prometheus (2012)

The root of the patent eligibility evil lies with the Supreme Court's decision in *Mayo v. Prometheus*. The real mischief of *Mayo* is found in the fact that SCOTUS intentionally chooses not to apply Title 35 of the United States Code, Section 102 (novelty), 35 U.S.C. 103 (obviousness) and 35 U.S.C. 112 (description) to evaluate the claims. The solicitor general of the United States specifically argued that the Supreme Court should look to those other sections of the statute—as the court itself commanded be done in *Diamond v. Diehr*, for example. Justice Stephen Breyer refused what he called the invitation of the government to allow the claims to be properly analyzed under 102, 103 and 112. It wasn't an invitation; rather, it is what the Patent Act required.

In *Diehr*, then-Associate Justice William Rehnquist explained why considering newness under 101 was inappropriate. Now, newness (or novelty) is considered in a patent eligibility inquiry, but this newness is considered without

CONTINUED ON PAGE 31



The United States' ranking in the U.S. Chamber of Commerce's Global IP Index for 2017.

Media fans the flames

The halls of Congress and the frustration of courtroom dealings are a long way from reality TV, where invention is glowing in the spotlight.

"Because of, perhaps, the publicity of shows like 'Shark Tank,' more and more individual inventors appear to be taking on the patenting process," says attorney Kara Verryt of Plager Shack LLP. "While there are certainly risks involved in starting this process, there's also the possibility of great success."

"What the shows do not always make clear is that obtaining a patent is more than just coming up with a good product or method. It's also prudent to ensure

that a patent application directed to the invention captures the essence of the invention and explains what truly sets the invention apart from the prior art."

No one better understands the impact of invention TV than Foreman of Enventys Partners, who created the Emmy Award-winning "Everyday Edisons" on PBS. He says these shows help bring "a high degree of awareness of invention, innovation."

As a result, "everybody's looking to launch the next great product, the next great app. ... Platforms like Kickstarter and Indiegogo are making it easier for people to fund their ideas, while sites like Edison Nation are providing great outlets for inventors who have the next great idea but don't want to start companies."

"When you take a look at the overall ecosystem—the different platforms to market an idea ... the media and shows about innovation, and just the general customer appetite for new and improved, it's a great time to be an inventor."

—LOUIS FOREMAN, FOUNDER AND CHIEF EXECUTIVE OF ENVENTYS PARTNERS



PHOTOS COURTESY OF CENTRAL PIEDMONT COMMUNITY COLLEGE

“So when you take a look at the overall ecosystem—the different platforms to market an idea whether it be Kickstarter if you want to do it yourself or Edison Nation if you want to license it, the media and shows about innovation, and just the general customer appetite for new and improved, it’s a great time to be an inventor.”

Youth, humanity served

The widespread appeal of “Shark Tank” is routinely on display when the show conducts auditions in various U.S. locations. Young people are prominent in the crowds.

Youth is no longer a fringe player in the inventing process. Last year, India’s Prime Minister Narendra Modi invited youths to research and invent solutions through technology to address the country’s many problems. Young people aren’t just complementing the push for worldwide innovation; in many instances, they are driving it.



The percentage increase of utility patent grants of U.S. origin from 2011 to 2015, the last year such statistics were available from the United States Patent and Trademark Office. In 2011, 43.8 percent of U.S. utility patent applications resulted in grants. That ratio was 48.8 percent in 2015.

Upper left: Hopeful entrepreneurs wait for “Shark Tank” auditions at Central Piedmont Community College in Charlotte, North Carolina, on April 30. Near left: An applicant makes his pitch while cameras roll. Typically, candidates have 1 minute to pitch their business, product or idea.

CONTINUED FROM PAGE 29

any prior art being applied. That makes the question of newness under 101 purely subjective and untethered to any scientific or technical reality.

Today, thanks to *Mayo*, decision makers consider whether claims are new, nonobvious and even properly described all under a 101 patent-eligibility analysis, which allows decisions to be made without information or thoughtful consideration. It allows claims to be deemed conventional and therefore patent ineligible without applying a single piece of prior art; considering priority dates or availability of references; or when teachings were made public.

Worse, *Mayo* also allows these decisions to be made without any claim interpretation. How can you know what a claim covers without a claim interpretation? The answer is simple: You cannot.

3. Post-grant administrative trials (2012)

The biggest change brought by the America Invents Act is the creation of three ill-considered procedural challenges to issued patents. These post-grant challenges—inter partes review, post-grant review and covered business method review—give those who don’t like patents fresh opportunities to seek the invalidation of intellectual property rights issued by the USPTO. These procedures are added to challenges already available in federal district court, as well as reexamination, which continue to be available at the USPTO.

These post-grant proceedings have been so horribly one-sided that it is almost impossible to believe they are being carried out within an American system of any kind. The statute gives patent owners the right to amend patent claims, but the PTAB denies virtually all motions to amend because it interprets the statute as giving only a right to file a motion to amend, which it almost universally denies. Patent owners are also harassed and subject to petitioners ganging up on their patents, even though the AIA gives the director the power to protect against this.

The post-grant challenges have made infringing patents a more economical choice—while making it more costly for inventors to get and keep the protection they need to make innovating a worthwhile endeavor. It was all too predictable that a new tribunal would over-assert its own jurisdiction, but the breadth of how arbitrary, capricious and fundamentally unfair the process would be was not predictable.

System has rallied before

We’ve seen the U.S. patent system in near collapse before. In the 1960s and 1970s, the Supreme Court basically never saw a patent that was valid, leading to the creation of the United States Court of Appeals for the Federal Circuit. In the 1970s and early 1980s there was great concern that Japan would win the technology future and America would become an also-ran in the burgeoning technological revolution, but that never happened.

President Ronald Reagan demanded a buildup of the USPTO as part of his overall strategy to restore America’s patent strength and compete with the Japanese for technology dominance. He demanded that the patent office push down unacceptably high pendency rates, getting the average down to 18 months.

The president accomplished this goal by reaching a compromise with Congress. According to then-USPTO Director Gerald Mossinghoff, Reagan would commit to reducing patent application pendency if “Congress would enact a meaningful increase in user fees, which the USPTO could retain...” This was exactly the opposite of what politicians have been doing during the past generation. President Reagan did not raid the USPTO coffers; he reinvested in the office so it could do its job.



CONTINUED ON PAGE 33

11,721

The number of claims (through last July 31) found unpatentable by the Patent Trial and Appeal Board in a final written decision.

Consider the ages of these people when they founded some of the world's most well-known companies: Steve Jobs, Apple, 21; Bill Gates, Microsoft, 20; Mark Zuckerberg, Facebook, 19. Zuckerberg began writing software in middle school.

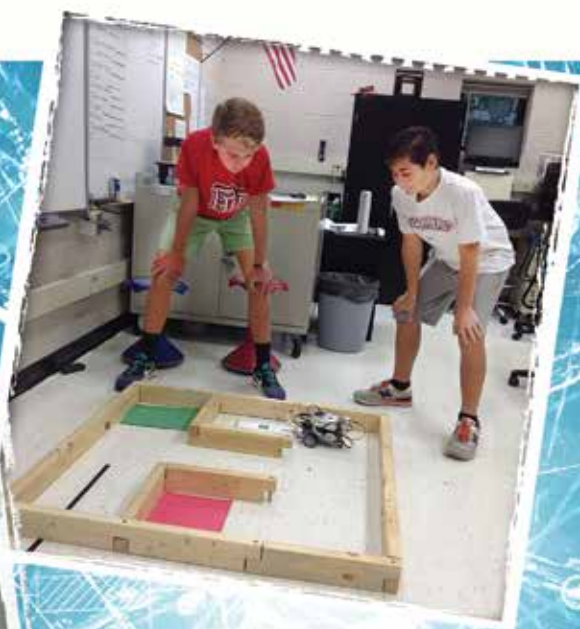
As inventing's appeal to the young continues to explode, innovation labs and makerspaces have become commonplace in schools around the world. Derrick Willard, assistant head of school for academic affairs at Providence Day School in Charlotte, North Carolina, says that since the school opened its

makerspace three years ago, "I've seen our students create some incredible things.

"If you have not seen one, a makerspace is like a high-tech garage—a place where students can investigate the latest technologies like 3D printers, laser cutters and Raspberry Pi devices, and use them to create unique things (virtual or physical). Makerspaces are also typically stocked with old-school tools, too, like hammers, saws, screwdrivers, sewing machines, tape and fabric. Spaces like this are important in cultivating a maker or hacker culture that fosters invention and innovation."

"If you have not seen one, a makerspace is like a high-tech garage—a place where students can investigate the latest technologies like 3D printers, laser cutters and Raspberry Pi devices, and use them to create unique things (virtual or physical). Makerspaces are also typically stocked with old-school tools, too, like hammers, saws, screwdrivers, sewing machines, tape and fabric."

—DERRICK WILLARD, ASSISTANT HEAD OF SCHOOL FOR ACADEMIC AFFAIRS AT PROVIDENCE DAY SCHOOL



Left: Providence Day School's Introduction to Engineering class took part in a project in which students had to construct a tower from balsa wood and were graded on a strength-to-weight ratio.

Above: Students in the school's robotics class attempted to program a robot to autonomously navigate through a maze, part of their introduction to various computer science principles and robot assembly.

PHOTOS BY MATT RICKET

The escalating tech cycle

The growing interest in inventing by youths and their growing clout in innovation circles have helped change the way some companies think. “Young, growing companies are seeking the technologies of tomorrow and their creators,” says Lawrence J. Udell. “University students are being romanced to join companies, especially if they are coming out of the engineering schools that have courses on creativity and inventing.”

Technology’s rampant gains and an expanding pool of inventors have had effects on licensing. Companies’ once-intractable stance on accepting outside submissions has begun to soften, with many now soliciting outside ideas and inventions in their best interests.

There is an almost poetic symmetry to technology’s role in inventing. Technology is the creation of inventors, who then benefit from technology’s role in fostering more innovation. Foreman recalls that when his company bought its first 3D printer 10 or 15 years ago, it cost about \$40,000. “Today, a machine with the same capabilities will probably cost \$1,000. Overall, there are more resources available today at a lower cost.”

But technology is not innovative by itself. It is only innovative when it provides real or perceived value for its customer or audience.

“Technology has made it less expensive to build a proof of concept or a minimally viable product,” Foreman says. “It has also made it easier to share your idea with others, whether it be uploading a video or social media. It has made it easier to do business, whether that be in researching patents, whether it be doing market research to determine demand, from the standpoint of development of prototypes to promoting a product.

“Technology is making the innovation process go faster and faster. We’re no longer satisfied with what we bought yesterday.”

Udell reminds that despite the massive technological and cultural changes of the past 100 years and beyond, there is still no secret to being a successful inventor.

The best chance for success, he says, is through commitment—“but needing to know when to stop, reconsider and find a new pathway. You can strive yourself right into bankruptcy if you do not carefully plan, surround yourself with the strength of others that balance your weaknesses and recognize that just maybe, your new idea or invention will never be successful.

“However, if you create one invention, you can go on to create more. Being human is being creative. History has proven this time and time again.”

Join the conversation: Inventorsdigest.com

As a result of the shifting technological dominance to Asia by the end of the 1970s, particularly to Japan, President Reagan also appointed a Presidential Commission on Industrial Competitiveness to determine why America was losing its competitive edge. The commission report issued in 1985 analyzed a massive migration of technology and industry from the United States to Germany, Japan, Korea and other parts of the world. The report concluded that the lack of meaningful intellectual property protection was a principal driver of that outflow of technology and industry, and that corrective action was required.

Poor marks for Trump so far

Today’s systemic problems are two-fold: The federal circuit, which was created to bring stability to patent law, is among those that are destabilizing it. And President Trump has yet to announce any clear vision that acknowledges the need for government to promote innovator-friendly policies.

The federal circuit was created to harmonize patent laws across the United States and act as the chief patent appeals court in the United States. So if the circuit declines to provide stability in uncertain, unstable and evolving areas of the law, the court is not living up to the reason it was created. If the circuit does not recognize that patents are important property rights that must be presumed valid and adjudicated to be valid in all but the most extraordinary cases, the Federal Circuit has become no different than the Supreme Court and other federal courts from the 1960s and 1970s.

For unknown reasons, President Trump has allowed Michelle Lee to continue as undersecretary of commerce for intellectual property and director of the USPTO. In her speeches, Lee has used the famous quote from Thomas Jefferson that is often referred to by infringers to justify the stealing of intellectual property as victimless. Jefferson wrote: “He who receives an idea from me, receives instruction himself without lessening mine; as he who lights his taper at mine, receives light without darkening me.” Patent owners find this fundamental disrespect difficult to accept.

As we know from the 1980s, a strong patent system was the primary driver for the economic achievements that unleashed American enterprise and allowed the United States to compete on the world stage. It worked then to address what was a similarly difficult time, and it will work today. Of course, that will require real leadership and cooperation from a federal circuit that was created to address this problem.

Conclusion

The darkness of the 1960s and 1970s gave way to the strong foundations built in the 1980s and 1990s. Things will turn around eventually; the only question is when.

With China outspending the United States on late-stage innovation, the political environment of the early 1980s could be closer at hand than many people realize. We can only hope that will cause our elected leaders to envision the same future that was seen as possible when a strong patent system was understood to be the foundation of great economic promise and technological advancement.

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.



After the Idea, Think Marketing

FOLLOW THESE EARLY STEPS TO INCREASE
YOUR ODDS OF SUCCESS **BY JOHN G. RAU**

So what makes your invention idea marketable? If it's just an idea, it has no marketable value.

The product that the idea is converted into is what is potentially marketable. Its marketability will be based on successful demonstration that the invention works, and that enough people want it and are willing to pay for it. Consider these marketability steps as your new product moves through its early lifecycle:

Assess

When you start with an idea, conduct an initial assessment as to whether your product or service concept addresses a problem that needs a solution. The marketability of your product will depend upon how many people have that problem and how many are willing to pay for that solution.

In order to be marketable, your invention must have features and benefits that will enhance the lives of your target customers. When the consumer can clearly see the need for your product, its marketability is that much greater. Getting answers to the following types of questions will help in your marketability assessment.

Is there anything else out there that does the same thing?

Is your invention totally new?

Is it potentially global?

Is it the best solution possible?

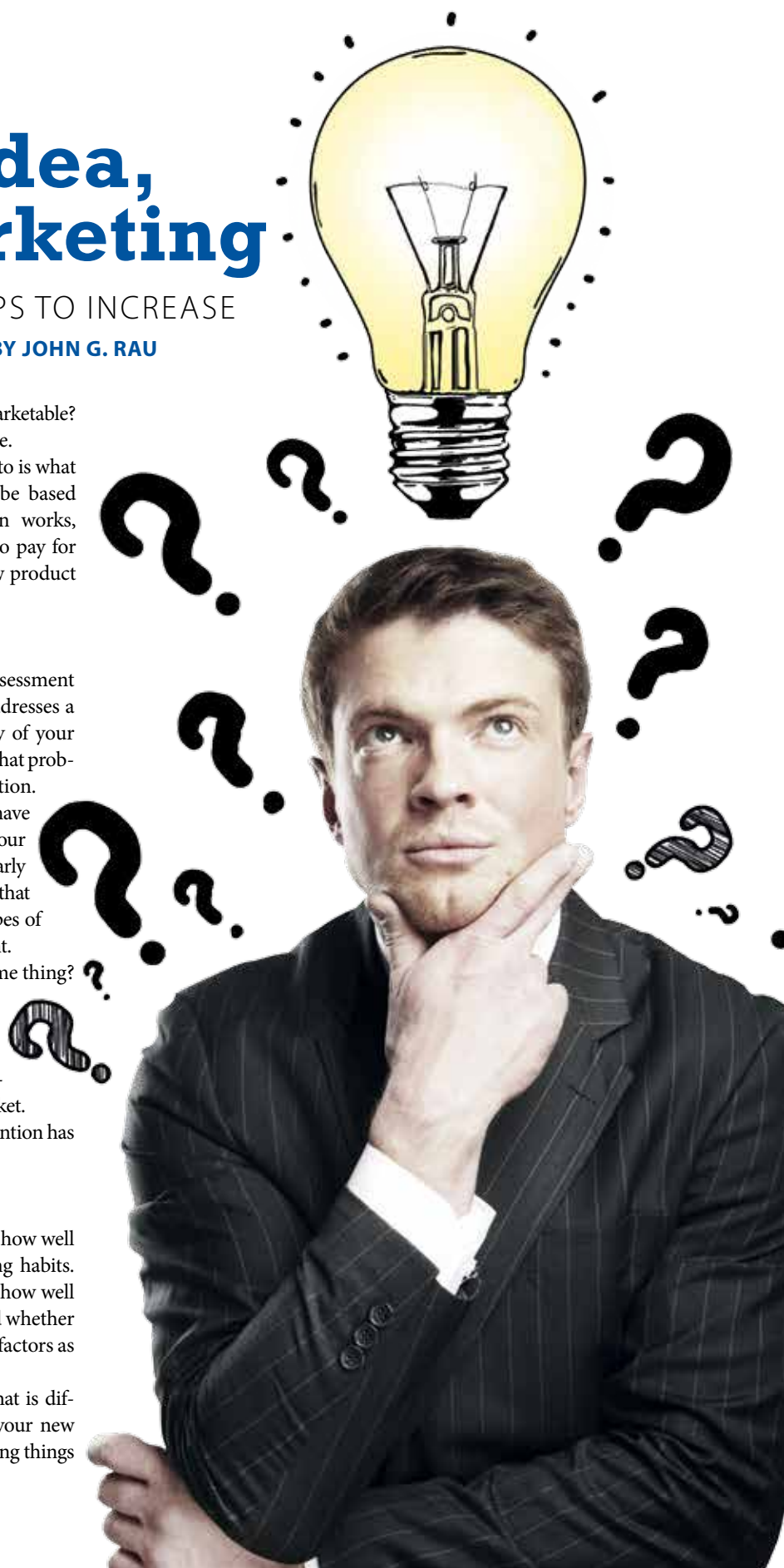
You must determine and understand your product's niche—specifically, where it will fit in the market.

The bigger the market, the more potential your invention has for success.

Factor in the competition

Whether the target customer will buy depends on how well your product invention fits the customer's buying habits. The size of your target market, your competition, how well your product stands out from the competition and whether you have found a unique niche are all influencing factors as to whether your new product is marketable.

The average person won't invest in a product that is difficult to use or understand. Generally speaking, your new product must be focused on convenience and making things



easier for your targeted customers. Novelty alone may mean nothing if your new product idea does not have good commercial potential. It has to be one that people will prefer to competing products.

Conduct a preliminary patent search

Doing this before actually applying for a patent will not necessarily give you information regarding the potential marketability of your new invention, but the results can provide some guidance as to whether you might be infringing on someone else's protected idea before deciding to further develop your new product.

Remember that many products in the marketplace most likely were never patented; thus, because of similar products already in the marketplace, you might not be able to get patent protection. However, that doesn't necessarily mean that your new product isn't marketable.

Think patent

If your product idea is patentable, considering filing for a patent. Receiving one could enhance the marketability of your invention.

A patent can add intangible value to your new product, even if that does not necessarily increase the chances of commercial success. To potential customers and potential licensing candidates, knowing that your product is patented can increase its stature in the marketplace. Having a patent is often perceived as an indication that a product is innovative and exclusive.

Additional legal steps you could consider to enhance this value of your new product include the use of copyrights, if applicable, to protect any form of artistic expression, and the use of trademarks to protect identifying features such as brand names. A new product with patent protection and both registered copyright and trademark protection is potentially very marketable to licensees and investors.

Demonstrate, and convincingly

Remember that "demonstrations sell technology." If you can show that your invention works as advertised—that is, you have a working prototype—you increase the chances of its marketability.

A working prototype allows you to test and check your invention to ensure that it's flawless before showing it to potential customers, licensees and investors. Nothing will demonstrate your new product better than a prototype, which speaks louder and more completely than drawings, written descriptions and photographs.

Remember that "a picture is worth a thousand words, but a prototype is worth a thousand pictures." A video of your prototype demonstration that shows consumers how to use your product can be convincing evidence to support your marketability claims.

Novelty alone may mean nothing if your new product idea does not have good commercial potential. It has to be one that people will prefer to competing products.

Strive for a perfect price

Inventors can usually make money from their inventions via licensing to someone, selling the invention outright to investors or manufacturing and marketing the invention themselves—but the key to commercial success is the product's selling price. The right price ensures a reasonable profit while making the product more attractive to target customers and the market as a whole. Products that are not priced to match what consumers are willing to pay will have no marketability.

In summary, product marketability determines whether your new invention product has what it takes to make it. You may have read in this magazine that documented statistics indicate fewer than 5 percent of all new ideas and patented products achieve success in the marketplace. Being aware of what it takes to make your new idea marketable will increase your odds of success. 📦

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.





This hybrid gear box from the "guts" of a music box contains a bevel gear (hidden), spur gears and a worm gear all in the same gear train.

PART 2 OF 2

Putting Hidden Gears to Work for You

KNOW THE DIFFERENT TYPES, AND THE POSSIBILITIES THEY PRESENT IN PROTOTYPING **BY JEREMY LOSAW**



Different sizes of bevel gears.

Gears tend to be shy, but they have a bold impact on inventing.

We are around gears every day, but rarely do we get to see them. They are usually hidden under the cloak of a protective shell or housing deep inside a product or mechanism. There is good reason for this.

Often gear trains, such as in the transmission of your car, need constant lubrication to run cool and friction free. It also important to keep debris away from gear trains to avoid undue wear, or cause the gear teeth to lock up or break. But the fact that we rarely get to see gears in action can make it harder for us to understand and appreciate them.

PHOTOS BY JEREMY LOSAW

Many different types of gears are used to transmit power in the devices we use. In Part 1, I talked about some basic principles of gears, focusing mostly on the standard spur gear. Part 2 will reveal some of these different types of gears and how they are used. I will also discuss ways to prototype innovations with gears, giving you tools to deploy them in your own prototypes.

Types of gears

- **Straight Cut Spur:** Spur gears are the most common type and the one most people picture when discussing gears. These gears have equally spaced, triangular-shaped teeth around the circumference of a circle. Most spur gears have teeth on the outside of a shaft, but they can also be formed on the inside bore of a shaft. In this instance, they are called internal spur gears.
- **Helical:** These are dry-fixed spur gears with teeth that twist along the axis of the gear like a candy cane. This allows the teeth to engage more gradually, which reduces stress on the gears and makes them run smoother. They are more expensive to produce than straight spur gears and thus usually reserved for high-precision devices. They are common in automotive gear trains, where efficiency and longevity is a priority.
- **Bevel:** These gears have teeth with a conical profile and mesh together at an angle. They are used when needing to change the drive direction in a gear train. Bevel gears are sometimes found on old hand-cranked drills and egg beaters.
- **Worm:** Worm gears employ a modified spur gear that is driven by a helical worm gear. This allows for high gear ratios with just two gears. A drawback: They can be inefficient due to the nature of the motion. They can also be used to change the drive direction in a gear train by 90 degrees.

Alternative Gear Trains

Some types of gear trains employ gears in a unique way, to achieve desired torque or motion requirements. A few interesting gear train arrangements outside of the standard and compound gear trains discussed in Part 1:

- **Planetary:** These are a great way to get a high gear ratio in a small amount of space with spur gears. In this configuration, a sun gear, which is driven by a motor, is surrounded by a number of planet gears. The planet gears are in turn surrounded by an internal spur gear called a ring gear. As the sun gear rotates,

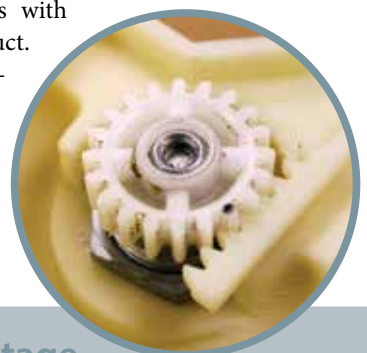
the planets walk around the inside of the ring gear, reducing speed and magnifying torque.

- **Rack and pinion:** Some applications require linear motion at the output instead of rotation. A rack and pinion uses a circular pinion gear meshed with a rack, which uses the same triangular cut gear teeth arranged in a straight line. This gear arrangement is often found in vehicle steering systems.
- **Hybrid:** These are gear trains that use a mix of different types of gears. You can design infinite configurations. Hybrid gear trains are used to exploit the advantages of the different types of gears to generate the desired motion.

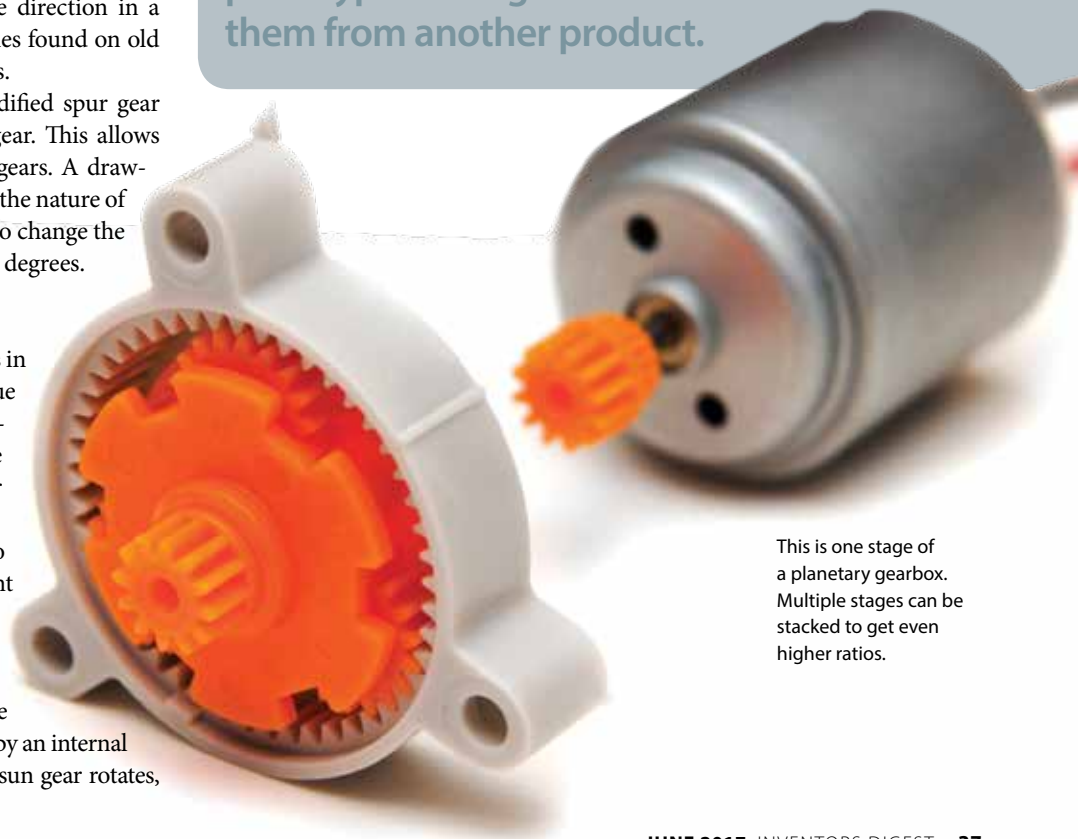
Prototyping a gear train

The best way to do early-stage prototypes with gears is to harvest them from another product. Gearboxes can be hacked out of servos, cordless drills, printers, or from toys. My favorites are the hobby gearboxes made by Tamiya. They have a number of different styles such as compound, worm gear and planetary arrangements. They are easy to build, come with their own motor, and often have many

A rack and pinion gear is deployed in this prototype.



The best way to do early-stage prototypes with gears is to harvest them from another product.



This is one stage of a planetary gearbox. Multiple stages can be stacked to get even higher ratios.



Above: The Tamaya gearbox sets are a cheap way to get smooth-running gears for prototypes.

Right: Straight cut gears are shown inside the gearbox of an R/C car.

gear ratio configurations in the same housing—all for \$10-15 from online retailers.

Custom gears may be required later in the prototyping process, which is where it gets a little tricky. Gears are hard to machine, so it is best if they can be sourced from a gear supply company such as Stock Drive (sdp-si.com) or McMaster-Carr. If they cannot be sourced and the tooth pattern is big enough—such as 32 pitch and bigger—they can be cut on a laser or water jet cutter with decent enough accuracy.

3D printing is an option, but you have to be careful with the type of material being used. SLA printing is accurate enough to make well-formed gears, but the material is not tough enough to withstand many cycles. The SLS 3D printing process uses tougher materials, but the resolution can be too coarse for small gears. Metal printing (DMLS) is a great 3D printing option,



but it is also one of the most expensive and should be a last resort.

The most important consideration when assembling your gear train is to properly space the gears. When assembled properly, there should be a little bit of play between each set of gears. This allows them to run smoothly at top speed and keeps them from binding. If you assemble the gear train and it is really noisy, you likely have the mesh too tight and need to rebuild it with the correct spacing.

Now that you know what gears are and what they do, it is time to start experimenting. In his tome “Zen and the Art of Motorcycle Maintenance,” writer/philosopher Robert Pirsig wrote: “The Buddah resides as comfortably in the circuits of a digital computer or the gears of a motorcycle transmission as he does at the top of a mountain.” Gears are an integral part of our world and may be an important part of your next innovation, too. 🛠️



Worm gears were in an electric rear view mirror from my Hyundai Accent. Thanks for busting it off, neighbor.



Enough with Bogus Claims of Patent Abuse

'CHICKEN LITTLE' COMPLAINTS HURT INNOVATION, DRIVE AWAY INVESTORS **BY GENE QUINN**



It is becoming tiresome to hear companies complain about patents while making wild, misleading, egregiously false claims of patent abuse. I realize that making these claims captures headlines, the attention of the popular press, and interest from some members of Congress who seem hell-bent on enacting the patent agenda of the infringer lobby. As it turns out, however, patents are not the root of every evil in the world—and just because some misguided CEO thinks patents are the problem doesn't mean that they are.

Increasingly, the target of those seeking to mislead through PR subterfuge are what are known as standard-essential patents (SEPs). The complaints about SEPs are never really about patents at all. That doesn't stop those who have made a career out of vilifying patent owners, and patents in general, from going to a very old, tired playbook in an effort to deceive. Still, no matter how much they want to pretend that their grievance is about patents, it will never change the truth.

So let's shine a spotlight on the truth.

Complaint is a contract issue

On April 20, a group of auto and technology companies sent a letter to President Trump, urging him to direct the Federal Trade Commission and other U.S. agencies to do something "to address patent abuse involving standardized technologies." The letter explains that these are vital to the "nation's innovation and economic development."

There is no patent abuse occurring with respect to standard-essential patents. Anyone who says otherwise is either grossly misinformed or has an agenda.

There is no patent abuse occurring with respect to standard-essential patents. Anyone who says otherwise is either grossly misinformed or has an agenda.

So, what is going on that has these companies all hot and bothered? They are complaining about a contract issue, nothing more. They parade around their complaints as patent abuse in an attempt to deceive and make it more likely the government will want to step in and tip the balance with an agency finger on the scale. After all, if it were a private contract matter, it would be much more difficult to get the federal government to pick a side. So these companies decide to grossly misrepresent the heart of the problem and pretend it is something that it is not.

"We are concerned that the entire concept of open standards could collapse if SEP abuse continues to proliferate, and we're urging the White House to take this threat to innovation and the American economy seriously," said App Association President Morgan Reed in a press release.

"The letter's signatories own more than 100,000 patents and believe strongly in the value of intellectual property, but the issue here is companies who voluntarily committed to license their patents under fair, reasonable, and non-discriminatory terms who are reneging on those promises."

The salient point: Reed admits this issue has nothing to do with patents; rather, the claim is that certain companies that own patents "voluntarily committed to license their patents," and those companies are allegedly "reneging on those promises." By his own admission, this is not a patent problem. It is not a form of patent abuse.

A larger damage

At its core, the grievance complained about and paraded around as patent abuse relates to a broken promise to license on certain terms. This is more than crying wolf. Such false claims unnecessarily harm the U.S. economy because they continue to weaken patents, which drives away investors.

If those companies and industry groups that signed this letter sent to President Trump are really supportive of the U.S. intellectual property system, as they claim, and believe in the value of strong patents, as Reed suggests, they will stop misleading everyone about the genesis of their grievance. At a time when the United States is falling behind China in innovation, Chicken Little-type claims of patent abuse must stop. ☒



USPTO Conflict Rules Called Into Question

PTAB JUDGE DECIDES CASES INVOLVING FORMER DEFENSE CLIENT
BY GENE QUINN

It is hard to imagine that a federal judge appointed for life under Article III of the United States Constitution would preside over a case in which one of the litigants was a former client. The Code of Conduct for Article III judges of the United States has specific provisions that would seem to prohibit this.

Some may argue that if enough time passes, such a conflict requiring disqualification would subside or even be moot. But after what length of time? Certainly not after 18 months.

As first reported by Steve Brachmann on IPWatchdog.com, Administrative Patent Judge Matt Clements represented Apple as patent infringement defense counsel up to his appointment as an APJ in March 2013. So far we have identified 17 final written decisions in which Apple was the petitioner and Clements sat on the Patent Trial and Appeal Board panel assigned to the case, with Clements authoring four of those decisions.

Lapse in judgment

The earliest decisions we have found in which Clements participated in Apple petitions are a series of Covered Business Method initiation decisions made in September 2014, just 18 months after he left private practice and joined the PTAB. These proceedings were filed in April 2014 and obviously assigned to Clements well before the institution decisions were made public.

Since the start of fiscal year 2015 up to this writing, there had been 4,624 post-grant challenges filed at the United States Patent and Trademark Office. (The PTAB is an administrative law body of the USPTO that decides patent issues.) Apple is the largest filer of post-grant challenges, but during the roughly 3 ½-year period from the start of fiscal year 2012 to the beginning of 2016, Apple filed 252 of those.

There is no reason that the PTAB had to assign Clements cases in which Apple was a petitioner seeking to invalidate patent rights. There were literally thousands of other cases on which Clements could have sat without any real or perceived conflict of interest.

Some have started to defend Clements' actions based on their belief that the decisions rendered were legally correct. This misses the point entirely. Judges are supposed to act such that there can be no question with respect to their impartiality; even a hint of impropriety is to be avoided at all costs. Clements' participation as a judge in petitions brought by a former client so soon after he represented that client is an egregious lapse in judgment by someone.

If an APJ making decisions in a case within 18 months of having represented a former client complies with whatever USPTO conflict guidelines apply to PTAB judges, the USPTO conflict guidelines must be changed.

Code of Conduct

Canon 2A of the Code of Conduct for Article III judges, under the title "Respect for Law," says: "A judge should respect and comply with the law and should act at all times in a manner that promotes confidence in the integrity and impartiality of the judiciary." The commentary that goes along with Canon 2A begins by tackling the issue of an appearance of impropriety. The comment, in relevant part, reads:

"An appearance of impropriety occurs when reasonable minds, with knowledge of all the relevant circumstances disclosed by a reasonable inquiry, would conclude that the judge's honesty, integrity, impartiality, temperament, or fitness to serve as a judge is impaired. Public confidence in the judiciary is eroded by irresponsible or improper conduct by judges. A judge must avoid all impropriety and appearance of impropriety. This prohibition applies to both professional and personal conduct. A judge must expect to be the subject of constant public scrutiny and accept freely and willingly restrictions that might be viewed as burdensome by the ordinary citizen."

Canon 3C of the Code of Conduct for Article III Judges, under the title "Disqualification," reads in relevant part: "A judge

shall disqualify himself or herself in a proceeding in which the judge's impartiality might reasonably be questioned..."

In the situation where there is not a per se disqualification under Canon 3C—such as for personal bias, a judge serving as a lawyer in the same controversy, or the judge or a family member having a financial interest—the judge may disclose the reason disqualification would seem appropriate under Canon 3C and leave it up to the parties to decide. In this situation, however, the rules are very specific.

The judge may participate in the proceeding if, after that disclosure, the parties and their lawyers have an opportunity to confer outside the presence of the judge; all agree in writing or on the record that the judge should not be disqualified; and the judge is then willing to participate. The agreement should be part of the record of the proceeding.

Administrative Patent Judge Matt Clements represented Apple as patent infringement defense counsel up to his appointment as an APJ in March 2013. So far we have identified 17 final written decisions in which Apple was the petitioner and Clements sat on the Patent Trial and Appeal Board panel assigned to the case.

Of course, a federal judge could (and perhaps should) conclude that adjudicating a matter involving a former client creates a personal bias, which creates a per se disqualification. If that is not the case, the parties would have to be notified and given the opportunity to discuss outside the presence of the judge. If—and only if—all parties agree in writing, the judge can continue on the case.

Unlike federal judges who have a specific Code of Conduct that is available for everyone to see, there seem to be no similar public Code of Conduct rules that govern administrative patent judges at the PTAB. I understand that there is an internal set of guidelines that govern conflicts of interest, and there is a two-year bar under those internal USPTO conflict guidelines. Assuming that is true and there is a two-year bar, Clements' participation in at least several of Apple's petitions seems to have violated even an exceptionally lenient internal USPTO conflict guideline by participating in cases involving Apple less than 2 years after he was representing them as defense counsel.

My guess is that most patent owners would be adamantly opposed to PTAB judges deciding petitions that challenge patents brought by their former patent infringement defense clients. ☹

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A Chance to Eliminate Dead Weight

INEFFECTIVE PATENT EXAMINERS SHOULD BE TARGETED IN WORKFORCE STREAMLINING

BY GENE QUINN

In April, Office of Management and Budget Director Mick Mulvaney sent a 14-page memo to Executive Branch leaders detailing how to implement President Trump's plan to reduce the size and scope of the federal government.

The memo, titled "Comprehensive Plan for Reforming the Federal Government and Reducing the Federal Civilian Workforce," explains that President Trump plans to "create a lean, accountable, more efficient government that works for the American people." It says that streamlining the federal government might "include merging agencies, components, programs, or activities that have similar missions." One very specific way the memo explains the process is through each agency pursuing a long-term workforce reduction.

The memo leaves no question as to whether this is a request or an order. When agencies submit their fiscal year 2019 proposed budgets to the White House this fall, "agencies will submit their proposed Agency Reform Plans to OMB."

Assuming that the United States Patent and Trademark Office follows the directives of the Mulvaney memo, it is clear what should happen. In pursuing President Trump's federal workforce reduction plan, the USPTO must target those patent examiners who have long been refusing to do their jobs. Losing these patent examiners to a workforce reduction will cut the "dead weight" from the office with no loss of productivity.

System is dysfunctional

The memo also instructs agencies to "take near-term actions to ensure that the workforce they retain and hire is as effective as possible." In order to accomplish this, the agencies are instructed to "determine whether their current policies and practices are barriers to hiring and retaining the workforce necessary to execute their missions..."

The government has an outdated civil service system that fails to hire the best, brightest and most qualified employees.

Anyone familiar with the way the USPTO hires patent examiners knows that hiring practices are not aimed at hiring those who are most qualified for the job, or who are most likely to be quality patent examiners. Most of the absurdity associated with hiring practices is not the fault of the USPTO but the federal government.

The government has an outdated civil service system that fails to hire the best, brightest and most qualified employees. The system, implemented through USAjobs.gov, only allows agencies to interview those who score the highest on a written application submitted online. Points are given for previous federal work experience or military experience, regardless of whether it is relevant to the job for which application is being made. Similarly, points are given to minorities and those with disabilities, again without regard to job suitability. Thus, the perfect applicant for a position who has never been employed by the federal government, who is not a minority and who is not disabled can and does easily score fewer points than someone without the best, most appropriate background, training, and experience for a position.



The solution is easy, although it would be a philosophical change of mammoth proportions. Eliminate points on the USAJobs.gov application for anything that does not directly relate to qualifications for the job in question. That would instantly, and rather dramatically, raise the quality of hires at the USPTO.

Another solution would be for the USPTO to hire only those fluent in English to be patent examiners. As crazy as it sounds, patent examiners are hired by the USPTO who struggle mightily with the English language. This is the largest single complaint I hear from patent professionals about patent examiners. It boggles the mind how a patent examiner who will be required to correspond in writing and speak verbally with applicants and their representatives can be employed for a position when he or she is not fluent in English, the official language of the office.

Who should be targeted

This said, the USPTO must target for workforce reduction:

1. Patent examiners who have not issued patents in years (there are many). Their absence will not cause any hardship on the agency.
2. Art Units with single-digit allowance rates, of which there are more than a few. Art Units such as 3689 have such low allowance rates that closing it and other similarly situated Art Units, as part of a workforce reduction plan, would not cause any hardship to the agency.
3. Patent examiners who are known to have gamed the system and who submit falsified time records. Although the inspector general's report did not identify these examiners, it appears as though 5 percent of the examiner workforce has been submitting questionable, if not fraudulent, timesheets.
4. Patent examiners who are unable to pass English language fluency screening. Although many of these examiners may be technically competent, it is unfair to applicants to be assigned an examiner who is not fluent in the language of the office.

The Mulvaney memo instructs agencies to "consult with key stakeholders including their workforce" when developing their workforce reduction plans. Hopefully, the USPTO will follow Mulvaney's recommendation and hold the typical roundtable stakeholder meetings across the country, or at the very least at their headquarters in Alexandria, Virginia. ☐



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Remarks on PTAB Fees Give Mixed Signals

ARE PATENT OWNERS SUBSIDIZING ADMINISTRATIVE LAW ARM OF USPTO? **BY GENE QUINN**



On May 4, Undersecretary of Commerce for Intellectual Property and Director of the United States Patent and Trademark Office Director Michelle Lee gave introductory remarks to the quarterly meeting of the Patent Public Advisory Committee at USPTO headquarters in Alexandria, Virginia. In prepared remarks, Lee said the office must significantly raise Patent Trial and Appeal Board fees in order for the PTAB to be self-sustaining.

Lee's acknowledgement that the PTAB is not self-funding is significant, but her comments dramatically underplayed what seems to be really happening: that patent owners and patent applicants are subsidizing the PTAB.

Lee characterized possible fee increases as modest, with one exception. She explained:

"Although it is not final, I can tell you the proposed fee increases are relatively modest. ... There is one exception to the modest fee increase, and that is in the area of PTAB fees. We believe there should be full-cost recovery for all costs associated with PTAB trials as they were intended under AIA (the America Invents Act). We have done a good job over the past several years ensuring that our fees generally covered costs. But we do need to raise PTAB trial fees to ensure that these trials are self-funding on a going-forward basis."

Saying that the office has "generally covered costs" is an admission that the PTAB has not always operated on a cost-neutral basis. A closer look at the numbers shows more problems.

Confusing indicators

Before looking at the numbers, there is an obvious disconnect between what Lee said and the office asking for substantial PTAB fee increases. If the office has charged fees that are high enough to generally cover costs, what is the justification for a substantial fee increase? It has been known for some time that the PTAB was operating in financially troubled waters. Therefore, the characterization that the office has been generally able to cover PTAB costs with fees is, at best, a stretch. At worst, it isn't true.

In its fiscal year 2016 annual report, the USPTO explained that fee increases would be required so the office could recover the aggregate costs of PTAB operations: "On October 3, 2016, the USPTO issued a notice of proposed rulemaking (NPRM) to set or increase certain patent fees, as authorized by the AIA. The proposed fees will allow the USPTO to recover the aggregate estimated cost of Patent and Patent Trial and Appeal Board (PTAB) operations and USPTO administrative services that support Patent operations."

However, the notice of proposed rulemaking published in the Federal Register by the USPTO last October 3 seems to tell an entirely different story—one that readers have to put together for themselves. Not only has the office not been covering the costs of

PTAB trial operations, but the significant fee increases will still not cover the costs of those operations. Even if the significantly increased fees were to go into effect, those fees will still be below fiscal year 2015 costs.

This issue is illustrated in a data table provided by the office that was included in the notice of proposed rulemaking. For example, the table shows that the proposed fee for an inter partes review challenging up to 20 claims filed by a large entity would raise \$5,000 to a total of \$14,000. (Inter partes review is a PTAB procedure for challenging the validity of a U.S. patent before the USPTO.) But according to the office, the fiscal year 2015 costs associated with that line item were \$22,165—meaning that for every such request, the office was running a deficit of \$13,165. Even with the substantial fee increase, the office would still run a deficit of \$8,165.

Not only has the USPTO not been covering the costs of PTAB trial operations, but the significant fee increases will still not cover the costs of those operations.

Deficit will continue

IPR filings have been extremely high, with 1,737 petitions filed in FY 2015 and 1,565 petitions filed in FY 2016. So it's easy to understand the significant financial woes of the PTAB. It seems the PTAB has been operating at a substantial deficit for some time; even with significant fee increases, the office continues to plan to run PTAB trials at a deficit.

In order to operate the PTAB, the office has been required to divert funds from other operations to fund PTAB operations. In simple terms, that means patent owners and those applying for patents have been subsidizing and will continue to subsidize the PTAB and the infringers who seek to destroy their patents in front of the PTAB death squad.

Also: If the PTAB is in such dire financial straits, why is the office refunding petition fees? The notice of proposed rulemaking continues to promise that the office will "refund the post-institution fee if the IPR proceeding is not instituted by the PTAB." Why?

Patent owners are getting the short end of everything. Petitioners are allowed to file challenge after challenge against the same patent and patent owners. If challenges are not instituted, they get a refund, and the patent owner continues to get legal bills and harassed.

It is hard to believe that a tribunal like the PTAB is operating in the United States of America. ☹

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Nervous tension, man's invention
Is the biggest killer that's around today
Let the tension out or it will build and build inside
And strike you

—"National Health," the Kinks

How could I forget to mention
The bicycle is a good invention
Sitting there in a silent movie
Beside the only girl who ever really moved me

—"Bicycle Song," Red Hot Chili Peppers

Wunderkinds

Robert Patch didn't peak as a 6-year-old: He later married, had a son and built a roofing business. But being the youngest person to ever receive a U.S. patent—54 years ago, on June 4—is impressive. Patch was a 5-year-old in Chevy Chase, Maryland, when he designed a toy truck that could be taken apart and reassembled in different configurations. He told Southern California Public Radio on the 50th anniversary of the patent that the original design utilized some shoeboxes, bottle caps and nails. He didn't know how to write his name, so he signed the patent application with an X. His father was a patent attorney.



What IS that?

The Hammacher Schlemmer **Pet High Chair** clips securely to tables that are up to 2 inches thick, has an adjustable height feature, and can hold pets weighing up to 10 lbs. The chair folds for storage and travel—just in case you want to try this in a restaurant. (If you do, we want to watch.) Alas, the HS website says "We regret that this item is no longer available."

10.4 million

The number of **residential swimming pools** in the United States, according to the Association of Pool & Spa Professionals. There are 309,000 public pools. The state with the most pool-service companies per capita is Arizona, with Connecticut and New Hampshire ranking a surprising fourth and fifth. California is not in the top 10. The heated swimming pool was invented by the Romans in the first century B.C.



WHAT DO YOU KNOW?

1 True or false: The Raggedy Ann doll, invented on June 28, 1917, was based on a character in children's books.

2 The "Eensie Weensie Spider" (or "Itsy Bitsy Spider"), copyright registered by Yola De Meglio on June 7, 1946, was recorded by which artist(s)?

- A) Little Richard B) Carly Simon
- C) Nicole Kidman D) B and C
- E) All of the above

3 True or false: George Washington Carver, who received a patent for a process of producing paints and stains on June 14, 1927, also invented peanut butter.

4 Which of these major sports teams' trademarks was registered first—the Baltimore Orioles (first season, 1954) or the New York Jets (first season, 1960)?

5 William Hadaway was issued the first patent for an electric stove on June 30 of which year:

- A) 1919 B) 1931
- C) 1943 D) None of the above



ANSWERS 1) True; she was created by American writer Johnny Gruelle, who received a patent for the doll in September 1917. Famousdaily.com says "Raggedy Ann is the anti-Barbie: downscale, fiercely unconcerned with image, and with a(n) adventure-filled backstory that Barbie could only dream about." 2) E. 3) False. According to the U.S. National Peanut Board, Carver developed many uses for peanuts but did not invent peanut butter, as many believe. 4) Trick question: Both trademarks were registered on June 27, 1967. 5) D. Hadaway received his patent in 1896. Canadian Thomas Ahearn is widely credited with its invention in 1882.

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