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Chicago's Most Innovative Companies 2020

Check out the ninth edition of our list, compiled in partnership with Ocean Tomo, which evaluates the patents produced each year by local companies and ranks them based on quality.

JOHN PLETZ

Bretford Manufacturing

One of Bretford Manufacturing's charging carts.

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There's no better time than the depths of a global pandemic to step back and think hard about invention and innovation.

Entire industries have been upended by the coronavirus, while others have received a turbo boost. This year's edition of Crain's Most Innovative Companies is full of examples of businesses that have reinvented themselves—often more than once—to adapt to changes and emerge stronger than ever. There are some surprising upstarts that are reinventing existing industries, from consumer electronics to heavy industry, with cutting-edge innovation, especially the internet of things.

This is our ninth edition of the Most Innovative Companies list, compiled in partnership with Ocean Tomo, an intellectual property advisory, investment-banking and consulting firm, which evaluates the patents produced each year by Chicago-area companies and ranks them based on quality.

1. BRETTFORD MANUFACTURING

What it does: Computer charging carts | **Patents last year:** 5

Decades ago, Bretford Manufacturing made the audiovisual carts for film projectors and TVs in schools. Now it's making carts to store and charge laptops. There's been a lot of innovation in between.

The Franklin Park company was founded in 1948 as a contract manufacturer, spitting out everything from hair dryers to barbecue grills, before making its own products.

"We're a U.S. manufacturer with a lot of challenges to compete. The only way we could survive is to innovate," says Chris Petrick, third-generation CEO of Bretford, which employs about 200. "We can't just be a metal bender or durable goods manufacturer. If you do that, you're going to get whipped. We have to use technology to provide value and separate ourselves from the metal box and rolling cart."

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Bretford was good at providing power for AV equipment, and it evolved from carts to furniture, outfitting things like conference rooms and computer labs in schools.

Last year, it received patents for a power strip used in classrooms to allow multiple laptop users to plug in safely from a single outlet, as well as mobile lockers used by schools and companies to recharge and protect tablets and laptops.

The company claims to have begun selling the first commercial charging cart for laptops in 1999. The charging cart almost didn't survive, but then the company landed a partnership with Apple in 2008. The carts have evolved, allowing for machines to be updated automatically and have data wiped between uses. Bretford developed software to allow customers to manage the devices remotely.

The coronavirus has schools focused less on carts needed to haul and store computers on-site, but Bretford is getting a lift from corporate users, such as hospitals and manufacturers. With more employees working from home, its lockers fill a different need: touchless tech support. "If a computer breaks, they can just drop off a computer for a no-touch swap," Petrick says.

2. UPTAKE TECHNOLOGIES

What it does: Data-analytics software for industrial companies | **Patents last year:** 15

Uptake Technologies helps companies keep their equipment running by having a better idea of when it might fail.

Groupon co-founder Brad Keywell launched the company in 2014 using Big Data to improve industrial performance. Uptake uses data captured by sensors on trains, construction equipment, wind turbines, trucks and the like to save companies money by making their machines perform better.

Several of the innovations that landed Uptake on Crain's Most Innovative Companies list are linked to its Radar product, which monitors vast amounts of data coming from sensors on rail cars, trucks and other equipment, applying algorithms to the information.

"We're able to see patterns in data leading up to failure," says Brian Silva, a director of data science at Chicago-based Uptake. "For on-highway trucks, unplanned failures can be very expensive repairs."

The company says it saved one customer \$50,000 engine replacements by recommending \$8,000 repairs. Uptake estimates its software helps customers reduce maintenance costs by as much as \$1,250 a year per truck.

Uptake also developed a way to do virtual load tests on locomotives, rather than pulling them out of service.

"Industrial data is different from other kinds of data," says Dennis Lee, Uptake's deputy general counsel. "There are so many challenges: in gathering it, processing it, then providing it to the customer in a way that's useful."

Uptake, which grew to more than 800 employees in its early days but has shrunk to about one-third of that size, has generated 33 U.S. patents, including 15 granted last year. One of those patents, for determining health scores for equipment or systems, was cited in patents by IBM, Equifax and others.

3. RTC

What it does: Retail shelf display systems | **Patents last year:** 12

Walk into a store, and RTC's innovation is all around you. For decades, the Rolling Meadows-based company has been making retail shelves smarter, sturdier and easier to

stock.

It's one of the top makers of retail displays—customized wood, metal and plastic devices that show off and dispense everything from drink bottles and razor blades to shoes and audio equipment. The company also has been [a top performer](#) on Crain's Most Innovative Companies list for the past five years.

Recent innovations include pushing the internet of things from the loading dock to the store shelf.

"There is incredible pressure on physical retail to become more and more cost- and space-efficient," says CEO Richard Nathan, whose father, Walter, founded the company in 1950 as a maker of cardboard tubes. "Our patents can bring inventory tracking and reporting down to the individual product, which then allows the store to react more quickly to low- or out-of-stock product. Out-of-stocks on a store visit is another sale for Amazon."

RTC received a patent last year on a wireless-communication hub that allows retailers to receive real-time information from sensors on store shelves. The technology, which is related to earlier innovations that included bringing [digital messaging capabilities](#) to the edges of shelves, gives stores the ability to communicate with customers, manage inventory and disseminate real-time video images to deter theft.

"We believe there are countless opportunities to leverage wireless technology, a network of sensors and intelligent software. We don't understand what all of the opportunities are, but we are ready to implement solutions as we figure it out," Nathan says.

Greenlee Tools

4. GREENLEE TOOLS

What it does: Electrical tools | **Patents last year:** 9

Even tools are getting smarter.

Rockford-based Greenlee, a maker of tools for electrical contractors, brought digital technology to the mechanical process of bending conduit, the pipe that contains the electrical wiring in most buildings.

The software takes computer-aided design drawings, or digital blueprints, and translates them into step-by-step instructions for the electrical worker, eliminating manual calculations

and guesswork. Integrating directly with CAD drawings allows contractors to bend conduit in their shops, rather than on the job site.

The digital conduit bender, introduced about 18 months ago, can improve efficiency by 10 to 15 percent, says Rob Trefz, Greenlee's vice president of marketing. It's one of the innovations that landed Greenlee, a business of Emerson Electric, on the Most Innovative Companies list.

"The whole tool industry is becoming much more active in the patent space," says James Malackowski, CEO of Ocean Tomo, a patent-valuation and intellectual property advisory firm that evaluated the patents and ranked the companies on Crain's Most Innovative Companies list. "You're buying more complex systems when you buy tools."

Greenlee was founded in 1862 as a barrel maker but eventually found itself in the woodworking-tools business, inventing the hollow chisel for mortising. Products soon included tools for making holes in metal for electrical applications, as well as conduit benders and wire and cable pullers. It added fish tapes, crimpers and cutters, as well as installation and test equipment.

It's still in the business of making holes. The company received a patent last year for a redesign of a popular multipurpose drill bit, improving its cutting speed by reformulating the alloy and its coating. The new product will hit the market soon.

Hollister's headquarters.

Hollister

5. HOLLISTER

What it does: Medical products | **Patents last year:** 18

Making a product that works is hard enough, and making it disposable is sometimes harder than making it last. Making a product that does both is where the real innovation comes in.

Hollister, a medical-products manufacturer in Libertyville, makes its [second straight appearance](#) in the Top 10 of Chicago's Most Innovative Companies list. Among the most innovative of its 18 U.S. patents issued last year are advances in catheters, including one that's flushable.

"We're trying to make the experience for the customer better and easier: an extension of that is making these products more sustainable from an environmental standpoint," says Seamus Fitzpatrick, Hollister's senior director of research and development. "When the catheter is used, the idea that it doesn't leave as much material behind and add to the amount of waste, that's a game-changer."

Hollister researchers worked on the problem for several years. "It took a tremendous amount of trial and error," Fitzpatrick says. "The level of chemistry and materials you use are a lot more sophisticated so that they remain functional to work as a catheter but disintegrate when you flush it down the toilet."

Hollister was founded in 1921 as a printing company, but it reinvented itself as a medical-products maker. The company is owned by its roughly 4,500 employees.

"New products are the lifeblood of Hollister," says Paola Wisner, vice president of R&D. "One of the beauties of being a private company is we're not being held to the quarterly results that public companies are. It enables us to make decisions for the long term, even when times are difficult, like we're seeing right now in a pandemic. Sometimes the best innovation comes in difficult times."

Flexterra

6. FLEXTERRA

What it does: Flexible electronics | **Patents last year:** 9

The key to fulfilling the promise of wearable electronics is to make them flexible.

Flexterra, a Skokie-based startup, earned patents last year for bendable displays, flexible circuitry and other materials that can be used in wearables. Some devices are flexible, but their electronics aren't, making them less durable. Flexterra solved the problem with chemistry, coming up with a way for new, more flexible materials to carry an electrical charge.

The company traces its roots to Polyera, which spun out of the lab of Tobin Marks, a chemistry researcher at Northwestern University and a [prolific inventor](#).

Flexterra, which has 20 employees, licenses its technology to companies that make electronics. But it declines to name the customers or describe the specific products.

"Wearables and smartwatches is one of the key areas of application of our technology, but we are also collaborating on multiple industrial applications where flexible and/or highly robust displays are required, such as integration of displays into tracking items and inexpensive circuits for sensors," says Antonio Facchetti, Flexterra's chief technology officer and an adjunct professor of chemistry at Northwestern.

Mondelez

7. MONDELEZ INTERNATIONAL

What it does: Snack foods | **Patents last year:** 28

When it comes to developing snack foods, innovation comes in many forms. There's the flavor, texture and packaging.

But it's not just about what the consumer can see and taste: It's about how it makes them feel.

Mondelez International received 28 patents last year, including one for its BelVita breakfast biscuits, which got their start in Europe and launched in North America in 2012. The biscuit contains specific starches and other ingredients that allow it to release energy into the body for four hours after it is consumed.

Though Mondelez is best known as the maker of Oreos, it has been delving deeper into wellness snacks in an effort to respond to consumers' desire to eat healthier.

The Chicago-based company has rolled out several healthy snacking brands in recent years and is working on more, says Brigette Wolf, head of SnackFutures Innovation at Mondelez. The U.S. is a hotbed of innovation surrounding well-being products.

"This is where we're now seeing what else can we develop for customers here."

The team launched several new brands last year. Ruckus and Co. is designed for kids with products like smoothies that are made from simple ingredients. Dirt Kitchen Snacks, with air-dried veggie and nut mixes, aims to satisfy the demand for quick vegetable-based foods. And CaPao, a plant-based snack, uses often-wasted parts of the cacao fruit, from which chocolate is derived.

Healthy snacks offer an important opportunity for Mondelez, says Darren Tristano, CEO of Chicago-based research and consulting firm Foodservice Results. "We seem to be moving toward a culture of grazers. As a result, the healthier foods are becoming more and more prominent and attractive to customers." —*Ally Marotti*

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Fortune Brands

8. FORTUNE BRANDS HOME & SECURITY

What it does: Cabinets, doors, plumbing and security products | **Patents last year:** 10

For the past five years, Nicholas Fink has been on a mission to transform Fortune Brands Home & Security—a staid maker of faucets, cabinets, doors and locks—from analog to digital.

Today, you can talk to your faucets. But the real innovation is behind the scenes: in a digital valve that can cut water usage 50 percent in a shower, or an algorithm that can detect a small water leak or a catastrophic failure—and shut off the main automatically.

A padlock controlled by a smartphone can give a neighbor or a UPS driver one-time access to a storage shed for a specified time. A lockbox controlled with a smartphone can point users to within a foot of its location. Your front door is about to get smarter, too.

Deerfield-based Fortune Brands introduced its first Bluetooth-connected padlock five years ago. Last year, it received patents for security features that authenticate users' identities, as well as camera integration.

"Moving a portfolio this big, a \$6 billion company, from analog to digital has been exciting," says Fink, whose company won five Best of Show awards at the Consumer Electronics Show this year. "At the Kitchen & Bath Industry Show, we won Best of Smart Home two years in a row," he says. "We beat out LG. We beat out Samsung."

Fink, who previously ran the Moen business and became CEO in January, is giddy about a voice-controlled faucet. "In April, we rolled out a COVID hand-washing update that gives you a precise temperature for 20 seconds. It's the first time we'd had a software upgrade to a hardware product in response to something happening in the world—kind of like a Tesla. It's unbelievably cool we could do that."

The wow factor doesn't come cheap or easy. "It was a huge investment," Fink says. "We've had to significantly boost our digital and electronic engineering hires."

But the payoff is potentially big and long lasting. "These are platforms, whether it's security or it's plumbing. Now we could control water digitally," Fink adds. "It's allowed us to roll out kitchen faucets, control the main, then how the main will interact with your kitchen faucet, your shower—even detect what might be happening with your sump pump."

ISCO International

9. ISCO INTERNATIONAL

What it does: Wireless communications software | **Patents last year:** 19

Wireless carriers are scrambling to keep up with our ever-increasing dependence on smartphones. One way is to build new networks. Another is to make them more efficient.

That's where Isco's software comes in. Its algorithms help streamline the links between cellular towers and phones, cleaning up interference and allowing networks to handle more traffic and do it more efficiently. By automating the process with artificial intelligence, networks can be adjusted on the fly, which has proved particularly helpful since the COVID-19 pandemic began.

"One of the challenges for carriers is the pattern of traffic has changed from driving back and forth to work," says Amr Abdelmonem, the company's chief technology officer. "Now it's all day long. Users are in different locations than before."

Wireless communication is complicated, fast-changing technology, which is why Schaumburg-based [Isco has been a regular](#) on Crain's Most Innovative Companies list.

One of the big challenges facing wireless carriers is the addition of new frequencies as they deploy new radio spectrum, which is becoming more prevalent with the rollout of next-generation networks known as 5G.

"Traffic is going to continue to go up, and there are more frequencies being brought into the network," says CEO Gordon Reichard.

Horizon Therapeutics

10. HORIZON THERAPEUTICS

What it does: Pharmaceuticals | **Patents last year:** 7

Horizon Therapeutics continues to ride the wave of its Ravicti treatment for urea cycle disorder, a rare metabolic disease that can cause a potentially fatal buildup of ammonia.

The company earned a spot on the Most Innovative Companies list for the second straight year with five follow-on patents to Ravicti. Urea cycle disorders affect the body's ability to remove waste after eating meals with proteins. Horizon acquired Ravicti in 2015, but the company is ramping up its own R&D efforts. It's adding a 20,000-square-foot facility with lab space in South San Francisco. The company also [received FDA approval](#) this year for Tepezza, a treatment for thyroid eye disease, a rare autoimmune disorder. Horizon acquired Tepezza three years ago.

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