



Great Inventors are Industry Outsider and Must be Protected



By **Paul Morinville**
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“It is the outsiders, the innovators and creative minds who found the startups on huge risks, while investing enormous time and money to bring the next step market.... But the patent system protecting these outsiders is fully broken. The incentives are all backwards.”

Every once in a while, a new invention changes an industry and sometimes even the world. In grade school, we all learned about some of these great inventions – the cotton gin, the lightbulb, the telephone, etc. Today, like no time in history, we are witnessing an explosion of innovation in every facet of life. Many of these inventions change the way we live our lives. But most of today’s great inventions are hidden behind touch screens or in the bowel of data centers. They are often not well understood, nor well known.



Throughout history, many great inventions do not originate from inventors working in the industries forever change. Great inventors are most often outsiders unencumbered by an industry’s culture and granted the freedom to do it in a different way. For example, Eli Whitney was not a cotton farmer who invented the cotton gin; Filo Farnsworth invented the core concepts of his image dissector tube (first television tube) when he was in high school farming; Alexander Graham Bell was working in hearing when he invented the telephone; and Sergey Brin and Larry Page were college students when they ir

Google's search algorithm. The list of inventors who changed industries from the outside is long and grow.

Outsiders Changed the Wireless Industry Forever

Technology experts David Sorrels and Greg Rawlins are outsiders who changed an industry. They invented a revolutionary way of processing radio frequency (RF) signals at ParkerVision, a Jacksonville, Florida company. That technology is now in every smartphone we use today, and it is that invention which enabled technology giant Qualcomm to consolidate the smartphone chip market and take the lion's share of

Early in his career, David worked at Parker Electronics developing electronic controls for heating, ventilation, and air conditioning (HVAC) systems. You may know Parker Electronics as the company that invented the thermostat.

Parker Electronics was sold to United Technologies Carrier Corporation. But after the sale, former Parker Electronics CEO, Jeff Parker, was reviewing childhood movies and found that his dad was not in them. He was running the camera. That became an idea. Jeff reassembled the Parker team and founded ParkerVision to develop a robotic camera that could automatically record without a person behind the camera. It was the development of that robotic camera, now used in TV newsrooms around the world, that led to David's revolutionary invention of RF signal processing that made ParkerVision a leader in RF technologies, and changed the wireless industry forever.

Big Corporations Commoditize Products

Big corporations commoditize products to maximize profits by reducing costs, increasing sales, and reducing risks. To accomplish that, they innovate primarily in their supply, manufacturing, sales, and distribution. Because their business model is focused on operational efficiency, they are not very good at making improvements to existing products or starting up new product lines. This comes with risk and big corporations are likely to be adversely affected.

The wireless industry had settled on complicated decades old technology called a *SuperHeterodyne* (called a SuperHet). SuperHets convert analog baseband signals (think radio signals) to digital RF signals that can be consumed by electronics) using an elaborate array of parts (oscillators, mixers, filters, and etc.). There were too many parts to efficiently put it all on a single chip, which made wireless transceivers physically large and hungry for battery power. Even so, academics and industry experts all agreed that the way to produce a high-quality digital RF signal was via a SuperHet.

But David did not know that a SuperHet was the only way to do it. All he knew was that ParkerVision's camera (called CameraMan) needed a small inexpensive wireless device that the robotic camera could use and SuperHets were too big, too expensive, and consumed too much power. He needed a better solution.

Inventions are Cumulative

There are no inventions that do not in one way or another build on things already invented. For example, Edison's lightbulb was an improved filament that made it last long enough to be commercially viable because other parts of a lightbulb were already invented.

To build a library of past inventions for future inventors to build upon, the patent system is a trade-off: government-granted exclusive right exchanged for public disclosure of an invention. This encourages inventors to disclose inventions to the public and puts them in one place.

The biggest challenge to inventing anything is to identify the next step. But that next step is not so easy to identify. It takes a certain kind of person under particular circumstances to figure out in which direction to go.

Experimentation in the Right Direction

Experimentation is obviously common among inventors. After all, Edison failed over 10,000 times with light bulb filaments before he got it right. David started tweaking a SuperHet in every way he could. It took a while, but David finally learned what the industry already knew – a SuperHet can't be reasonably simplified and made smaller. So, he abandoned the SuperHet and started looking in a different direction.

Direct Conversion was another existing technology to convert analog baseband to digital RF signals, but experts had dismissed it as incapable of producing a high-quality digital RF signal. As a result, it was limited to hobby applications and toys that could get by with a poor signal quality.

David started experimenting with Direct Conversion anyway. Eventually, his experimentation led to the development of a method of *Energy Transfer Sampling* that when applied to Direct Conversion radically improved signal quality. The improvement put Direct Conversion RF signal quality on par with SuperHets, but at a fraction of the power consumption and a fraction of the parts, and its simplicity meant that it could be implemented on a silicon chip. ParkerVision named this new technology Direct to Data, or D2D for short.

Bringing the Invention to Market

David had limited experience in the wireless industry, so he reached out to one of the industry's leading experts, Greg Rawlins in Orlando, Florida. Greg took on some of the toughest RF problems that the military and others could not solve. He was a hands-on problem solver with deep industry knowledge. Greg was hesitant to believe that the new technology could replace a SuperHet. After all, if it did, it would upset decades of research. But he tested it anyway and found that it did work. Soon he joined ParkerVision.

Together, David and Greg perfected D2D technology by inventing more technology around it. ParkerVision developed a silicon chip and began chip production in the United States. D2D made CameraMan a success and ParkerVision sold the CameraMan product line. A few years later, ParkerVision's technology won an Emmy Award.

David and Greg continued to develop D2D technology for other markets including the cellphone market. At the time, the market was operating on 2G. They put it on a cellphone chip and brought it to market.

The benefits of the millions of dollars that ParkerVision invested to invent and develop D2D technology were profound. It radically extended battery life, the range of frequencies that could be used, and the distance.

could be from a tower. Because D2D could easily be put on a chip, it reduced the physical size of cell enabling the plethora of other things you can now do now on your smartphone.

As a Qualcomm executive said in a 1998 email, which is available in public court documents, D2D “is holy grail of RF receiver designs.”

Market Adoption

D2D was adopted by Qualcomm in the mid 2000s, which gave their chipset a huge advantage over their competitors, an advantage significant enough that Qualcomm was able to take the market for cellph themselves.

In 2011, ParkerVision was forced to sue Qualcomm for patent infringement. The results are dozens of and Appeal Board (PTAB) inter partes review (IPR) challenges and more than 10 years of litigation co ParkerVision millions of dollars with millions more to spend and many more years to go before litiga concludes.

Outsiders Must be Protected

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Since *eBay v. MercExchange*, an infringer who steals patented technology and then runs a startup ou cannot be enjoined. Between the PTAB and the evolution of judicial interpretations of Section 101 a “abstract idea” concept, infringers have shot after shot to invalidate the patents they stole. Inventors very expensive game of whack-a-mole to get through the gauntlet.

This happened because of a multi-year disinformation campaign launched by Big Tech that has corr with “patent troll” cartoons and “bad patent” fiction. Trial judges drank the Kool-Aid and the Federa rubber stamps bad court decision without explanation under Rule 36.

Under today’s patent laws, big corporations no longer acquire companies or license technology. It h: bad that it is now a CEO’s fiduciary duty to their shareholders to steal patented technology, wait to g that ever happens), and then litigate the inventor into oblivion.

It is a complete breakdown of the U.S patent system that once supported creative minds—people lik Sorrels, Greg Rawlins, and Jeff Parker—so they could change the world.

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