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The Patent, Used as a Sword

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When [Apple](#) announced last year that all iPhones would come with a voice-activated assistant named Siri, capable of answering spoken questions, Michael Phillips's heart sank.

For three decades, Mr. Phillips had focused on writing software to allow computers to understand human speech. In 2006, he had co-founded a voice recognition company, and eventually executives at Apple, Google and elsewhere proposed partnerships. Mr. Phillips's technology was even integrated into Siri itself before the digital assistant was absorbed into the [iPhone](#).

But in 2008, Mr. Phillips's company, Vlingo, had been contacted by a much larger voice recognition firm called Nuance. "I have patents that can prevent you from practicing in this market," Nuance's chief executive, Paul Ricci, told Mr. Phillips, according to executives involved in that conversation.

Mr. Ricci issued an ultimatum: Mr. Phillips could sell his firm to Mr. Ricci or be sued for patent infringements. When Mr. Phillips refused to sell, Mr. Ricci's company filed the first of six lawsuits.

Soon after, Apple and Google stopped returning phone calls. The company behind Siri switched its partnership from Mr. Phillips to Mr. Ricci's firm. And the millions of dollars Mr. Phillips had set aside for research and development were redirected to lawyers and court fees.

When the first lawsuit went to trial last year, Mr. Phillips won. In the companies' only courtroom face-off, a jury ruled that Mr. Phillips had not infringed on a broad voice recognition patent owned by Mr. Ricci's company.

But it was too late. The suit had cost \$3 million, and the financial damage was done. In December, Mr. Phillips agreed to [sell his company](#) to Mr. Ricci. "We were on the brink of changing the world before we got stuck in this legal muck," Mr. Phillips said.

Mr. Phillips and Vlingo are among the thousands of executives and companies caught in a software patent system that federal judges, economists, policy makers and technology executives say is so flawed that it often stymies innovation.

Alongside the impressive technological advances of the last two decades, they argue, a pall has descended: the marketplace for new ideas has been corrupted by software patents used as destructive weapons.

Vlingo was a tiny upstart on this battlefield, but as recent litigation involving Apple and Samsung shows, technology giants have also waged wars among themselves.

In the smartphone industry alone, according to a Stanford University analysis, as much as \$20 billion was spent on patent litigation and patent purchases in the last two years — an amount equal to eight Mars rover missions. Last year, for the first time, spending by Apple and Google on patent lawsuits and unusually big-dollar patent purchases exceeded spending on research and development of new products, according to public filings.

Patents are vitally important to protecting intellectual property. Plenty of creativity occurs within the technology industry, and without patents, executives say they could never justify spending fortunes on new products. And academics say that some aspects of the patent system, like protections for pharmaceuticals, often function smoothly.

However, many people argue that the nation's patent rules, intended for a mechanical world, are inadequate in today's digital marketplace. Unlike patents for new drug formulas, patents on software often effectively grant ownership of concepts, rather than tangible creations. Today, the patent office routinely approves patents that describe vague algorithms or business methods, like a software system for calculating online prices, without patent examiners demanding specifics about how those calculations occur or how the software operates.

As a result, some patents are so broad that they allow patent holders to claim sweeping ownership of seemingly unrelated products built by others. Often, companies are sued for violating patents they never knew existed or never dreamed might apply to their creations, at a cost shouldered by consumers in the form of higher prices and fewer choices.

“There's a real chaos,” said Richard A. Posner, a federal appellate judge who has helped shape patent law, in an interview. “The standards for granting patents are too loose.”

Almost every major technology company is involved in ongoing patent battles, but the most significant player is Apple, industry executives say, because of its influence and the size of its

claims: in August in California, the company won a **\$1 billion patent infringement judgment** against Samsung. Former Apple employees say senior executives made a deliberate decision over the last decade, after Apple was a victim of patent attacks, to use patents as leverage against competitors to the iPhone, the company's biggest source of profits.

Apple has filed multiple suits against three companies — HTC, Samsung and Motorola Mobility, now part of Google — that today are responsible for more than half of all smartphone sales in the United States. If Apple's claims — which include ownership of minor elements like rounded square icons and of more fundamental smartphone technologies — prevail, it will most likely force competitors to overhaul how they design phones, industry experts say.

HTC, Samsung, Motorola and others have filed numerous suits of their own, also trying to claim ownership of market-changing technologies.

While Apple and other major companies have sometimes benefited from this war, so have smaller partners. In 2010, Apple acquired Siri Inc., the company behind the software of the same name. The stock price of Mr. Ricci's company, Nuance, which had by then become Siri's partner, rose by more than 70 percent as iPhone sales skyrocketed. Some former executives at Vlingo, Nuance's old rival, remain bitter.

"We had spent \$3 million to win one patent trial, and had five more to go," said a former Vlingo executive who spoke on condition of anonymity because he had signed confidentiality agreements. "We had the better product, but it didn't matter, because this system is so completely broken."

Mr. Ricci declined to be interviewed. Others at Nuance said they were simply protecting their intellectual property.

"Our responsibility is to follow the law," said Lee Patch, a vice president at Nuance. "That's what we do. It's not our fault if some people don't like the system."

Today, Nuance is a giant in voice recognition. Apple is the most valuable company in the world. And the iPhone is wrapped in thousands of patents that keep companies in numerous court battles.

"Apple has always stood for innovation," the company wrote in a statement in response to questions from The New York Times. "To protect our inventions, we have patented many of the new technologies in these groundbreaking and category-defining products. In the rare cases when we take legal action over a patent dispute, it's only as a last resort.

“We think companies should dream up their own products rather than willfully copying ours, and in August a jury in California reached the same conclusion,” the statement said.

At a technology conference this year, Apple’s chief executive, Timothy D. Cook, said patent battles had not slowed innovation at the company, but acknowledged that some aspects of the battles had “kind of gotten crazy.”

“There’s some of this that is maddening,” he said. “It’s a waste; it’s a time suck.”

The evolution of Apple into one of the industry’s patent warriors gained momentum, like many things within the company, with a terse order from its chief executive, Steven P. Jobs.

A Patent Warrior’s Education

It was 2006, and Apple was preparing to unveil the first iPhone. Life inside company headquarters, former executives said, had become a frenzy of programming sessions and meetings between engineers and executives. And, increasingly, patent lawyers.

Just months earlier, Apple **reluctantly agreed** to pay \$100 million to Creative Technology, a Singapore-based company. Five years before, Creative applied for a broad software patent for a “portable music playback device” that bore minor similarities to the iPod, an Apple product that had gone on sale the same year. Once the patent was granted to Creative, it became a license to sue.

Apple settled three months after Creative went to court. “Creative is very fortunate to have been granted this early patent,” Mr. Jobs said in a statement announcing the settlement in 2006.

Privately, Mr. Jobs gathered his senior managers. While Apple had long been adept at filing patents, when it came to the new iPhone, “we’re going to patent it all,” he declared, according to a former executive who, like other former employees, requested anonymity because of confidentiality agreements.

“His attitude was that if someone at Apple can dream it up, then we should apply for a patent, because even if we never build it, it’s a defensive tool,” said Nancy R. Heinen, Apple’s general counsel until 2006.

Soon, Apple’s engineers were asked to participate in monthly “invention disclosure sessions.” One day, a group of software engineers met with three patent lawyers, according to a former Apple patent lawyer who was at the meeting.

The first engineer discussed a piece of software that studied users' preferences as they browsed the Web.

"That's a patent," a lawyer said, scribbling notes.

Another engineer described a slight modification to a popular application.

"That's a patent," the lawyer said.

Another engineer mentioned that his team had streamlined some software.

"That's another one," the lawyer said.

"Even if we knew it wouldn't get approved, we would file the application anyway," the former Apple lawyer said in an interview. "If nothing else, it prevents another company from trying to patent the idea."

The disclosure session had yielded more than a dozen potential patents when an engineer, an Apple veteran, spoke up. "I would like to decline to participate," he said, according to the lawyer who was at the meeting. The engineer explained that he didn't believe companies should be allowed to own basic software concepts.

It is a complaint heard throughout the industry. The increasing push to assert ownership of broad technologies has led to a destructive arms race, engineers say. Some point to so-called patent trolls, companies that exist solely to sue over patent violations. Others say big technology companies have also exploited the system's weaknesses.

"There are hundreds of ways to write the same computer program," said James Bessen, a legal expert at Harvard. And so patent applications often try to encompass every potential aspect of a new technology. When such applications are approved, Mr. Bessen said, "the borders are fuzzy, so it's really easy to accuse others of trespassing on your ideas."

The number of patent applications, computer-related and otherwise, filed each year at the United States patent office has increased by more than 50 percent over the last decade to more than 540,000 in 2011. Google has received 2,700 patents since 2000, according to the patent analysis firm M-CAM. Microsoft has received 21,000.

In the last decade, the number of patent applications submitted by Apple each year has risen almost tenfold. The company has won ownership of pinching a screen to zoom in, of using magnets to affix a cover to a tablet computer and of the glass staircases in Apple stores. It has received more than 4,100 patents since 2000, according to M-CAM.

And as patent portfolios have expanded, so have pressures to use them against competitors.

In March 2010, Apple sued HTC, a Taiwanese smartphone manufacturer that had partnered with Google. Apple did not talk to HTC before suing. Negotiations were not part of the strategy, according to a former executive. "Google was the enemy, the real target," the executive said.

It was one of seven major smartphone and patent-related lawsuits Apple has initiated since 2006. The suits have focused on two large companies, HTC and Samsung, both Google partners, which together account for 39 percent of American smartphone sales. Apple has also filed countersuits against Nokia, as well as against Motorola Mobility, which is now owned by Google and accounts for 12 percent of sales.

In addition, the company has filed two declaratory judgment actions asking the courts to rule on the provenance and validity of patents. Over the same period, Apple itself has been sued 135 times, mostly by patent trolls interested in its deep pockets.

Apple is not alone. The number of patent lawsuits filed in United States district courts each year has almost tripled in the last two decades to 3,260 in 2010, the last year for which federal data is available. Microsoft has sued Motorola; Motorola has sued Apple and Research in Motion; Research in Motion has sued Visto, a mobile technology company; and in August, Google, through its Motorola unit, sued Apple, contending that Siri had infringed on its patents. (Google dropped the suit last week, leaving open the possibility of refileing at a later date.) All of those companies have also been sued numerous times by trolls.

Patents for software and some kinds of electronics, particularly smartphones, are now so problematic that they contribute to a so-called patent tax that adds as much as 20 percent to companies' research and development costs, according to a study conducted last year by two Boston University professors.

Supporters of suits initiated by Apple say that the litigation is vital to the company's success and that Apple is sued far more often than it sues, as do all major tech firms.

"If we can't protect our intellectual property, then we won't spend millions creating products like the iPhone," a former Apple executive said, noting that some of Apple's patents, like the "slide to unlock" feature on the iPhone, took years to perfect. The concept "might seem obvious now, but that's only after we spent millions figuring it out," the executive said. "Other companies shouldn't be able to steal that without compensating us. That's why the patent system exists."

But others challenge that logic, given the huge profits the technology industry enjoys. Apple collects more than \$1 billion a week in iPhone and related sales. “I am skeptical whether patents are needed in the software industry to provide adequate incentives,” Judge Posner wrote in an e-mail.

One consequence of all this litigation, policy makers and academics say, is that patent disputes are suffocating the culture of start-ups that has long fueled job growth and technological innovation.

“Think of the billions of dollars being flushed down the toilet,” said Ms. Heinen, the former Apple general counsel, who left the company and [paid \\$2.2 million](#) in connection with a federal investigation of stock option backdating. “When patent lawyers become rock stars, it’s a bad sign for where an industry is heading,” she said, adding that she had no issue with the lawyers themselves.

There are some indications that the big companies themselves are growing weary of this warfare.

In its response to The Times, Apple addressed “standards-essential” patents, which companies are obligated to license to competitors at reasonable rates, and wrote that it was “deeply concerned by the rampant abuse of standards-essential patents by some of our competitors.”

“Standards-essential patents are technologies which these companies have volunteered to license to anyone for a reasonable fee,” the statement said, “but instead of negotiating with Apple, they’ve chosen to sue us.” Samsung, Motorola, Nokia and HTC have sued Apple, claiming it violated standards-essential patents.

Another sign of fatigue is the frequency with which executives and lawyers from Apple and Google speak to one another about patent disputes. Earlier this year, Google proposed a cease-fire, according to people familiar with the conversations. And when Google withdrew its Motorola suit last week, it was widely seen as a peace gesture.

But Apple has been hard to pin down, said one person from Google who was not authorized to speak publicly. “Sometimes they’re asking for money. Then they say we have to promise to not copy aspects of the iPhone. And whenever we get close to an agreement, it all changes again.

“Our feeling is they don’t really want this to end. As long as everyone is distracted by these trials, the iPhone continues to sell.”

Apple declined to comment on the negotiations.

The Patent Bureaucracy

The application by Apple that eventually became patent 8,086,604 first crossed desks at the Patent and Trademark Office on a winter day in 2004.

In the next two years, a small cast of officials spent about 23 hours — the time generally allotted for reviewing a new application — examining the three dozen pages before recommending rejection. The application, for a voice- and text-based search engine, was “an obvious variation” on existing ideas, a patent examiner named Raheem Hoffler wrote. Over the next five years, Apple modified and resubmitted the application eight times — and each time it was rejected by the patent office.

Until last year.

On its 10th attempt, Apple got patent 8,086,604 approved. Today, though the patent was not among those Vlingo and Nuance fought over, it is known as the Siri patent because it is widely viewed as one of the linchpins of Apple’s strategy to protect its smartphone technologies.

In February, the company deployed this new patent in a continuing lawsuit against Samsung that could radically reorder the \$200 billion smartphone business by giving Apple effective ownership of now-commonplace technologies, software experts say.

Patent 8,086,604’s path to approval “shows there’s a lot wrong with the process,” said Arti K. Rai, an [intellectual property](#) expert at Duke University School of Law who reviewed the patent application for The Times. That patent, like numerous others, is an example of how companies can file an application again and again until they win approval, Ms. Rai said.

When Apple submitted the first application for 8,086,604, the iPhone and Siri did not exist. The application was aspirational: it described a theoretical “universal interface” that would allow people to search across various mediums, like the Internet, corporate databases and computer hard drives, without having to use multiple search engines. It outlined how such software might function, but it did not offer specifics about how to build it. It suggested that some people might speak a search phrase rather than use a keyboard.

The ideas contained in the application would blossom at Apple, Google, Microsoft, Nuance, Vlingo and dozens of other companies. All the while, the application traveled quietly through the patent office, where officials rejected it twice in 2007, three times in 2008, once in 2009, twice in 2010 and once in 2011.

The patent office has a reputation for being overworked, understaffed and plagued by employee turnover, and employees concede that some of their work is subjective.

“When I get an application, I basically have two days to research and write a 10- to 20-page term paper on why I think it should be approved or rejected,” said Robert Budens, a 22-year patent examiner and president of the examiners’ labor union. “I’m not going to pretend like we get it right every time.”

To receive a patent, an invention must be novel (substantially different from what exists), not obvious (one can’t patent a new toaster simply by expanding it to handle five slices of bread), and useful (someone can’t patent an invisibility machine if invisibility is impossible).

“If you give the same application to 10 different examiners, you’ll get 10 different results,” said Raymond Persino, a patent lawyer who worked as an examiner from 1998 to 2005.

After patent 8,086,604 was first rejected in 2007, Apple’s lawyers made small adjustments to the application, changing the word “documents” to “items of information” and inserting the phrase “heuristic modules” to refer to bits of software code. A few years later, the inclusion of the word “predetermined” further narrowed Apple’s approach.

These changes had little substantial impact, said experts who reviewed the application for The Times. But the patent office slowly began to come around to Apple’s point of view.

Though submitting an application repeatedly can incur large legal fees, it is often effective. About 70 percent of patent applications are eventually approved after an applicant has altered claims, tinkered with language or worn down the patent examiners.

One consequence is that patents are sometimes granted for ideas that already exist.

In 1999, for instance, two men received a patent for a crustless, sealed peanut butter and jelly sandwich. (The J. M. Smucker company acquired the patent and used it to sue other food makers. In 2007, after press scrutiny, federal officials canceled the patent.)

A year earlier, the patent office had awarded an Illinois company effective ownership of many of the basic systems that power the Internet. That firm sued a number of tech giants, persuading many to sign multimillion-dollar settlements, until a jury declared some of the patents invalid last year.

For Apple’s 8,086,604, the examiners finally relented last December and issued a patent.

“Apple got another warhead in its arsenal, but there’s no big invention here,” said David J. Pratt, president of M-CAM, the patent analysis firm, who analyzed the application for The Times.

The patent office declined to discuss 8,086,604. Officials pointed out that the agency’s 7,650 examiners received more than half a million applications last year, and the numbers have kept climbing.

By all accounts, there have been improvements in the patent office since David J. Kappos took over as director in 2009. In an interview, Mr. Kappos said the lengthy back-and-forth between examiners and Apple was evidence that the system worked.

“It’s called the patent office,” he said, noting that issuing patents is the agency’s job. In a statement, the agency said it had spent the last three years strengthening policies to improve patent quality. Besides, Mr. Kappos said, “we realize that only a handful of these patents will be really important.”

However, patent 8,086,604 has proved very important. In February, Apple sued Samsung in a California court, arguing that 17 of Samsung’s smartphones and tablets violated 8,086,604. In June, a judge [banned sales](#) of Samsung’s Galaxy Nexus phone, validating 8,086,604 and ruling that the phone infringed on Apple’s patent because it featured a “Google quick search box” that allowed users to enter one search term, either typed or spoken, that returned results simultaneously from the Internet, contacts stored on the phone and recently visited Web sites. (The ban has been stayed while under appeal.)

Searching for Fixes

Some experts worry that Apple’s broad patents may give the company control of technologies that, over the last seven years, have been independently developed at dozens of companies and have become central to many devices.

“Apple could get a chokehold on the smartphone industry,” said Tim O’Reilly, a publisher of computer guides and a software patent critic. “A patent is a government-sanctioned monopoly, and we should be very cautious about handing those out.”

Others say the system works fine.

“Intellectual property is property, just like a house, and its owners deserve protection,” said Jay P. Kesan, [a law professor](#) at the University of Illinois. “We have rules in place, and they’re getting better.”

“And if someone gets a bad patent, so what?” he said. “You can request a re-examination. You can go to court to invalidate the patent. Even rules that need improvements are better than no rules at all.”

Five years ago, Congress was debating how to fix the patent system when an inventor named Stephen G. Perlman went to Capitol Hill.

Mr. Perlman worked at Apple in the 1980s. Today, he runs a start-up incubator called Rearden in San Francisco. He holds 100 patents — including for the software behind the reverse aging in the film “The Curious Case of Benjamin Button” — and has about 100 more applications pending.

Patents are crucial to his business, Mr. Perlman said, particularly in raising money from venture capitalists and deterring large companies from copying his innovations. “When we file a patent application, it’s a big deal,” he said.

When Mr. Perlman went to Congress, he brought ideas to protect small inventors. He wasn’t alone in suggesting solutions. Thousands of companies, from start-ups like Vlingo to large technology firms, have argued that a well-functioning patent system is essential to their success. The problems with the current system are so pervasive, they say, that the courts, lawmakers and Silicon Valley must find their own fixes.

One option is judicial activism. This year, Judge Posner, in an Illinois federal court, tossed out patent arguments made by both Apple and Motorola Mobility in [a 38-page opinion](#) that dismissed a lawsuit between the two companies. Cleaning up the patent mess, Judge Posner said in an interview, might also require reducing the duration of patents on digital technologies, which can be as long as 20 years. “That would make a big difference,” he said. “After five years, these patents are mainly traps for the unwary.”

Ideas have also come from policy experts and Silicon Valley. The Federal Reserve Bank of St. Louis recently published [a working paper](#) calling for the abolition of patents, saying they do more harm than good.

Another idea is to create different classes of patents, so that some kinds of inventions, like pharmaceuticals, would receive 20 years of ironclad protection, while others, like software, would receive shorter and more flexible terms.

A third suggestion was made by the Internet company Twitter, which released an [“Innovator’s Patent Agreement”](#) this year intended to give software engineers some control

over how their creations are used. Under the terms of the agreement, companies pledge that patents will be used only for defensive purposes.

“We’re just trying to do something modest,” said Benjamin Lee, Twitter’s legal counsel.

Similarly, law school faculty at the University of California, Berkeley, have proposed a “[Defensive Patent License](#)” in which companies would contribute patents to a common pool that shielded participants from litigious aggressors. Companies would be allowed to participate as long as they did not become first-strike plaintiffs. The benefit is that “you don’t have to worry about your patent being weaponized” and used to attack competitors, said Jason M. Schultz, [an assistant professor](#) who helped design the license.

But to really make a difference, such ideas require the participation of large technology companies, and the incentives to cooperate are small. So some frustrated engineers have become outspoken advocates for reform.

Mr. Perlman, the independent inventor, for instance, was hopeful his voice would be heard on Capitol Hill. But alongside Mr. Perlman were hundreds of lobbyists from high-tech corporations and the pharmaceutical industry, which often push conflicting proposals. Big technology companies, in general, want to limit the financial damages juries can award for minor patent violations, while drug makers want to make sure they can sue for billions of dollars if a single patent is violated.

These and dozens of other narrow battles have paralyzed Congress’s ability to make real changes, lawmakers and lobbyists say. The last attempt, the America Invents Act, which was passed last year, achieved mostly administrative fixes, like making it easier for outsiders to challenge a patent’s validity.

The new law did make one fundamental change. Since the patent system was overseen by Thomas Jefferson, the United States has awarded ownership of an innovation to whoever created the first prototype, a policy known as “first to invent.” Under the America Invents Act, ownership will be awarded to whoever submits the first application, or “first to file.”

The shift, inventors like Mr. Perlman say, makes life harder for small entrepreneurs. Large companies with battalions of lawyers can file thousands of pre-emptive patent applications in emerging industries. Start-ups, lacking similar resources, will find themselves easy prey once their products show promise.

That is the concern of people like Mr. Phillips, the voice recognition specialist and one-time Siri partner who founded Vlingo. “Start-ups are where progress occurs,” he said in an interview. “If you spend all your time in court, you can’t create much technology.”

In June, Mr. Phillips started work at his new employer, and former courtroom adversary, Nuance. Theoretically, his job was to help manage the companies’ integration and find new technological frontiers to explore. With a background at M.I.T. and Carnegie Mellon, he is widely acknowledged as one of the most innovative thinkers in computer speech.

But he spent much of the summer on vacation, recuperating from the last six bruising years. And in September, he quit. He plans to leave voice recognition altogether, he has told friends, and find an industry with less treacherous patent terrain.