Patent Act Must Be Updated To Protect Quantum, AI Industries

By **Clark Bakewell** (February 7, 2022)


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Recent indications that Congress is considering revisions to America's patent laws provide an opportunity to update Title 35 of the U.S. Code, Section 271(g), to better reflect the nature of the information economy now and in the future.

Specifically, the U.S. Court of Appeals for the Federal Circuit's ongoing interpretation of Section 271(g) has effectively created a loophole in the field of information technology.

This article explores this loophole, failed efforts to circumvent it, and why Congress should act to close it for the benefit of crucial high-growth industries, such as those based on quantum technologies and artificial intelligence.

What is protected under Section 271(g)?

Broadly speaking, America's patent laws allow a patent owner to restrict the ability of another party to "make[], use[], offer[] to sell, or sell[]" a patented invention, such as a process, in the U.S.[1]

But what happens when a patented process is performed abroad and the product is imported into the U.S.? This possibility is addressed by Title 35 of the U.S. Code, Section 271(g), which generally protects patent owners from this scenario. According to its plain language, Section 271(g) provides protection to patent holders from importation of "product[s] which [are] made by a process patented in the United States."[2]

But is information, such as that which would be produced by an information technology process, a "product" within the meaning of Section 271(g)? In binding guidance that has been consistently followed for over 18 years, the Federal Circuit has unambiguously and repeatedly answered this question in the negative.

Specifically, in Bayer AG v. Housey Pharmaceuticals Inc., the Federal Circuit examined what "a product made by" a patented process meant in the context of Section 271(g) and decided that "the statute clearly contemplates that 'made' means 'manufactured.'"[3]

The court considered the statutory provision's origins in the Omnibus Trade and Competitiveness Act of 1988, dictionary definitions of "make" and "manufacture" from 1968 and 1998, and various inferences about congressional intent at the time that it had passed the pertinent laws and decided that manufactured products could only be "tangible objects and not intangibles such as information."[4]

The Federal Circuit then concluded its analysis by explicitly inviting Congress to amend Section 271(g) if it wanted to change the scope of the protections offered to patent owners:

> [W]e think it is best to leave to Congress the task of expanding the statute if we are wrong in our interpretation. Congress is in a far better position to draw the lines that must be drawn if the product of intellectual processes rather than manufacturing processes are to be included within the statute.[5]

Since 2003, the Federal Circuit has been unwavering in its statutory interpretation of this issue, effectively calcifying the meaning of Section 271(g) and excluding information produced by a patented process from its protections.[6]

Efforts by litigants to establish alternative protections have largely failed.

Faced with the Federal Circuit's unyielding interpretation of Section 271(g), creative patent owners have tried to find other sources of protection within America's patent laws over the past few decades but have been largely unsuccessful, with only one notable, and narrow, exception.

Specifically, in the In re: Nuijten decision in 2007, the Federal Circuit examined the efforts of a patent applicant to patent information itself — rather than just the process for creating the information.[7] If granted, such a patent would have allowed the patentee to skip Section 271(g) entirely and instead look to the more straightforward protections of Section 271(a) to protect any use or sale of the information, regardless of where it was created.[8]

Upon review, the Federal Circuit found that information itself is not patent-eligible subject matter under Section 101 of the Patent Act. Specifically, the Federal Circuit determined that information is not any of a "process, machine, manufacture, or composition of matter," which are the only forms of subject matter eligible for patent protection.[9]

The court's opinion largely adhered to the earlier determination in Bayer that information is not manufactured within the meaning of the patent statute.[10] Thus, with this decision, one potential avenue for protection outside the provision of Section 271(g) was closed off to patent owners.

In 2015, the owner of a patented method for creating information tried a different strategy and turned to the U.S. International Trade Commission to exclude the digital transfer of electronic information into the U.S.[11] The ITC has authority to exclude importation into the U.S. of patent infringing articles under Title 19 of the U.S. Code, Section 1337.

However, the Federal Circuit decided in ClearCorrect Operating LLC v. ITC that "electronic transmission of digital data" did not involve any article, and thus electronic information was not within the scope of the ITC's jurisdiction.[12]

Similar to Bayer, this decision by the Federal Circuit was based on a statutory interpretation rooted in the realities of the past, including the observation that the term "articles" originated in the 1922 Tariff Act, at which time the plain meaning of an article was a "material thing."[13] Thus, this alternative possibility for protection of process patents from overseas performance was also sealed off.[14]

In fact, there has been only one notable strategy pursued since 2003 that has provided a level of protection against the use of an invention abroad in the context of information technology, and even this strategy has limited applicability.

Specifically, in the 2005 NTP Inc. v. Research In Motion Ltd. decision, the patent owner claimed a system that performed a process, rather than just the process itself.[15] When an accused infringer's system, located in Canada, was remotely accessed from the U.S., the Federal Circuit determined that the system had been used within the U.S. and thus could violate Section 271(a), regardless of where the system was physically located:

> The use of a claimed system under section 271(a) is the place at which the system as a whole is put into service, i.e., the place where control of the system is exercised and beneficial use of the system obtained.[16]

However, the practical applications of this potential workaround are limited. First, with due respect to the considerable skills of patent prosecution attorneys, not all inventions in the field of information technology are suitable to be written and claimed as novel systems.

Second, this limited rule is ripe for would-be infringers to circumvent by taking steps to situate the physical act of controlling the system outside the U.S. Indeed, the viability of this work-around was promptly illustrated in the 2007 epicRealm Licensing LLC v. Autoflex Leasing Inc. decision in the U.S. District Court for the Eastern District of Texas, in which an accused infringer successfully used an intermediary abroad to control the process, merely submitting requests to that intermediary, and thus escaped liability.[17]

Thus, with only a single narrow exception of limited effectiveness available, patent owners have been largely unable to construct a statutory alternative to Section 271(g) that might prevent the electronic transfer of information into the U.S. that was created using a patented process abroad.

The need for changes to Section 271(g) reflects the needs of the quantum and artificial intelligence industries.

The result of the Federal Circuit's interpretation of Section 271(g) is a split in the protections offered by U.S. patent laws: Products created by a patented process are protected from unauthorized importation into the U.S., but information created by a patented process is not.

Moreover, because the Federal Circuit has grounded its interpretation of Section 271(g) in the context of the economic realities when Section 271(g) was passed, the protections that this law offers will remain grounded in those past realities unless Congress acts to update the laws and close this de facto exemption for electronically transferred information.

Indeed, such a change will have particular importance to the domestic growth of certain industries that are intrinsically rooted in the novel manipulation of information, such as those relating to quantum computing and the application of artificial intelligence.

The centrality of information as the basis for these industries creates a problem, because the quantum and artificial intelligence technologies that will be harnessed in the decades ahead by American companies are largely premised on remote computation, which can generally be executed anywhere in the world.

For example, in the field of quantum computing, International Business Machines Corp. has focused a large part of its business model on offering cloud access to its current generation of quantum computers for partner organizations and has recently noted that one of its key goals for 2024 is to create the ability for users to "call 1K+ qubit services" from its cloud interface.[18]

Most other leading quantum computing companies, such as Google LLC, Microsoft Corp., Honeywell International Inc., IonQ, Rigetti Computing and D-Wave Systems Inc., have similarly focused on cloud services for the commercialization of quantum technologies.[19]

And prominent American quantum software companies, such as Zapata Computing, QC Ware and 1Qbit Information Technologies Inc., have focused their efforts on facilitating the use of quantum computers and devices developed by others, regardless of where they are located.[20] Taken together, the words and actions of the domestic quantum computing industry overwhelmingly indicate that quantum technologies will largely operate in a cloud-based ecosystem.

Similarly, artificial intelligence is and will be a cloud-based service. This is because artificial intelligence requires enormous computational resources, but frequently for just short periods of time. Furthermore, the complexity of designing and implementing artificial intelligence algorithms favors specialized companies with the ability to leverage their expertise for companies that will then use cloud-based computational resources.[21]

Cloud-based artificial intelligence services are not a new trend,[22] but they are a powerful economic driver, and global spending on artificial technology is expected to reach $110 billion by 2024.[23]

But the cloud-based future of these industries leaves would-be innovators vulnerable to their inventive methods being used overseas, with the resulting information being electronically transferred back into the U.S., effectively bypassing American patent protections.

Relatedly, the loophole within Section 271(g) incentivizes would-be infringers to build their companies and infrastructure offshore, out of the reach of American patent enforcement but with equal access to the American market. Fostering the development of advanced industries overseas is certainly not an objective of America's patent laws, but it is an unfortunate byproduct of the current system.

To be sure, well-funded companies are pursuing worldwide patent portfolios in an effort to ameliorate these threats, on the theory that patents could be enforced wherever the process is performed. This strategy is undoubtedly difficult and expensive, and the prospect of actually obtaining worldwide patent enforcement should be daunting to any company.

But moreover, conceptually, protecting an invention just within the U.S. should not require companies to obtain global patent protection — the U.S. patent system should provide this protection.

Thus, American patent holders in the information-based field such as quantum and artificial intelligence technologies will face difficulties protecting their patents from cloud-based competitors abroad. In effect, the current contours of Section 271(g) undermine the effectiveness of patent protections in these high-growth industries and incentivize offshore development.

Congress has shown a desire to amend the patent laws to better enable the domestic growth of quantum and artificial intelligence economies.

Fortunately, Congress has expressed its desire to update America's patent laws to better protect the domestic growth of quantum and artificial intelligence economies, even singling out these technologies explicitly.

For example, in a recent letter to the U.S. Patent and Trademark Office, a bipartisan group of U.S. senators — Sen. Thom Tillis, R-N.C., Sen. Mazie Hirono, D.-Hawaii, Sen. Tom

Cotton, R-Ark., and Sen. Chris Coons, D-Del. — expressed their intentions to strengthen patent protections for quantum computing and artificial intelligence in particular, among other key technologies.[24]

While this letter focused on potential changes to patent eligibility, the senators noted their underlying concern that patent protections were difficult to obtain in these technologies and expressed their intention to modify the patent laws to better protect innovation in these key industries.

Other senators have also recently expressed their interest in updating America's patent laws in other ways, showing that patent laws have congressional attention. For example, on Sept. 29, 2021, Sens. Patrick Leahy, D-Vt., and John Cornyn, R-Tex. introduced the Restoring the America Invents Act in an effort to boost the ability of procedures before the Patent Trial and Appeal Board to invalidate low quality patents.[25]

But in introducing this proposed bill, which would generally favor alleged patent infringers, Leahy also expressed the desire to "reinforce[] high-quality patents" as key to the workings of the American economy.[26]

Thus, Congress is clearly interested in updating America's patent laws. To date, Section 271(g) does not appear to have been publicly identified as a target for amendment, but modifying its scope would fit within the goals of many senators who might otherwise disagree on other changes to the patent system. This is because the proposed change would create consistency across the patent system rather than modifying any high-level patent scheme.

It is also possible that expanding Section 271(g) to close the loophole for electronic information would be less contentious than proposed changes to patent eligibility or PTAB procedures, as this change would not affect what patents should be issued, or maintained, in the first place, but rather would merely strengthen the protections against foreign competition available for valid patents.

Accordingly, modifying Section 271(g) appears to be broadly within the goals expressed by many members of Congress for America's patent system and should be considered closely by lawmakers as potential statutory changes are explored.

Conclusion

American patent laws prohibit from importation into the U.S. unlicensed physical products created by a patented process, but not information created by a patented process. This creates a loophole that will harm innovative American companies operating in high-growth areas of the information economy, such as in quantum and artificial intelligence technologies.

Congress should close this de facto loophole by expanding Section 271(g) to cover electronically transferred information as well as tangible objects.

Such a change should be made narrowly to target the threat of overseas cloud computing while avoiding unintended consequences, such as a prohibition against products that merely have some indirect connection to information created by a patented process — a line that would be potentially impossible to police.

But Congress and courts are more than capable of making this distinction; after all, courts

already decline to extend the protections of Section 271(g) to products that themselves have only a tangential relationship to otherwise covered products.[27]

If modified, the new Section 271(g) would protect the growth of quantum computing and artificial intelligence industries in the U.S. and avoid incentivizing offshore implementation of these cutting-edge technologies.

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[1] 35 U.S.C. § 271.

[2] 35 U.S.C. § 271(g).

[3] Bayer AG v. Housey Pharms., Inc., 340 F.3d 1367, 1371-72 (Fed. Cir. 2003).

[4] Id. at 1372-76.

[5] Id. at 1376-77.

[6] See, e.g., Momenta Pharms., Inc. v. Teva Pharms. USA Inc., 809 F.3d 610, 615-17 (Fed. Cir. 2015); ClearCorrect Operating, LLC v. ITC, 810 F.3d 1283, 1299 (Fed. Cir. 2015); Phillip M. Adams & Assocs., LLC v. Dell Computer Corp., 519 Fed. Appx. 998, 1005 (Fed. Cir. 2013).

[7] In re Nuijten, 500 F.3d 1346, 1348 (Fed. Cir. 2007).

[8] See 35 U.S.C. § 271(a) (prohibiting the "use[]" of a patented invention in the United States).

[9] Nuijten, 500 F.3d at 1354-57.

[10] Id. at 1356.

[11] ClearCorrect Operating, LLC v. ITC, 810 F.3d 1283, 1286 (Fed. Cir. 2015).

[12] Id.

[13] Id. at 1291-94.

[14] Id. at 1299.

[15] NTP, Inc. v. Research In Motion, Ltd., 418 F.3d 1282, 1316-18 (Fed. Cir. 2005).

[16] Id. at 1317.

[17] epicRealm Licensing, LLC v. Autoflex Leasing, Inc., 492 F. Supp. 2d 608, 614-15 (E.D.

Tex. 2007).

[18] IBM Research, "The IBM Quantum State of the Union," November 17, 2021 (available at https://www.youtube.com/watch?v=-qBrLqvESNM).

[19] See https://quantumai.google/quantum-computing-service; https://azure.microsoft.com/en-us/solutions/quantum-computing/; https://www.honeywell.com/us/en/company/quantum/quantum-computer; https://ionq.com/get-started/#cloud-access; https://www.rigetti.com/what-we-build; https://www.dwavesys.com/solutions-and-products/cloud-platform/.

[20] See https://www.zapatacomputing.com/orquestra-platform/; https://forge.qcware.com/; https://1qbit.com/1qloud/.

[21] See Amazon Web Services, "High-performance, low-cost machine learning infrastructure is accelerating innovation in the cloud," MIT Technology Review (November 1, 2021) (available at https://www.technologyreview.com/2021/11/01/1038962/high-performance-low-cost-machine-learning-infrastructure-is-accelerating-innovation-in-the-cloud/).

[22] See Janakiram MSV, "The Rise Of Artificial Intelligence As A Service In The Public Cloud," Forbes (February 22, 2018) (available at https://www.forbes.com/sites/janakirammsv/2018/02/22/the-rise-of-artificial-intelligence-as-a-service-in-the-public-cloud).

[23] BusinessWire, "Worldwide Spending on Artificial Intelligence Is Expected to Double in Four Years, Reaching $110 Billion in 2024, According to New IDC Spending Guide" (August 25, 2020) (available at https://www.businesswire.com/news/home/20200825005099/en/Worldwide-Spending-Artificial-Intelligence-Expected-Double-Years).

[24] Letter from Senators Tillis, Cotton, Hirono, and Coons to Mr. Drew Hirshfeld (March 5, 2021) (available at https://www.tillis.senate.gov/services/files/04D9DCF2-B699-41AC-BE62-9DCA9460EDDA).

[25] Leahy And Cornyn Introduce Bipartisan Bill To Support American Innovation And Reduce Litigation (Sept. 29, 2021) (https://www.leahy.senate.gov/press/leahy-and-cornyn-introduce-bipartisan-bill-to-support-american-innovation-and-reduce-litigation).

[26] 167 Cong. Rec. S6782-83 (daily ed. Sept. 29, 2021) (statement of Sen. Leahy).

[27] See 35 U.S.C. § 271(g)(1)-(2).