

Is the standard essential patent a certainty for the field of uncertainty — quantum technology?

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Where the first quantum revolution upended our understanding of the world, the second quantum revolution is radically altering how we design our technology. Just as the semiconductor replaced vacuum tubes and is now ubiquitous in our technology, the implements of quantum computing, quantum communication, quantum sensing, and quantum optics are likewise poised to replace current technologies. Quantum — in particular quantum mechanics — refers to the measurement and operations (or behavior) of matter and light on the atomic and subatomic scale.

Our quest to understand and control matter and light at these subatomic scales has made the rules of quantum mechanics unavoidable. In our highly interconnected world, the replacement of vital technologies with new ones is bound to require new technology standards. And in a standard-setting environment, the Standard Essential Patent (SEP) is the goose that lays the golden egg.

SEPs are an integral part of many industries — such as telecommunications. In industries where a new standard has developed, often promulgated by a standard-setting organization (SSO), patents that are critical to implementing the standard may be designated by the SSO as SEPs. And because inventions are often improvements over previous developments, companies are likely to innovate against the backdrop of an industry standard, which means they will need to practice the patents that are critical to the standard to practice their own patents. However, while patents are creatures of statute (e.g., the Leahy-Smith America Invents Act in the United States and other law codified in Title 35 of the United States Code), SEPs are not recognized by the law as a unique subset of patents. Instead, when a patent is determined to be a SEP, the owner of the patent is required to license and negotiate under fair, reasonable, and non-discriminatory (or “F/RAND”) terms.

Thus, while there is no statutory provision for a private right of action that is particular to SEPs, the commitment to provide licenses on F/RAND terms has been held by the 9th U.S. Circuit Court of Appeals in the 2012 case, *Microsoft v. Motorola*, to create a contractual obligation in cases where a prospective licensee would be a third-party beneficiary. In addition to claims under contract law, claims under federal antitrust laws have also been made, e.g., in the Northern District of Texas 2020 case, *Continental v. Avanci*. With this framework in mind, the next section discusses

the industries likely impacted by quantum technology and the standard-setting bodies that currently promulgate standards for those industries.

In the second quantum revolution, the design principles for our technology will themselves utilize quantum mechanics. By doing so, new capabilities will emerge in such varied industries as telecommunications, semiconductors, and computing more generally. Current technologies in those industries are already governed by a wide array of standards promulgated by a number of organizations, including the American National Standards Institute (ANSI), International Telecommunications Union (ITU), Institute of Electrical and Electronic Engineers (IEEE), International Standards Organization (ISO), and Video Electronics Standards Association (VESA), to name a few. Many of these organizations have recognized the second quantum revolution is occurring.

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For example, the ITU ran a focus group on “Quantum Information Technology for Networks.” ITU-T Focus Group on Quantum Information Technology for Networks (FG-QIT4N), Int’l Telecomm. Union. Attention placed on quantum technology by these SSOs is not occurring in a vacuum — the market for quantum technology and the number of patents issued covering it are increasing. Many of these projects are in their infancy; however, market trends make it clear that quantum technology is an area for growth.

The domain of quantum technology has seen rapid growth on several fronts. Market size for quantum technology is expected to grow at double-digit percentage rates. See Matt Swayne, “Quantum Computing Market Expected to Grow at Double-Digit Rate” The Quantum Insider (Dec. 27, 2021). And investment in this area of deep technology is beginning to ramp up. See Mateusz Masiowski

et al., “Quantum Computing Funding Remains Strong, But Talent Gap Raises Concern,” McKinsey & Co. (June 15, 2022).

The growth in the number of patents being sought in quantum computing has only just begun. See Elliott Mason, “Trends in Quantum Computing Patents,” Quantum Econ. Dev. Consortium (May 24, 2021). And over half of quantum-related patents in recent years have gone to companies outside the set of recognizable technology companies. *Id.* In light of this landscape, companies need to be cognizant of a number of considerations during development of their quantum technology.

While racing to beat their competitors in this new technological frontier, companies need to be sure they are protecting the patentable advances they generate. Patenting serves a number of purposes beyond suing another party for infringement. Importantly, for a young company, patents are a way to communicate value to prospective investors. In addition, a company that lacks the will or resources to practice their patent may still generate revenue through licensing. And while current quantum technology may not currently be mature enough for widespread adoption, companies should keep in mind that future standards may develop based on current patentable innovations.

SEPs are likely a certainty for fields related to quantum technology. Therefore, companies should look for opportunities to direct the development of those standards: first, because it is in their self-interest; and second, because a standard that is forged from contributions by the greatest number of stakeholders will be a better standard. If a company is interested in creating a portfolio of SEPs, it is advisable to continually evaluate patenting efforts to appropriately declare innovations as essential to a standard when appropriate (e.g., after a thorough evaluation of the patent

claims and standard documents), to avoid the perception of under-declaration or over-declaration.

Companies must also consider the legal enforcement landscape. A series of policy statements by the Department of Justice, the United States Patent and Trademark Office, and the National Institute of Standards and Technology on the remedies available in SEP-related disputes reveal an unsettled legal landscape. For the most recent stance taken, see “Withdrawal of 2019 Policy Statement on Remedies for Standards-Essential Patents Subject to Voluntary F/RAND Commitments,” published June 8, 2022.

While such policy statements do not have the force of law, it is unclear how courts will interpret policy statements and the impacts those statements will have. See generally Congressional Research Service, “General Policy Statements: Legal Overview,” prepared by Jared Cole and Todd Garvey, Washington: Library of Congress, Apr. 14, 2016. The most recent proposed guidance from 2021, titled “Draft Policy Statement on Licensing Negotiations and Remedies for Standards-Essential Patents Subject to Voluntary F/RAND Commitments” and ultimately not adopted, observed that the relevant factors would “generally militate against an injunction” in a dispute involving SEPs.

Nevertheless, the guidance discusses situations where an injunction may be an appropriate remedy. Another legal consideration is the variation in legal regimes between countries and the likelihood of enforcing a judgment obtained in one jurisdiction in a different jurisdiction. Unfortunately, the legal regime that should facilitate the use and protection of a standard is itself not standardized. Companies will therefore have to be cognizant of two shifting landscapes: technology and law.

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