

Statement of
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Before the
Subcommittee on Intellectual Property

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Hearing on
The State of Patent Eligibility in America: Part III

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Chairman Tillis, Ranking Member Coons, and Members of the Subcommittee, thank you for inviting me to testify today. My name is Laurie Self and I am Senior Vice President and Counsel, Government Affairs at Qualcomm, Inc. I appreciate this opportunity to share Qualcomm’s perspective on this Subcommittee’s important efforts to reform section 101 of the Patent Act, and to underscore the importance of strong, predictable patent rights to U.S. leadership in global innovation, and consequently our national security and economic competitiveness.

I. Qualcomm, Inc.

A. History of Qualcomm

Qualcomm was founded in San Diego, California by Dr. Irwin Jacobs and Andrew Viterbi, two University of California at San Diego professors, along with five other colleagues, in the emerging field of wireless communications. It is the quintessential American success story of a highly innovative startup, whose wireless technology and deep commitment to research and development (R&D) have positioned mobile as the largest and most transformative communications platform in history.

Dr. Jacobs and his colleagues pioneered the development of the code division multiple access (CDMA) wireless standard, one of the early wireless communications protocols. Efforts to promote commercial adoption of the CDMA standard, however, were not easy. Even after Qualcomm had successfully built and demonstrated a small CDMA system in the 1980s, a Stanford University professor decried the technology, stating that it “defied the laws of physics.”¹ Yet the company persisted, by anticipating the future of technology and investing to bring it to fruition. For example, Dr. Jacobs was among the very first to envision that every person would eventually have their own phone number and communicate wirelessly.

In the three decades since Qualcomm’s founding, the mobile phone first used for simple voice communication has become an extraordinarily powerful mobile computer, thanks to Qualcomm’s innovative CDMA technology—the foundational wireless technology that has enabled every “G” of wireless technology and that continues to undergird the 5G revolution.

B. Qualcomm’s Focus on Wireless Research & Development

At its core, Qualcomm is a wireless R&D engineering company. Today, Qualcomm has close to 30,000 employees, more than 20,000 of whom are engineers, many of whose focus includes long-term R&D in foundational wireless technologies. Most of the research work is done at the company’s San Diego headquarters, and in New Jersey, North Carolina, and Texas. Many of Qualcomm’s significant R&D projects require considerable investments of time and resources and may not be commercialized for up to a decade, if ever. Qualcomm’s investments in R&D results in transformative inventions, including most recently with respect to 5G.

In addition to 5G-critical technology, Qualcomm is also conducting significant R&D into technologies that will be enabled by 5G, including IoT, automotive devices, artificial

¹*Id.*

intelligence, and machine learning. These technologies will only be possible with 5G networks and devices. Each will create new platforms that will not only revolutionize the way people and machines interact, but also enable the creation of new technologies and innovations on top of those platforms. Similarly, Qualcomm has invested significantly in R&D in wireless battery charging, industrial IoT, healthcare, and automotive. These technologies expand Qualcomm's longstanding expertise in wireless communications into other technologies that will drive an even more mobile-based economy.

II. Importance of Strong, Predictable Patent Rights to Innovation

A. Patent Rights Protect and Incentivize Innovation

Qualcomm's innovations are made possible by a strong U.S. patent system. Patent rights incentivize high risk, long horizon investments in innovation. By ensuring that inventors own their inventions, intellectual property rights provide monetary reward for resource-intensive R&D. Patent owners are entitled to charge licensing fees in exchange for permission to use the patented invention, or exclude others from using their invention altogether. Patents permit innovators to recoup the investment they made in their R&D enterprise, perpetuating a cycle that rewards inventors for risk-taking and accelerates consumer access to innovative technologies.

Patent rights also facilitate commercialization, collaboration and follow-on innovation. Patent protection ensures that an invention can be freely bought, sold, or licensed, allowing patents owners to reap the benefit of their invention, while transferring their invention directly to the party best positioned to commercialize it for public or industry use. Intellectual property protections thereby unlock a vast innovation economy in the United States that, according to the USPTO, accounts for more than \$8 trillion in economic activity, or more than one-third of U.S. GDP.²

Public disclosure of foundational technologies also ensures that other innovators can identify them and work with their inventors to collaborate on future new and add-on technologies. With respect to 5G, for example, patent rights facilitate the development of international standards, which ultimately allow devices, networks, and other 5G infrastructure to operate seamlessly with one another around the globe, no matter which company manufactures the equipment.

B. Qualcomm's Licensing Business Model

Qualcomm holds over 130,000 patents on its technology, and its patent portfolio is the most widely and extensively licensed in the wireless industry, with over 300 licensees. Revenue from Qualcomm's licensing business is invested back into R&D to continue the cycle of innovation. Over the last decade, the company has invested over 20 percent of its total annual revenue in R&D, bringing the company's total lifetime R&D expenditures to over \$57 billion.

² Econ. & Stats. Admin. and U.S. Patent & Trademark Office, *Intellectual Property and the U.S. Economy* (2016), at ii, <https://www.uspto.gov/sites/default/files/documents/IPandtheUSEconomySept2016.pdf>.

Broad licensing of Qualcomm technology enables competition in the wireless industry and has given rise to a healthy ecosystem consisting of smart devices, networks, and applications. The patenting of innovative technology ensures that this basic technology is publicly disclosed, allowing others to incorporate the technology into their own devices and innovations, and also to improve upon it. Qualcomm participates in and contributes substantially to standards-setting organizations, international bodies of engineers who contribute technology to standards that allow devices and products from different manufacturers and different countries to interact with one another, further encouraging innovation and collaboration. Indeed, Qualcomm’s long-term research and standards participation provides U.S. leadership in 3GPP, the organization that develops technical wireless standards.

This level of private sector investment in wireless R&D—which is now being applied to the development of 5G wireless—is unparalleled anywhere in the world. No other U.S. company or government has made a commitment to developing 5G that rivals Qualcomm’s investments.

III. Section 101 and 5G

A. Patents and 5G

Qualcomm’s most significant R&D project involves building the foundational technologies that underpin 5G wireless. 5G is the much-anticipated new standard for mobile wireless communications. As the successor to the “4G LTE” standard that ushered in the current proliferation of connected mobile phones and tablets, 5G offers a great leap forward in connectivity, speed, response time, power optimization, and capacity, enabling the next generation of wireless networks.

These innovations do not occur in a vacuum. Strong patent rights are an essential part of Qualcomm’s business model. Qualcomm invents 5G technologies, patents them, then licenses the patents to implementers to build 5G devices and networks. Qualcomm, in turn, invests a portion of its licensing revenue back into R&D to continue developing and improving 5G technologies.

Consistency and predictability in patent eligibility standards are important features of a strong patent system that facilitates 5G R&D. Innovative companies like Qualcomm need to know what inventions are patentable and have confidence that their applications will be reviewed on their merits, and not rejected out of hand on subject-matter eligibility grounds.

However, as numerous witnesses from the first two days of hearings have explained, the Supreme Court’s recent section 101 jurisprudence has left the scope of patent eligible subject matter unsettled and caused tremendous confusion in the courts,³ at USPTO, and among

³ See, e.g., *Interval Licensing v. AOL*, 896 F.3d 1335, 1348 (Fed. Cir. 2018) (calling patent eligibility law “incoherent,” and explaining that “[t]he law . . . renders it nearly impossible to know with any certainty whether the invention is or is not patent eligible.”) (Plager, J.) (dissenting); *Berkheimer v. HP, Inc.*, 890 F.3d 1369, 1375 (Fed. Cir. 2018) (stating that the law of section 101 “needs clarification by a higher

innovators like Qualcomm. The importance of a strong, reliable patent system to incentivize inventors to assume the risky investment of time and resources necessary to innovate has also been a common theme throughout these hearings. Lack of predictability and uncertainty over patent rights, as we currently face today, makes it risky to develop and invest in new technology, thereby deterring innovation.

Former Federal Circuit Chief Judge Paul Michel has expressed frustration at the difficulty of applying the Supreme Court’s *Alice/Mayo* test, observing that, “in scores of appeals, [the Federal Circuit] has struggled to make sense of the opaque Supreme Court decisions,” and has “introduced its own confusing notions and language.”⁴ At the first day of hearings, Judge Michel stated that the “most fundamental problem . . . is unpredictability,” and that even he “cannot predict in a given case whether eligibility will be found or not found.” He went on to question how when even he, with 22 years of experience at the Federal Circuit, cannot make this prediction, how “bankers, venture capitalists, business executives . . . [can] make reliable predictions and sensible decisions.”

B. *Qualcomm’s Experience with Section 101*

At Qualcomm, we have experienced the very problem Judge Michel so cogently described. We have invested billions of dollars to create the 3G and 4G networks that the world depends on today. We made this investment with confidence in our ability to obtain patents on our innovations and ability to license these patents to recoup the enormous cost it takes to develop these technologies. Today, as we fight in the race to bring 5G to the world, whether we will be able to obtain adequate patent protection for this incredibly important technology is murky and uncertain.

In particular, there has been great confusion as to what inventions do—and do not—constitute an “abstract idea.” As the USPTO explained, “similar subject matter has been described both as abstract and not abstract in different [Federal Circuit] cases. The growing body of precedent has become increasingly more difficult for examiners to apply in a predictable manner, and concerns have been raised that different examiners within and between technology centers may reach inconsistent results.” *See* 2019 Revised Patent Subject Matter Eligibility Guidance, 84 Fed. Reg. 50, 52 (Jan. 7, 2019).

Qualcomm’s difficulty obtaining certain 5G patents under section 101 illustrates our concerns with the state of the law. In large scale wireless communication systems with many users, over the air communication is messy and difficult. Signals transmitted over the air are susceptible to error for a variety of reasons. Adding faster speeds, lower latencies, and increased bandwidth, as is done with 5G technologies, provides additional challenges. Signal errors prevent quality communication and requires additional power and transmission resource

authority, perhaps by Congress, to work its way out of what so many in the innovation field consider are § 101 problems.”) (Lourie, J.);

⁴ Judge Paul Michel, *Is 2019 the Year Clarity Returns to Section 101? Judge Paul Michel Is Hopeful*, IPWATCHDOG INSTITUTE, Jan. 24, 2019, <https://www.ipwatchdog.com/2019/01/24/2019-year-clarity-returns-section-101-judge-paul-michel-hopeful/id=105566/>.

consumption to account for and rectify the errors. To prevent errors, signals can be coded (or encoded) so that components involved in wireless communication can detect and correct errors. Enhanced error detection and correction methods are essential to fulfilling 5G's promise of near-instant, high-quality, low-power data transmissions—all critical features to 5G devices and applications.

On several occasions, Qualcomm patents on polar coding technology have been abandoned, rejected, or delayed due to the difficulty of applying section 101 in cases where a U.S. patent examiner insisted that claims were too abstract. During one such examination⁵, the examiner discounted the practical and tangible effects of the claimed technology asserting several times that the claims were too abstract – premised mainly on the claims reciting encoding techniques. After several good-faith attempts with the examiner and enduring shifting examination efforts, we determined not to pursue this application further. Qualcomm has also had similar polar coding patents outright rejected by the USPTO on section 101 grounds.⁶

In another case, section 101 issues delayed the grant of a patent on polar coding techniques, despite Qualcomm's use of the USPTO's patent prosecution highway (PPH) to expedite the examination. During examination, the USPTO examiner issued four actions consisting solely of a 101 rejection of all claims. Our first three responses included arguments and good-faith amendments in an attempt to resolve the repeated 101 challenges. Our final, fourth response repeated our prior arguments without any new amendments, but was filed after the new 101 guidelines and resulted in allowance in March 2019. The series of 101 rejections added 8 to 11 months of unnecessary delay, especially considering efforts to use the expedited PPH program.

These examples show the impact of uncertainty surrounding patent eligibility on 5G technology. Reliance on 5G networks for mission-critical services, autonomous vehicles, remote surgeries, military operations, and countless other applications depends on technology that minimizes the risk of error in transmission of 5G signals. Yet on multiple occasions, section 101 jurisprudence has unreasonably delayed or defeated the grant of a patent on these essential features of 5G. To be clear, we do not blame the patent examiner for this outcome. The state of patent eligibility law makes it extraordinarily difficult to apply the “abstract idea” concept consistently across applications and technologies, making it uncertain to both examiners and applicants what is patentable.

As we move forward into the new frontier of 5G technology, we have great concerns about the scope of the abstract idea exception and how it will impact our ability to protect our innovations in this field. Technology used to create 5G is often algorithmic in nature in that it consists of a process or set of rules to be followed in calculations or other problem-solving operations by a computer chip on a mobile phone. Under the unbounded definition of the abstract idea exception, the USPTO could deny patent applications and the courts could strike down any granted patents covering important technology related to 5G technology.

⁵ U.S. Application 15/395,749 (Published as USPGPUB 2017/0353267).

⁶ *See, e.g.*, U.S. Application 15/851,303 (Published as USPN 10,224,966).

C. Section 101 and National Security

In the context of 5G and other essential technologies, uncertainty surrounding patent eligibility has significant implications for national security. While uncertainty in patent eligibility has weakened the U.S. patent system, other countries, such as China, that harbor aspirations to lead the world to 5G, have invested heavily in intellectual property, strengthening patent rights as a part of their broader innovation strategy.

As noted at the first hearing by former USPTO Director David Kappos, it is currently easier to secure patent protection for critical life sciences and information technology inventions in China and Europe than in the U.S. A study by scholars at George Mason University examined nearly 18,000 patent applications filed in the U.S., Europe, and China, that were rejected in the United States on section 101 grounds. The study found that of the almost 18,000 applications rejected and abandoned in the U.S., nearly 1,700 were granted in Europe, China, or both. See Kevin Madigan & Adam Mossoff, *Turning Gold into Lead: How Patent Eligibility Doctrine Is Undermining U.S. Leadership in Innovation*, 24 Geo. Mason L. Rev. 939 (2017).

The Qualcomm patents described above further demonstrate the comparative disadvantage that section 101 confusion creates for U.S. innovators. Each of the three patents abandoned, denied, or delayed in the United States was granted by European and Chinese examiners reviewing them under the Patent Cooperation Treaty (PCT). In none of these cases did the PCT examiner raise any concerns regarding subject matter eligibility.

The ability to obtain patents on 5G technologies overseas, but not in the United States, favors our foreign competitors and disadvantages U.S. companies. U.S. patents are reviewed, granted, and enforced under U.S. law, where patent owners can rely on an independent judiciary and a strong rule of law tradition to ensure that U.S. companies are treated fairly in patent disputes. If essential technologies in 5G cannot be patented in the United States, U.S. innovators cannot rely on U.S. courts to vindicate their rights, losing “home court” advantage relative to their foreign competitors. If the United States is to remain competitive in the global race to 5G, Congress and the Administration must make every effort to ensure that U.S. patent rights remain strong, predictable, and enforceable, in the United States.

The importance of maintaining U.S. leadership in global technology innovation cannot be overstated. Foreign dominance of any critical technology presents significant national security concerns, as competitors, many with ties to hostile governments, control wireless networks, computer hardware, medical devices, and other technologies used by individuals, businesses, and governments in the United States.

5G in particular carries an elevated risk of foreign control because U.S. companies are not competitive in all areas of the 5G ecosystem. Today’s mobile 5G ecosystem is built upon a foundation of 5G R&D and standards setting that enables the entire wireless environment. The other elements—mobile phones and other devices, 5G infrastructure, and mobile semiconductors—each present their own challenges and opportunities for U.S. leadership in the broader 5G environment, and key implications for U.S. national security.

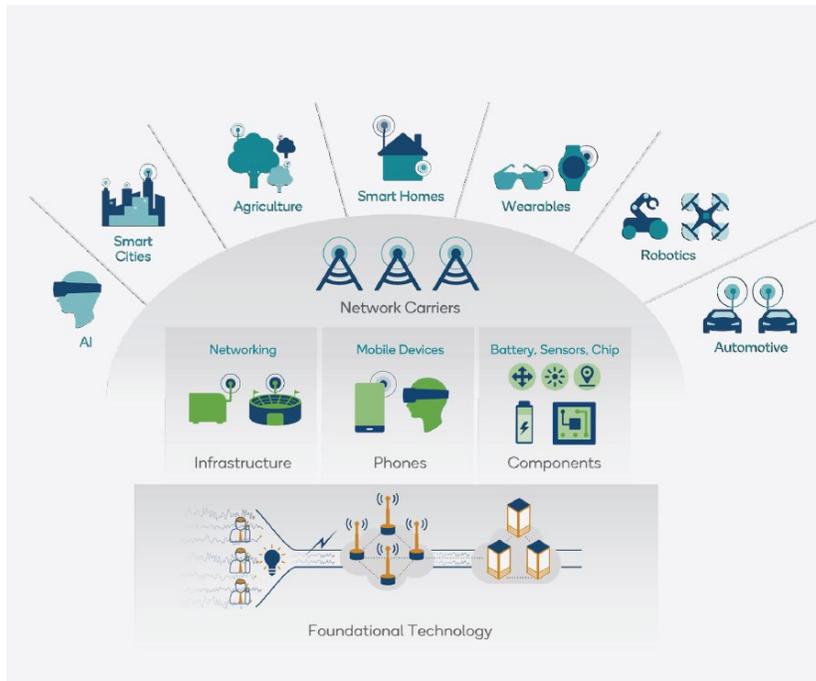


Fig. 1: The 5G Ecosystem.

- *Foundational technology.* Qualcomm has been a global leader in mobile R&D for over 30 years. Cutting-edge innovations in mobile communications form the foundational pillar for 5G networks and are essential to driving the technology forward. Today, Qualcomm is the only U.S. company making significant technical contributions to foundational 5G wireless technology and is the recognized global leader in the 3GPP standards body responsible for selecting and releasing 5G standards. This is the foundational technology that underpins and enables the entire wireless ecosystem.
- *5G infrastructure and equipment.* Today, no U.S. companies produce the large telecommunications infrastructure to connect mobile devices to 5G networks, such as cell towers, base stations, and wireless routers. Huawei is the largest global provider of telecommunications infrastructure, with Ericsson and Nokia competing with each other for market share.
- *Mobile devices.* Mobile phones and IoT devices, built on mobile semiconductors, will be the principal way users access 5G networks during the initial phase of 5G deployment. With hundreds of mobile phone manufacturers operating globally, primarily based in China, the industry is intensely competitive. On a per-unit basis, the majority of mobile phones are manufactured outside the United States. South Korea’s Samsung holds the number one position, with China’s Huawei closing in. Apple—which manufactures its devices in Asia—is the only U.S.-based mobile phone manufacturer that remains competitive, holding third place behind Huawei.

- *Mobile semiconductors and systems (“chips”)*. Semiconductor technology in the form of 5G chipsets and software bring the research and standards to life, by developing products that allow mobile phones and IoT devices to connect to 5G networks. While Qualcomm is highly competitive in the mobile semiconductor industry, no company can claim undisputed leadership in mobile chip design and supply. However, the fact that the United States holds a major position in chipset and software supply, rather than being forced to import such technology, is positive for both national and economic security.

U.S. leadership at the foundational layer of 5G has significant implications for U.S. national security. As the leading U.S. company in 5G R&D, Qualcomm’s success in foundational R&D remains critical to our national success in the 5G ecosystem. As the Committee on Foreign Investment in the United States (CFIUS) recognized in March of last year, “Qualcomm’s technological success and innovation is driven by its unmatched expertise and research and development expenditures” and any “[r]eduction in Qualcomm’s long-term technological competitiveness and influence in standard setting would significantly impact U.S. national security” because a “shift to Chinese dominance in 5G would have substantial negative national security consequences for the United States.”

All of the other components of 5G depend on this base layer of innovation, and each has their own unique national security and competitiveness concerns. It is therefore imperative that the U.S. continue to lead in the foundational R&D layer of the 5G ecosystem.

Protecting U.S. economic and national security has always gone hand-in-hand with ensuring U.S. technological leadership. From the invention of the telephone, the United States has been at the forefront of developing new generations of telecommunications technology. As companies from around the world participate in the development and implementation of 5G mobile devices and networks, it is critical that the U.S. maintain its leadership in wireless R&D and standards, particularly as critical 5G technologies evolve to enable smart cities, Industrial IoT, connected cars, and other forms of machine-to-machine communications.

Indeed, if the United States were to lose leadership in the underlying 5G foundational technology and standards, foreign governments and businesses, including adversaries, could gain unprecedented control over all aspects of a 5G wireless communications system that will connect every part of our economy, infrastructure, and daily lives.

A secure 5G, therefore, depends on continually maintaining the conditions necessary for U.S. inventors—both individuals and companies—to innovate. The United States must enact laws and policies that incentivize and reward risky and transformative investments in 5G innovation and ensure a fair and competitive global marketplace.

Strong, predictable patent rights are an essential part of the national security paradigm. While our overseas competitors strengthen their position in 5G, the United States has been weakening our innovation ecosystem, particularly with respect to patent eligible subject matter. For example, it’s harder to obtain patents on computer software in the United States than it is in Europe or China, even though innovative algorithms are essential security features of technologies like artificial intelligence, smart cities, smart homes, and secure networks. The

ability to patent core technologies of the future in the United States is essential to maintaining a competitive edge over foreign companies that patent abroad.

Moreover, since many foreign companies enjoy financial and political support from their home governments, the private sector-driven system in the United States depends on strong patent rights, not government intervention, to incentivize innovation. This includes broad subject matter eligibility for patents that does not categorically exclude any particular technology or industry from patent protection. A predictable patent eligibility regime ensures that as new technologies emerge, U.S. innovators can seek patent protections in the United States to ensure U.S.-based innovation can keep pace with overseas competition.

IV. The Need for Section 101 Reform: Patent Subject Matter Eligibility and the *Alice/Mayo* Framework

As the Subcommittee has heard repeatedly over the past week, section 101 of the Patent Act, 35 U.S.C. § 101 broadly defines what subject matter is eligible for patent protection by setting forth that “*any* new and useful process, machine, manufacture, or composition of matter, or *any* new and useful improvement thereof ” is eligible for a patent. Patent eligibility under section 101 has provided patent protection to inventions in a wide array of fields for many years, encouraging exploration and discovery across many industries, including medical diagnostics, personalized medicine, software development, and artificial intelligence. Since Qualcomm was founded in 1985, we have relied on the expansive scope of patent eligible subject matter to build our patent portfolio that protects our valuable technology and enable us to invest billions of dollars in cutting-edge R&D toward future technologies such as 5G.

Until recently, the law of section 101 was relatively settled and understood as a “coarse filter” for what subject matter is patent eligible. Courts recognized a few implicit exceptions to what subject matter is eligible—laws of nature, natural phenomena, and abstract ideas—but these were applied in a relatively narrow fashion.

Over the past decade, Qualcomm’s ability to protect its inventions and continue innovating has declined significantly. As you heard over the course of the first two days of hearings in The State of Patent Eligibility in America, the Supreme Court has greatly expanded the reach of the judicially created exceptions and greatly narrowed the scope of patent eligible subject matter in the past decade. In so doing, the question of what subject matter is and is not patent eligible has been thrown into disarray.

In four recent cases,⁷ the Supreme Court set forth a new two-part test, often called the *Alice/Mayo* test, for determining when a patent claim is said to cover one of the three judicially created exceptions, and thus not subject matter eligible. This two-step inquiry in evaluating patent eligibility requires that the Court: (1) determine whether the patent claim “is directed to” an exception to subject matter eligibility—*i.e.*, a law of nature, natural phenomenon, or abstract

⁷ *Bilski v. Kappos*, 561 U.S. 593 (2010); *Mayo Collaborative Servs. v. Prometheus Labs*, 132 S. Ct. 1289 (2012); *Association for Molecular Pathology v. Myriad Genetics*, 569 U.S. 576 (2013); *Alice Corp. v. CLS Bank*, 573 U.S. 208 (2014).

idea; and if so, (2) whether the patent claim has an “inventive concept” that ensures that the patent claim amounts to “significantly more” than the exception itself.⁸

As numerous witnesses at the hearings have described, this test has proven to be incoherent and highly subjective. The first step of this test—whether a patent claim is “directed to” a judicial exception—is unworkable because, *all* patent claims “at some level . . . embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas.”⁹ Given that *all* patent claims at *some level* rely upon the judicial exceptions, the determination of which claims are “directed to” a judicial exception—and which claims are not—has become an unpredictable, arbitrary determination that depends more on the identity of the Judge making the determination than anything else.

Two aspects of the Supreme Court’s two-part *Alice/Mayo* test have proven particularly problematic—claim dissection and conflation of subject matter eligibility with inventiveness. These practices contribute to the uncertainty of what subject matter is and is not patent eligible and result in ground-breaking innovations being denied patent protection.

With respect to claim dissection, the Supreme Court has long recognized this practice as a major problem and warned against it several decades ago, advising that it is “inappropriate to dissect the claims into old and new elements and then to ignore the presence of the old elements in the analysis” of subject matter eligibility. *Diamond v. Diehr*, 450 U.S. 175, 188–191 (1981). But following the Supreme Court’s recent section 101 decisions, including *Alice*, courts are now effectively *required* to engage in claim dissection to determine whether a patent claim is “directed to” a judicial exception by discounting “routine” or “conventional” claim elements in determining whether a claim covers patent eligible subject matter. *Alice*, 573 U.S. at 225.

With the current jurisprudence, inventors cannot count on patent claims being assessed *as written*. Even a claim that falls squarely within one of the four statutory categories of patent eligible subject matter can be reduced to one of the three judicially created exceptions through claim dissection, and denied patent protection.

For example, in *Chargepoint, Inc. v. Semaconnect, Inc.*, 920 F.3d 759 (Fed. Cir. 2019), the Federal Circuit acknowledged that the claims were “associated with a physical machine that is quite tangible,” but held that the claims were directed to an abstract idea, and found that the claims were not subject matter eligible. The Court ignored the fact that the claims, as written, recited numerous physical electrical components, including a control device (on/off switch), transceiver to communicate with a remote server, and a controller to activate the on/off switch based on communications from the server, and instead distilled the invention to a single abstract idea and denied patent protection.

Not only is such a practice unfair—depriving the inventor of the benefit of how he or she claimed the invention—it contributes to the unpredictability that inventors face in assessing whether their invention is subject matter eligible.

⁸ *Alice*, 573 U.S. at 217–18.

⁹ *Alice*, 573 U.S. at 217 (citations and internal quotation marks omitted).

Regarding conflation of patent eligibility and inventiveness considerations, the Patent Act makes clear that patentable eligibility under section 101 and inventiveness under sections 102 and 103 are distinct concepts that should be treated separately. Unfortunately, the Supreme Court has conflated these very different issues by requiring courts to determine whether an invention has an “inventive concept” in the second step of the *Alice/Mayo* test. This conflation has created confusion in the case law and forced inventors to argue the inventiveness of their inventions without the benefit of testimony from technical experts of at an unfair disadvantage, resulting in true innovations being deemed *non-inventive*.

Historically, inventiveness has been addressed through novelty and non-obviousness inquiries under sections 102 and 103 of the Patent Act. Both sections require an intensive fact-based inquiry through discovery to develop a thorough record of why the invention is innovative, with a well-developed body of case law that allows for relatively consistent and predictable determinations.

By contrast, there is no well-developed test for assessing whether a claimed invention is innovative under section 101. Thus, judges often make under-informed “inventiveness” determinations on a hunch without *any* discovery, on a motion to dismiss.¹⁰ This has led to *groundbreaking innovations* being held invalid for failing to meet the “inventive concept” test.¹¹

V. Proposed Bipartisan Section 101 Legislation

Qualcomm commends you on your efforts to reform section 101, and we fully support those efforts. We believe that the proposed bipartisan bill is an impressive and positive step toward sensible reform.

A. Proposed Section 101

We believe that the proposed amendments to Section 100 and 101 are a very favorable step towards sound reform of patent subject matter eligibility. The proposal is simple, straight forward, and will address a number of the problems with the current section 101 jurisprudence that I, and may others, have raised.

The proposed legislation, first and foremost, creates a presumption in favor of eligibility. This reinforces an important principle—that subject matter eligibility should be a low bar to obtain a patent, and doubts should be resolved in favor of subject matter eligibility.

¹⁰ See, e.g., *Chargepoint, Inc. v. Semacnect, Inc.*, 920 F.3d 759 (Fed. Cir. 2019); *Finnavations LLC v. Payoneer, Inc.*, No. 1:18-cv-00444, 2018 WL 6168618 (D. Del. Nov. 26, 2018); *Tangelo IP, LLC v. Tupperware Brands Corporation*, No. 1:18-cv-00692, 2018 WL 6168083 (D. Del. Nov. 26, 2018); *Epic IP LLC v. Backblaze, Inc.*, 351 F. Supp. 3d 733 (D. Del. Nov. 26, 2018); *Secure Cam, LLC v. Tend Insights, Inc.*, 351 F. Supp. 3d 1249 (N.D. Cal. Nov. 14, 2018).

¹¹ See, e.g., *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371 (Fed. Cir. 2015) (holding that the patent claims at issue were ineligible and thus invalid because of the “Supreme Court’s blanket dismissal of conventional post-solution steps,” despite recognizing Sequenom’s invention as “truly meritorious.”)

The proposed legislation also eliminates *all* judicially created exceptions to subject matter eligibility—including abstract ideas, laws of nature, or natural phenomena. This is an incredibly important change to the law given the judicial exceptions have caused tremendous confusion, resulting in anomalous and unpredictable results. By abolishing the abstract idea exception, companies like ours will be able to move forward with confidence that our incredibly important and valuable innovations will not be denied patent protection solely based on eligibility.

Finally, the proposed amendment helpfully prohibits claim dissection and conflation of subject matter eligibility under section 101 with novelty and non-obviousness considerations under sections 102 and 103. As noted above, section 101 is not well-equipped to address questions of inventiveness, and application of the “inventive concept” test has produced under-informed and divergent results.

B. Proposed Section 112

While we commend the section 101 proposal, we did want to raise a concern with the proposed change to a *different* statutory provision, section 112(f). The proposed changes to section 112(f) could cause serious and adverse unintended consequences that we would like to bring to your attention.

Today, section 112(f) is narrowly applies only to “means plus function claims,” where a claim recites a means for achieving a claimed function without reciting the structure for achieving that function. Such claims are construed as being limited to *only* the structure described in the specification, and equivalents to that described structure.

With few exceptions, section 112(f) is *only* applies to a patent claim when the patent applicant chooses to draft the claim element using the phrase “means for” or “step for” performing a specified function. Practitioners know that when they invoke section 112(f) using this specific language, the resulting claim will be limited to the disclosure and will not cover other well-known equivalents for a function. This means that accused infringers need only make a minor change to the structure described in the specification to avoid infringement. Practitioners take that risk only when it is appropriate, knowing the language creates a substantial narrowing of the resulting claims that makes it easy for competitors to avoid findings of infringement.

The current proposal would broaden the application of section of 112(f) in an expansive manner, such that the recitation of *any function* in a claim “without the recital of a structure, material, or act in support thereof” will limit the claim to the specific structural embodiments laid out in the specification that practice the claimed function. This change to section 112(f) would presumably sweep in *all* method claims which, by their nature, describe a claimed invention in a series of functional steps—processing, computing, transmitting, reciting, etc. Qualcomm often uses functional language in patents, such as the encoding techniques describe above.

For decades, Qualcomm has relied on the well-established principle that patent holders may rely on the knowledge and skill of a person of ordinary skill in the art and need not enumerate *each way* of carrying out *each step* of a method in the patent specification when

drafting a patent. Given inventions are a combination of old and new elements, the Patent Act simply does not require innovators to disclose every potential embodiment of known claim elements.

By limiting the scope of any claim with functional language to only those specific embodiments described in the specification, the proposed changes to section 112(f) is at odds with these longstanding practices. It would mean that Qualcomm will need to enumerate every possible way of carrying out every step of a claimed method, or else be limited to a very narrow claim scope. Our patent applications would have to recite *all* aspects of known elements that our claims encompass to try to minimize the risk of non-infringement by competitors. This practice is unworkable and insensible given the time and expense it would take to draft and prosecute such patent applications. And most importantly, the change to section 112(f) would allow our competitors to copy our technology and avoid infringement by making small, insubstantial changes to the embodiments described in the specification, rendering Qualcomm's patent portfolio covering its wireless technologies worthless.

We believe that, in its existing form, section 112 is adequate to address concerns about preemption, without further reform. Section 112 requires inventors to describe their invention and provide enough information so as "to enable any person skilled in the art . . . to make and use the same." 35 U.S.C. § 112. Because written description and enablement must be commensurate in scope with the claims, broad claims require a fuller, broader, and more robust disclosure than narrow claims—which prevents applicants from monopolizing things like scientific principles through broad open-ended claiming that are not supported by an enabling description in the specification. We therefore believe that reform should be limited to the changes proposed to sections 100 and 101, and absent more substantial deliberation about the precise problem to be solved and how best to solve it, that it should not include section 112.

If the Subcommittee were to proceed with an amendment to section 112, we believe that more discussion and thought is needed to ensure that any change is limited in scope and avoids adverse and unintended consequences—in the same way that significant time and care has been devoted to thinking about how to reform section 101 in a helpful way.

That concern noted, Qualcomm greatly appreciates the reform efforts on section 101, and state our belief that it successfully addresses several of the problems with the current patent subject matter eligibility jurisprudence.

Thank you again for inviting me to testify today. We stand ready to work with you to ensure that U.S. law and public policy, including section 101, promote continued U.S. leadership in global innovation and protect our national security. I look forward to answering your questions.