

Statement of

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Before the

**United States Senate Committee on the Judiciary
Subcommittee on Intellectual Property**

Hearing on

“The State of Patent Eligibility in America: Part III”

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Chairman Tillis, Ranking Member Coons, and distinguished members of the Subcommittee, thank you for the opportunity to appear before you to address the state of patent eligibility and the bipartisan, bicameral legislative proposal under consideration. My name is Byron Holz. I work for Nokia as Senior Intellectual Property Rights Licensing Counsel and have served as the Head of IP Services for Nokia's Software Business Group. My legal experience includes a clerkship with the Honorable Marilyn L. Huff in the United States District Court for the Southern District of California, teaching International Intellectual Property at Emory University School of Law as an adjunct professor, and practicing law in Alston & Bird's intellectual property litigation group.

Nokia is one of the leading providers of the equipment, software, and services that create the communications networks connecting our world. After Nokia completed the sale of its handset business to Microsoft in 2014, Nokia has sometimes been viewed, incorrectly, as a company focused solely on patent assertion. To the contrary, Nokia continues to be one of the largest manufacturers of wireless, fixed, and optical telecommunications equipment. Nokia has approximately 100,000 employees, spread over roughly 130 countries. About 11,000 of those employees are based at sites around the US, including the Nokia Bell Labs campus in Murray Hill, New Jersey. Bell Labs, a venerable research institution that gave the world inventions as profound as the transistor and the laser, became part of Nokia when it acquired Alcatel Lucent through a process completed in 2016. Nine Nobel Prizes have been awarded to researchers for their work done at Bell Labs. In 2018, for example, Dr. Arthur Ashkin received the Nobel Prize for work done at Bell Labs relating to so-called "optical tweezers," which use lasers to trap and examine microscopic objects like individual cells or nanoparticles.

Nokia has cumulatively invested approximately \$155 billion in research and development related to mobile communications over the last two decades, including approximately \$5.3 billion in 2018. Nokia's R&D investment represents approximately 20% of net sales. Nokia has played a prominent role in developing technologies incorporated into 2G, 3G, 4G, and now 5G mobile cellular standards. Nokia is also leading developments in other key technologies such as artificial intelligence¹ and quantum computing.² For example, Nokia develops self-organizing networks software that allows a communications network to improve its own performance.

Because Nokia is both a large product manufacturer and a leader in technology development, we experience the patent system from the perspectives of both a major patent holder and a defendant in patent cases. Starting with the patent owner's perspective, Nokia's investments have led to it currently holding a portfolio of around 20,000 patent families. Nokia is a leading holder of 5G patents, with over 1,500 patent families declared essential to 5G.³ Nokia licenses patents for a wide range of technologies including 2G, 3G, 4G, and 5G mobile communications, video coding, and wireless LAN (also referred to by the "Wi-Fi" trademark). Our licensing programs cover products including mobile devices, consumer electronics, broadcast media, automobiles, and smart meters. The patent licensing revenue from these programs is an important part of Nokia's business and its continued investment in R&D.

Patent protection has served a key role in the success of the open standards underlying technologies like 5G. Technologies like 4G, 5G, and others before them have been made possible by many companies working together, openly, to solve huge technical challenges. Nokia and others have contributed their ideas to these efforts, after extensive R&D investment,

¹ See, e.g., <https://www.nokia.com/blog/four-most-promising-applications-artificial-intelligence-telecom/>

² See, e.g., <https://www.bell-labs.com/var/articles/security-quantum-era/>

³ Based on declarations to ETSI by the end of Q1 2019.

with the expectation that contributors can obtain patents on deserving inventions and seek fair, reasonable, and non-discriminatory royalties on their patented contributions. When patents are weakened, it risks deterring public disclosure of innovation, and thus impairing the type of public collaboration that has given us extraordinary technologies like 4G and 5G, which are complex standards built upon thousands of contributions.

Patents also present risks for Nokia. Nokia has signed many patent licenses as both a licensee and licensor, and we are regularly faced with allegations that our products practice others' patents. Nokia strives to respect others' valid intellectual property rights and incurs both significant litigation costs and licensing fees in doing so. Indeed, my own work currently focuses on analyzing patent assertions brought against Nokia products. No patent system is perfect, and Nokia has seen its share of improper patent assertions directed against it. On balance, however, Nokia believes that recent changes in U.S. patent law—including in the area of subject matter eligibility—have tipped the scales too much against the interests of patent owners.

It is from this perspective that Nokia supports the proposed reforms to Section 101, while encouraging refinement and reconsideration of the remaining proposals, especially for Section 112(f). Before turning to comments on specific issues, however, I thank the Subcommittee and its staff for the work that has gotten us this far. You have convened an exacting and deliberative multi-stakeholder process, which is essential to developing sound policy on such a complex issue with so many divergent interests. And the extensive hearing time given to this topic shows serious commitment to a topic that is vital to the U.S. economy.

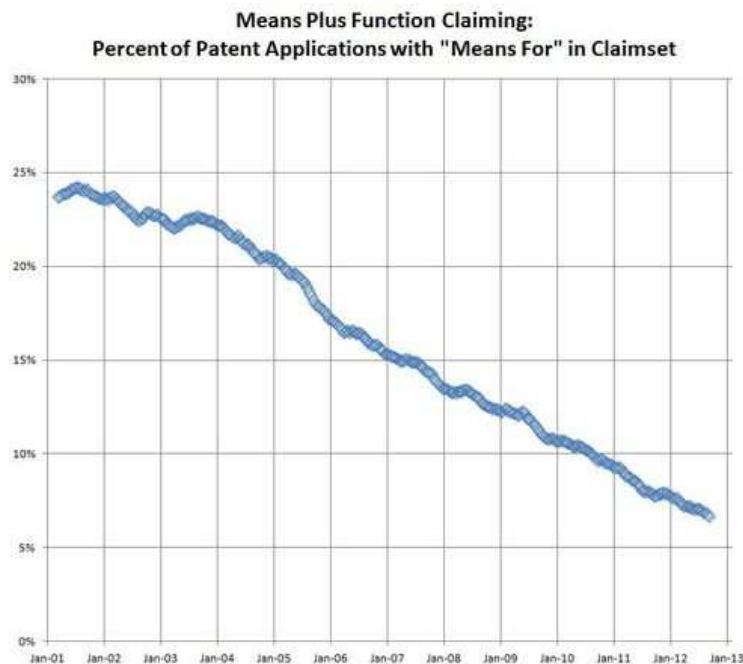
Regarding Section 101, the subcommittee has already heard expert testimony during Parts I & II about the problems with the state of Section 101 law. The uncertainty surrounding

patentability of emerging technologies, including artificial intelligence (AI) and other software-based innovations, hampers investment and risks America's global competitiveness in these fields. Rather than belaboring these points, I will briefly add some practical consequences that Nokia has observed. Nokia looked at a public data set of office actions released by the USPTO in 2017 and found that, in the roughly 3-year period after *Alice*, rejections under Section 101 were about 400% higher for AI-related applications than for all office actions combined.⁴ Although Nokia fared better than average, our rate of Section 101 rejections for AI-related applications increased by about 50% from before *Alice* to this same 3-year period after *Alice*. This trend continued beyond 2017 and, though we expect to see improvement under the latest USPTO Guidelines, agency-issued guidelines will not provide the same level of certainty as a change in the controlling law. The state of Section 101 law is undermining clarity in the extent to which rights may be secured in important technologies like artificial intelligence and other software-based technologies. This uncertainty can discourage investment and increase the cost of prosecuting patents. The proposed changes to Section 101 should correct these issues by removing ambiguous and subjective obstacles to protecting valuable innovations, such as the uncertainty embodied in current analysis of what constitutes an "abstract idea."

In light of the testimony already provided on Section 101 last week, I will focus the rest of my statement on Section 112(f). Patent claims under the current Section 112(f) tend to be disfavored by patent drafters because they create uncertainty and risk about the scope and validity of claims. Section 112(f) limits claim elements to the "corresponding structure, material, or acts" in the specification. This reduces clarity about which aspects of the specification will be

⁴ AI-related applications were identified using a key word search derived from WIPO methodology: https://www.wipo.int/export/sites/www/tech_trends/en/artificial_intelligence/docs/techtrends_ai_methodology.pdf.

deemed to correspond, when the claims are construed. When evaluating infringement, Section 112(f) also creates uncertainty about what will be considered an “equivalent” of the corresponding structure(s) identified during claim construction. These ambiguities introduced by Section 112(f) increase the possibility, for example, that some minor difference a patent drafter did not foresee, which should not matter to the invention, will cause future products to fall outside the scope of what an applicant intended to, and was entitled to, claim. Section 112(f) claims also face a risk of invalidity if insufficient corresponding structure is found—an inquiry that can be fraught with dispute and uncertainty. In light of these additional risks placed upon Section 112(f) claims, it is no surprise that Professor Dennis Crouch documented a drastic decline in use of means-plus-function claims, from about ¼ of all patents claims in 2001, to barely over 5% in 2012.⁵



⁵ <https://patentlyo.com/patent/2013/01/means-plus-function-claiming.html>

Software innovation is often functional in nature. Software may be run on general-purpose computing hardware, and innovation in the functioning of software does not necessarily require a corresponding innovation in the particular hardware on which the software is run.

Patentees have developed approaches to protect software innovation without implicating Section 112(f). If Section 112(f) is modified or expanded, however, the functional nature of software innovation may increase uncertainties about how to draft software-related claims without falling under this frequently disfavored claim format. Some may seek to interpret the proposed Section 112(f) language so broadly that it would effectively prevent software-related claims from avoiding Section 112(f) at all, which would put software innovation at a systematic disadvantage. Protecting software innovations with patents is already challenging due to the state of the law regarding Sections 101 and 112(f). Modifying Section 112(f) in a way that could expand its application is likely to create uncertainties for software-related claims, and lower the perceived value of such claims. As Professor Crouch observed in the above post, regarding a suggestion to treat all software claims as means-plus-function claims: “In all likelihood this would severely limit the scope of many software related patents and would also lead many of them to be invalidated under MPF-indefiniteness.”⁶ Applying the proposed change to 112(f) retroactively would be especially harmful to patent owners because it would result in patents being construed under a stricter standard than drafters could have anticipated.

Section 112(f), and much of the Federal Circuit case law applying it, is atypical among the world’s major patent systems, suggesting that application of Section 112(f) is not needed to address concerns about overly broad claims. Indeed, I am unaware of any patent system outside the United States that follows the same approach as the United States for “means-plus-function”

⁶ *Id.*

claims. Other major patent systems have, for example, focused on mechanisms that ensure that the scope of disclosure supports the claims (but without the US Section 112(f) claim interpretation and related approaches), while leaving the inventor able to state more clearly what they intend to claim when dealing with functional elements. Approaches like this may provide better incentives for innovation while still safeguarding future inventors.

In conclusion, Nokia applauds the Subcommittee for its efforts to provide clarity and certainty to what constitutes patentable subject matter. Recent Supreme Court jurisprudence has transformed Section 101 from its historically limited gatekeeping function to a test that inappropriately blocks protection for important innovations, while also muddling the role of Section 101 with other parts of the Patent Act. The Section 101 reform proposal put forth by the Subcommittee will go a long way towards reversing this damaging trend and, therefore, to restoring America's patent system to one that incentivizes innovation and attracts more research investment.