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October 28, 2022

The Honorable Thom Tillis
United States Senate
113 Dirksen Senate Office Building
Washington, DC 20510

Re: S. 4734 Patent Eligibility Restoration Act of 2022

Dear Senator Tillis:

The National Association of Patent Practitioners (NAPP) is a North Carolina-based non-profit organization representing hundreds of patent attorneys and agents specializing in patent practice before the U.S. Patent and Trademark Office (USPTO). NAPP members frequently use the U.S. patent system and are highly knowledgeable of U.S. patent matters. Many NAPP members focus their work on representing small businesses, startups, and individual inventors before the USPTO.

NAPP enthusiastically applauds your leadership in introducing your bill: S. 4734 Patent Eligibility Restoration Act of 2022. The reforms in S. 4734 make significant advances toward the clarity of patent eligibility. These reforms will meaningfully improve the ability of inventors to protect their ideas and help spur innovation.

S. 4734 does an exemplary job of addressing patent issues facing the biotechnology and pharmaceutical industries. However, we suggest clarifications to S. 4734 to better address issues facing the computer and software engineering industries and to capture the bill's restorative intent. Although NAPP's proposal uses high-tech examples, we offer a unique perspective that should receive bipartisan support. NAPP's proposal reflects its members' decades of diverse experience representing a broad range of clients (considered in combination with all other requirements of patent law), and it is neither over-inclusive nor under-inclusive.

The most significant volume of 21st-century innovation is in computer applications: software, machine learning, data structures, and big data analytics. Therefore, 35 U.S.C. § 101 should embrace the inventions of the 21st-century, including computerized implementations that solve problems by nontraditional techniques or improve solutions to existing problems. A goal of S. 4734 should be to "first, do no harm" to the inventions that will power the 21st-century, e.g.: (i) the mathematics, algorithms, and software that drive 5G telecommunications, (ii) artificial intelligence, (iii) machine learning, (iv) medical imaging and diagnosis, (v) productivity improvements, and (vi) novel data collection and analysis. NAPP believes some of the current language in S. 4734 could lead to the under-inclusion of patent protection for significant technological innovations in these fields. NAPP proposes to remedy this as follows (and as outlined below): 1. removing or amending the "mathematical formula" exception (§ 101(b)(1)(A)), 2. removing or amending the "economic, financial, business, social, cultural, or arts" exception (§ 101(b)(1)(B)(i)), and 3. removing the "useful" definition (§ 100(k)).

1. “Mathematical formula” exception (§ 101(b)(1)(A)).

We suggest removing the "mathematical formula" exception in § 101(b)(1)(A) of S. 4734. NAPP's experience is that mathematics implemented on a computer *should* be eligible when implemented in a useful invention. Many 21st-century mathematical techniques are inventions that should be patentable as computer-implemented mathematics. Examples include: (i) the Karmarkar algorithm for linear programming (U.S. Pat. No. 4,744,028), (ii) the Inverse Lucas-Kanade Algorithm for video analysis, and (iii) many techniques used in 5G coding, artificial intelligence, and medical imaging and diagnostics. Quantum computing advances may lead to sophisticated mathematical formulas and innovative applications that warrant patent protection to advance such useful arts. Mathematical techniques save billions of dollars annually and are essential *precisely because* they apply in many fields across many "useful inventions." As currently drafted, S. 4734 would require an inventor to patent each use as a separate patent.

Non-removal of the "mathematical formula" exception in § 101(b)(1)(A) of S. 4734 presents the potential to recreate a problem from decades ago. From the mid-1970s until the late 1980s, the courts attempted to find the boundary for a “mathematical algorithm” exception, and the result paralleled today’s *Alice* indeterminacy—the word “mathematical” is inherently indeterminate. In many cases, the courts had to resolve whether the subject matter was "mathematical" simply because of the way computers store data (e.g., subject matter such as the placement of type for printing, seismographic signals for petroleum exploration, written text for machine language translation, and display of figures on a display screen). The issue dissipated in the late 1980s when the "mathematical algorithms" analysis was folded into the same analysis used for other mental processes.

We suggest the legislative history be used to explain the term "mental process" of § 101(b)(1)(B)(ii) includes mathematical algorithms if the patent claim is broad enough to cover entirely mental implementation. More specifically, "mathematical algorithms" per se and unassociated with any useful process, machine, manufacture, or composition of matter, or any useful improvement thereof, represent one class of “mental process” subject to the statutory "mental process" carve out of § 101(b)(1)(B)(ii). In our experience from past decades, confining “mathematical formulas” within the bounds of the “mental process” exception and capable of being performed wholly in “the human mind” savings clause gives the correct result—neither too broad nor too narrow. Computer-implemented mathematical techniques that should be excluded are already excluded by other principles of patent law, i.e.: (i) §§ 102 and 103 (especially the “printed matter” rule that applies to §§ 102 and 103), (ii) the "utility" requirement of § 101, or (iii) the "mental process" exception in § 101(b)(1)(B)(ii) of S. 4734.

Nonetheless, if a "mathematical formula" exception is necessary, NAPP suggests a slight but semantically meaningful revision to S. 4734 (shown marked up far below).

2. “Economic, financial, business, social, cultural, or arts” exception (§ 101(b)(1)(B)(i)).

The carve-out for inventions in the fields of “non-technological economic, financial, business, social, cultural, or arts” in § 101(b)(1)(B)(i) of S. 4734 is of concern. NAPP’s experience is no such exception is needed because other principles of patent law already exclude the inventions that should be excluded, e.g.: (i) the four categories “process, machine, manufacture, or composition of matter,” (ii) the “mental steps” exception, (iii) obviousness, (iv) the “printed matter” exception to §§ 102 and 103, (v) long-standing rules of claim construction, and (vi) the “utility” requirement. For example, the “printed matter” exception excludes wedding vows from patentability. Duplicate coverage and extraneous language, as in this carve-out in S. 4734, may create more problems than it solves.

Nonetheless, if a “non-technological economic, financial, business, social, cultural, or arts” carve out is required, it should be more clearly defined so particular subject matter remains eligible, i.e.: (i) computer-implemented assistants, (ii) computer-implemented training and teaching aids, (iii) error correction and detection software, (iv) inventions protecting financial markets from fraud and abuse, (v) inventions improving the reliability of financial computing systems, (vi) inventions making financial efficiencies available to small investors and others who could not otherwise benefit, and (vii) therapeutic and rehabilitation techniques using the knowledge gained from arts and dance. Any exception should be stated precisely rather than with a term inviting dispute (i.e., “non-technical”). We, therefore, offer a slight but essential revision to § 101(b)(1)(B)(i) of S. 4734 (shown marked up far below).

3. “Useful” definition (§ 100(k)).

NAPP suggests the definition of “useful” in § 100(k) of S. 4734 be stricken. We assume the bill does not intend to change the current law of utility. NAPP is unaware of any concerns that today’s law of utility is deficient. However, the definition in § 100(k) of S. 4734 omits the third requirement of today’s case law that utility be “credible.” The courts will read great importance into any difference in today’s case law and § 100(k) of S. 4734, which NAPP believes would be counterproductive.

NAPP respectfully proposes amending S. 4734 to strike the definition of “useful” in § 100(k), and further, as shown marked up as follows:

“(b) Eligibility exclusions. —

“(1) IN GENERAL. —Subject to paragraph (2), a person may not obtain a patent for any of the following, if claimed as such¹:

“(A) A mathematical formula, apart from a useful process, machine, manufacture, or composition of matter, or any useful improvement thereof.

“(B) A process that—

“(i) is an economic, financial, business, social, cultural, or artistic process, unless such process is embodied in machine, article of manufacture, or composition of matter;

“(ii) is a mental process performed wholly in a human mind²; or

“(iii) occurs in nature wholly independent of, and prior to, any human activity.

“(C) An unmodified human gene, as that gene exists in the human body.

“(D) An unmodified natural material, as that material exists in nature independent of human activity.

“(2) CONDITIONS. —

“(A) CERTAIN PROCESSES. —Notwithstanding paragraph (1)(B)(i), a person may obtain a patent for a claimed invention that is a process described in such provision if that process is embodied in a machine or manufacture, unless that machine or manufacture is recited in a patent claim without integrating, beyond merely storing and executing, the steps of the process that the machine or manufacture perform.

“(B) HUMAN GENES AND NATURAL MATERIALS. —For the purposes of subparagraphs (C) and (D) of paragraph (1), a human gene or natural material that is isolated, purified, enriched, or otherwise altered by human activity, or that is otherwise employed in a useful invention or discovery, shall not be considered to be unmodified.

¹ By “if claimed,” we suggest that the legislative history reflect that the claim be considered with precision—for example, a claim that requires at least one step to be performed “in a computer processor” by definition cannot be performed entirely in the human mind.

² In the “mental process” exception, we suggest that the legislative history reflect that the mental process be performed in a reasonable amount of time in a single, ordinary human mind.

NAPP would be pleased to meet with you to discuss our concerns and proposed amendments to this important bill. We appreciate your leadership and your consideration,

Sincerely,

Christopher M. Turoski

Christopher M. Turoski
National Association of Patent Practitioners, President

cc: The Honorable Chris Coons, United States Senate
Cassandra Fields, Majority Chief Counsel of the Senate Judiciary Committee Subcommittee on IP
Bradley Watts, Minority Chief Counsel of the Senate Judiciary Committee Subcommittee on IP