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**Comment in Response to USPTO's Request for Comments on Patenting Artificial Intelligence Inventions published August 27th at 84 FR 44889: It Would Be Unconstitutional and Unwise To Revise Law or Regulation Regarding Inventorship on the Premise that Non-Persons Can "Contribute to the Conception of an Invention"**

**Question 3**<sup>1</sup> of the above-noted Request for Comments asks:

Do current patent laws and regulations regarding inventorship need to be revised to take into account inventions where an entity or entities other than a natural person contributed to the conception of an invention?

The term, “contributed to the conception of an invention” at the heart of the Question is a term of art inextricable from the essential determination of who qualifies as an *inventor* consistent with the meaning of that term in the Constitution’s Patent Clause (in Article I, Section 8, Clause 8) and appurtenant law.<sup>2</sup> To deem *non*-persons capable of contributing to the conception of an invention would be to deem them capable of the foundational qualifying act of “*Inventors*.“ Any effort to revise law or regulation as contemplated by Question 3 would face at least two barriers.

First, “Inventors” as used in the Constitution is limited to natural persons. Revising the patent system to accommodate putative contribution to conception of inventions by non-persons would not only exceed constitutional authority, it likely would *undermine* the constitutional goal.

Second, the AIs of our era are *incapable* of the mental acts requisite to contributing to the conception of an invention, so the contemplated revision would depend crucially on a false premise. (Or alternatively it would require fundamental revision of jurisprudence on the meaning of “inventor” and “invention” in a way at odds with the Patent Clause).

**1. The Contemplated Revision Would Conflict with the Constitution’s Patent Clause, which Is Limited to Natural Persons**

As Thomas Jefferson noted, “an inventor ought to be allowed a right to the benefit of his invention for some certain time. ... [I]ngenuity should receive a liberal encouragement.”<sup>3</sup>

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<sup>1</sup> This Comment is also generally responsive to **Question 4**.

<sup>2</sup> E.g., *Fiers v. Revel*, 984 F.2d 1164, 1168 (Fed. Cir. 1993) (“Unless a person contributes to the conception of the invention, he is not an inventor”); *Pro-Mold Tool v. Great Lakes Plastics*, 75 F.3d 1568, 1575 (Fed. Cir. 1996) (“To be a joint inventor, one must contribute to the conception of an invention.”).

<sup>3</sup> Letter to Oliver Evans dated May 2, 1807.

Manifestly, *persons* are the peculiar and exclusive subject of the promoting incentive of the Patent Clause and its reference to “Inventors.” The word has always referred to a class of *persons*, and neither the Constitution’s drafters nor anyone at the time used the word to refer to microscopes, machines, or anything other than *persons*.

Setting aside that the AIs of our era are ineffably rudimentary compared to the human brain, they are not subject to meaningful psychological characterization – much less encouragement of the kind animating the Patent Clause.<sup>4</sup> There is no “encouragement” in being deemed an inventor that would accrue directly to an AI, nor would a change the legal system governing people cause an AI to “decide” (in any non-contrived way) to focus more on pursuing invention. Someday, we may develop a general AI exhibiting sentience that warrants one or more legal rights of persons ... but in the meantime, our laws cannot be revised to selectively grant non-thinking computational systems the quintessentially human right of “Inventors.”

It may be argued that the implicit human nature of the Patent Clause’s incentive is sidestepped if no “inventor” rights are *actually* vested in AIs but rather directly in AI owners, whose behavior *can* be encouraged by legal incentives. Yet the Patent Clause is limited to “Inventors,” not “Inventors or Persons Who Own Them.” And in any case, the putative incentive of deeming AIs (or AI owners) as inventors is *already* in place – the *persons* who devise AI algorithms, choose data to feed them, and recognize and apply unexpected results are legally the “inventors” of all AI-assisted or “AI-produced” inventive subject matter and duly incentivized by the existing patent laws.<sup>5</sup> While inventors are free to contract away their rights in inventions (and common laws and state statutes also may obligate assignment in lieu of an express contract), changing the law to deem AIs contributors to the conception of inventions would divest that freedom and power from (actual) inventors. This would directly undermine the goal of the Patent Clause.

## 2. Today’s AIs Are Not Capable of Contributing to the Conception of an Invention

Setting aside the human underpinning of the Patent Clause’s incentive and the fact that no AI legally qualifies as a “person,” AIs cannot today nor for the foreseeable future will they be able to contribute to conception in the ways essential to the subject of the Patent Clause. Conception is a *mental act*, and it requires *ingenuity*; the AIs of our era are capable of neither.

As the Federal Circuit has often emphasized, conception “is a mental act”:

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<sup>4</sup> James Vincent, The State of AI in 2019, THE VERGE (Jan. 28, 2019), [www.theverge.com/2019/1/28/18197520/ai-artificial-intelligence-machine-learning-computational-science](http://www.theverge.com/2019/1/28/18197520/ai-artificial-intelligence-machine-learning-computational-science) (“There’s intelligence in AI [machine learning] systems, if you want to call it that. But it’s not organic intelligence, and it doesn’t play by the same rules humans do. You may as well ask: how clever is a book? What expertise is encoded in a frying pan?”); Paul Thagard, *How Does Current AI Stack Up Against Human Intelligence?*, PSYCHOLOGY TODAY (Nov. 12, 2018), [www.psychologytoday.com/us/blog/hot-thought/201811/how-does-current-ai-stack-against-human-intelligence](http://www.psychologytoday.com/us/blog/hot-thought/201811/how-does-current-ai-stack-against-human-intelligence) (“AI systems are notably ineffective with respect to abstracting, understanding, and feeling”).

<sup>5</sup> This last sentence is also responsive to **Question 2**. A possible concern that some AI-produced subject matter might “fall through the cracks” and be unpatentable is premature as discussed in footnote 10.

Conception is the touchstone of inventorship, the completion of the mental part of invention. ... It is “the formation in the mind of the inventor, of a definite and permanent idea of the complete and operative invention, as it is hereafter to be applied in practice.”

...

... The conception analysis necessarily turns on the inventor’s ability to describe his invention with particularity. Until he can do so, he cannot prove possession of the complete mental picture of the invention. These rules ensure that patent rights attach only when an idea is so far developed that the inventor can point to a definite, particular invention.<sup>6</sup>

The AIs of our era cannot “possess[ a] mental picture of” – i.e., understand – an invention. They cannot autonomously discern and articulate how to make and use a definite, particular, complete, operative, novel invention from anything their use by people generates; they are devoid of the sweeping, dynamic mental framework and judgment requisite to such acts.<sup>7</sup> They cannot even meaningfully connect *cause and effect*.<sup>8</sup> Just as yesteryear’s discoveries were sometimes made by persons peering unexpected things through microscopes, it remains *persons* who appreciate and conceive inventions resulting from the use of AI.

The other essential to contributing to the conception of an invention is *ingenuity*.<sup>9</sup> This quality was alluded to in Jefferson’s letter quoted above, and our courts have always deemed it essential to invention:

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<sup>6</sup> *Burroughs Wellcome Co. v. Barr Labs.*, 40 F.3d 1223, 1227-28 (Fed. Cir. 1994) (quoting *Hybritech v. Monoclonal Antibodies*, 802 F.2d 1367, 1376 (Fed. Cir. 1986); other cites omitted). Joint inventorship, from which the term “contribution to conception of the invention” derives, already stands as “one of the murkiest concepts in the muddy metaphysics of patent law.” *Mueller Brass Co. v. Reading Indus.*, 352 F. Supp. 1357 (E.D. Pa. 1972). Trying to shoehorn the non-mental acts of AI into a framework founded on the necessarily mental nature of conception would produce a true quagmire.

<sup>7</sup> Cf. Terence Tse & Mark Esposito, *Why AI Isn’t the Threat We Think It Is*, DUKE UNIVERSITY CORPORATE EDUCATION (June 2018), [www.dukece.com/insights/why-ai-isnt-threat-we-think](http://www.dukece.com/insights/why-ai-isnt-threat-we-think) (“[I]t is important to understand that there isn’t really that much intelligence in AI. Intelligence refers to one’s capacity for logic, understanding, self-awareness, learning, emotional knowledge, planning, creativity and problem-solving. Yet, at the moment, machines can do very few of these things. Intelligence implies the ability to think. But AI does not think.”).

<sup>8</sup> Cf. Will Knight, *An AI Pioneer Wants His Algorithms to Understand the 'Why'*, WIRED (October 8, 2019), [www.wired.com/story/ai-pioneer-algorithms-understand-why](http://www.wired.com/story/ai-pioneer-algorithms-understand-why) (“[D]eep learning is fundamentally blind to cause and effect”).

<sup>9</sup> An arguable exception is cases in which invention results more from *serendipity* than ingenuity per se. Notably in such cases, while the *timing* of conception has been subject to debate, the *fact* of conception – and thus inventorship by the person who encountered the serendipitous event – has *not*. Cf. Sean B. Seymore, *Serendipity*, 88 N.C. LAW REVIEW 185 (2009). Instances in which AI produces a genuinely unexpected concept that is then recognized by a human fall within this category of invention, and no precedent or meritorious basis supports depriving inventorship from persons who exercise the mental faculties needed to recognize the concept and adequately envision an invention based upon it.

[U]nless more ingenuity and skill ... were required ... than were possessed by an ordinary mechanic acquainted with the business, there was an absence of that degree of skill and ingenuity which constitute essential elements of every invention.<sup>10</sup>

No matter how opaque their operation or unexpected their results, AIs of our era are still *tools* devised, applied, and exploited by *humans*. Until AIs acquire something akin to genuine sentience, they will not be capable of the creative mental activity of Inventors that the Constitution's drafters sought to promote.

### Conclusion

Changing law or regulation “to take into account inventions where an entity or entities other than a natural person contributed to the conception of an invention” – such as to effect a right akin to inventorship based upon ownership of an AI – would be unconstitutional, and it would enshrine a false premise that contemporary AI is capable of such contributions. Such an unconstitutional windfall for AI owners likely also would snowball because: a) individual inventorship determinations in “grey areas” would be decided pervasively in favor of AI owners due to their greater negotiating power (vis-à-vis their inventor employees and contractors) as well as the loyalty owed them by the attorneys and agents responsible for drafting claims and deciding inventorship, and b) AI owners would use their greater financial power in pursuit of contested cases toward a body of precedent systemically disfavoring constitutional “Inventors.”

Sincerely,



Thomas J. Brindisi

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<sup>10</sup> *Hotchkiss v. Greenwood*, 52 U. S. 248, 267 (1851) (quoted in *Graham v. John Deere*, 383 U.S. 1, 11 (1966)). Partly in response to **Question 8**, it is noted that the Court continued, “In other words, the improvement is the work of the skillful mechanic, not that of the inventor.” This might be argued to set up (in lieu of changes to the patent laws and regulations) a progressive erosion of the available scope of patentable subject matter as the level of ordinary skill enhances with increasingly pervasive and powerful AIs taking the role of the “skillful mechanic.” Indeed AI indeed *will* remove some types of advances from the realm of ingenuity to the realm of ordinary and straightforward work – just like countless other tools have done in the past. Still, genuinely inventive subject matter – i.e., that which one of ordinary skill in the art using available tools (including AI) would not have produced through straightforward work – will fully remain the subject of invention by *persons*. As AIs advance in coming decades, a point may be reached at which they begin exhibiting meaningful autonomy and “mental” agency such that genuinely inventive subject matter becomes unpatentable under the present system. At that point, however, fully-sentient systems eligible for certain rights of persons presumably would be imminent and any need to revise the laws to accommodate non-sentient “inventors” fleeting.