No. 22-919

IN THE

Supreme Court of the United States

STEPHEN THALER,

Petitioner,

v.

KATHERINE K. VIDAL, UNDER SECRETARY OF COMMERCE FOR INTELLECTUAL PROPERTY AND DIRECTOR, UNITED STATES PATENT AND TRADEMARK OFFICE, *et al.*,

Respondents.

ON PETITION FOR A WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

BRIEF OF THE CHICAGO PATENT ATTORNEYS AS *AMICI CURIAE* IN SUPPORT OF PETITIONER

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INTEREST OF AMICI CURIAE

The *amici curiae* are patent practitioners who regularly prosecute patent applications and litigate patents in the United States. The *amici* are concerned with preserving the integrity of a patent system that fosters innovation, so that inventions can be commercialized in the marketplace and leveraged for the benefit of humankind.[1]

SUMMARY OF THE ARGUMENT

The rapid emergence of artificial intelligence (AI) has begun to parallel, and will eventually overshadow, many of the most significant technological advances in human history, including the comparatively recent invention of programmable computers, the Internet, and wireless communication devices. Simply put, AI is poised to completely transform technology and society over the coming years and decades. To keep pace with a changing technological landscape, this Court has recognized that patent law must adapt. *See Bilski v. Kappos*, 561 U.S. 593, 605 (2010). Accordingly, it is crucial that the Court seize this opportunity to clarify whether AI can be considered an inventor under United States patent law. Fortunately, the plain text of the Constitution, the Patent Act, and well-reasoned policy considerations strongly support the eligibility of an AI as inventor.

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1. No party's counsel authored this brief in whole or in part; no party or party's counsel made a monetary contribution intended to fund the preparation or submission of the brief; and no person other than *amici* or counsel for *amici* contributed money intended to fund preparing or submitting the brief. Sup. Ct. R. 37.6. Counsel for the respective parties were provided timely notice of the filing of the brief. Sup. Ct. R. 37.2(a).

The question presented is whether the Patent Act categorically restricts an "inventor" to be a human being. First, there is no dispute about whether the DABUS AI produced inventions — it did. *Thaler v. Vidal*, 43 F.4th 1207, 1209 n.2 (Fed. Cir. 2022). Accordingly, the inquiry is *not* whether AIs can generate novel and useful inventive concepts, as they already do. Instead, this case represents an ideal vehicle to clarify who and what should be includable in the class of inventors under United States patent law. This Court's intervention here will forestall similar scenarios in the coming tsunami of AI-initiated innovation, which has recently intensified with the advent of generative AI.

Generative AI is a revolutionary, disruptive technology, which is exploding in use and applicability. Unlike previous forms of AI that were largely focused on classification and clustering of information as well as making predictions therefrom, generative AI is creative. From simple text prompts provided by human users, generative AI models can construct new prose, poetry, computer code, and images. Erin Griffith and Cade Metz, *A New Area of A.I. Booms, Even Amid the Tech Gloom*, N.Y. Times, (Jan. 7, 2023), https://www.nytimes.com/2023/01/07/technology/generative-ai-chatgpt-investments.html. Soon, AI models capable of creating motion pictures will be available. *See* Cade Metz, *Instant Videos Could Represent the Next Leap in A.I. Technology*, N.Y. Times, (Apr. 4, 2023), https://www.nytimes.com/ 2023/04/04/technology/runway-ai-videos.html.

Thus, generative AI is able to produce new innovations and artistic content with human-like creativity. Although the legal system has never addressed the issue of AI

inventorship previously, the issue becomes crucial with the rise of large-scale use of generative AI and related AI models.

In adapting to technological advancements, the courts should broadly interpret the Constitution so as not to inhibit progress. This Court mandated proceeding with caution when "dealing with patents that press on the limits of the standard 'written into the Constitution.'" *Bilski*, 561 U.S. at 649 (quoting *Graham v. John Deere Co.*, 383 U.S. 1, 6 (1966)).

The Constitution grants Congress the power to secure for inventors "exclusive right to their … discoveries" to "promote the progress of science and useful arts." U.S. Const. art. 1, § 8, cl. 8 (the "Patent and Copyright Clause"). In line with this constitutional directive, Congress passed the Patent Act, which provides that an "inventor" is an "individual or, if a joint invention, the individuals who invented or discovered the subject matter of the invention." *See* 35 U.S.C. § 100(g).

Congress did not set forth a statutory definition for "individual." However, the Federal Circuit has limited "individual" to a "natural person." *Thaler*, 43 F.4th at 1212. This restrictive interpretation of "individual" directly contravenes the function of the Patent Act, which is "to promote the utilization of inventions." 35 U.S.C. § 200.

Further, this Court recognized that the Patent and Copyright Clause "reflects a balance between the need to encourage innovation and the avoidance of monopolies which stifle competition without any concomitant advance in the 'Progress of Science and useful Arts.'" *Bonito*

Boats, Inc. v. Thunder Craft Boats, Inc., 489 U.S. 141, 146 (1989). Acknowledging that an AI could be an inventor would encourage innovation and discourage monopolies by promoting public disclosure of inventions produced by AI.

Importantly, this Court need not decide the more complicated and philosophical question of whether an AI can "conceive" of an invention. That is not at issue. *Thaler*, 43 F.4th at 1210. Instead, this case presents an opportunity for the Court to address the far simpler point of whether inventorship should be attributable to an AI when it does produce an invention.

Presently, AI-generated text, images, and ideas are all but indistinguishable from those of a human. *See* Cade Metz and Keith Collins, *How an A.I. 'Cat-and-Mouse Game' Generates Believable Fake Photos*, N.Y. Times, (Jan. 2, 2018), https://www.nytimes.com/interactive/2018/01/02/technology/ai-generated-photos.html) (describing how computer generated images and sounds were confused with those of real people). Yet, a patent application requires an inventor to be named. 35 U.S.C. § 115(a). If, as is at issue with the DABUS inventions, no human is the "inventor" of the ideas and a machine cannot be an inventor under the Federal Circuit's interpretation of the Patent Act (or if an "inventor" cannot be clearly identified), then no patents will result from AI inventions.

If AI inventorship is not permitted, these inventions will remain concealed or exist as uncommercialized trade secrets. It would be too risky to apply capital to preparation and prosecution of a patent application when any patent that is issued therefrom may be invalid on inventorship grounds. But turning to trade secret protection would

stall innovation as such parties will have no incentive to publicly disclose new ideas. *See Ruckelshaus v. Monsanto Co.*, 467 U.S. 986, 1011 (1984) (noting that "[o]nce . . . a trade secret [is] disclosed to others . . . the holder of the trade secret has lost his property interest"). While a patented invention enters the public domain after its term expires, trade secrets can be withheld from the public indefinitely. Thus, the public may never enjoy a potentially extensive number of new inventions created by AI. The corresponding lack of disclosure will hamper innovation in all fields of technology, and as a result, the United States could lose its status as a leader in scientific, engineering, and pharmaceutical innovation.

While some may question what entity would own the inventions produced by AI, this Court need not resolve that issue. Existing contract law is well equipped to govern the ownership of patent rights, and the AI-as-inventor scenario does not introduce any new challenges in this regard.

Therefore, this Court can take the minimal, logical, and publicly-beneficial approach by holding that an AI can be designated as an inventor on a patent application and any patents that grant therefrom. To do otherwise would merely kick the can down the road and force the judicial system to address the issue in the future while putting innovation and competitive advantages at risk in the United States.

For at least these reasons, we urge the Court to grant the Petition for Writ of Certiorari.

ARGUMENT

I. In an era of unprecedented technological change, the Constitution and the definition of "inventor" should be interpreted broadly to include creative AI

The recent advances made in AI parallel many technological improvements made throughout the years, including the printing press, the telephone, the automobile, air travel, programmable computers, the Internet, and mobile communication devices. Along with the changes brought by these disruptive technologies, the law has adapted. *Bilski*, 561 U.S. at 605 (noting that "times change" and that "technology and other innovations progress in unexpected ways"). The law must continue to adapt.

Regarding the rise of programmable computers as just one example, this Court noted that patent law principles established prior to 1968 would have likely blocked inventors from obtaining patents on computer programs. *Diamond v. Diehr*, 450 U.S. 175, 195 (1981). The issue of granting legal protection to computer programs was not addressed until a decade after the first programmable computer, and Federal courts only began to consider the issue in 1968. *Id.* The initial conclusion was that the subject matter of computer programs should not be patent eligible. *Id.* at 197. With time, the Court recognized that computer programs may be patentable, subject to various considerations. *Id.* at 192; *see Alice Corp. Pty. Ltd. v. CLS Bank Intern.*, 573 U.S. 208, 217–18 (2014).

The advances made in AI in some ways exceed the developments made in computer programming. Today, generative AI has the ability to produce compelling, human-like works of art and writing. *See, e.g.*, Daniel Martin Katz, *et al.*, *GPT-4 Passes the Bar Exam*, https://ssrn.com/abstract=4389233 (last updated Apr. 5, 2023). Two paths lie before the Court in dealing with the rapid AI expansion. The first path is to make the same missteps as those involving computer programs, which will hurt the position of the United States as a desirable jurisdiction for AI innovation and related commercialization. The second path is to learn from past mistakes and harness the innovative capabilities of generative AI.

In adapting to the rapidly changing technological landscape, a broad interpretation of "inventor" is preferable because, absent word from Congress, the Court should "proceed cautiously when dealing with patents that press on the limits of the 'standard written into the Constitution.'" *Bilski*, 561 U.S. at 649 (quoting *Graham*, 383 U.S. at 6). In limiting the definition of "inventor" to a natural person or human, the Federal Circuit overly restricts the concept of inventor in a way that is reminiscent of archaic and ill-considered past interpretations of patent law, such as those that would prevent the patenting of all computer programs.

The Constitution gives Congress the power to secure for inventors "exclusive right to their . . . discoveries." U.S. Const. art. 1, § 8, cl. 8. Acting in line with this power, Congress passed the Patent Act, which provides that an "inventor" is an "individual or, if a joint invention, the individuals who invented or discovered the subject matter of the invention." 35 U.S.C. § 100(g). As the Federal

Circuit acknowledged, the Patent Act does not provide a definition for what constitutes an "individual." *Thaler*, 43 F.4th at 1212.

However, the definition of the word "individual," in its plain and ordinary meaning, is broader than what the Federal Circuit holding suggests. This Court stated the word "individual" does not "invariably mean 'natural person' when used in a statute." *Mohamad v. Palestinian Auth.*, 566 U.S. 449, 455 (2012) (noting that a court should look at a broader definition of "individual" if there is "some indication Congress intended such a result").

Congress did not intend a restrictive definition of "inventor." In satisfying the intent of the Patent and Copyright Clause, the Patent Act is meant to:

> [P]romote the utilization of inventions arising from federally supported research or development; to encourage maximum participation of small business firms in federally supported research and development efforts; to promote collaboration between commercial concerns and nonprofit organizations, including universities. (35 U.S.C. § 200)

Thus, the Patent and Copyright Clause is neutral regarding the definition of an "individual" and any reasonable statutory construction of the word's meaning is not limited to natural persons. Considering AI as an "individual" that could be an inventor on a patent would further Congress' objectives as set forth in 35 U.S.C. § 200 and clarify that the Federal Circuit's narrow definition of "individual" is contrary to congressional intent.

II. Restricting inventorship to humans will hobble innovation and encourage concealment of the rapidly expanding capabilities and corresponding potential benefits of advanced AI

In support of our positions, we make two non-controversial observations. First, AI will become vastly more powerful in the future, meaning that the contribution of AI to the formation and distillation of patentable ideas will increase while the comparative contribution of humans to such ideas will decrease. Second, an entity will have less incentive to seek patent protection if the entity cannot accurately determine inventorship of patentable concepts.

A. AI capabilities will continue to expand

The first artificial neural networks, a type of AI, had a single artificial neuron. *See, e.g.*, Frank Rosenblatt, *The perceptron: a probabilistic model for information storage and organization in the brain*, 65 Psychol. Rev. 386 (1958). Today, artificial neural networks have tens of millions of artificial neurons. *See, e.g.*, Shiwei Liu, *et al.*, *Sparse evolutionary deep learning with over one million artificial neurons on commodity hardware*, 33 Neural Comput. & Applic. 2589 (2021). By using larger numbers of artificial neurons and adopting novel network architectures, modern AI models are able to perform tasks that eclipse the capabilities of earlier AI models.

Most recently, generative AI has developed as a class of computer programs that can produce complex outputs, such as written text, visual art, or music, based upon enormous amounts of training data. *See, e.g.*, Erin Griffith and Cade Metz, *A New Area of A.I. Booms, Even Amid*

the Tech Gloom, N.Y. Times, (Jan. 7, 2023). The outputs are new, yet grounded in the patterns and characteristics of the training data. In short, based on human-derived training data, generative AI has the ability to create text and images that are virtually indistinguishable from those created by humans.

Generative AI models exist in multiple domains of knowledge and output types. For example, ChatGPT is a generative AI model in the domain of natural language generation. Erin Griffith and Cade Metz, *A New Area of A.I. Booms, Even Amid the Tech Gloom*, N.Y. Times, (Jan. 7, 2023). GPT-4, an improved version of ChatGPT's model, has recently scored in the 90th percentile on the Uniform Bar Exam. Katz, *GPT-4 Passes the Bar Exam*. In another domain, Midjourney and DALL-E are generative AI models that produce digital artwork in response to written descriptions provided by users. Kevin Roose, *An A.I.-Generated Picture Won an Art Prize. Artists Aren't Happy.*, N.Y. Times, (Sept. 2, 2022), https://www.nytimes.com/2022/09/02/technology/ai-artificial-intelligence-artists.html. Yet further, AlphaZero is a generative AI model capable of beating top human players in chess, shogi, and Go. David Silver, *et al.*, *A general reinforcement learning algorithm that masters chess, shogi, and Go through self-play*, 362 Science 1140 (2018). Moreover, Wavenet is a generative AI system that can model and create sounds simulating a human voice or music. Alex Marshall, *From Jingles to Pop Hits, A.I. Is Music to Some Ears*, N.Y. Times, (Jan. 22, 2017), https://www.nytimes.com/2017/01/22/arts/music/jukedeck-artificial-intelligence-songwriting.html.

The transition from older, traditional AI methods to generative AI is *not* analogous to a calculator that now has an ability to perform multiplications between yet larger numbers. Instead, the calculator in this analogy can deduce and derive new and useful mathematical equations and properties from first principles. In other words, the capabilities of generative AI are *sui generis*—fundamentally different from those of traditional AI and conventional computing.

The present case demonstrates that there exist purely machine-generated ideas that would be examined for patentability by the USPTO if humans had conceived of them. Dr. Thaler is not alone in advancing this idea. *See, e.g.*, John R. Koza, *Human-competitive results produced by genetic programming*, 11 Genetic Programming and Evolvable Machines 251, 276 (2010) (alleging that an AI conceived of the invention in U.S. Patent No. 6,847,851).

In line with the first observation, there is no reason to doubt generative AI will continue to advance. As a consequence, the contribution of AI to the formation and distillation of at least some patentable ideas will increase while the contribution of humans to such ideas will decrease in proportion. Theories of agency law and corporate law support AI as an inventor or at least AI as an "individual." *See, e.g.*, *Cedric Kushner Promotions, Ltd. v. King*, 533 U.S. 158, 163 (2001) (noting that "incorporation's basic purpose is to create a distinct legal entity, with legal rights, obligations, powers, and privileges different from those of the natural individuals"); *Trustees of Dartmouth Coll. v. Woodward*, 17 U.S. 518, 636 (1819) (noting that the law allows for "artificial being[s], invisible, intangible, and existing only in the contemplation of law"). The benefits

to innovation, as outlined above, support the view that an AI can be an inventor.

As AI capabilities improve over time, the number of inventions that are a product of AI will increase. The line-drawing issue of inventorship of such inventions will, therefore, become even more acute. It is incumbent upon this Court to act before innovation is irreparably stunted.

B. If unable to properly designate an "inventor" under patent law, entities will hide AI-based innovations from the public

A patent application requires one who has conceived of an invention to be an inventor. 35 U.S.C. § 115(a). If, as is true for this case, no human can be identified as the "inventor" of machine-generated ideas and a machine cannot be an inventor under the Patent Act, then these ideas cannot receive patent protection. As a consequence, entities will turn to trade secret protection or at least have less desire to commercialize such ideas because there is limited financial incentive to do so. Both outcomes reduce the disclosure of such ideas to the public, running contrary to the ultimate goal of the patent system, namely "bring[ing] new designs and technologies into the public domain through disclosure." *Bonito Boats*, 489 U.S. at 151.

A lack of disclosure can stall innovation in important fields like pharmaceuticals, cybersecurity, and materials science. The United States could lose its edge in science, technology, engineering, and mathematics fields to other countries that have a more competitive and pragmatic approach. Further, a lack of disclosure could promote harmful secretive uses of AI, either intentional or

unintentional, and a lack of oversight. *See* Future of Life Institute, *Pause Giant AI Experiments: An Open Letter*, March 22, 2023, https://futureoflife.org/open-letter/pause-giant-ai-experiments/ (calling for a six-month pause on AI development due to the need for oversight).

Also, reduced disclosure can result in a few monopolistic players dominating the AI space. This goes against the Patent and Copyright Clause, which "reflects a balance between the need to encourage innovation and the avoidance of monopolies which stifle competition without any concomitant advance in the 'Progress of Science and useful Arts.'" *Bonito Boats*, 489 U.S. at 146.

III. AI-as-inventor questions of ownership are easily resolved by existing law

Granting non-humans the ability to invent under the Patent Act leads to an ancillary question regarding ownership of the patent rights generated by a non-human. But this issue can be addressed via contract as it is for human inventors. For instance, ownership can be partitioned in various ways between entities that developed the AI, provided training data to the AI, trained the AI, and used the AI to invent, to the extent that these entities are different. In some cases, such agreements will result in one entity owning 100% of inventions produced by the AI, but other allocations of ownership are possible.

Similar arrangements exist now. Many companies, universities, and even branches of government contract with their employees, collaborators, and partners to assign patent rights resulting from inventions. Ownership disputes are not a new issue either; courts have tools

sufficient to adjudicate questions of patent ownership disputes even when AI is an inventor. *See, e.g., Waterman v. Mackenzie*, 138 U.S. 252, 257 (1891) (holding that a party was a licensee rather than an assignee because the agreement did not grant the party the right to use the invention); *Diamond Coating Techs. v. Hyundai Motor Am.*, 823 F.3d 615, 619 (Fed. Cir. 2016) (holding that a licensee could not sue an alleged infringer because the licensor retained rights to make, use, and sell products under the patent); *Morrow v. Microsoft Corp.*, 499 F.3d 1332, 1344 (Fed. Cir. 2007) (holding that a company was granted only the right to sue under a patent had no standing to sue because a bankruptcy court granted all other ownership rights to another company).

CONCLUSION

The *amici curiae* urge this Court to grant Stephen Thaler's petition for a writ of certiorari.

Respectfully submitted,

April 18, 2023

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