



**The Journal of Robotics,
Artificial Intelligence & Law**

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Articles and Submissions

Direct editorial inquiries and send material for publication to:

Steven A. Meyerowitz, Editor-in-Chief, Meyerowitz Communications Inc.,
26910 Grand Central Parkway, #18R, Floral Park, NY 11005, smeyerowitz@
meyerowitzcommunications.com, 631.291.5541.

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Federal Circuit Decision Casts Doubt on Availability of Patent Protection for AI-Generated Inventions

Robert A. McFarlane and Rosanna W. Gan*

In this article, the authors discuss a recent federal circuit court decision holding that an artificial intelligence system cannot be named as an inventor on a U.S. patent.

The U.S. Court of Appeals for the Federal Circuit, in *Thaler v. Vidal*,¹ has ruled that an artificial intelligence (AI) system cannot be named as an inventor on a U.S. patent. The court's decision stems from a straightforward interpretation of the relevant patent statutes. However, the ruling may make it difficult to obtain intellectual property protection for inventions generated by advanced AI systems.

Ordinarily, the person who conceives of an invention is permitted to file for patent protection and initially owns any resulting patent.

Thaler, however, creates a category of otherwise patentable inventions—those “conceived” independently by advanced AI systems—that now arguably have no qualified inventor and, therefore, may not be eligible for patenting.

Inventorship Springs from Conception

U.S. patent laws have “operated on the premise that rights in an invention belong to the inventor” since enactment of the earliest patent statutes in 1790.² “Although much in intellectual property law has changed in the [230] years since the first Patent Act, the basic idea that inventors have the right to patent their inventions has not,”³ and the current patent statutes provide that “[w]hoever invents or discovers any new and useful process,

machine, manufacture of composition of matter . . . may obtain a patent therefor.”⁴ Simply put, the ownership of a patent “springs from invention.”⁵

The “inventor” in patent law is the person or, in the case of joint inventors, the persons who “conceived” of the invention,⁶ and conception is commonly referred to as the “touchstone of inventorship.”⁷ Conception is “the formation in the mind of the inventor, of a definite and permanent idea of the complete and operative invention, as it is [t]hereafter to be applied in practice.”⁸ Conception is completed when “only ordinary skill would be necessary to reduce invention to practice, without extensive research or experimentation.”⁹

“It is elementary that inventorship and ownership are separate issues,”¹⁰ and inventors are free to assign their rights in an invention to third parties.¹¹ Consequently, “inventorship is a question of who actually invented the subject matter claimed in a patent” while ownership “is a question of who owns legal title to [that] subject matter . . . , patents having the attributes of personal property.”¹² “Thus, although others may acquire an interest in an invention, any such interest—as a general rule—must trace back to the inventor.”¹³

Case law has limited inventors to “natural persons.”¹⁴ As a result, corporations ordinarily obtain patent rights to the inventions of their employees through formal assignments based on or required by employment contracts.¹⁵

If inventorship is limited to natural persons, what happens if an invention is “conceived” independently and entirely by an AI system and there is no natural person who was involved in the conception? Faced with this question, the Federal Circuit adhered to the case law holding that only natural persons can be named as inventors and categorically held that AI systems cannot be named inventors on U.S. patents.¹⁶

While *Thaler* expressly avoided “metaphysical matters” regarding “the nature of invention or the rights, if any, of AI systems,”¹⁷ its impact on AI-generated subject matter is significant. A patent that does not name the correct inventor may be rendered invalid.¹⁸ Indeed, the U.S. Patent and Trademark Office (USPTO) concluded that both of the patent applications in *Thaler* were incomplete because they lacked a valid inventor.¹⁹

Consequently, under *Thaler*, otherwise patentable subject matter that is independently “conceived” by an AI system may be deemed to have no cognizable inventor and that no valid patent may be issued to claim it.

Thaler Presented Inventions Created Solely by the AI System DABUS

Plaintiff-Appellant Stephen Thaler developed an AI system called “Device for the Autonomous Bootstrapping of Unified Science,” referred to as “DABUS,” that he contends generates patentable inventions.²⁰ Thaler filed applications seeking patent protection for two of DABUS’s purported creations.²¹

The first application, called “Devices and Methods for Attracting Enhanced Attention,” disclosed a light source that pulses at a frequency and fractal dimension that is allegedly highly noticeable to humans, which allows it to serve an effective emergency beacon because it can quickly draw a person’s attention even in chaotic environments that have multiple random and distracting light sources.²² The second application, called “Food Container,” disclosed a design for a “fractal container” that can be used for storing food and beverages.²³ Rather than being smooth like ordinary containers, the surface of the claimed container had a complex surface structure based on fractal geometry.²⁴ The application explained that this novel construction provided several advantages over conventional packaging, including the ability to interlock containers such as soda bottles rather than having to tie them together with separate packaging elements such as a six-pack ring.²⁵

Thaler asserted that the two claimed inventions were generated by DABUS, that Thaler did not contribute to their conception, and that any person having skill in the relevant arts could have taken DABUS’s output and reduced the ideas set forth in the applications to practice.²⁶ Moreover, the patent office did not challenge these assertions and Thaler’s representations were taken as undisputed facts for purposes of the opinion.²⁷ Based on this record, DABUS’s conception of the claimed subject matter would have established its inventorship without controversy if DABUS was a natural person. But as DABUS is a machine, that was not the case.

The Parties’ Arguments for and Against DABUS as a Named Inventor

While recognizing that prior cases held that inventors must be natural persons, Thaler argued that AI was “fundamentally different” from corporations and state sovereigns and that recognizing

DABUS as an inventor was critical to serving the purposes behind the patent statutes.²⁸

In a nutshell, Thaler argued that the patent laws were written before the possibility of AI inventors and that the statutes should be construed to include an AI as a possible inventor in order to serve the purpose of the Patent Act to encourage inventions, their disclosure, and their commercialization.²⁹

Furthermore, Thaler argued, preventing AI from being listed as an inventor removes the incentive to disclose otherwise patentable inventions generated by AI. Instead, such ideas would have to be maintained as trade secrets, and the public would lose the benefit of patent disclosure. This would frustrate the constitutional and statutory purposes of patent law to promote the progress of science and the useful arts.³⁰

In response, the USPTO presented a much simpler argument based primarily on the plain meaning of the statutory language.³¹

Primarily, the USPTO argued that term “inventor” is defined in the statute to mean an “individual,” and that “individual” is referenced elsewhere in the statute with the pronouns “himself or herself.”³²

These terms indicate an inventor must be a natural person, which comports with case law to the same effect.³³

Because the plain language is unambiguous, there is no reason to look to the purpose of the statute, or to policy.³⁴

And, finally, it is Congress, not the courts, who should address this issue.³⁵

The Federal Circuit Unequivocally Held That AI Cannot Be Named as an Inventor

The Federal Circuit sided unequivocally with the USPTO, finding that its task “begins—and ends—with consideration of the applicable definition of the relevant statute,” and that the “statute unambiguously and directly answers the question” at hand.³⁶ Looking to the statutory language, the Patent Act provides that inventors are “individuals.”³⁷ Case law has construed “individual” to mean a human being,³⁸ dictionaries confirm this understanding,³⁹ and the Federal Circuit’s own case law supports the construction of an “individual as a natural person.”⁴⁰ Finally, the Patent Act also uses personal pronouns—himself and herself—to refer to an “individual.”⁴¹

The court also summarily dismissed Thaler's policy arguments relating to the constitutional purpose of the patent statutes to encourage public disclosure and technological advancement, finding that they were speculative and lacked basis in the language of the Patent Act.⁴² Moreover, the court found that, in light of the unambiguous statutory text, it could not "elevate vague invocations of statutory purpose" over the plain statutory language.⁴³

Thaler and a Brave New World of AI-Generated Inventions

Thaler did not address the patentability of inventions made by human beings with the assistance of AI,⁴⁴ and such inventions are likely patentable to the same extent as any other inventions that are conceived with the assistance of advanced computer modeling or data manipulation. Given the present state of AI technology, the situation considered in *Thaler*, where the AI indisputably "conceived" of the patentable subject matter, may be an outlier for the time being. However, with quickly advancing AI technology, it is only a matter of time before AI-generated inventions become more commonplace.

Thaler correctly argued that the constitutional purpose of the patent law is to further the advancement science and the useful arts. By granting exclusive rights to the inventor for a limited amount of time, the patent system encourages investment in research and development by rewarding the fruits of such efforts and allowing patentees to exclude others from making, using, selling, offering to sell, or importing the patented invention during the term of the patent.⁴⁵ In today's economy, patentable subject matter is commonly generated by employees who are required to assign their inventions to their corporate employer. Thus, while the patent right originates with the human inventors, the right to enforce the patent is assigned to the employer along with the economic benefit of the patent monopoly. In this fashion, corporations are encouraged to invest billions of dollars in research and development and to employ the researchers who generate technological breakthroughs.

On its face, there is arguably no reason to treat the use of AI-generated subject matter differently than human-generated inventions under the current incentive system. Just as with their current investments in research and development efforts that do not use

AI, corporations and individual inventors can be further encouraged to invest in developing inventions with advanced AI systems by the knowledge that the fruits of those efforts would be subject to patent protection.

Indeed, Thaler attempted to effectuate that outcome using current forms and procedures. Thaler provided a statement that he executed on behalf of DABUS to satisfy the statutory requirement that inventors submit a sworn oath or declaration establishing that they are the true and correct inventor.⁴⁶ He also filed what he called a “Statement on Inventorship,” explaining that DABUS was “a particular type of connectionist artificial intelligence” called a “Creativity Machine,” along with a document purporting to assign himself all of DABUS’s rights as an inventor.⁴⁷ However, because DABUS was found to be ineligible to be named as an inventor, this attempted solution failed.

Conclusion

Absent a Supreme Court ruling reversing *Thaler*, Congress may want to consider amending the patent statute so that, in the case of inventions “conceived” by AI systems, the inventor is deemed to be the human operating, controlling, and/or providing input to the AI system. That would clear up any ambiguity regarding inventorship of patentable subject matter generated by AI systems and encourage the on-going investment in developing and using advanced AI systems.

Notes

* Robert A. McFarlane, a registered patent attorney and partner at Hanson Bridgett LLP, co-chairs the firm’s intellectual property practice. He also teaches patent law as an adjunct professor at the University of California, Hastings College of the Law. Rosanna W. Gan, a senior counsel at the firm, is an experienced patent litigator who focuses on patent and intellectual property litigation and on complex appellate matters. The authors may be contacted at rmcfarlane@hansonbridgett.com and rgan@hansonbridgett.com, respectively.

1. *Thaler v. Vidal*, 43 F.4th 1207, 2022 WL 3130863 (Fed. Cir. 2022). The pagination of the Federal Reporter has not been finalized, so the Westlaw pagination is used herein.

2. *Bd. of Trustees of Leland Stanford Junior Univ. v. Roche Molecular Sys., Inc.*, 563 U.S. 776, 780, 131 S. Ct. 2188 (2011); *see also id.* at 785-86 (cit-

ing *Gayler v. Wilder*, 51 U.S. 477, 493, 13 L.Ed. 504 (1850) (“the discoverer of a new and useful improvement is vested by law with an inchoate right to its exclusive use, which he may perfect and make absolute by proceeding in the manner which the law requires”); *Solomons v. United States*, 137 U.S. 342, 346, 11 S. Ct. 88, 34 L.Ed. 667 (1890) (“whatever invention [an inventor] may thus conceive and perfect is his individual property”).

3. *Bd. of Trustees of Leland Stanford Junior Univ.*, 563 U.S. at 785.

4. *Id.* (citing 35 U.S.C. § 101).

5. *Teets v. Chromalloy Gas Turbine Corp.*, 83 F.3d 403, 407 (Fed. Cir. 1996); *see also Beech Aircraft Corp. v. EDO Corp.*, 990 F.2d 1237, 1248 (Fed. Cir. 1993) (an invention presumptively belongs to its creator).

6. *See C.R. Bard, Inc. v. M3 Sys., Inc.*, 157 F.3d 1340, 1353 (Fed. Cir. 1998).

7. *See, e.g., Ethicon, Inc. v. U.S. Surgical Corp.*, 135 F.3d 1456, 1460 (Fed. Cir. 1998).

8. *Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1376 (Fed. Cir. 1986) (citations omitted); *see also Burroughs Wellcome Co. v. Barr Labs, Inc.*, 40 F.3d 1223, 1227-28 (Fed. Cir. 1994) (referring to conception as “the completion of the mental part of invention”).

9. *Hybritech Inc.*, 802 F.2d at 1376 (citation omitted); *see also Burroughs Wellcome Co.*, 40 F.3d at 1228 (“An idea is definite and permanent when the inventor has a specific, settled idea, a particular solution to the problem at hand, not just a general goal or research plan he hopes to pursue.”).

10. *Beech Aircraft Corp.*, 990 F.2d at 1248.

11. *See Bd. of Trustees of Leland Stanford Junior Univ.*, 563 U.S. at 786 (citing *United States v. Dubilier Condenser Corp.*, 289 U.S. 178, 187, 53 S. Ct. 554 (“A patent is property and title to it can pass only by assignment”).

12. *Beech Aircraft Corp.*, 990 F.2d at 1248.

13. *Bd. of Trustees of Leland Stanford Junior Univ.*, 563 U.S. at 786.

14. *See, e.g., Univ. of Utah v. Max-Planck-Gesellschaft zur Forderung der Wissenschaften E.V.*, 734 F.3d 1315, 1323 (Fed. Cir. 2013) (“[I]nventors must be natural persons and cannot be corporations or sovereigns.”).

15. *See Bd. of Trustees of Leland Stanford Junior Univ.*, 563 U.S. at 786 (“The respective rights and obligations of employer and employee, touching an invention conceived by the latter, spring from the contract of employment”) (internal quotations omitted).

16. *Thaler*, 43 F.4th 1207, 2022 WL 3130863 at *4.

17. *Id.* at *1.

18. *See C.R. Bard, Inc.*, 157 F.3d at 1353 (“To invalidate a patent based on incorrect inventorship it must be shown not only that the inventorship was incorrect, but that correction is unavailable under [35 U.S.C. § 256].”); *see also* 35 U.S.C. § 256(b) (“The error of omitting inventors or naming persons who are not inventors shall not invalidate the patent in which such error occurred if it can be corrected as provided in this section.”).

19. Thaler, 43 F.4th 1207, 2022 WL 3130863 at *2.
20. *Id.* at *1.
21. *Id.* (citing U.S. Patent Application Serial Nos. 16/524,350 (teaching a Neural Flame) and 16/524,532 (teaching a Fractal Container).
22. Thaler v. Vidal, Case No. 2021-2347 (Fed. Cir.), Corrected Opening Brief for Plaintiff-Appellant Stephen Thaler (Docket No. 26, filed Dec. 9, 2021) (Thaler’s Opening Brief), App’x 34 and 38.
23. *Id.* at App’x 76 and 78.
24. *Id.* at App’x 78.
25. *Id.*
26. Thaler, 43 F.4th 1207, 2022 WL 3130863 at *1.
27. *Id.* at *1, fn. 2.
28. *See* Thaler’s Opening Brief at 24, 30-31.
29. *See id.* at 23 (citing Application of Sarkar, 588 F.2d 1330, 1332 (CCPA 1978)).
30. *Id.* at 30.
31. *See* Thaler v. Vidal, Case No. 2021-2347 (Fed. Cir.), Corrected Combined Brief and Supplemental Appendix for the Defendants-Appellees—Andrew Hirshfeld and the United States Patent and Trademark Office (Docket No. 39, filed Feb. 10, 2022).
32. *Id.* at 19-20 (citations omitted).
33. *Id.* at 25-26 (citations omitted).
34. *Id.* at 18-19.
35. *Id.* at 30-31.
36. *See* Thaler, 43 F.4th 1207, 2022 WL 3130863 at *1 and 5.
37. *Id.* at *2 (citing 35 U.S.C. § 100(f) and (g)).
38. *Id.* at *3 (citing Mohamad v. Palestinian Auth., 566 U.S. 449, 454 (2012)).
39. *Id.* (citing, e.g., Oxford English Dictionary (2022) (giving first definition of “individual” as “[a] single human being”).
40. *Id.* at *4 (citing Univ. of Utah, 734 F.3d at 1323 (Fed. Cir. 2013) (“[I]nventors must be natural persons and cannot be corporations or sovereigns.”); Beech Aircraft Corp., 990 F.2d at 1248 (“[O]nly natural persons can be ‘inventors.’”)).
41. *Id.* (citing 35 U.S.C. § 115(b)(2)).
42. *Id.*
43. *Id.*
44. *Id.*
45. *See* 35 U.S.C. § 271.
46. Thaler, 43 F.4th 1207, 2022 WL 3130863 at *1.
47. *Id.*