

**United States Court of Appeals  
for the Federal Circuit**

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**STEPHEN THALER,**  
*Plaintiff-Appellant*

v.

**KATHERINE K. VIDAL, UNDER SECRETARY OF  
COMMERCE FOR INTELLECTUAL PROPERTY  
AND DIRECTOR OF THE UNITED STATES  
PATENT AND TRADEMARK OFFICE, UNITED  
STATES PATENT AND TRADEMARK OFFICE,**  
*Defendants-Appellees*

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2021-2347

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Appeal from the United States District Court for the  
Eastern District of Virginia in No. 1:20-cv-00903-LMB-  
TCB, Judge Leonie M. Brinkema.

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Decided: August 5, 2022

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RYAN BENJAMIN ABBOTT, Brown, Neri, Smith & Khan,  
LLP, Los Angeles, CA, argued for plaintiff-appellant.

DENNIS BARGHAAN, JR., Office of the United States At-  
torney for the Eastern District of Virginia, United States  
Department of Justice, Alexandria, VA, argued for defend-  
ants-appellees. Also represented by JESSICA D. ABER;  
FARHEENA YASMEEN RASHEED, PETER JOHN SAWERT,

MEREDITH HOPE SCHOENFELD, Office of the Solicitor,  
United States Patent and Trademark Office, Alexandria,  
VA.

MITCHELL APPER, Jerusalem, Israel, amicus curiae, pro  
se.

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Before MOORE, *Chief Judge*, TARANTO and STARK, *Circuit  
Judges*.

STARK, *Circuit Judge*.

This case presents the question of who, or what, can be an inventor. Specifically, we are asked to decide if an artificial intelligence (AI) software system can be listed as the inventor on a patent application. At first, it might seem that resolving this issue would involve an abstract inquiry into the nature of invention or the rights, if any, of AI systems. In fact, however, we do not need to ponder these metaphysical matters. Instead, our task begins – and ends – with consideration of the applicable definition in the relevant statute.

The United States Patent and Trademark Office (PTO) undertook the same analysis and concluded that the Patent Act defines “inventor” as limited to natural persons; that is, human beings. Accordingly, the PTO denied Stephen Thaler’s patent applications, which failed to list any human as an inventor. Thaler challenged that conclusion in the U.S. District Court for the Eastern District of Virginia, which agreed with the PTO and granted it summary judgment. We, too, conclude that the Patent Act requires an “inventor” to be a natural person and, therefore, affirm.

I

Thaler represents that he develops and runs AI systems that generate patentable inventions. One such system is his “Device for the Autonomous Bootstrapping of

Unified Science,” which Thaler calls “DABUS.” Thaler has described DABUS as “a collection of source code or programming and a software program.” Supp. App. at 781.

In July 2019, Thaler sought patent protection for two of DABUS’ putative inventions by filing two patent applications with the PTO: U.S. Application Nos. 16/524,350 (teaching a “Neural Flame”) and 16/524,532 (teaching a “Fractal Container”).<sup>1</sup> He listed DABUS as the sole inventor on both applications. Thaler maintains that he did not contribute to the conception of these inventions and that any person having skill in the art could have taken DABUS’ output and reduced the ideas in the applications to practice.<sup>2</sup>

In lieu of an inventor’s last name, Thaler wrote on the applications that “the invention [was] generated by artificial intelligence.” App. at 28, 69. He also attached several documents relevant to inventorship. First, to satisfy 35 U.S.C. § 115’s requirement that inventors submit a sworn oath or declaration when applying for a patent, Thaler

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<sup>1</sup> The administrative records for both applications are materially identical.

<sup>2</sup> While inventorship involves underlying questions of fact, *see Dana-Farber Cancer Inst., Inc. v. Ono Pharm. Co.*, 964 F.3d 1365, 1370 (Fed. Cir. 2020), *cert. denied*, 141 S. Ct. 2691 (2021), for purposes of this litigation the PTO has not challenged Thaler’s representations, *see* D. Ct. Dkt. No. 25, at 11. Accordingly, our analysis must be consistent with the undisputed facts in the administrative record, drawing inferences in favor of the non-moving party. *See Safeguard Base Operations, LLC v. United States*, 989 F.3d 1326, 1349 (Fed. Cir. 2021) (discussing when it is appropriate to supplement administrative record and noting “[t]he focal point for judicial review should be the administrative record already in existence”) (quoting *Camp v. Pitts*, 411 U.S. 138, 142 (1973)).

submitted a statement on DABUS' behalf. Second, Thaler provided a supplemental "Statement on Inventorship" explaining that DABUS was "a particular type of connectionist artificial intelligence" called a "Creativity Machine." App. at 198-203, 483-88. Third, Thaler filed a document purporting to assign himself all of DABUS' rights as an inventor.

The PTO concluded both applications lacked a valid inventor and were, hence, incomplete. Accordingly, it sent Thaler a "Notice to File Missing Parts of Nonprovisional Application" for each application and requested that Thaler identify valid inventors. In response, Thaler petitioned the PTO director to vacate the Notices based on his Statements of Inventorship. The PTO denied Thaler's petitions on the ground that "a machine does not qualify as an inventor." App. at 269-71, 548-50. Thaler sought reconsideration, which the PTO denied, explaining again that inventors on a patent application must be natural persons.

Thaler then pursued judicial review of the PTO's final decisions on his petitions, under the Administrative Procedure Act (APA). *See* 5 U.S.C. §§ 702-704, 706.<sup>3</sup> The parties agreed to have the District Court adjudicate the challenge based on the administrative record made before the PTO and filed cross-motions for summary judgment. After briefing and oral argument, the Court granted the PTO's motion for summary judgment and denied Thaler's request to reinstate his applications. The District Court concluded that an "inventor" under the Patent Act must be an "individual"

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<sup>3</sup> The District Court had jurisdiction under 28 U.S.C. § 1331. *See also* 5 U.S.C. § 702 ("A person suffering legal wrong because of agency action, or adversely affected or aggrieved by agency action within the meaning of a relevant statute, is entitled to judicial review thereof.").

and the plain meaning of “individual” as used in the statute is a natural person.

Thaler appealed. We have jurisdiction under 28 U.S.C. § 1295. *See Odyssey Logistics & Tech. Corp. v. Iancu*, 959 F.3d 1104, 1108 (Fed. Cir. 2020) (explaining that Federal Circuit has jurisdiction over appeals from district court decisions raising APA claims against PTO regarding patents).

## II

We review grants of summary judgment according to the law of the regional circuit, in this case the Fourth Circuit. *See Supernus Pharms., Inc. v. Iancu*, 913 F.3d 1351, 1356 (Fed. Cir. 2019). In the Fourth Circuit, a district court’s grant of summary judgment is reviewed *de novo*. *See id.* (citing *Gallagher v. Reliance Standard Life Ins. Co.*, 305 F.3d 264, 268 (4th Cir. 2002)). Challenges to PTO petition decisions are governed by the APA and pertinent administrative law standards. Thus, we may set aside the judgment resulting from an administrative adjudication only if the agency’s decision is “arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law” or if the agency’s actions are “in excess of statutory jurisdiction, authority, or limitations.” 5 U.S.C. § 706. “Statutory interpretation is an issue of law that we review *de novo*.” *Facebook, Inc. v. Windy City Innovations, LLC*, 973 F.3d 1321, 1330 (Fed. Cir. 2020).

## A

The sole issue on appeal is whether an AI software system can be an “inventor” under the Patent Act. In resolving disputes of statutory interpretation, we “begin[] with the statutory text, and end[] there as well if the text is unambiguous.” *BedRoc Ltd. v. United States*, 541 U.S. 176, 183 (2004). Here, there is no ambiguity: the Patent Act requires that inventors must be natural persons; that is, human beings.

The Patent Act expressly provides that inventors are “individuals.” Since 2011, with the passage of the Leahy-Smith America Invents Act, the Patent Act has defined an “inventor” as “the *individual* or, if a joint invention, the *individuals* collectively who invented or discovered the subject matter of the invention.” 35 U.S.C. § 100(f) (emphasis added). The Act similarly defines “joint inventor” and “coinventor” as “any 1 of the *individuals* who invented or discovered the subject matter of a joint invention.” § 100(g) (emphasis added). In describing the statements required of an inventor when applying for a patent, the statute consistently refers to inventors and co-inventors as “individuals.” *See* § 115.

The Patent Act does not define “individual.” However, as the Supreme Court has explained, when used “[a]s a noun, ‘individual’ ordinarily means a human being, a person.” *Mohamad v. Palestinian Auth.*, 566 U.S. 449, 454 (2012) (internal alteration and quotation marks omitted). This is in accord with “how we use the word in everyday parlance”: “We say ‘the individual went to the store,’ ‘the individual left the room,’ and ‘the individual took the car,’ each time referring unmistakably to a natural person.” *Id.* Dictionaries confirm that this is the common understanding of the word. *See, e.g., Individual, Oxford English Dictionary* (2022) (giving first definition of “individual” as “[a] single human being”); *Individual, Dictionary.com* (last visited July 11, 2022), <https://www.dictionary.com/browse/individual> (giving “a single human being, as distinguished from a group” as first definition for “individual”). So, too, does the Dictionary Act, which provides that legislative use of the words “person” and “whoever” broadly include (“unless the context indicates otherwise”) “corporations, companies, associations, firms, partnerships, societies, and joint stock companies, *as well as individuals.*” 1 U.S.C. § 1 (emphasis added). “With the phrase ‘as well as,’ the definition marks ‘individual’ as distinct from the list of artificial entities that precedes it,” showing that Congress understands

“individual” to indicate natural persons unless otherwise noted. *Mohamad*, 566 U.S. at 454.

Consequently, the Supreme Court has held that, when used in statutes, the word “individual” refers to human beings unless there is “some indication Congress intended” a different reading. *Id.* at 455 (emphasis omitted).<sup>4</sup> Nothing in the Patent Act indicates Congress intended to deviate from the default meaning. To the contrary, the rest of the Patent Act supports the conclusion that “individual” in the Act refers to human beings.

For instance, the Act uses personal pronouns – “himself” and “herself” – to refer to an “individual.” § 115(b)(2). It does not also use “itself,” which it would have done if Congress intended to permit non-human inventors. The Patent Act also requires inventors (unless deceased, incapacitated, or unavailable) to submit an oath or declaration. *See, e.g., id.* (requiring oath or declaration from inventor that “such individual believes himself or herself to be the original inventor or an original joint inventor of a claimed invention in the application”). While we do not decide whether an AI system can form beliefs, nothing in our record shows that one can, as reflected in the fact that Thaler submitted the requisite statements himself, purportedly on DABUS’ behalf.

Thaler directs us to several provisions of the Patent Act as supposed support for his position that “inventor” should be broadly read to include AI software, but each fails to persuade. First, Thaler points to the use of “whoever” in

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<sup>4</sup> While *Mohamad* interpreted a statute other than the Patent Act, the Court’s reasoning is directly applicable here. *See generally Legal Def. Fund v. Dep’t of Agric.*, 933 F.3d 1088, 1093-94 (9th Cir. 2019) (concluding that “individual” refers to human beings and not animals, based in part on *Mohamad*).

35 U.S.C. §§ 101 and 271. Section 101 provides that “[w]hoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.” As this very section makes clear, however, patents must satisfy the “conditions and requirements of” Title 35 of the U.S. Code, including its definition of “inventor.” Section 271, in setting out what constitutes infringement, repeatedly uses “whoever” to include corporations and other non-human entities. That non-humans may infringe patents does not tell us anything about whether non-humans may also be inventors of patents. The question before us inevitably leads back to the Patent Act’s definition of “inventor,” which uses the word “individual” – and does not use “whoever.”<sup>5</sup> Furthermore, as we noted already, the Dictionary Act establishes that Congress uses “whoever” as a much broader term than “individual.” See 1 U.S.C. § 1.

Second, Thaler contends that AI software programs must qualify as inventors because otherwise patentability would depend on “the manner in which the invention was made,” in contravention of 35 U.S.C. § 103. Section 103 is not about inventorship. Instead, it provides, in relevant part, that inventions may still be nonobvious even if they are discovered during “routine” testing or experimentation. See *Honeywell Int’l Inc. v. Mexichem Amanco Holding S.A. de C.V.*, 865 F.3d 1348, 1356 (Fed. Cir. 2017); see also *Graham v. John Deere Co.*, 383 U.S. 1, 15 (1966) (explaining that second sentence of § 103 was intended to clarify that “flash of creative genius” is unnecessary for patentability). This statutory provision relates to *how* an invention is

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<sup>5</sup> While the PTO also initially relied on the use of “whoever” in § 101 of the Patent Act, the PTO has also consistently explained that “individual” is limited to natural persons, a position we now uphold.



made and does not trump a provision that specifically addresses *who* may be an inventor.

Third, Thaler emphasizes that the term “inventor” must be interpreted with attention to the “context in which that language is used[] and the broader context of the statute as a whole.” *Yates v. United States*, 574 U.S. 528, 537 (2015) (internal quotation marks omitted). We have undertaken precisely this task. For the reasons explained above, the Patent Act, when considered in its entirety, confirms that “inventors” must be human beings.

## B

Our holding today that an “inventor” must be a human being is supported by our own precedent. See *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.”) (emphasis added); *Beech Aircraft Corp. v. EDO Corp.*, 990 F.2d 1237, 1248 (Fed. Cir. 1993) (“[O]nly natural persons can be ‘inventors.’”). While these opinions addressed different questions – concluding that neither corporations nor sovereigns can be inventors – our reasoning did not depend on the fact that institutions are collective entities. The two cases confirm that the plain meaning of “inventor” in the Patent Act is limited to natural persons.

## C

Statutes are often open to multiple reasonable readings. Not so here. This is a case in which the question of statutory interpretation begins and ends with the plain meaning of the text. See *Bostock v. Clayton Cnty.*, 140 S. Ct. 1731, 1749 (2020) (“This Court has explained many times over many years, when the meaning of the statute’s terms is plain, our job is at an end.”). In the Patent Act, “individuals” – and, thus, “inventors” – are unambiguously natural persons. Accordingly, we have no need to consider

additional tools of statutory construction. *See Matal v. Tam*, 137 S. Ct. 1744, 1756 (2017) (“[I]nquiry into the meaning of the statute’s text ceases when the statutory language is unambiguous and the statutory scheme is coherent and consistent.”) (internal quotation marks omitted).

### III

We briefly address Thaler’s additional arguments.

Thaler argues that inventions generated by AI should be patentable in order to encourage innovation and public disclosure. Thaler’s policy arguments are speculative and lack a basis in the text of the Patent Act and in the record. In any event, the text before us is unambiguous, and we may not “elevate vague invocations of statutory purpose over the words Congress chose.” *Sw. Airlines Co. v. Saxon*, 142 S. Ct. 1783, 1792-93 (2022). Moreover, we are not confronted today with the question of whether inventions made by human beings with the *assistance* of AI are eligible for patent protection.

Thaler invokes the canon of constitutional avoidance. In Thaler’s view, permitting AI programs to be inventors would support the constitutional purpose of patents “[t]o promote the progress of science and the useful arts.” U.S. Const. art. I, § 8, cl. 8. It follows, Thaler continues, that not recognizing AI as an inventor undermines such progress, raising potential constitutional concerns we should be careful to avoid. Thaler is incorrect. The constitutional provision he cites is a grant of legislative power to Congress; Congress has chosen to act pursuant to that power by passing the Patent Act. Thaler does not (and cannot) argue that limiting inventorship to human beings is unconstitutional. Therefore, the canon of constitutional avoidance is simply inapplicable. *See Veterans4You LLC v. United States*, 985 F.3d 850, 860-61 (Fed. Cir. 2021) (explaining that this canon may be helpful when there is serious question regarding statute’s constitutionality); *see also*

*Warger v. Shauers*, 574 U.S. 40, 50 (2014) (noting that canon of constitutional avoidance “has no application in the absence of . . . ambiguity”) (internal quotation marks omitted).

Thaler also notes that South Africa has granted patents with DABUS as an inventor. This foreign patent office was not interpreting our Patent Act. Its determination does not alter our conclusion.

We have considered Thaler’s additional arguments and find they do not merit discussion.

#### IV

When a statute unambiguously and directly answers the question before us, our analysis does not stray beyond the plain text. Here, Congress has determined that only a natural person can be an inventor, so AI cannot be. Accordingly, the decision of the district court is affirmed.

### **AFFIRMED**

#### COSTS

Costs shall be assessed against Appellant.