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The AI Quid Pro Quo Problem: Suggesting a Framework for Patents Involving Artificial Intelligence-Assisted or -Created Inventions

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THE AI QUID PRO QUO PROBLEM: SUGGESTING A FRAMEWORK FOR PATENTS INVOLVING ARTIFICIAL INTELLIGENCE–ASSISTED OR –CREATED INVENTIONS

DANIEL WICKLUND*

ABSTRACT

Innovation involving artificial intelligence (AI) is rapidly expanding and diffusing into other areas of technology. Additionally, inventors have been using AI to assist in new technology for quite a while and have likely received patents from the United States Patent and Trademark Office (USPTO or “Office”) for their inventions without disclosing the AI involved in the patentable subject matter. As AI has become increasingly present in the implementation of new technology, the question of whether an AI can be an inventor has arisen. In Thaler v. Iancu and on appeal, the courts have affirmatively said no. However, this decision implicates the reliability, clarity, and incentivization of patents involving this subject matter. Given how fast AI technology has been developing, Congress should act to modernize the Patent Act to account for AI-assisted or -created inventions. In the meantime, this Note suggests the USPTO, through its regulatory power, can help alleviate these concerns by creating an identification system and requiring inventors to disclose the kind of AI involved in the assistance or in the creation of subject matter in patent applications.

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INTRODUCTION

In July of 2019, Dr. Stephen Thaler submitted two patent applications with an unprecedented twist: the applications listed Device for the Autonomous Bootstrapping of Unified Sentience (DABUS), an artificial intelligence, as the inventor of the disclosed subject matter.¹ The United States Patent and Trademark Office (USPTO or “Office”) thereafter rejected these applications and asserted that the applications had not properly listed the inventor by their legal name.² From there, the applicant filed a petition for the USPTO to reconsider their position.³ In response, the USPTO maintained its point of view and stated that an artificial intelligence (AI) cannot be an inventor of a patented invention.⁴ Subsequently, litigation commenced in federal court at the Eastern District of Virginia and, in *Thaler v. Hirshfeld*, the court ruled in favor of the USPTO’s determination that an AI cannot be an inventor.⁵

¹ Application of 16/524,350, No. 50567-3-01-US, at 1–2 (Dec. Comm’r Pat. July 29, 2019). Other jurisdictions worldwide have also begun to address this issue including the United Kingdom, the European Patent Office, Australia, and South Africa. *Compare* *Thaler v. The Comptroller-General of Patents, Designs and Trade Marks* [2021] EWCA (Civ) 1374 (Eng.) (holding an artificial intelligence cannot be an inventor under UK patent law), *and In re EP 18 275 163 / In re 18 275 174* (holding an AI cannot be an inventor to receive a patent grant from the EPO), *with* *Thaler v. Commissioner of Patents* [2021] FCA 879 (30 July 2021) (Austl.) (stating it is possible to have inventorship attributed to an AI under Australian patent law), *and* S. Afr. Patent No. 2021/03242 (granting a patent to an AI). To note, South Africa is the only jurisdiction described that does not have a substantive patent examination system. *See* Érik Van Der Vyver, *Inventive AI in South Africa and Australia: Can Such Applications Be Validly Filed and Granted in These Two Commonwealth States?*, INT’L FED’N OF INTELL. PROP. ATT’YS (Sept. 16, 2021), <https://ficpi.org/blog/inventive-ai-south-africa-and-australia-can-such-applications-be-validly-filed-and-granted> [<https://perma.cc/Q7HY-BYY9>]; *see generally* THE ARTIFICIAL INVENTOR PROJECT, <https://artificialinventor.com/> [<https://perma.cc/8RXX-LG4R>].

² Application of 16/524,350, *supra* note 1, at 2.

³ *Id.*

⁴ *Id.* at 7.

⁵ *Thaler v. Hirshfeld*, 558 F. Supp. 3d 238, 245 (E.D. Va. 2021) (“[T]he USPTO’s interpretation that an “inventor” must be a natural person is entitled to deference. Even if no deference were due, the USPTO’s conclusion is correct under the law.”).

AI is a rapidly expanding field,⁶ and it is possible patent holders have received grants for inventions originating from AI rather than human creativity for years.⁷ This topic is important considering the high rate of technology diffusion AI has had over the past several decades: from 2002 to 2018, the number of patent applications that included AI increased from nine to sixteen percent.⁸ Not only that, but intellectual property is extremely important to the U.S. economy, accounting for about forty-one percent of domestic economic output in 2019,⁹ with \$4.43 trillion of the United States' gross domestic product attributed to patent-intensive industries.¹⁰ A report published by the USPTO indicates that because of this diffusion, AI will likely have a global impact similar to that of technologies like steam power, electricity, and the Internet.¹¹ Because the courts have held that only natural persons can be inventors, AI-created inventions risk entering the public domain upon disclosure.¹² As a result, incentives for researchers to develop new AI technology will likely decrease, the clarity of the disclosure of inventions will likely suffer, and the reliability of patents granted will likely diminish.¹³

⁶ See, e.g., Ryan Abbott, *I Think, Therefore I Invent: Creative Computers and the Future of Patent Law*, 57 B.C. L. REV. 1079, 1088–89 (2016) [hereinafter *Creative Computers*].

⁷ Ryan Abbott, *Everything Is Obvious*, 66 UCLA L. REV. 2, 27–29 (2019) [hereinafter *Everything Is Obvious*].

⁸ USPTO, INVENTING AI TRACING THE DIFFUSION OF ARTIFICIAL INTELLIGENCE WITH U.S. PATENTS 2–6 (2020) [hereinafter DIFFUSION OF ARTIFICIAL INTELLIGENCE], <https://www.uspto.gov/sites/default/files/documents/OCE-DH-AI.pdf> [<https://perma.cc/R5NS-5Y9Z>] (defining diffusion as “the spread and adoption of a new technology by inventors, companies, and other innovators” and explaining “[t]echnologies that diffuse broadly have potentially large effects on innovation, productivity, and economic growth.”).

⁹ See USPTO, INTELLECTUAL PROPERTY AND THE U.S. ECONOMY: THIRD EDITION 3 (2022), <https://www.uspto.gov/sites/default/files/documents/uspto-ip-us-economy-third-edition.pdf> [<https://perma.cc/CRZ5-62C5>].

¹⁰ See *id.* at 5.

¹¹ DIFFUSION OF ARTIFICIAL INTELLIGENCE, *supra* note 8, at 2.

¹² Complaint at 7, *Thaler v. Iancu*, No. 1:20-cv-00903 (E.D. Va. Aug. 6, 2020), *sub nom.* *Thaler v. Hirshfeld*, 558 F. Supp. 3d 238 (E.D. Va. 2021); *Thaler v. Vidal*, 43 F.4th 1207, 1209 (Fed. Cir. 2022), *aff'd sub nom.* *Thaler v. Hirshfeld*, 558 F. Supp. 3d 238 (E.D. Va. 2021).

¹³ Complaint, *supra* note 12, at 7, 9.

This Note argues AI-created inventions should still receive patent protection not by recognizing the AI as the inventor, but by attributing inventorship to the person who created the AI.¹⁴ Further, this Note proposes a regulatory framework of disclosure requirements for patent applications that address the policy concerns in *Thaler* of patent clarity, reliability, and incentivization within the field of AI.¹⁵ Part I discusses the background of the issue and explains the policy concerns legal scholars have raised regarding inventorship of AI.¹⁶ Part II sets forth the legal effects these concerns have in patent law.¹⁷ Part III describes previous statutes and regulations used to alleviate inventorship problems in the United States, particularly focusing on plant patents.¹⁸ Part IV details suggestions from legal scholars in enhancing patent disclosure related to AI inventions and explains the USPTO's regulatory power.¹⁹ Part V defines the regulatory framework and how it ameliorates clarity, reliability, and incentivization for AI-assisted or -created inventions.²⁰

I. UNDERSTANDING THE POLICY CONSIDERATIONS AND ARGUMENTS IN *THALER*

The roots of American patent law extend back to the founding of the United States.²¹ The U.S. Constitution gives Congress the power “[t]o promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.”²² The Patent Act further sets out statutory provisions, which include several requirements for a patent: eligibility, novelty, non-obviousness, and definite and enabled disclosure.²³ Patents are

¹⁴ See *infra* Part III; *Creative Computers*, *supra* note 6, at 1104.

¹⁵ See *Creative Computers*, *supra* note 6, at 1104; Tabrez Y. Ebrahim, *Artificial Intelligence Inventions & Patent Disclosure*, 125 PENN ST. L. REV. 147, 210–11 (2021).

¹⁶ See *infra* Part I.

¹⁷ See *infra* Part II.

¹⁸ See *infra* Part III.

¹⁹ See *infra* Part IV.

²⁰ See *infra* Part V.

²¹ U.S. CONST. art. I, § 8, cl. 8.

²² *Id.*

²³ See 35 U.S.C. §§ 101–03, 112.

public disclosures, and by allowing inventors to secure monopolies that exclude others from making, selling, and using their inventions for a limited time, inventors are encouraged to create new technology and build on what others have done before.²⁴ Over the years, new technologies have created challenges to patent law, requiring the government to re-evaluate how to properly apply these statutory requirements.²⁵

An area of technology that has expanded recently is artificial intelligence.²⁶ In general, there are three different classifications of AI: artificial narrow intelligence (ANI), artificial general intelligence (AGI), and artificial super intelligence (ASI).²⁷ ANI refers to AI that works to solve problems in particular areas of technology;²⁸ AGI is AI that is capable of learning across any area similar to that of a human;²⁹ finally, ASI refers to AI that even surpasses human intelligence.³⁰ To date, ANI is the only AI in use.³¹ However, it is quite possible AGI will exist in the near future.³²

As AI is improving, it is becoming an area of technology that some legal scholars believe is not fully addressed under current patent law.³³ Attorney Ryan Abbott addressed a number of policy concerns that arise from not recognizing AI as inventors in

²⁴ See *Creative Computers*, *supra* note 6, at 1096–97.

²⁵ See, e.g., H.R. Rep. No. 71-1129, at 1 (1930); see also Russ Pearlman, *Recognizing Artificial Intelligence (AI) as Authors and Inventors Under U.S. Intellectual Property Law*, 24 RICH. J.L. & TECH. 2, 24–25 (2018).

²⁶ See DIFFUSION OF ARTIFICIAL INTELLIGENCE, *supra* note 8, at 2–6.

²⁷ See Kaelyn R. Knutson, *Anything You Can Do, AI Can't Do Better: An Analysis of Conception as a Requirement for Patent Inventorship and a Rationale for Excluding AI Inventors*, 11 CYBARIS: AN INTELL. PROP. L. REV. 1, 3 (2020); *Everything Is Obvious*, *supra* note 7, at 25–26 (referring to ANI as specific artificial intelligence or SAI).

²⁸ See *Everything Is Obvious*, *supra* note 7, at 25–26; Naveen Joshi, *7 Types of Artificial Intelligence*, FORBES (June 19, 2019, 10:54 PM), <https://www.forbes.com/sites/cognitiveworld/2019/06/19/7-types-of-artificial-intelligence/#5660adfa233e> [<https://perma.cc/D236-BQPV>].

²⁹ See *Everything Is Obvious*, *supra* note 7, at 25–26; Joshi, *supra* note 28.

³⁰ See *Everything Is Obvious*, *supra* note 7, at 25–26; Joshi, *supra* note 28.

³¹ Knutson, *supra* note 27, at 3.

³² See *Everything Is Obvious*, *supra* note 7, at 25–26; Joshi, *supra* note 28.

³³ See *Creative Computers*, *supra* note 6, at 1096–98; Shlomit Yanisky Ravid & Xiaoqiong (Jackie) Liu, *When Artificial Intelligence Systems Produce Inventions: An Alternative Model for Patent Law at the 3A Era*, 39 CARDOZO L. REV. 2215, 2217–23 (2018).

his arguments in *Thaler*.³⁴ First, mandating human inventorship disincentivizes researchers to create AI because these inventions could enter into the public domain immediately upon publication of patent applications.³⁵ Patent protection is important to incentivizing innovation because it guarantees the owner of a patent (i.e., a patentee) a limited monopoly to commercially exploit their creative efforts.³⁶ In fact, the purpose of the Plant Patent Act was to remedy the failure of protecting creative efforts for producing new plant cultivars, which resulted from disincentives for the agricultural industry to innovate because innovators could not reap the financial benefits of their labor.³⁷

The second policy concern Abbott raised was requiring inventors be human makes patents less reliable. This stance can lessen the value of human inventors' work by allowing others to take credit for what an AI has arguably contributed to an invention.³⁸ Here, he further asserted creativity in patent law has less meaning.³⁹ Abbott argued this result is undesirable because it undermines the purpose of giving limited monopolies to inventors for their own discoveries.⁴⁰

Third, he explained failing to attribute inventorship to AI reduces the clarity of patents by obfuscating the invention's origin to the public.⁴¹ The patent system has a quid pro quo: inventors provide sufficient disclosure of the invention, and, in turn, the government gives the inventor a limited monopoly in a patent grant.⁴² Adequate disclosure is important because it allows dissemination of technical information to the public in a way that others may

³⁴ See Complaint, *supra* note 12, at 7.

³⁵ See *id.*; see also MPEP 1120 (8th ed. Rev. 7, Sept. 2008) (explaining publication occurs eighteen months after filing of the non-provisional patent application).

³⁶ *Creative Computers*, *supra* note 6, at 1096.

³⁷ H.R. Rep. No. 71-1129, at 1 (1930); see also *Cultivar*, WIKIPEDIA, <https://en.wikipedia.org/wiki/Cultivar> [<https://perma.cc/ANQ6-4X2F>] (defining cultivar as "type of plant that people have bred for desired traits, which are reproduced in each new generation by a method such as grafting, tissue culture, or carefully controlled seed production.").

³⁸ See Complaint, *supra* note 12, at 7.

³⁹ See *id.* at 9.

⁴⁰ See U.S. CONST. art. I, § 8, cl. 8.; *Creative Computers*, *supra* note 6, at 1092.

⁴¹ See Complaint, *supra* note 12, at 9.

⁴² See Ebrahim, *supra* note 15, at 158–59.

be able to build off of and generate further innovative ideas, thereby increasing the overall social welfare.⁴³ By not disclosing that an invention originates with an AI in their patent application, a patentee likely does not meet their end of the bargain of providing adequate disclosure.⁴⁴ This lack of disclosure makes it more difficult for the public to use the technology described in the patent and results in a reduced societal benefit.⁴⁵ Additionally, Abbott argued that there likely have been applications the USPTO has already granted in which AI had a substantial part in the creation of the subject matter.⁴⁶ This fact emphasizes how these policy concerns reflect the USPTO's general lack of awareness of the source of the ideas regarding AI-created inventions.⁴⁷

On the other side, the USPTO's perspective is mainly one of statutory interpretation.⁴⁸ In *Thaler*, the Office argued Congress intended to fix and modernize the patent system by amending the Patent Act through the passage of the America Invents Act (AIA) in 2011.⁴⁹ In doing so, Congress explicitly defined inventor as "the individual . . . who invented or discovered the subject matter of the invention."⁵⁰ The Office further advanced the position that the term "individual" means a natural person.⁵¹ In rejecting the two patent applications at issue, the USPTO explained the policy underlying its reasoning as "conception is the touchstone of inventorship It is the formation in the mind of the inventor . . . [and] is complete only when the idea is so clearly identified in the inventor's mind."⁵² Further, if Congress intended

⁴³ See *id.* at 159 n.43.

⁴⁴ See *id.* at 158–59.

⁴⁵ See *id.* at 158–59.

⁴⁶ Complaint, *supra* note 12, at 3; see also Pearlman, *supra* note 25, at 8; *Creative Computers*, *supra* note 6, at 1084–91.

⁴⁷ See *Creative Computers*, *supra* note 6, at 1085–88.

⁴⁸ See Mem. of Law in Supp. of Defs' Mot. for Summ. J. & in Opp'n to Pl.'s Mot. for Summ. J. at 2, *Thaler v. Iancu* No. 1:20-cv-00903, *sub nom.* *Thaler v. Hirshfeld*, 558 F. Supp. 3d 238 (E.D. Va. 2021) [hereinafter Defs' Mot. for Summ. J.].

⁴⁹ 35 U.S.C. § 100(f); see Defs' Mot. for Summ. J., *supra* note 48, at 2–4.

⁵⁰ 35 U.S.C. § 100(f).

⁵¹ See Defs' Mot. for Summ. J., *supra* note 48, at 4–5.

⁵² *Burroughs Wellcome Co. v. Barr Labs., Inc.*, 40 F.3d 1223, 1227–28 (Fed. Cir. 1994); see also *Thaler*, 558 F. Supp. 3d at 243; *Mohamad v. Palestinian Auth.*, 566 U.S. 449, 453–54 (2012) (explaining statutory construction of "individual" and the ordinary meaning of "individual" is "[a] human being, a person").

to include AI as inventors, Congress would have used a different definition for inventor in the AIA, especially considering AI existed at the time they passed the Act.⁵³

While the Eastern District of Virginia did ultimately agree with the USPTO in *Thaler*, it recognized that AI may affect patent reliability, patent clarity, and the ability to maintain incentives for patentability.⁵⁴ However, the court did not address these issues because it reasoned that it is the duty of Congress, not the judiciary, to find an appropriate solution.⁵⁵ In recognizing this dilemma, Congress should address these concerns to avoid any detrimental impact to technology and innovation the court's holding of AI cannot be an inventor could have.⁵⁶ This Note ultimately argues a regulatory framework that complies with current statutes will be sufficient to provide a stopgap until Congress can enact new legislation and can continue to work in conjunction with this legislation.⁵⁷ Next, this Note will explain how failing to recognize AI inventorship can affect different areas of patent law and what lawmakers should consider evaluating.⁵⁸

II. LOOKING AT THE IMPLICATIONS OF ARTIFICIAL INTELLIGENCE—ASSISTED AND —CREATED INVENTIONS HAVE ON PATENT LAW

The Patent Act establishes several requirements for an invention to qualify for a patent grant.⁵⁹ First, patent eligibility

The Federal Circuit further emphasized examples in *Mohamad* of the standard usage of “individual” 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.” *Thaler v. Vidal*, 43 F.4th 1207, 1211 (Fed. Cir. 2022) (quoting *Mohamad*, 566 U.S. at 453–54).

⁵³ See Application of 16/524,350, *supra* note 1, at 7; Defs’ Mot. for Summ. J., *supra* note 48, at 3; *Thaler*, 558 F. Supp. 3d at 247. The Federal Circuit also emphasized this point stating “the [Patent] Act uses personal pronouns—‘himself’ and ‘herself’—to refer to an ‘individual’ . . . It does not also use ‘itself,’ which it would have done if Congress intended to permit non-human inventors.” *Thaler*, 43 F.4th at 1211.

⁵⁴ *Thaler*, 558 F. Supp. 3d at 248–49.

⁵⁵ *Id.*

⁵⁶ See generally *Everything Is Obvious*, *supra* note 7, at 4–10.

⁵⁷ See Herbert C. Wamsley, *The Rulemaking Power of the Commissioner of Patents and Trademarks (Part 2)*, 64 J. PAT. OFF. SOC’Y 539, 546 (1982) [hereinafter *Rulemaking Power Part 2*]; Ebrahim, *supra* note 15, at 213–18.

⁵⁸ See *infra* Part II.

⁵⁹ See 35 U.S.C. §§ 101–03, 112; *Everything Is Obvious*, *supra* note 7, at 10–11.

is reserved for inventors of articles, compositions, and processes.⁶⁰ Additionally, the subject matter may not fall under the judicial exceptions of abstract ideas, laws of nature, or natural phenomena.⁶¹ The underlying expression of ideas, on the other hand, is reserved for copyright protection.⁶² For example, how a film is seen by the viewer is copyrightable, whereas the equipment used to show the film and the digital storage on which the film is stored would be patent-eligible subject matter.⁶³

However, it is not enough for an invention to be patent-eligible subject matter; the invention must also be novel (i.e., never been done before) and any differences the invention may have when compared to any other publicly available material, on sale, or in use must be nonobvious to “a person having ordinary skill in the art” (PHOSITA).⁶⁴ Essentially, this standard exists to determine a threshold of patentable creativity at which the invention overcomes trivial incremental changes, such as generally changing the shape, material, color, or what is already commonly known in the technology area of the invention.⁶⁵

Further, the Patent Act sets forth several disclosure requirements to ensure inventors are incentivized to generate new ideas including those that build upon others’ inventions.⁶⁶ In doing so, a patent application must include a specification that is descriptive enough so that a person skilled in the art would understand how to make and use the technology that is described (i.e., it is enabled) and include claims that are clear enough to describe the invention (i.e., it is definite).⁶⁷ After filing a patent application, the USPTO reviews it for compliance with these and other statutory requirements, and examiners issue rejections or allowances based on their findings.⁶⁸ Examiners are required to point out the reasons for any rejections and courts give the examiners deference in any findings of fact.⁶⁹ As a result, not recognizing AI inventorship most

⁶⁰ See 35 U.S.C. § 101.

⁶¹ See Ravid & Liu, *supra* note 33, at 2247.

⁶² See 17 U.S.C. § 102.

⁶³ See 35 U.S.C. § 101; 17 U.S.C. § 102(6).

⁶⁴ See 35 U.S.C. §§ 101, 103; *Everything Is Obvious*, *supra* note 7, at 10–11.

⁶⁵ See *Everything Is Obvious*, *supra* note 7, at 16–22.

⁶⁶ See 35 U.S.C. § 112.

⁶⁷ See 35 U.S.C. § 112(a)–(b).

⁶⁸ See 35 U.S.C. § 132.

⁶⁹ See 35 U.S.C. § 132; *Dickinson v. Zurko*, 527 U.S. 150, 160–61 (1999).

implicates patent-eligible subject matter, obviousness, enablement, patent examination, subsequent litigation, and legal counseling.⁷⁰

A. Implications on Patent Eligibility

Because patent eligibility is intertwined with inventorship,⁷¹ how much a person utilizes AI in the creation of the invention is an important consideration.⁷² Presently, many argue there is not much of a concern as the level of AI used is almost entirely ANI.⁷³ However, AGI and ASI provide a unique problem because these levels of AI rely on less or, at the extreme, no human input.⁷⁴ Addressing this issue in the near future is important considering some believe AGI may already be in existence.⁷⁵ The level of human involvement is an important factor because the Federal Circuit has consistently held “conception” is the cornerstone of inventorship and merely “running [an] AI algorithm on the data and obtaining the results is unlikely to qualify as a contribution [to conception].”⁷⁶ However, creating the AI itself is likely to qualify as a contribution to the conception of any inventions that may result from the use of the AI.⁷⁷ As a result, many believe current patent law is sufficient to tackle these issues on a case-by-case basis which is already common with computer- and software-related patent disclosures.⁷⁸

⁷⁰ Defs’ Mot. for Summ. J., *supra* note 48, at 1; *see also* Application of 16/524,350, *supra* note 1, at 5 (explaining conception is a mental act attributed to people); *Univ. of Utah v. Max-Planck-Gesellschaft*, 734 F.3d 1315, 1323 (Fed. Cir. 2013) (holding states cannot be considered inventors); *Beech Aircraft Corp. v. EDO Corp.*, 990 F.2d 1237, 1248 (Fed. Cir. 1993) (holding “only natural persons can be ‘inventors’” and not corporations).

⁷¹ 35 U.S.C. § 101 (entitling “[w]hoever invents or discovers . . . a patent”).

⁷² *Public Views on Artificial Intelligence and Intellectual Property Policy*, USPTO, 7–13 (Oct. 7, 2020) [hereinafter *Public Views on Artificial Intelligence*], https://www.uspto.gov/sites/default/files/documents/USPTO_AI-Report_2020-10-07.pdf [<https://perma.cc/MY2J-PQZR>].

⁷³ *See id.*, at ii, 6; Knutson, *supra* note 27, at 3; *Everything Is Obvious*, *supra* note 7, at 25–26.

⁷⁴ *See Everything Is Obvious*, *supra* note 7, at 25–26.

⁷⁵ *See id.*

⁷⁶ *Burroughs Wellcome Co. v. Barr Labs., Inc.*, 40 F.3d 1223, 1227–28 (Fed. Cir. 1994); *Public Views on Artificial Intelligence*, *supra* note 72, at 3 n.17.

⁷⁷ *Public Views on Artificial Intelligence*, *supra* note 72, at 3.

⁷⁸ *Id.*

B. Implications on Obviousness

AI inventorship also affects what inventions are obvious. The legal standard for determining obviousness is whether a PHOSITA would have found it obvious to arrive at the claimed invention.⁷⁹ A PHOSITA, however, is predicated on the technology, education, and solutions inventors use in the particular field of the invention.⁸⁰ In *KSR v. Teleflex*, the Supreme Court reasoned “if a technique has been used to improve one device, and a [PHOSITA] would recognize that it would improve similar devices in the same way, using the technique is obvious.”⁸¹ The Manual of Patent Examining Procedure (MPEP) expands upon this analysis to include the following rationales for supporting an obviousness rejection:

Applying a known technique to a known device . . . ready for improvement to yield predictable results . . . and [k]nown work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable.⁸²

Whether individuals utilize AI in a particular technology area likely affects the threshold at which an invention becomes nonobvious.⁸³ That is, the more frequently inventors use AI as a “technique” or a “known work” to discover or create new methods and manufactures the more likely those methods and manufactures would be obvious and not patentable.⁸⁴ Because there is nothing

⁷⁹ 35 U.S.C. § 103; *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17 (1966) (stating the factual inquiries of obviousness are “the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved”); MPEP 2141.II (10th ed. Rev. 7, June 2020).

⁸⁰ See *Everything Is Obvious*, *supra* note 7, at 18–19; Ben Hattenbach & Joshua Glucoft, *Patents in an Era of Infinite Monkeys and Artificial Intelligence*, 19 STAN. TECH. L. REV. 32, 40 (2015).

⁸¹ *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 417 (2007).

⁸² MPEP 2143 (10th ed. Rev. 7, June 2020).

⁸³ See Ravid & Liu, *supra* note 33, at 2215, 2249–50; *KSR Int’l Co.*, 550 U.S. at 417; MPEP 2143 (10th ed. Rev. 7, June 2020).

⁸⁴ See Ravid & Liu, *supra* note 33, at 2215, 2249–50; *KSR Int’l Co.*, 550 U.S. at 417; MPEP 2143 (10th ed. Rev. 7, June 2020).

currently requiring inventors to disclose the use of AI, examiners at the USPTO do not know where to set this obviousness threshold. As a result, patent examiners may set this threshold too low thereby allowing “junk patents” to issue and disincentivizing innovation.⁸⁵

C. Implications on Enablement and the Level of Skill in the Art

As an additional requirement to patentability, the disclosure of a patent application must enable a person skilled in the art to make and use the subject matter of the claimed invention.⁸⁶ Here, a comparable dilemma to evaluating obviousness occurs when examiners evaluate enablement of patent applications, which include AI-assisted or -created inventions.⁸⁷ For example, how frequently inventors in a particular technology use AI changes the point at which a person skilled in that technology would understand how to make and use the invention disclosed in a patent application.⁸⁸ This issue becomes problematic when examiners assess the level of skill in the art.⁸⁹ Here, the factors an examiner uses to determine an enabled disclosure include:

- (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented [by the inventor], (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims.⁹⁰

If AI is commonly used in a particular technology, but the examiner is unaware of that fact, the examiner may determine the disclosed invention is not enabled, especially if there is little

⁸⁵ See Ravid & Liu, *supra* note 33, at 2250; *Everything Is Obvious*, *supra* note 7, at 27–30.

⁸⁶ 35 U.S.C. § 112(a); see also Gordon K. Hill & A. John (Jack) Pate, *Avoiding Confusion of PHOSITA*, AM. INTELL. PROP. L. ASS’N, <https://www.aipla.org/list/innovate-articles/avoiding-confusion-of-phosita> [<https://perma.cc/B7PG-M63B>] (explaining the PHOSITA standard in determining obviousness is separate from the person skilled in the art standard in the enablement analysis).

⁸⁷ See Ebrahim, *supra* note 15, at 158–59, 177.

⁸⁸ *Id.*

⁸⁹ *Id.*

⁹⁰ *In re Wands*, 858 F.2d 731, 737 (Fed. Cir. 1988).

direction or guidance from the inventor in the application's disclosure and there are no working examples.⁹¹ Thus, it becomes more difficult for applicants to meet the enablement requirement because examiners may view the disclosed invention as beyond what a person skilled in the art would be capable of making or using.⁹²

D. Implications on the Examination Process, Litigation, and Legal Advice

Finally, the level of skill in the art particularly affects the examination process, subsequent litigation proceedings where fact-finding is relevant, and in giving legal advice to clients.⁹³ The USPTO, as the primary fact-finder, requires patent examiners to perform a search of relevant prior art and to ensure that all statutory provisions are met.⁹⁴ The law generally recognizes patent examiners are experts in the field of technology in which they examine.⁹⁵ Fact-finding becomes particularly difficult for examiners in evaluating patent applications for obviousness and disclosure requirements when it is unknown if inventors used AI in the creation of the claimed subject matter.⁹⁶ For example, USPTO policy requires patent examiners to assess patent applications as filed and inquiry into the mind of the inventor is generally unavailable unless the application produces some evidence in its disclosure.⁹⁷ As a result, a patent examiner may accept a

⁹¹ See Ebrahim, *supra* note 15, at 151, 152, 177. For example, explainability (i.e., how understandable an AI's functionality is to a human observer) and inscrutability (i.e., the difficulty to determine what the output of the AI means) are concerns that affect the evaluation of undue experimentation in particular relating to how much experimentation, the "state of the prior art," the predictability of the technology, and the relative skill of those involved. Ebrahim, *supra* note 15, at 151, 152, 177; *In re Wands*, 858 F.2d at 737.

⁹² *Id.*

⁹³ See Ebrahim, *supra* note 15, at 148, 155, 158–59, 177, 196, 202–03, 210; *supra* notes 83–84, 88 and accompanying text.

⁹⁴ *Dickinson v. Zurko*, 527 U.S. 150, 160–61 (1999) (explaining the USPTO "is an expert body . . . [and] the [US]PTO can better deal with the technically complex subject matter"); MPEP 904.02 (8th ed. Rev. 7, Sept. 2008).

⁹⁵ *In re Sang-Su Lee*, 277 F.3d 1338, 1345 (Fed. Cir. 2002).

⁹⁶ See Ebrahim, *supra* note 15, at 148, 155, 158–59, 177, 196, 202–03, 210; *supra* notes 83–86, 90 and accompanying text.

⁹⁷ See Ebrahim, *supra* note 15, at 210.

part of the disclosure as comporting with a PHOSITA or those skilled in the art when in reality the opposite may be true.⁹⁸ Further, given time constraints of examination, it is difficult for patent examiners to focus on understanding issues that are not apparent in the disclosure.⁹⁹

As AI becomes more sophisticated in a particular field, the tools at the disposal of inventors in creating new technology become wider and affect the level of skill in the art.¹⁰⁰ Therefore, if the level of AI usage is ordinary in the art, examiners are at the risk of either granting patents to applications where a PHOSITA using AI would have found it obvious or rejecting applications where AI would enable a person skilled in the art to make and use the claimed invention.¹⁰¹ Similarly, courts look at the same factors as the USPTO in determining statutory compliance in patent litigation cases.¹⁰² Attorneys also may have a difficult time performing freedom to operate analyses, preliminary searches for clients, and evaluating patentability in litigation.¹⁰³ All of these services require evaluating issues this Note has discussed, including patent eligibility,¹⁰⁴ disclosure requirements,¹⁰⁵ and obviousness.¹⁰⁶

⁹⁸ *Id.*

⁹⁹ Naira Rezende Simmons, *Putting Yourself in the Shoes of a Patent Examiner: Overview of the United States Patent and Trademark Office (USPTO) Patent Examiner Production (Count) System*, 17 J. MARSHALL REV. OF INTELL. PROP. L. 32, 34, 39 (2017).

¹⁰⁰ *Everything Is Obvious*, *supra* note 7, at 25–27.

¹⁰¹ See Ravid & Liu, *supra* note 33, at 2250; *Everything Is Obvious*, *supra* note 7, at 27–30; Ebrahim, *supra* note 15, at 158–59. Ordinary in this sense is what the level of ordinary skill is which would be at the time of filing of the patent application and would “focus[] on the user’s control, selection, and use of the process” of the AI. Patric M. Reinbold, *Taking Artificial Intelligence Beyond the Turing Test*, 2020 WIS. L. REV. 873, 893–94, 901–02 (2020).

¹⁰² Reinbold, *supra* note 101, at 893, 901–02.

¹⁰³ Ebrahim, *supra* note 15, at 148, 190–91, 203–04. A freedom to operate analysis evaluates whether an entity has engaged in patent infringement, which requires looking into all relevant defenses including patent invalidity. Jennifer F. Nelson & Scott D. Locke, *Freedom to Operate Opinions: Worth the Cost?*, 33 NO. 8 ACC DOCKET 86, 88 (2015); *see also* 35 U.S.C. § 282.

¹⁰⁴ *See supra* Section II.A.

¹⁰⁵ *See supra* Section II.B.

¹⁰⁶ *See supra* Section II.C.

III. REVIEWING PAST LEGISLATIVE AND REGULATORY ACTION
AFFECTING PATENT DISCLOSURE

In 1930, Congress passed the Plant Patent Act, which allows the USPTO to issue patents to inventors for asexually reproduced plants and meet the same general standards of patentability as other patent-eligible subject matter.¹⁰⁷ Prior to this moment, many believed plants constituted unpatentable subject matter.¹⁰⁸ Most of these concerns were related to similarities plants have with other patent-ineligible subject matter, including minerals.¹⁰⁹ Like minerals, plants exist in nature apart from human intervention¹¹⁰ and plants inherently grow on their own without intervention because of natural processes.¹¹¹

However, the legislative history of the Plant Patent Act reveals Congress believed cultivated plants were patent-eligible because “the work of the plant breeder ‘in aid of nature’ was patentable invention.”¹¹² The policy reason behind this change of view was “to stimulate plant breeding by providing a financial incentive for plant breeders to engage in their work.”¹¹³ In particular, Congress focused on human ingenuity and creativity in cultivation and gave patent protection to plant breeders for their efforts in asexually creating new varieties of plants.¹¹⁴ Congress likened asexually reproduced cultivars less to finding a new mineral existing in nature and more to chemists discovering new chemical compounds through experimentation.¹¹⁵ Further emphasis was placed on the principle that an inventor does not have to purposefully create an invention, but also may receive patent protection even for accidental discovery as long as the inventor “ha[s] the foresight and ability to see and appreciate its possibilities and to take steps to preserve its existence.”¹¹⁶ This principle has existed since the founding of the Constitution when

¹⁰⁷ See 35 U.S.C. § 161; *Diamond v. Chakrabarty*, 447 U.S. 303, 311 (1980).

¹⁰⁸ *Diamond*, 447 U.S. at 311.

¹⁰⁹ See H.R. Rep. No. 71-1129, at 7 (1930).

¹¹⁰ *Id.*

¹¹¹ *Id.*

¹¹² *Diamond*, 447 U.S. at 312.

¹¹³ *In re Beineke*, 690 F.3d 1344, 1350 (Fed. Cir. 2012); see also H.R. Rep. No. 71-1129, at 1–2 (1930); 72 CONG. REC. 8391–92 (1930).

¹¹⁴ *In re Beineke*, 690 F.3d at 1351.

¹¹⁵ See H.R. Rep. No. 71-1129, at 7–8 (1930).

¹¹⁶ *Id.* at 8.

the plain meaning of inventor included both “a creator of something new” and “a discoverer.”¹¹⁷ While the former definition of inventor is what is commonly used now, patent law still recognizes that discovery may result in patentable invention.¹¹⁸ As an example, unpredictable results deriving from routine experimentation are still considered probative evidence of nonobviousness today.¹¹⁹

While some may argue the legislative history of the Plant Patent Act is irrelevant because plants are natural organisms, AI-created inventions are similar to plants eligible for patent protection in that they are not the sole work of the human inventor.¹²⁰ Without the output from the AI or the natural growth of the plants, these inventions would likely not exist.¹²¹ Further, an inventor who uses the “aid of artificial intelligence” to create patent-eligible subject matter is like the inventor who uses the “aid of nature” to create a new cultivar because they both require human intervention and ingenuity separate from the process itself.¹²² All AI is the result of human labor, consisting commonly of neural networks requiring inputs for the AI to evaluate.¹²³ The greater the complexity of the AI, the lower amount of human intervention is required for the AI to find a solution to an assigned problem.¹²⁴ Denying patent protection to inventions resulting from the output of AI with initial guidance from humans would result in a similar imbalance in patent protection that the agricultural industry had before the enactment of the Plant Patent Act in 1930.¹²⁵ The person designing an AI contemplates the inventions the AI may create and “take[s] steps to preserve” these inventions through producing them or reducing them to practice and, therefore, AI-assisted or -created inventions should receive patent protection.¹²⁶

¹¹⁷ *Id.* at 8–9.

¹¹⁸ *See id.* at 8–10 (1930); *Creative Computers*, *supra* note 6, at 1098.

¹¹⁹ *See United States v. Adams*, 383 U.S. 39, 51–52 (1966); MPEP 2143.IA (10th ed. Rev. 7, June 2020).

¹²⁰ *See Hattenbach & Glucoft*, *supra* note 80, at 47–50.

¹²¹ *Id.*

¹²² *See Public Views on Artificial Intelligence*, *supra* note 72, at 5.

¹²³ *See Knutson*, *supra* note 27, at 19; *Creative Computers*, *supra* note 6, at 1084.

¹²⁴ *See Knutson*, *supra* note 27, at 3–4; *Everything Is Obvious*, *supra* note 7, at 25–26.

¹²⁵ *See H.R. Rep. No. 71-1129*, at 1–2 (1930); *supra* notes 37–46 and accompanying text.

¹²⁶ *See H.R. Rep. No. 71-1129*, at 8 (1930).

The requirements for plant patents are set forth in the Patent Act and relevant sections of the Patent Rules.¹²⁷ The patent provisions for plants parallel the general provisions for other patent applications, but they also include additional requirements that are more clearly described in the MPEP.¹²⁸ The inventor's declaration and drawings for plant patents as part of the specification are particularly relevant for this discussion.¹²⁹ The declaration requires the inventor to name the plant, certify they asexually reproduced the plant in a cultivated area, and they were the original inventor or joint inventor of the cultivar.¹³⁰ The drawings are equally important as they fully describe in color what the cultivar looks like.¹³¹ Taken together, these requirements aid the USPTO in determining the patentability of applications and put the public on notice as to the identity of the newly found variety without which it would be difficult to fully assess the patentability of the asexually reproduced plant.¹³²

Plant patents are not the only technology area that have additional disclosure requirements.¹³³ In 1990, the USPTO began to require patent applicants whose applications include nucleotide and amino acid sequences to submit the sequence data in computer-readable form.¹³⁴ Because of the increasing length and complexity of sequences and the increasing number of applications in these technology areas, examiners had difficulty performing reliable searches of prior art for these patent applications.¹³⁵ These additional requirements for applications related to computer software and biological technologies aimed to alleviate these issues as well as provide clarity and reliability of patent grants in the area of nucleotide sequencing.¹³⁶

¹²⁷ 35 U.S.C. §§ 161–64; 37 C.F.R. §§ 1.161–1.167.

¹²⁸ See 35 U.S.C. §§ 101–03, 112, 161–64; MPEP 1601–13 (10th ed. Rev. 7, June 2020).

¹²⁹ See 37 C.F.R. §§ 1.162, 1.165.

¹³⁰ See 37 C.F.R. § 1.162.

¹³¹ See 37 C.F.R. § 1.165.

¹³² See MPEP 1601–13 (10th ed. Rev. 7, June 2020).

¹³³ See 37 C.F.R. §§ 1.821–1.825.

¹³⁴ *Id.*

¹³⁵ See Requirements for Patent Applications Containing Nucleotide Sequence and/or Amino Acid Sequence Disclosures, 55 Fed. Reg. 18,230 (May 1, 1990) (to be codified at 37 C.F.R. §§ 1.821–1.825).

¹³⁶ *Id.*

Further, alternative disclosure already exists for computer program listings, and the Office allows an applicant to include the actual listing as part of drawings or specification if it is 300 lines or less,¹³⁷ or to submit the listing as an appendix that will not be printed.¹³⁸ Regardless, this regulation does require “the operation and general content” to appear in the disclosure.¹³⁹ The new regulation’s purpose was to reduce the cost of printing lengthy computer program listings when disclosure of the listings was required for a complete understanding of the invention.¹⁴⁰ Therefore, this Note suggests additional disclosure requirements identifying the level of AI used in AI-assisted or AI-created inventions will similarly aid the USPTO in the examination process and increase the reliability, clarity, and incentives of these patents.¹⁴¹

IV. ENHANCED PATENT DISCLOSURE RELATING TO AI INVENTIONS AND THE USPTO’S REGULATORY POWER

To address concerns of hampered reliability, reduced clarity, and decreased incentives in not recognizing AI inventorship, Congress should consider adopting a regulatory framework of enhanced patent disclosure. While additional disclosure requirements add cost to patent applicants and could be ineffective,¹⁴² implementing new ones for AI-assisted or -created inventions will, at the very least, prove useful in alleviating reliability, clarity, and incentive issues in this field.¹⁴³

A. Alternatives for Enhanced Disclosure Suggested by Legal Scholars

Professor Tabrez Ebrahim suggested an optional survey to allow inventors to describe what AI tools and methods were implemented in the creation of these inventions.¹⁴⁴ This type of

¹³⁷ See 37 C.F.R. § 1.96(b).

¹³⁸ See § 1.96(c).

¹³⁹ See § 1.96(a).

¹⁴⁰ See Rules of Practice in Patent Cases; Deposit of Computer Program Listings, 46 Fed. Reg. 2611 (Jan. 12, 1981) (to be codified at 37 C.F.R. § 1.98).

¹⁴¹ See *infra* Parts IV and V.

¹⁴² See Ebrahim, *supra* note 15, at 187–89, 205–07.

¹⁴³ See *id.* at 190, 210–11.

¹⁴⁴ See *id.* at 147, 162, 212.

system in exchange for information about the AI would provide “prioritized examination . . . [or] reduced maintenance fees” quickly because this action requires no involvement of Congress.¹⁴⁵ The USPTO has even initiated several opportunities for public discourse and has provided guidance, which examiners and officers at the USPTO should follow in determining inventorship for artificial intelligence assisted inventions.¹⁴⁶ However, because of the voluntary nature of this kind of disclosure arrangement, the likelihood of participation, even with the USPTO giving out incentives to applicants, is low.¹⁴⁷ On the other end of the spectrum, Ebrahim discusses an act of Congress may require AI disclosure similar to that of the Plant Patent Act, but doing so will be a lengthy undertaking because it will involve going through the entire legislative process.¹⁴⁸

B. USPTO’s Authority to Enact Regulations Relating to AI Disclosure

Besides voluntary disclosure and congressional enactment, the USPTO can use its regulatory power to enhance public disclosure in AI-assisted or -created inventions.¹⁴⁹ In general, the USPTO has the authority to create regulations designed to govern proceedings at the Office that are “not inconsistent” with current law.¹⁵⁰ This requirement means that any regulations proposed must be consistent with both statutory law and any court precedent.¹⁵¹ Also, new rules may not be substantive in nature;¹⁵² however, they may interpret the law and “explain the agency’s view of existing case law or statutes.”¹⁵³

¹⁴⁵ *Id.*

¹⁴⁶ See *Public Views on Artificial Intelligence*, *supra* note 72, at 2–6; Request for Comments Regarding Artificial Intelligence and Inventorship, 88 Fed. Reg. 9492–95 (Feb. 14, 2023).

¹⁴⁷ See Ebrahim, *supra* note 15, at 212–13.

¹⁴⁸ See *id.* at 213–18.

¹⁴⁹ See 35 U.S.C. § 2(b)(2).

¹⁵⁰ *Id.*

¹⁵¹ See *Rulemaking Power Part 2*, *supra* note 57, at 539, 556 (1982); *In re Van Ornum*, 686 F.2d 937, 945–46 (C.C.P.A. 1982).

¹⁵² See *Merck & Co., Inc. v. Kessler*, 80 F.3d 1543, 1549–50 (Fed. Cir. 1996).

¹⁵³ See R. CARL MOY, *RULE-MAKING ACTIVITIES OF THE USPTO—RULE MAKING PROCEDURES*, 1 *MOY’S WALKER ON PATENTS* § 2:28 (4th ed. 2020); see also *Cooper Techs. Co. v. Dudas*, 536 F.3d 1330, 1335–37 (Fed. Cir. 2008).

The Administrative Procedure Act (APA) governs rule-making made by administrative agencies, including the USPTO, and generally requires the publication of proposed rules to afford members of the public the opportunity to comment.¹⁵⁴ The agency may then revise the rules in consideration of the comments and publish the rules in the Federal Register.¹⁵⁵ This process proves to be beneficial for a number of reasons.¹⁵⁶ First, public comments allow the USPTO to gain feedback before implementation and to clarify ambiguity, which is often why courts will defer to agency rules.¹⁵⁷ This is in contrast to policy provisions such as Professor Ebrahim’s suggestion of voluntary disclosure and guidance found in the MPEP.¹⁵⁸ Second, the process is less arduous than legislation and may act as a stopgap where Congress can consider either legislation approving of AI inventorship or codifying this suggested regulation into statute.¹⁵⁹

In the common law, patent applicants “are required to prosecute patent applications in the [US]PTO with candor, good faith, and honesty.”¹⁶⁰ In doing so, applicants must not fail to provide material information that could mislead the USPTO and includes any information “a reasonable examiner would be substantially likely to consider important in deciding whether to allow an application to issue as a patent.”¹⁶¹ Given the significant implications the use of AI has on various areas of patentability,¹⁶²

¹⁵⁴ See 5 U.S.C. § 553; *Rulemaking Power Part 2*, *supra* note 57, at 543.

¹⁵⁵ See *Rulemaking Power Part 2*, *supra* note 57, at 543–44; see, e.g., *supra* notes 129, 130, 134 and accompanying text.

¹⁵⁶ See Ebrahim, *supra* note 15, at 212–13; *Rulemaking Power Part 2*, *supra* note 57, at 541.

¹⁵⁷ See *Rulemaking Power Part 2*, *supra* note 57, at 543; *Cooper Techs. Co.*, 536 F.3d at 1335–37; Herbert C. Wamsley, *The Rulemaking Power of the Commissioner of Patents and Trademarks (Part 3—Conclusion)*, 64 J. PAT. OFF. SOC’Y 604, 625 (1982).

¹⁵⁸ See *Rulemaking Power Part 2*, *supra* note 57, at 546; Ebrahim, *supra* note 15, at 213–18.

¹⁵⁹ *Id.*

¹⁶⁰ *Molins PLC v. Textron, Inc.*, 48 F.3d 1172, 1178 (Fed. Cir. 1995).

¹⁶¹ *Bristol-Myers Squibb Co. v. Rhone-Poulenc Rorer, Inc.*, 326 F.3d 1226, 1234 (Fed. Cir. 2003); see also 37 C.F.R. § 1.56; MPEP 2001, 2001.04 (10th ed. Rev. 7, June 2020).

¹⁶² See *supra* Part II.

how much AI plays into the invention process is arguably material to examination.¹⁶³ Therefore, the USPTO likely has the power to interpret material information to include the level of AI the applicant used in the inventing or discovery process and require its disclosure as long as it is procedural in nature.¹⁶⁴

It is true the legislative history of the AIA does not include any mention of AI, so at the time, Congress did not contemplate any legislation on including any express protection or limitations on patent rights regarding AI, including whether disclosing the use of AI is material to examination.¹⁶⁵ Therefore, some may argue the USPTO would be overstepping its rulemaking authority and legislating by creating a rule to require disclosure relating to the extent of the involvement of AI.¹⁶⁶ However, technology is an area that changes frequently, which requires flexibility in administering patent laws.¹⁶⁷ Second, Congress recognized this issue in its organic statute establishing the USPTO by giving large discretion to “establish regulations, not inconsistent with law, which . . . govern the conduct of proceedings in the Office.”¹⁶⁸ Finally, the USPTO has already promulgated multiple regulations that require additional disclosure, including requiring nucleotide sequences and to include computer program listings mentioned previously.¹⁶⁹

¹⁶³ See *Bristol-Myers Squibb Co.*, 326 F.3d at 1234 (explaining a document that was important in making a determination of enablement was considered material); 37 C.F.R. § 1.56; MPEP 2001, 2001.04 (10th ed. Rev. 7, June 2020); Amicus Curiae Mem. Supp. Affirming (Den.) Mot. for Summ. J. by District Court at 83–84, *Thaler v. Hirshfeld*, No. 21-2347 (Fed. Cir. filed Nov. 17, 2021).

¹⁶⁴ See *Bristol-Myers Squibb Co.*, 326 F.3d at 1234; *Rulemaking Power Part 2*, *supra* note 57, at 539, 556.

¹⁶⁵ See generally Patrick A. Doody, *Comprehensive Legislative History of the Leahy-Smith America Invents Act*, PILLSBURY (Sept. 16, 2012), <https://www.pillsburylaw.com/images/content/4/0/v2/4067/AIA-LegislativeHistory-final.pdf> [<https://perma.cc/54FB-3RTT>].

¹⁶⁶ See R. CARL MOY, *RULE-MAKING ACTIVITIES OF THE USPTO—RULE MAKING PROCEDURES*, 1 MOY’S WALKER ON PATENT § 2:28 (4th ed. 2020); see also *Cooper Techs. Co. v. Dudas*, 536 F.3d 1330, 1335–37 (Fed. Cir. 2008).

¹⁶⁷ See *DIFFUSION OF ARTIFICIAL INTELLIGENCE*, *supra* note 8, at 2–6.

¹⁶⁸ 35 U.S.C. § 2(b)(2)(A).

¹⁶⁹ See *supra* notes 133–41 and accompanying text.

V. THE ARTIFICIAL INTELLIGENCE DISCLOSURE FRAMEWORK:
A NEW FRAMEWORK ENHANCING PATENT DISCLOSURE

Using its regulatory authority, the USPTO should promulgate a rule requiring the inventor to disclose what kind of AI (i.e., ANI, AGI, or ASI), if any, the inventor used in the creation of the subject matter disclosed in a patent application. The patent applicant would file this disclosure either as an oath or declaration or as part of the specification.¹⁷⁰ Patent application publications and patent grants should also print this information as a part of the publication.¹⁷¹

A. The Effects of the Artificial Intelligence Disclosure Framework

While applicants will bear the burden of additional cost of disclosing the information as part of the application process, there are notably many benefits to this system.¹⁷² Not only will this regulatory scheme improve public dissemination by indicating the level of AI on the face of the disclosure,¹⁷³ but this scheme will also assist the USPTO in examining applications and aid attorneys in advising clients.¹⁷⁴ By indicating whether the invention utilizes ANI, AGI, or ASI, patent examiners will be able to understand the level of skill in a particular art better because that information is not hidden.¹⁷⁵ Therefore, the USPTO will give a more accurate assessment of patentability with this framework.¹⁷⁶

Patent practitioners (i.e., attorneys and agents) will also be able to better serve their clients with a more precise understanding of the level of skill in the art when patent documents disclose the level of AI used.¹⁷⁷ These requirements will also

¹⁷⁰ See 35 U.S.C. § 25; 37 C.F.R. § 1.77(b); Ebrahim, *supra* note 15, at 212.

¹⁷¹ See 37 C.F.R. § 1.77(b); *see, e.g.*, U.S. Pat. No. 11,008,584 (showing a variety of information that is presently printed as part of the patent publication process including nucleotide sequences).

¹⁷² See Ebrahim, *supra* note 15, at 203.

¹⁷³ See *id.* at 212; 37 C.F.R. § 1.77(b); *see, e.g.*, U.S. Pat. No. 11,008,584.

¹⁷⁴ See Ebrahim, *supra* note 15, at 210–12.

¹⁷⁵ See *id.* Cf. *supra* Part II (explaining no disclosure hinders examination in various areas of patent law including determining obviousness and enablement).

¹⁷⁶ See Ebrahim, *supra* note 15, at 210–12.

¹⁷⁷ *Id.* at 211 (explaining no disclosure hampers attorneys' ability to advise clients).

likely improve the quality and clarity of patents over time.¹⁷⁸ With each patent and patent application publication that has such a designation, the understanding of which inventions utilize what level of AI increases.¹⁷⁹ This result is similar to how patent classifications on patent disclosures indicate the field of invention and increase in availability as more patent documents include classification symbols.¹⁸⁰ Ultimately, the level of skill in each art area will be easier to ascertain as it becomes clear the amount of diffusion of AI that has occurred.¹⁸¹ Further, this regulatory framework will maintain incentives for inventors in the area of AI technology to continue to innovate and improve upon previous works.¹⁸² With a sufficient amount of disclosures with AI designations, inventors will be able to see what technology areas do not utilize AI, which may prove ripe for improvement.¹⁸³

¹⁷⁸ See, e.g., Heather J.E. Simmons, *Categorizing the Useful Arts: Past, Present, and Future Development of Patent Classification in the United States*, 106 L. LIBR. J. 563, 566–67 (2014).

¹⁷⁹ *Id.* at 566–67. The USPTO has already begun to create a database that includes patents that relate to AI in the areas of “machine learning, natural language processing, computer vision, speech, knowledge processing, AI hardware, evolutionary computation, and planning and control.” Alexander V. Giczy et al., *Identifying Artificial Intelligence (AI) Invention: A Novel AI Patent Dataset*, THE J. OF TECH. TRANSFER 2 (Aug. 2, 2021), https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3866793# [<https://perma.cc/VC9J-PMDP>].

¹⁸⁰ *Id.*

¹⁸¹ See DIFFUSION OF ARTIFICIAL INTELLIGENCE, *supra* note 8, at 2–6; see, e.g., Simmons, *supra* note 178, at 566–67.

¹⁸² See Ebrahim, *supra* note 15, at 210–12, 214; *Everything Is Obvious*, *supra* note 7, at 4–10; see, e.g., Simmons, *supra* note 178, at 566–67.

¹⁸³ See Ebrahim, *supra* note 15, at 210–12, 214; *Everything Is Obvious*, *supra* note 7, at 4–10; see, e.g., Simmons, *supra* note 178, at 566–67.

B. An Explanatory Hypothetical: Applying the Artificial Intelligence Disclosure Framework to Application 16/524,532

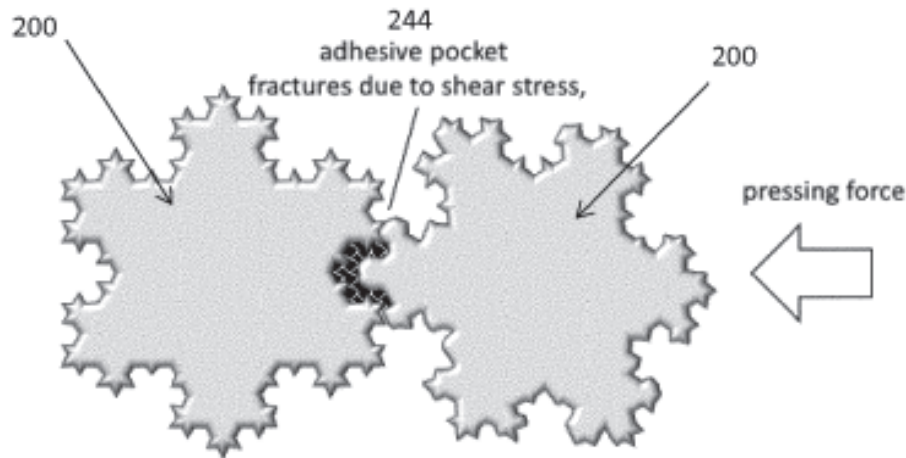


FIGURE 1: FRACTAL FOOD CONTAINER¹⁸⁴

One of the patent applications at issue in *Thaler*, 16/524,532, discloses a food container with a fractal geometry seen in Figure 1.¹⁸⁵ This flexible fractal geometry provides several benefits over other known containers: a) it enables the coupling of containers to reduce the need of tying structures;¹⁸⁶ b) it creates an easy way for users to disengage coupled containers;¹⁸⁷ c) it increases the surface area of the container to aid in the cooling and heating (i.e., heat transfer) of the stored contents;¹⁸⁸ and d) it allows

¹⁸⁴ See *Thaler v. Hirshfeld*, 558 F. Supp. 3d 238, 240–41 (E.D. Va. 2021) (referring to application 16/524,532 as a “Fractal Container” which also corresponds to Eur. Patent Application No. 3,564,144); Eur. Patent Application No. 3,564,144 fig.8 (filed Oct. 17, 2018); *Patents and Applications*, THE ARTIFICIAL INVENTOR PROJECT, <https://artificialinventor.com/patent-applications/> [<https://perma.cc/C7PU-RW9S>].

¹⁸⁵ See *Thaler*, 558 F. Supp. 3d at 240–41.

¹⁸⁶ See ‘144 Eur. Patent Application ¶ 10.

¹⁸⁷ See *id.* ¶ 11.

¹⁸⁸ See *id.* ¶ 12.

users to better grip the container while in use.¹⁸⁹ There is no mention in the specification of any AI involved in the creation of the claimed subject matter.¹⁹⁰ However, in the Application Data Sheet, Thaler asserted that the AI DABUS was the inventor of the patentable subject matter.¹⁹¹

DABUS, according to the patents that describe the AI, operates through a series of neural networks and looks for new concepts and ideas based on certain criteria, which the user programs into the system.¹⁹² Users of DABUS can also program and adjust different “perturbations” (e.g., weights and input or output signals) to account for variations in the neural networks and to train the system to find desired solutions.¹⁹³ From these descriptions, DABUS qualifies as an ANI because it requires specific training and criteria from natural persons to find a solution to a given input.¹⁹⁴

Under this Note’s proposed framework, a designation of ANI would appear on the cover of the publication of 16/534,532 and any subsequent patent grant, indicating the application utilized ANI in the creation of the invention.¹⁹⁵ Practically, this indication gives the public and the USPTO important information to improve quality and clarity of patent disclosures and incentives to innovate.¹⁹⁶

First, research and development departments of competitors in container technology, such as Elopak and Tetra Pak, can look at the disclosure of this patent application and consider utilizing ANI in its future creation of containers or packaging materials.¹⁹⁷ This designation helps incentivize creation, notifies competitors of the true origin of the invention, the tools that were at Thaler’s disposal, and how the invention was made.¹⁹⁸

¹⁸⁹ *See id.* ¶ 15.

¹⁹⁰ *See Thaler*, 558 F. Supp. 3d at 240–41; ‘144 Eur. Patent Application.

¹⁹¹ *See Thaler*, 558 F. Supp. 3d at 241.

¹⁹² Amicus Curiae Mem. Supp. Affirming (Den.) Mot. for Summ. J. by District Court, *supra* note 163, at 63–64.

¹⁹³ *Id.* at 65.

¹⁹⁴ *See id.* at 74, 80.

¹⁹⁵ *See supra* notes 168–69 and accompanying text.

¹⁹⁶ *See supra* Section V.A.

¹⁹⁷ *See* ‘144 Eur. Patent Application ¶ 3.

¹⁹⁸ *See supra* Section V.A.

For example, looking to the ANI designation of the 16/534,532 application, competitors could look to or design their own ANI to create an innovative fractal pattern container geometry that may be a substantial improvement over the DABUS application.¹⁹⁹ Without this information, competitors might only research known fractal patterns in the container industry or in analogous technologies, especially considering the fractal pattern shown in Figure 1 of 16/534,532 is a common pattern (i.e., a Koch snowflake).²⁰⁰ As a result, competitors may not create as effective of a fractal pattern geometry for a container as they could have if they utilized ANI to find a solution.²⁰¹

Additionally, the USPTO will be able to use the ANI designation to better aid in the determination of patentability.²⁰² In reviewing 16/534,532, the designation of ANI informs the examiner of key information that may affect their search strategy.²⁰³ For example, in the background of the invention, the specification mentions the packaging industry is already well developed.²⁰⁴ USPTO policy suggests that in determining the appropriate field of search the examiner should consider “whether the subject matter deals with technology not well developed in the patent documents.”²⁰⁵

If a technology is considered well developed, as the disclosure of 16/534,532 suggests, the MPEP directs the examiner to frame their search around classification and text searches of patent databases at the USPTO’s disposal.²⁰⁶ However, if the application included an ANI designation, the examiner may decide the technology disclosed in the DABUS application is not well developed because it includes an AI-assisted creation.²⁰⁷ As a result, according to USPTO policy, the examiner should include

¹⁹⁹ See ‘144 Eur. Patent Application; *supra* notes 168–69 and accompanying text.

²⁰⁰ See ‘144 Eur. Patent Application fig. 1; *Koch Snowflake*, WIKIPEDIA, https://en.wikipedia.org/wiki/Koch_snowflake [<https://perma.cc/LR65-CR3V>].

²⁰¹ See, e.g., *Everything Is Obvious*, *supra* note 7, at 22–25, 27–30.

²⁰² See *supra* Section V.A.

²⁰³ See MPEP 904.02-904.02(b) (8th ed. Rev. 7, Sept. 2008).

²⁰⁴ See ‘144 Eur. Patent Application ¶ 2.

²⁰⁵ MPEP 904.02(b) (10th ed. Rev. 7, June 2020).

²⁰⁶ *Id.*

²⁰⁷ See *id.*; see also *Everything Is Obvious*, *supra* note 7, at 22–25, 27–30.

nonpatent literature (NPL) in their field of search and patent searching.²⁰⁸ This NPL could include scientific papers, journals, or foreign patent applications related to AI usage in creating fractal pattern geometries for containers or those related to heat transfer or surface adhesion.²⁰⁹ Thus, the prior art that the examiner uncovers, based on whether the patent application indicates AI's involvement, affects the examination, including the determination of the level of skill in the art.²¹⁰ Therefore, if 16/534,532 later issues into a patent without such an indication, the examination record will likely lack relevant prior art that the examiner would have otherwise cited if there was an ANI designation.²¹¹

Furthermore, the USPTO could use the ANI indication attached to 16/534,532 to aid in future examinations.²¹² For example, an examiner reviewing another patent application of an improvement in heating and cooling container technology would likely come across 16/534,532 in their field of search.²¹³ If this hypothetical application also used ANI in developing the invention's subject matter, the examiner could look to the prior art cited in 16/534,532, such as the NPL suggested previously, and understand that the skill in the art may be changing as AI diffuses into the container technology.²¹⁴ Over time, if applicants continue to file such hypothetical cases, a compilation of cases using ANI in creating heating and cooling applications for containers will be developed, allowing examiners to likely rely less on NPL and more on patent documents from classification and text searching.²¹⁵ This result will increase the efficiency of examiners'

²⁰⁸ MPEP 904.02(b) (10th ed. Rev. 7, June 2020).

²⁰⁹ *See id.* 901.06, 901.06(a); '144 Eur. Patent Application ¶¶ 10–15.

²¹⁰ *See* MPEP 904.02(b) (10th ed. Rev. 7, June 2020) (discussing that the field of search the examiner employs is partially influenced by the knowledge of the skill level and the technology's development; the examiner will rely more on NPL for less developed technology and will rely mainly on patent documents for more developed technology based on USPTO policy).

²¹¹ *See supra* notes 204–07 and accompanying text; MPEP 904.03, 1302.12 (10th ed. Rev. 7, June 2020).

²¹² *See* MPEP 904.01(c), 904.02, 2131.05, 2141.01(a) (10th ed. Rev. 7, June 2020).

²¹³ *See id.*; '144 Eur. Patent Application ¶ 12.

²¹⁴ *See* MPEP 904.02(b), 1302.12, 2141.03 (10th ed. Rev. 7, June 2020).

²¹⁵ *See id.* 904.01(c), 904.02, 2131.05, 2141.01(a); *see also* DIFFUSION OF ARTIFICIAL INTELLIGENCE, *supra* note 8, at 2–6.

searching because examiners are more well-accustomed to evaluating prior art through patent documents than NPL.²¹⁶ As a result, this framework will help to ameliorate the clarity, reliability, and incentivization of AI-assisted or -created inventions.²¹⁷

C. The Artificial Intelligence Disclosure Framework's Applicability in Future Legislation

Although not requiring immediate attention, it is important to get ahead of AI technology before AGI becomes mainstream.²¹⁸ Once this occurs, AI assistance in creating inventions will likely become much more widespread because the technology will be able to solve problems and find solutions in numerous fields rather than in narrow applications.²¹⁹ This regulatory framework can, therefore, provide a stopgap giving Congress the time to consider other directions related to AI-assisted or -created inventions.²²⁰ First, Congress could amend the definition of “inventor” in the Patent Act to allow AIs to be inventors.²²¹ One potential option for Congress to consider, as Professor Ebrahim suggests, is the creation of a data repository for the particular AI used in the patented subject matter’s creation.²²² In doing so, inventors can provide greater disclosure and insight into the invention’s inner workings because the repository will require detailed descriptions of the data structures and the AI’s neural

²¹⁶ See U.S. GOV’T ACCOUNTABILITY OFF., GAO-16-479, INTELLECTUAL PROPERTY: PATENT OFFICE SHOULD STRENGTHEN SEARCH CAPABILITIES AND BETTER MONITOR EXAMINERS’ WORK 17 (2016).

²¹⁷ See *supra* Section V.A.

²¹⁸ See DIFFUSION OF ARTIFICIAL INTELLIGENCE, *supra* note 8, at 2–6; *Everything Is Obvious*, *supra* note 7, at 25–31.

²¹⁹ See DIFFUSION OF ARTIFICIAL INTELLIGENCE, *supra* note 8, at 2–6; *Everything Is Obvious*, *supra* note 7, at 25–31.

²²⁰ See *Rulemaking Power Part 2*, *supra* note 57, at 546; Ebrahim, *supra* note 15, at 213–18. Congressional consideration of new legislation is especially important for ASI where there may be no inventor in its known conception in patent law. See *Burroughs Wellcome Co. v. Barr Labs., Inc.*, 40 F.3d 1223, 1227–28 (Fed. Cir. 1994); *Public Views on Artificial Intelligence*, *supra* note 72, at 3 n.17.

²²¹ See *Thaler v. Hirshfeld*, 558 F. Supp. 3d 238, 249 (E.D. Va. 2021), *affd. sub nom.* *Thaler v. Vidal*, 43 F.4th 1207 (Fed. Cir. 2022).

²²² See Ebrahim, *supra* note 15, at 214–18.

networks.²²³ This system is similar to what the USPTO already requires for seeds in plant patents.²²⁴

This regulatory framework would prove useful even after the passage of this suggested legislation because examiners will also be able to readily assess the AI level by directly going to the data repository.²²⁵ In doing so, a collection of inventions utilizing ANI, AGI, and ASI will develop overtime and aid the public and the USPTO in providing clear and reliable patent disclosures and increased incentives to innovate.²²⁶ Even before implementing such a regulatory framework, the USPTO can take steps to address the clarity, reliability, and incentivization concerns through an optional and voluntary process allowing applicants to submit information related to the AI involved in the disclosed subject matter's creation in patent applications.²²⁷

CONCLUSION

AI poses a difficult challenge to innovation and patentability because it has the potential to substantively impact the creative process in inventing or discovering the subject matter in patent applications.²²⁸ AGI and ASI, in particular, possess the ability to require little to no human intervention in the creation of potentially patent-eligible subject matter.²²⁹ The court's decision in *Thaler* to not allow AI inventorship has many implications on the patent system as doing so threatens the patentability of inventions for which inventors use AI in their creative process.²³⁰ If these inventions receive no patent protection, it will likely decrease the reliability, reduce the clarity, and disincentivize the creation of new developments in this technological field in the future.²³¹

²²³ *See id.*

²²⁴ *See id.* at 215–18.

²²⁵ *See id.* at 214–18.

²²⁶ *See supra* Section V.A.

²²⁷ *See Ebrahim, supra* note 15, at 212.

²²⁸ *See* DIFFUSION OF ARTIFICIAL INTELLIGENCE, *supra* note 8, at 2–6; *Everything Is Obvious, supra* note 7, at 25–31.

²²⁹ *See Everything Is Obvious, supra* note 7, at 25–31.

²³⁰ *See supra* Part I; *Thaler v. Hirshfeld*, 558 F. Supp. 3d 238, 249 (E.D. Va. 2021), *affd. sub nom. Thaler v. Vidal*, 43 F.4th 1207 (Fed. Cir. 2022).

²³¹ *See supra* Part I.

This issue also affects the current legal standards that apply to patent law.²³² Notably, patent eligibility, patent disclosure requirements, and obviousness are the most affected.²³³ Not only do these concerns affect patent examination, but they also affect subsequent litigation and legal advice.²³⁴ The Plant Patent Act's legislative history reveals similar issues regarding inventorship.²³⁵ However, Congress recognized the need for the agricultural industry and created disclosure requirements to allow patent protection for asexually reproduced cultivars that use the "aid of nature."²³⁶ The USPTO has also, in the past, created rules to enhance patent applications' disclosure in different technology areas, including computer programming and nucleotide sequences.²³⁷

The policy concerns that the appellants addressed in *Thaler* will likely be reduced by creating a regulatory framework that is within the USPTO's rulemaking authority and requiring disclosure of the kind of artificial AI that will allow public commentary, be faster than the legislative process, and develop over time.²³⁸ As AI innovations become more complex and utilize less human intervention in solving new technological problems, patent law needs to be ready to handle these issues as they occur.²³⁹

²³² See *supra* Part II.

²³³ See *supra* Sections II.A–II.C.

²³⁴ See *supra* Section II.D.

²³⁵ See *supra* Part III; H.R. REP. NO. 71-1129, pt. IV, at 7–8 (1930).

²³⁶ *Diamond v. Chakrabarty*, 447 U.S. 303, 312 (1980) (quoting H.R. REP. NO. 71-1129, pt. IV, at 8 (1930)); see *supra* Part III.

²³⁷ See *supra* Part III.

²³⁸ See *supra* Parts IV, V.

²³⁹ See *supra* Parts IV, V.