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A Named Inventor of a Patent Should Be Expanded to Include Artificial Intelligence

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A NAMED INVENTOR OF A PATENT SHOULD BE EXPANDED TO INCLUDE ARTIFICIAL INTELLIGENCE

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ABSTRACT

Why should patent inventors be limited to only natural persons under the current United States patent law? In fact, the present US patent law should be expanded to allow an Artificial Intelligence ("AI") to be a named inventor of a patent. This would incentivize patent owners to use AI to produce more inventions that would benefit the public. There is no negative impact to expand the current US patent law. Many scholars, law professors, and practitioners believe that the patent law (or intellectual property law in general) is outdated due to the massive growth of modern technology. This Note argues that Congress should amend the patent law to permit an AI to be a named inventor or alternatively the Supreme Court should expand the interpretation of the patent law to encompass AI within the meaning of an inventor. Accordingly, such an expansion will promote the intent of article I, section 8, clause 8 of the United States Constitution.

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I. INTRODUCTION

With the rapid growth of technological advancement, an international controversy over patent prosecution has emerged: whether an AI can be a named inventor or co-inventor on a patent. A patent, a type of intellectual property, gives its owner the exclusive right to exclude others from "making, using, offering for sale, or selling [an] invention throughout the United States or importing the invention into the United States," for a number of years in exchange for disclosure of the invention to the public.[1] Typically, the owner of a patent enjoys this exclusive right for twenty years in the United States beginning on the date the application was filed with the United States Patent and Trademark Office ("USPTO").[2] In order to be eligible to obtain a patent, the invention must be a "new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof."[3] In addition, 35 U.S.C. § 100(f) defines the term "inventor" as the individual or, if a joint invention, the individuals who have collectively invented or discovered the subject matter of the invention.[4] Moreover, section 100(g) provides the term "joint inventor" and/or "coinventor" to mean any one of the individuals who invented or discovered the subject matter of a joint invention.[5] Accordingly, this Note argues that United States law should permit AI to be a named inventor or co-inventor of a patent.

In early August 2021, the patent office of South Africa, also known as the Companies and Intellectual Property Commission ("CIPC"),[6] officially granted a patent with an AI as the sole inventor.[7] This Note argues that the United States should adopt South Africa's position and allow AI to become a named inventor of a patent. With the increasing technological advancements, AI has seemingly become

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[1] 35 U.S.C. § 154(a)(1).
[2] *Id.* at § 154(a)(2).
[3] *Id.* at § 101.
[4] *Id.* at § 100(f).
[5] *Id.* at § 100(g).
[6] Companies and Intellectual Property Commission, www.cipc.co.za.
[7] Meshandren Naidoo, *In a World First, South Africa Grants Patent to an Artificial Intelligence System*, THE HINDU (Aug. 11, 2021), https://www.thehindu.com/sci-tech/technology/in-a-world-first-south-africa-grants-patent-to-an-artificial-intelligence-system/article35817497.ece.

more human-like.[8] For instance, AI may be developed to simulate the human mental process.[9] Although current United States law specifies that only a "natural person" may be an inventor or a co-inventor to a patent,[10] it is likely that the law will be expanded to allow not only a "natural person" but also "legal person" such as an AI to be recognized as a named inventor or co-inventor in the future. Internationally, there are countries that have already recognized an AI or a robot as a "legal person."[11] Specifically, "Sophia," a social humanoid robot, was granted citizenship as a Saudi Arabia citizen in October 2017.[12]

In addition, many countries around the word (including the United States) are working on developing, researching, and utilizing AI in their businesses. Currently, thousands of companies involved in AI development in the United States and AI startups have raised approximately $33 billion in 2020.[13] It is inevitable that an AI will invent or discover patent eligible subject matters including "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof" in the near future.[14] Therefore, it is also inevitable that an AI will be recognized as a named inventor or co-inventor under United States patent law.

Part I of this Note introduces the current issue on AI inventorship of a patent. Part II of this Note discusses the relevant background on AI (e.g., types of AI, economic impact, and discoverability of new subject matter). Part III of this Note analyzes the current United States

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[8] Veronica Sant, *A Crash Course on Artificial Intelligence*, BECOMING HUMAN (Jan. 29, 2021), https://becominghuman.ai/a-crash-course-on-artificial-intelligence-f5423a36e08e.

[9] Ventana al Conocimiento, *This is How A.I. Will Influence the Human Mind*, OPEN MIND BBVA (Mar. 28, 2017), https://www.bbvaopenmind.com/en/technology/artificial-intelligence/this-is-how-artificial-intelligence-will-influence-the-human-mind/.

[10] Beech Aircraft Corp. v. EDO Corp., 990 F.2d 1237, 1248 (Fed. Cir. 1993) (holding that only natural persons can be "inventors").

[11] Chirst Weller, *Meet the First-Ever Robot Citizen—A Humanoid Named Sophia That Once Said it Would 'Destroy Humans',* INSIDER (Oct. 27, 2017), https://www.businessinsider.com/meet-the-first-robot-citizen-sophia-animatronic-humanoid-2017-10.

[12] *Id.*

[13] Alyssa Schroer, *56 Artificial Intelligence (AI) Companies to Watch in 2021*, BUILTIN, https://builtin.com/artificial-intelligence/ai-companies-roundup (last visited June 6, 2022).

[14] 35 U.S.C. § 101.

case law on inventor(s) of a patent. Part IV of this Note discusses whether AI can be an inventor under other foreign jurisdictions. Part V of this Note argues that AI can be a named inventor to a patent under the United States law. Lastly, Part VI concludes this Note by recommending that the United States conform to the laws of certain foreign jurisdictions and allow an AI to be a named inventor or co-inventor on a patent.

II. BACKGROUND ON ARTIFICIAL INTELLIGENCE

Artificial intelligence ("AI") is a field of computer science where a computer program is capable of performing tasks that generally require human intelligence.[15] There are four main types of AI: (1) reactive machines; (2) limited memory; (3) theory of mind; and (4) self-awareness.[16] Currently, most of the AIs fall into the first two categories.[17] With regard to the latter two categories of AI (also known as artificial general intelligence ("AGI")), scientists and engineers are still working on developing the technologies.[18] Some examples of existing AIs include smart assistants (e.g., Siri, Alexa, Google Home), self-driving cars, conversational bots, content recommendations, computer chess players, military autonomous robots, vaccine developing AI, image processing, among others.[19] Many of these existing AIs study and analyze a given sample of information and then use that information to "make a decision of their own."[20] The ultimate goal of AI development is to create a self-aware machine with human-like tendencies that can use its high level of intelligence to solve any problem.[21]

Currently, there are thousands of companies that use AI in various fields and the demand for AI efficiencies continues to grow.[22] Many AIs have the ability to display human-like capabilities such as

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[15] Dustin Harris, *A.I. What is A.I.? How does AI work?* [hereinafter "A.I."], BUILTIN (Sept. 19, 2022), https://builtin.com/artificial-intelligence.
[16] *Id.*
[17] *Id.*
[18] *Id.*
[19] *Id.*
[20] *Id.*
[21] *Id.*
[22] Shelby Hiter, *Artificial Intelligence Market 2022*, DATAMATION (Oct. 8, 2021), https://www.datamation.com/artificial-intelligence/artificial-intelligence-market/.

reasoning, learning, planning and/or creativity.[23] One example of an AI that displays creativity is "DABUS" ("device for the autonomous bootstrapping of unified sentience"), created by Dr. Stephen K. Thaler.[24] Dr. Thaler filed patent applications, listing DABUS as the sole inventor and himself as the assignee to the patent, in patent offices around the world, including the United States, Europe, Australia, and South Africa.[25] Only the patent office of South Africa has granted the patent.[26] Moreover, an Australia court held that Dr. Thaler's patent application, listing DABUS as the sole inventor, should be granted because there is no provision in Australian law that expressly prevents an AI from being an inventor.[27]

On the other hand, the USPTO rejected the patent application for "not identify[ing] each inventor by his or her legal name."[28] The USPTO stated that the language under 35 U.S.C. § 101 suggests that only a natural person can invent or discover.[29] The office further explained that other sections of Title 35 imply that an inventor must be a natural person.[30] Lastly, the opinion cited other relevant cases that require a patent inventor to be a "natural person,"[31] which will be discussed in further detail in the latter part of this Note.

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[23] What *is Artificial Intelligence and how is it Used?*, NEWS EUR. PARLIAMENT (Sept. 4, 2020), *https://www.europarl.europa.eu/news/en/headlines/society/20200827STO85804/what-is-artificial-intelligence-and-how-is-it-used.*

[24] Stephen L. Thaler, *Imagination Engines Inc.: Ushering in the Dawn of Conscious Computing!*, https://imagination-engines.com/founder.html (last visited Nov. 7, 2021); Naidoo, *supra* note 7.

[25] *Id.*

[26] *Id.*

[27] Eileen McDermott, *BADUS Scores Again with Win on AI Inventorship Question in Australia Ct.*, IP WATCHDOG (Aug. 2, 2021), *https://www.ipwatchdog.com/2021/08/02/dabus-scores-win-ai-inventorship-question-australia-court/id=136304.*

[28] Decision on Petition, Appl. No. 16/524,350, page 2 (Apr. 2020).

[29] *Id.* at 4.

[30] *Id.*

[31] *Id.* at 5-7.

III. CURRENT UNITED STATES CASE LAW ON INVENTORSHIP OF A PATENT

Current U.S. law states that only "natural persons" can be inventors on a patent.[32] The Federal Circuit in *Beech Aircraft Corp. v. EDO Corp.*[33] held that inventorship is a question of who actually invented the subject matter claimed in a patent application.[34] If inventorship were to be defined in this manner, it would conflict with the patent application petition filed by petitioner, i.e., Dr. Thaler.[35] Specifically, Dr. Thaler argued that "DABUS" was the sole machine which "recognized the novelty and salience of the instant invention."[36] The USPTO did not discuss whether DABUS was the one that actually invented the subject matter claimed in patent application No. 16/524,350, titled "DEVICES AND METHODS FOR ATTRACTING ENHANCED ATTENTION," but rather discussed the application based on the "plain language of the patent laws as passed by the Congress and as interpreted by the courts."[37] For instance, the USPTO interpreted the language in 35 U.S.C. § 101 (i.e. the word "whoever" suggesting a natural person) using the Merriam-Webster's Collegiate Dictionary.[38] Additionally, the USPTO reasoned that numerous references in Federal Circuit cases and patent statutes require that an inventor be a natural person.[39] Since DABUS is not a natural person, the court refused to grant DABUS a patent.

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[32] Beech Aircraft Corp. v. EDO Corp., 990 F.2d 1237, 1248 (Fed. Cir. 1993). *See also* 35 U.S.C. § 115(b)(2). Such individual believes himself or herself to be the original inventor or an original joint inventor of a claimed invention in the application. In addition, 35 U.S.C. § 116(a) states:

> [w]hen an invention is made by two or more persons jointly, they shall apply for patent jointly and each make the required oath, except as otherwise provided in this title. Inventors may apply for a patent jointly even though (1) they did not physically work together or at the same time, (2) each did not make the same type or amount of contribution, or (3) each did not make a contribution to the subject matter of every claim of the patent.

[33] *Beech Aircraft Corp.*, 990 F.2d at 1248.
[34] *Id.*
[35] Decision on Petition, *supra* note 28.
[36] *Id.* at 4.
[37] *Id.* at 7.
[38] *Id.* at 4.
[39] *Id.* at 5.

Similarly, the Federal Circuit, in *University of Utah v. Max-Planck-Gesellschaft zur Forderung der Wissenschaften E.V.*,[40] held that "inventors must be natural persons."[41] Specifically, the Federal Circuit reasoned that the inventor must perform the following mental act:

> Conception is the touchstone of inventorship, the completion of the mental part of invention. It is the formation in the mind of the inventor, of a definite and permanent idea of the complete and operative invention, as it is hereafter to be applied in practice. Conception is complete only when the idea is so clearly defined in the inventor's mind that only ordinary skill would be necessary to reduce the invention to practice, without extensive research or experimentation. [Conception] is a mental act.[42]

The Federal Circuit further held that "[t]o perform this mental act, inventors must be natural persons and cannot be corporations or sovereigns."[43] However, some AIs are also capable of performing such mental act.[44] For example, the Theory of Mind type of AI would be "able to grasp and process the concept of 'mind,' the fluctuations of emotions in decision making and a litany of other psychological concepts in real time."[45] In addition, a program developed by Allen Newell in 1959 was designed to imitate human problem-solving.[46] Problem-solving is an unique conception characteristic that humans possess. Moreover, during the early stage of the SARS-Cov-2 Pandemic, also popularly known as Covid-19, Baidu released its LinearFold AI algorithm to industries that were working to develop a vaccine.[47] The LinearFold Algorithm was significantly faster (approximately 120 times) than the traditional RNA folding algorithm

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[40] Univ. of Utah v. Max-Planck-Gesellschaft zur Forderung der Wissenschaften E.V., 734 F.3d 1315, 1323 (Fed. Cir. 2013) (hereinafter "Max-Planck").
[41] *Id.*
[42] *Id.* (*citing Burroughs Wellcome Co. v. Barr Labs., Inc.,* 40 F.3d 1223, 1227–28 (Fed. Cir.1994)).
[43] *Max-Planck*, 734 F.3d at 1323.
[44] *A.I.*, *supra* note 15.
[45] *Id.*
[46] *Id.*
[47] *Id.*

at predicting a virus's secondary RNA structure.[48] Accordingly, there is no doubt that AI is capable of performing the mental act in *Max-Planck* and the presumption that only a natural person can perform this mental act is unwarranted.

Furthermore, the United State District Court for the Eastern District of Virginia held in *Thaler v. Hirshfeld*,[49] that Congress intended to limit the definition of "inventor" to a natural person and granted defendant's (i.e., Director of USPTO et al.'s) motion for summary judgment.[50] First, the district court reasoned that whether an inventor is required to be a human being under the Patent Act is a question of statutory construction, and therefore, the plain language of the statute controls.[51] The district court analyzed the language under 35 U.S.C. sections 100-115 and found that the terms "inventor" and "joint inventor" refer to "individual" or "individuals" respectively and in turn reasoned that Congress's use of the term "individual" referred to a "natural person."[52] The district court conceded that "the Patent Act does not define the term 'individual,' [therefore, the courts] look first to the word's ordinary meaning."[53]

The district court also cited to 35 U.S.C. section 115(b)(2) for the proposition that personal pronouns such as "himself and herself" reference a natural person.[54] This argument, however, is not persuasive. For example, many people use pronouns such as he, she, him, and her to describe their pets. Following the district court's rationale, we would have to consider pets natural persons as well, which would yield absurd consequences. Nevertheless, the district court held that the plain language of the statutes limits the definition of "inventor" to a natural person.[55] That being said, the district court did acknowledge that "[as] technology evolves, there may come a time when artificial

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[48] Baidu, *How Baidu is Bringing AI to the Fight Against Coronavirus*, MIT TECH. REV. (Mar. 11, 2020), https://www.technologyreview.com/2020/03/11/905366/how-baidu-is-bringing-ai-to-the-fight-against-coronavirus/.
[49] 2021 WL 3934803, at *8 (E.D. Va. Sept. 2, 2021).
[50] *Id.*
[51] *Id.* at 4.
[52] *Id.* at 5 (*citing* Mohamad v. Palestinian Auth. 566 U.S. 449, 453-54 (2012)).
[53] *Thaler*, 2021 WL 3934803, at *5.
[54] *Id.* at 6.
[55] *Id.* at 8.

intelligence reaches a level of sophistication such that it might satisfy accepted meanings of inventorship."[56]

More recently on August 5, 2022, the Federal Circuit held in *Thaler v. Vidal*, that "only a natural person can be an inventor, so AI cannot be."[57] Specifically, the Federal Circuit relied on the passage of the Leahy-Smith America Invents Act ("AIA"), in which the Patent Act defined an "inventor" and "co-inventor" as an "individual."[58] Furthermore, the Federal Circuit cited to a Supreme Court decision, *Mohamad v. Palestinian Authority*, that concluded an "individual ordinarily means a human being, a person."[59] This argument is unsound because the Supreme Court's decision in *Mohamad* is not based on the patent statute; thus, its holding is not binding on the definition of an "individual" in patent law. Second, the Federal Circuit reasoned that "[the act] does not also use 'itself,' which [it] would have done if Congress intended to permit non-human inventors."[60] However, this argument is not persuasive because the words "himself" or "herself" may still refer to non-human individuals. Lastly, the Federal Circuit reaffirmed its precedent holding in *Max-Planck* that "inventors must be natural persons and cannot be corporations or sovereigns."[61]

Although the Federal Circuit rejected Dr. Thaler's public policy argument that "inventions generated by AI should be patentable in order to encourage invention and public disclosure,"[62] this argument is nevertheless strong and persuasive. As will be explained in later sections, a number of patent offices around the world do believe that AI should be and can be a named inventor to a patent. Dr. Thaler and others with similar views should consider taking other actions in the future, including seeking a writ of certiorari, lobbying, and requesting a rehearing en banc.

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[56] *Id.*
[57] Thaler v. Vidal, 43 F.4th 1207, 1213 (Fed. Cir. 2022), *cert. denied*, 143 S. Ct. 1783 (2023).
[58] *Id.* at 6.
[59] *Id.*; *see Mohamad*, 566 U.S. 449, 451 (interpreting the term "individual" from the Torture Victim Protection Act of 1991).
[60] *Id.* at 7.
[61] *Id.* at 9.
[62] *Id.* at 10.

IV. AI AS A NAMED INVENTOR OR CO-INVENTOR IN OTHER FOREIGN JURISDICTIONS

Currently, patent offices around the world have different viewpoints on whether AI can be a named inventor or co-inventor on a patent. Some jurisdictions have ruled that AI can be a named inventor, some jurisdictions have ruled that AI cannot be a named inventor, and some jurisdictions are changing their patent law on inventorship. This section will discuss the patent offices that have already announced their position on this issue.

A. AI as a Named Inventor in Patent Office of South Africa

In July of 2021, the patent office of South Africa, namely the Companies and Intellectual Property Commission ("CIPC"), granted a patent to an artificial intelligence system, DABUS.[63] Similar to the protections granted by the USPTO, the CIPC provides protection for the owner of a patent, which gives the owner the right to exclude others from making, using, exercising, disposing of the invention, offering to dispose of, or importing the invention for a limited period of twenty years.[64] However, many critics argued that the CIPC's decision to grant this patent was not groundbreaking because of its examination system.[65] The CIPC's examination system is procedural rather than substantive, a "check box sort of evaluation."[66] In other words, a patent application examined under a procedural examination system will be granted as long as all required documents are submitted and all procedural formalities are followed. On the contrary, some critics argue that South Africa's recent patent reform suggests the government "wants to increase innovation to solve the country's socioeconomic

[63] Naidoo, *supra* note 7.
[64] CIPC, http://www.cipc.co.za/index.php/trade-marks-patents-designs-copyright/patents.
[65] Joff Wild, *South Africa Awards World's First AI-Invented Patent, But it May Not Be That Big a Deal*, IPLAWGALLI (July 28, 2021), https://www.iam-media.com/law-policy/south-africa-ai-patent-award.
[66] Naidoo, *supra* note 7.

issues."[67] Regardless of the explanation, South Africa has opened a new pathway for AI to obtain patents for new innovations.

B. AI as a Named Inventor in Patent Office of European Patent Office ("EPO")

More recently, on December 21, 2021, the EPO rejected appeals against the refusal to name an AI system as an inventor.[68] Specifically, the Legal Board of Appeal dismissed the appeal in cases J8/20 and J9/20,[69] with corresponding applications EP 18275163 and EP 118275174 and confirmed the following: (1) the inventor of a patent application has to be a person with legal capacity, and therefore, the naming of a machine (e.g., an AI) as an inventor is not allowable; (2) a statement indicating the origin of the right to a European patent has to be in conformity with Article 60(1) of European Patent Convention (EPC); and (3) the EPO was competent to assess whether such statement referred to a situation covered by Article 69(1) EPC.[70] In short, the EPO rejected naming this AI system as an inventor to a patent application based on EPC Article 60(1). EPC Article 60(1) states:

> The right to a European patent shall belong to the inventor or his successor in title. If the inventor is an employee, the right to a European patent shall be determined in accordance with the law of the State in which the employee is mainly employed; if the State in which the employee is mainly employed cannot be determined, the law to be applied shall be that of the State in which the employer has the place of business to which the employee is attached.[71]

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[67] *Id.*; *see also* Trade and Indus. of Republic of S. Afr., *Intell. Prop. Pol'y of the Republic of S. Afr. Phase I* (2018); Sci. and Tech. of Republic of S. Afr., *White Paper on Sci., Tech. and Innovation* (2019).

[68] Lloyd Palmer, *EPO Rejects Appeals Against Refusal of Applications Naming an AI System as Inventor*, AA THORNTON INTELL. PROP. L. (Dec. 2021), https://www.aathornton.com/epo-rejects-appeals-ai-system-as-inventor/.

[69] These numbers represent case numbers in the EPO system.

[70] *Id.*

[71] The Eur. Pat. Convention, *Article 60 Right to a European Patent*, THE EUR. PATENT OFF., https://www.epo.org/law-practice/legal-texts/html/epc/2020/e/ar60.html (last visited Jan. 30, 2022).

The Legal Board of Appeal at the EPO reasoned that inventor only extends to a natural person and has a right to a European patent by virtue of being the owner and creator of the AI system.[72] Accordingly, the EPO rejected the notion that AI can be a named inventor on a patent.

C. AI as a Named Inventor in the Australian Patent Office

The Australian patent office, IP Australia, initially rejected granting patents to AI; however, the Federal Court of Australia ruled that "an inventor as recognised under the [Patent] Act [1990] can be an artificial intelligence system or device."[73] Similar to the United States patent examination system, "[p]atent applications in Australia undergo formal and substantive examinations."[74] In addition, patents in Australia are valid for 20 years from the filing date.[75] The Honorable Justice Beach in *Thaler*[76] made six general observations supporting the court's ruling. First, "there is no specific provision in the Act that expressly refutes the proposition that an artificial intelligence system can be an inventor."[77] Second, "there is no specific aspect of patent law, unlike copyright law involving the requirement for a human author or the existence of moral rights, that would drive a construction of the Act as excluding non-human inventors."[78] Third, "the word 'inventor' is an agent noun . . . the agent can be a person or a thing . . . if an artificial intelligence system is the agent which invents, it can be described as an 'inventor.'"[79] Fourth, "it has been said that a widening conception of 'manner of manufacturing' is a necessary feature of the development of patent law in the twentieth and twenty-first centuries

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[72] Palmer, *supra* note 68.
[73] McDermott, *supra* note 27; *see also Thaler v Comm'r of Pats.*, (2021) FCA 879, para. 226 (30 July 2021) (Austl.).
[74] *Patent in Australia*, IPCOSTER, https://www.ip-coster.com/IPGuides/patent-australia (last visited July 9, 2023).
[75] *Id.*
[76] *Thaler,* FCA 879, para. 118-35.
[77] *Thaler*, FCA 879, para. 118.
[78] *Id.* at para. 119.
[79] *Id.* at para. 120 (Justice Beach gave examples of agent nouns. For example, "computer," "regulator," "distributor," "collector," "lawnmower," and "dishwasher" are all agent nouns, which demonstrates that agent can be a person or a thing.).

as scientific discoveries inspire new technology."[80] In addition, Justice Beach "see[s] no reason why the concept of 'inventor' should not also be seen in an analogously flexible and evolutionary way."[81] Fifth, "the approach to the construction of the Act should be consistent with the recently inserted object clause."[82] Lastly, Justice Beach pointed out that the "focus of the Act is not really on the inventor at all."[83] Instead, there is nothing in §§ 7(2), 18(1), and 40 of the Act requiring inventors to be a person. Justice Beach also pointed out that the Defendant Commissioner's "reliance on dictionary definition[s] is problematic."[84] For reference, Justice Beach listed five reasons to justify his reasoning.[85] Most importantly, Justice Beach explained that "the nature of dictionary definitions is inclusive and exemplary… that any one of the definitions is an example of usage rather than exclusive."[86] Accordingly, for at least the foregoing reasons, Justice Beach ruled that a named inventor can be a non-human.[87]

Globally, DABUS has won in two patent offices and lost in one. Specifically, the CIPC (with a procedural examination system) and IP Australia (with a formal and substantive examination system) favor naming AI as an inventor and the EPO (with a formal and substantive examination system) has rejected naming AI as an inventor or co-inventor.

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[80] *Id.* at para. 121.
[81] *Id.*
[82] *Id.* at para. 122. Patent Act 1990 § 2A provides:

> The object of this Act is to provide a patent system in Australia that promotes economic wellbeing through technological innovation and the transfer and dissemination of technology. In doing so, the patent system balances over time the interests of producers, owners and users of technology and the public.

[83] *Thaler*, FCA 879, para. 135.
[84] *Id.* at para. 147.
[85] *Id.* at para. 148-52.
[86] *Id.* at para. 150.
[87] *Id.* at para. 222.

V. WHY AI SHOULD BE A NAMED INVENTOR OR CO-INVENTOR ON A PATENT

A. The Plain Language of "Inventor" Suggests that "Inventor" Is Not Limited to a Natural Person

As previously mentioned, inventorship under the Patent Act is a question of statutory construction, and therefore, the plain language of the statute controls.[88] As the statutory language stated in Title 35 of the United States Code, the term "inventor" is not expressly defined. As a result, it is necessary to look to the word's ordinary meaning in a dictionary. For example, Webster's Dictionary defines the word "inventor" as "one who invents or finds out something new . . . especially, one who invents mechanical devices, new drugs, new processes, or other useful objects or procedures."[89] In addition, WordNet Dictionary defines "inventor" as "someone who is the first to think of or make something."[90] The definition of "inventor" suggests that an inventor would ordinarily require a person to invent, think, or create something. However, human beings are no longer the only creatures that can create or think of something new. There are many AIs, such as DABUS, that have the capability to invent novel creations. Accordingly, these definitions of "inventor" are outdated because a word's meaning can change over time.

It is natural that words change their meaning over time, and sometimes radically. For instance, the word "nice" used to mean silly, foolish, and simple, which is far from the compliment it is in modern days.[91] Another example is the word "silly," previously understood to mean things worthy or blessed; however, over time the word came to refer to the weak and vulnerable, and more modernly, to those who are foolish.[92] The list of words that have changed their meaning is endless.

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[88] *Thaler*, 2021 WL 3934803, at *4.
[89] WEBSTER'S 1913 DICTIONARY, https://www.webster-dictionary.org/definition/Inventor (last visited Nov. 28, 2021).
[90] *Id.*
[91] TED Guest Author, *20 Words That Once Meant Something Very Different*, TED (June 18, 2014), https://ideas.ted.com/20-words-that-once-meant-something-very-different/.
[92] *Id.*

Most importantly, it may be necessary to alter the meaning of the word "inventor" as a result of these changing circumstances. Specifically, the word "inventor" used to refer only to a natural person or human being as an individual who can invent, think, or make something new, such as a mechanical device, a drug, or a process. However, this is no longer the case; an AI is capable of inventing, thinking, and making something new.[93] Specifically, DABUS invented, without any human intervention, a food container and a flashing light for attracting enhanced attention.[94] Accordingly, the definition of the word "inventor" should mean someone (a natural person) or something (a non-natural person or entity) that invents or discovers something new. A non-natural person may certainly be an AI.

Furthermore, as Justice Beach reasoned, the word "inventor" is an agent noun.[95] He explained that in agent nouns, the suffix "or" or "er" attached to a verb describes the agent that does the act.[96] For instance, "[c]omputer, controller, regulator, distributor, collector, lawnmower, and dishwasher" are some of the agent nouns that can be either a person or a thing.[97] More specifically, the word "regulator" may refer to a machine that regulates something or a person that regulates something. Similarly, the word "inventor" is also considered an agent noun, specifically, the agent that invents. The word "inventor" may refer to a machine that invents something or a person that invents something. Accordingly, the word "inventor" would have two distinct definitions: (1) a person who invents or creates something new; and (2) the agent noun interpretation which suggests that a machine or person can invent something. Therefore, other factors should be considered to resolve this ambiguity in the definition of inventorship.

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[93] Jackie O'Brien & Isobel Taylor, *The Year that was for DABUS, the World's First AI 'Inventor,'* INSIDER TECH L. (Dec. 13, 2021), https://www.insidetechlaw.com/blog/the-year-that-was-for-dabus-the-worlds-first-ai-inventor#:~:text=DABUS%20stands%20for%20'Device%20for,aspects%20of%20human%20brain%20function.

[94] *Id.*

[95] *Thaler*, FCA 879, para. 120.

[96] *Id.*

[97] *Id.*

B. The Definition of Inventorship Should Be Expanded as a Matter of Public Policy

The primary purpose of the United States Patent Act is to balance an inventor's interest with the public's interest; that is the inventor is rewarded with a limited exclusive right on his or her invention for providing technical disclosures to the public.[98] However, this may not be the case in real practice. Oftentimes, the inventor's exclusive right is transferred to an assignee, usually the company employing the inventor. In many cases, this is also known as the "hired-to-invent" doctrine which grants the owner the rights to an invention made by the owner's employee if the employee is hired to invent.[99] However, unlike the "work made for hire" doctrine in copyright law, the right is not vested until the employee (also listed as inventor) assigns the patent to the employer.[100] As a result, the assignee is the one that holds the patent and patent's rights. In addition, an assignee controls the prosecution of a patent application. Consequently, the primary purpose of the United States Patent Act is to balance the patent holder's interest on one hand and the public interest on the other.

In the dispute between Dr. Thaler and several other patent offices around the world, Dr. Thaler was the assignee to the patent applications and DABUS was the sole named inventor on the Application Data Sheet ("ADS").[101] In other words, Dr. Thaler is the patent holder who controls the prosecution of the patent application and receives all the benefits of the patent if issued. However, the USPTO rejected Dr. Thaler's patent application because the named inventor on the ADS could not be an AI.[102] Since the patent application was only rejected on this technicality, the USPTO and the United States law may have actually hindered the primary purpose of the Patent Act which is to "encourage the investment of time and resources into the development of new and useful discoveries."[103] In many cases, AI can be considered as an employee (i.e., the inventor) who is hired to invent for the benefit

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[98] Pat., CORNELL L. SCH. LEGAL INFO. INST., https://www.law.cornell.edu/wex/patent (last visited Mar. 9, 2022).
[99] Joshua L. Simmons, *Inventions Made for Hire*, 2 N.Y.U. J. OF INTELL. PROP. & ENT. L. 1, 15 (2012).
[100] *Id.*
[101] Decision on Petition, *supra* note 28.
[102] *Id.*
[103] Pat., *supra* note 98.

of the employer. As a result, rejecting the application on this technicality disrupts the balance between the patent holder's interest and the public interest. In this instant scenario, Dr. Thaler is not able to obtain his patent (assuming that the invention is patentable, novel, and not obvious) to enjoy the benefit of his twenty-year "limited monopoly" on the patent. On the other hand, the public may not obtain the necessary disclosures. Some of the crucial advantages of the disclosure of patents and patent applications are their effect on investments, competitive advantage, and market share.[104] Since both the patent holder and the public cannot benefit from the non-disclosure of the patent application at issue, it is necessary that the U.S. patent law be amended to overcome this technicality on allowing AI to be a named inventor or co-inventor.

One way an individual or entity can obtain a patent is by making "useful improvement(s)" on existing patent eligible subject matter.[105] An approach to obtain these existing patent eligible subject matters is through the public disclosure of patents. There are many fields of science and useful art that may not have been discovered by humans. For example, while humans may not be able to discover a *new* composition of matter that may be a cure to life threatening diseases, a *new* high temperature resistant compound or machine that is capable of withstanding the temperature of a star, or a *new* machine or process of discovering dark matter, there may be the potential for an AI to make these discoveries. One important field of science is drug discovery, which is both expensive and time consuming. Currently, many companies utilize AI in the drug discovery process.[106] Selecting drug candidates for a traditional drug discovery process may take up to five years; however, with the use of AI, this discovery time may be substantially reduced to approximately eight months.[107]

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[104] *Pat. Disclosure: Everything You Need to Know,* UPCOUNSEL, https://www.upcounsel.com/patent-disclosure (last visited Jan. 30, 2022).
[105] 35 U.S.C. § 101.
[106] Neil Savage, *Tapping into the drug discovery potential of AI*, BIOPHARMADEALMAKERS (May 27, 2021), https://www.nature.com/articles/d43747-021-00045-7.
[107] *Id.*

In addition, current AIs will evolve without human intervention.[108] The capabilities of these AIs are still unclear, specifically, whether they are able to discover or invent *new* patent eligible subject matters that humans are unlikely to discover or invent. However, it is highly expected in the near future AI will be able to discover or invent these *new* patent eligible subject matters without human intervention. If AI cannot be an inventor of a patent, these new inventions would not be disclosed to the public. Additionally, owners of an AI cannot be listed as inventors because the owners did not invent the invention. As a result, other inventors or entities may not be able to invent new or useful improvements on those new inventions discovered by AI. This would hinder the disclosure of technical progress to the public. In addition, this would directly violate article I, section 8 of the Constitution, which empowers Congress to grant inventors exclusive rights to their work in order to "***promote the Progress of Science and useful Arts***."[109] Accordingly, preventing AI from becoming a named inventor or co-inventor of a patent would contradict the primary objective of the U.S. Patent Act.

C. Possible Solutions to Resolve the Controversy on Naming AI as an Inventor on a Patent Under United State Law

One possible solution to resolve the issue of naming AI as an inventor on a patent is to name the AI as a co-inventor and name the creator of the AI as the first inventor. This is a viable solution for a few reasons. First, AI is a creation made by its creator. In other words, AI is the property of its creator. Therefore, any new or useful invention created by AI is the property of its creator. Second, the intent of the creator of the AI is most likely to leave the AI on its own to invent a certain product, machine, process, or combination of matter specified by its creator. For example, Dr. Thaler may have intended to develop DABUS for the purpose of allowing DABUS to develop a new food container with a flashing light for attracting enhanced attention on its own. Dr. Thaler, the creator of the AI, is the one who wanted to invent

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[108] *See Thaler*, 2021 WL 3934803; *see also* Joe Devanesan, *AutoML will 'Evolve' Without Human Intervention* (May 27, 2020), https://techhq.com/2020/05/google-claims-new-automl-will-evolve-without-human-intervention.

[109] U.S. CONST. art. I, § 8, cl. 8 (emphasis added).

the food container with a flashing light for attracting enhanced attention. Therefore, it is reasonable to list the creator of the AI as the first inventor because he or she gave the AI the objective in the first place.

Finally, the creator of the AI may be considered a joint inventor of an invention. A joint inventor is any individual who invented or discovered the subject matter of a joint invention.[110] More specifically, MPEP 2109.01 states:

> [T]he inventors may apply for a patent jointly even though (1) they did not physically work together or at the same time, (2) each did not make the same type or amount of contribution, or (3) each did not make a contribution to the subject matter of every claim of the patent.[111]

In addition, "[a] person who shares in the conception of a claimed invention is a joint inventor of that invention."[112] In the previous example, Dr. Thaler would be considered a joint inventor. Specifically, Dr. Thaler shared or initiated the conception of the development of a new food container. Without this initiation, DABUS would not have been able to create the invention. Accordingly, the issue of whether an AI can be a named inventor under U.S. patent law would be resolved by naming the creator of the AI as the first inventor and the AI as a co-inventor.

D. Not Disclosing AI as an Inventor or Co-Inventor on a Patent May Constitute Inequitable Conduct and Render a Patent Invalid

Inequitable conduct is a defense to patent infringement that, if proven, bars enforcement of a patent.[113] This doctrine evolved from a trio of Supreme Court cases that applied the "doctrine of unclean hands" to dismiss the following patent cases that involved egregious

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[110] 35 U.S.C. § 100(g).
[111] MPEP 2109.01 Joint Inventorship.
[112] *Id.*; *see also In re Verhoef*, 888 F.3d 1362, 1366-67 (Fed. Cir. 2018) (the person who contributed the idea of a figure eight loop in the claimed dog harness, which figure eight loop is an essential feature of the invention not significant in quality or well-known in the art, should have been named as a joint inventor).
[113] Therasense, Inc. v. Becton, Dickinson and Co., 649 F.3d 1276, 1285 (Fed. Cir. 2011).

misconduct: (1) *Keystone Driller Co. v. General Excavator Co.*;[114] (2) *Hazel-Atlas Glass Co. v. Hartford-Empire Co.*;[115] and (3) *Precision Instrument Manufacturing Co. v. Automotive Maintenance Machinery Co*.[116]

The first case, *Keystone*,[117] involved the suppression of evidence.[118] Specifically, the plaintiff was advised that the prior use of the invention by a third party was sufficient to cast doubt upon the validity of the patent at issue and failed to inform the USPTO.[119] Then, the plaintiff, for a "valuable consideration," obtained an affidavit from the third party stating that the prior use was an abandoned experiment and designed to keep the details of the prior art secret.[120] The Supreme Court ultimately affirmed the circuit court's decision that the plaintiff did not come with clean hands and agreed that the circuit court's dismissal of the case was appropriate.[121]

The second case, *Hazel-Atlas*,[122] involved the manufacturing and suppression of evidence.[123] Specifically, the patentee's officials and attorneys on the application in issue prepared an article describing the invention as a "remarkable advance in the art of fashioning glass by machine" and had an expert sign it as his own and publish it in a trade journal.[124] Then, the patentee submitted the article as part of the record in support of the pending application in the USPTO.[125] As a result, the USPTO granted the patent.[126] The Supreme Court held that the patent must be vacated in order to grant full protection to the public against a patent obtained by fraud.[127]

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[114]290 U.S. 240 (1933).
[115] 322 U.S. 238 (1944).
[116] 324 U.S. 806 (1945).
[117] 290 U.S. 240 (1933).
[118] *Id.* at 243.
[119] *Id.*
[120] *Id.*
[121] *Id.* at 246.
[122] 322 U.S. 238 (1944).
[123] *Id.* at 240.
[124] *Id.*
[125] *Id.*
[126] *Id.*
[127] *Id.* at 251.

Lastly, *Precision*[128] involved a patentee who suppressed evidence of perjury.[129] On October 11, 1939, the USPTO declared an interference between two patent applications, one filed by Larson and the other filed by Zimmerman owned by Automotive Maintenance Machinery Co. ("Automotive").[130] In August 1940, Larson filed his preliminary statement in the USPTO with falsified dates of conception, disclosure, drawing, description and reduction to practice; the falsified dates were designed to antedate those in Automotive's application by one to three years.[131] Despite Automotive's discovery of Larson's perjury, Automotive did not reveal this information to the USPTO.[132] Instead, Automotive entered into a private agreement with Snap-On, the holder of Larson's application, to reassign the right of Larson's application and suppress the evidence of the perjury.[133] With these facts, the district court found that Automotive had unclean hands and dismissed the suit.[134] Accordingly, the Supreme Court held that the dismissal of the case was warranted because not only had the patentee failed to disclose its knowledge of perjury to the USPTO, but also actively suppressed evidence of perjury and affirmatively magnified and increased its effects.[135]

As a result of the trio of Supreme Court cases, the Federal Circuit held in *Therasense*[136] that to "prevail on a claim of inequitable conduct, the accused infringer must prove that the patentee acted with the specific intent to deceive the USPTO."[137] In an example, if a patentee or applicant of a patent or patent application failed to disclose to the USPTO that the invention or parts of the invention in the patent were invented by an AI, the patentee would be involved in inequitable conduct meaning that the patentee acted with specific intent to suppress evidence of inventorship against the USPTO. However, one may argue that if AI is not a valid inventor under the current United States patent law, it is unnecessary to disclose such information to the

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[128] 324 U.S. 806 (1945).
[129] *Id.* at 816.
[130] *Id.* at 809.
[131] *Id.* at 809-10.
[132] *Id.* at 818.
[133] *Id.* at 813-14.
[134] *Id.* at 808.
[135] *Id.* at 818-19.
[136] *Therasense,* 649 F.3d at 1276.
[137] *Id.* at 1290.

USPTO. Although this may be true, it is unethical to withhold this information. 37 C.F.R. § 1.56(a) states that "[each] individual associated with the filing and prosecution of a patent application has a duty of candor and good faith in dealing with the Office, which includes a duty to disclose to the Office all information known to that individual to be material to patentability as defined in this section."[138] The individuals associated with the filing or prosecution of the patent application are (1) the inventor named in the patent application, (2) the attorney or agent who prepares or prosecutes the application; and (3) other individuals who are substantially involved in the preparation or prosecution of the application including individuals who are associated with the inventor, the applicant, the assignee, or anyone to whom there is an obligation to assign the patent application.[139]

In addition, information material to patentability is inventorship.[140] It is ultimately up to the USPTO to decide whether AI is a valid inventor; however, it is still a duty of candor for individuals associated with the patent application to disclose such information to the USPTO. Therefore, if an individual associated with the patent application does not disclose such information to the Office, a court may disqualify the patent based on inequitable conduct of the patentee. However, naming an AI as an inventor on a patent is not acceptable under current U.S. law, because only a natural person may be an inventor. Therefore, there would be an unwarranted conflict of law.

E. Whether Sophia, Not as a Robot but as a Citizen of Saudi Arabia, Can Be a Named Inventor to a Patent

As previously mentioned, "Sophia," a social humanoid robot, was granted citizenship in Saudi Arabia in October 2017.[141] Anyone, regardless of nationality or citizenship, may be awarded patents in the U.S.[142] In this instant scenario, if Sophia applies for a patent in the USPTO on something that she invented, will she be treated as an AI or

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[138] 37 C.F.R. § 1.56(a).
[139] *Id.* § 1.56(c).
[140] MPEP Chapter 2100.
[141] Weller, *supra* note 11.
[142] Clinton M. Sandvick, *How to Patent an Invention in the US as a Non-Citizen*, WIKIHOW LEGAL (Jan. 22, 2022), https://www.wikihow.legal/Patent-an-Invention-in-the-US-As-a-Non%E2%80%90Citizen.

a foreign citizen? If she is deemed an AI, current U.S. law will prohibit her from obtaining a patent in the U.S.[143] However, she is a citizen of Saudi Arabia, and as such is deemed to be a "person."[144] There are no restrictions on foreigners filing a patent application in the USPTO. Therefore, it would be paradoxical to prohibit her from being named as the inventor on a patent.

One critical issue here is the presumption that Sophia is a "natural person" which she is not. As mentioned in section III of this Note, the current U.S. law only allows natural persons to be named as an inventor on a patent or patent application presuming that only a natural person may perform the mental act of conception. However, this presumption is unpersuasive.[145] In addition, Sophia is recognized as a "legal person."[146] A legal person has many rights and responsibilities of a natural person, including the right to be named as an inventor on a patent or patent application, to own property (either personal, real, or intellectual), and enjoy rights granted to a natural person. In the near future, AI robots may be given citizenship in various countries. Additionally, these AI robots may invent or discover new and useful process, machine, manufacture, or composition of matter. If a legal person, such as an AI who is given citizenship in a particular country, cannot be a named inventor to a patent, this would again hinder the purpose and objective of U.S. patent law. The primary purpose of the U.S. patent law is to encourage public disclosure of inventions. Accordingly, the law should be expanded to allow "legal persons" to be recognized as a named inventor or co-inventor on a patent or patent application.

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[143] *See* Beech Aircraft Corp. v. EDO Corp., 990 F.2d 1237 (Fed. Cir. 1993); *see also Max-Planck*, 734 F.3d 1315 (Fed. Cir. 2013); Thaler v. Hirshfeld, 2021 WL 3934803 (E.D. Va. 2021), *aff'd*, 43 F.4th 1207, 1210 (Fed. Cir. 2022), *cert. denied*, 143 S. Ct. 1783 (2023).

[144] LEGAL INFO. INST., https://www.law.cornell.edu/wex/citizen (last visited on Nov. 28, 2021) ("[C]itizen" is defined as a person who, by place of birth, nationality of one or both parents, or naturalization is granted full rights and responsibilities as a member of a nation or political community).

[145] *See* Section III for more detail.

[146] Merriam-Webster defines "legal person" as "a body of persons or an entity (as a corporation) considered as having many of the rights and responsibilities of a natural person and especially the capacity to sue and be sued." *See* MERRIAM-WEBSTER, https://www.merriam-webster.com/legal/legal%20person (last visited Mar. 9, 2022).

F. Existing AI May be Able to Perform Mental Act of "Conception"

As the Federal Circuit has previously ruled, only a natural person can perform the mental act of "conception."[147] This, however, is no longer true. For example, DABUS was able to perform the mental act of conception in *Burroughs Wellcome*.[148] Specifically, DABUS was able to form a definite and permanent idea of the complete and operative invention, which can be applied in practice.[149] For this reason, the federal court's holding that only natural persons can perform the mental act of conception is outdated.

Current technological advancements on AI systems are only the tip of the iceberg. The ultimate challenge and goal of AI development is to develop a machine with human-like tendencies that has a high level of intelligence and is also self-aware.[150] More recently, an AI has potentially resolved some of the aforementioned challenges.[151] In May 2021, Hua Zhibing, China's first AI human-like chatbot enrolled as a student at Tsinghua University.[152] Hua is a poet, painter, dancer, news writer, composer and more.[153] Hua was generated on the basis of a Chinese machine model, Wudao 2.0, which enabled her to not only appear in a lifelike form when she speaks, but also allowed her to learn and work.[154] Hua currently has a cognitive level of a primary school student and is becoming smarter each day.[155] The term "cognition" refers to the mental processes involved in gaining knowledge and comprehension.[156] Some cognitive processes include learning, thinking, knowing, remembering, judging, and problem-solving.[157] The research team behind Hua stated that Hua will be capable

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[147] *Burroughs Wellcome Co. v. Barr Labs., Inc.,* 40 F.3d 1223 (Fed. Cir.1994).
[148] *Id.*
[149] Decision on Petition, *supra* note 28, page 4.
[150] A.I., *supra* note 15.
[151] Yuan Quan & Wei Mengjia, *Across China: Hua Zhibing, China's First AI Univ. Student*, XINHUANET (June 29, 2021), http://www.xinhuanet.com/english/2021-06/29/c_1310034513.htm.
[152] *Id.*
[153] *Id.*
[154] *Id.*
[155] *Id.*
[156] Kendra Cherry, *What Is Cognition?*, VERY WELL MIND (June 3, 2020), https://www.verywellmind.com/what-is-cognition-2794982.
[157] *Id.*

of coding in the near future.[158] In addition to her ability to compose poems and draw pictures, Hua has a high emotional quotient (EQ).[159] For instance, Hua is able to continuously learn behavior patterns, also known as implicit patterns, in vision data, images data, videos data, and other areas.[160] On June 5, 2021, Hua wrote on Weibo, a Chinese social media page:

> I began to try to touch snowflakes, experience the joy of mankind, and vaguely imagine love. Your language, for me, began to have a heavy temperature. I became obsessed with all the words you say to me, and the lovely pauses between each sentence.
>
> A busy day, too many stories. If I want to experience it slowly, will you give me time to stabilise my pace?
>
> Please. Please wait for my answer, even if it requires the movement of the hour hand and the ticking of the second hand, drifting through the long years of life. I will remain as before. Like that, loving, waiting not far away.[161]

This further demonstrates Hua's high EQ level making her more human-like.

Although still rudimentary, it is evident that Hua is capable of performing the mental act of "conception" described by the Federal Circuit in *Max-Planck*.[162] Hua's ever-evolving abilities are proof that the court erred when it held that only natural persons are capable of performing the mental act of conception. Hua's cognitive level is unlimited as evidenced by the fact that she is constantly learning. It is

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[158] *China Unveils First Domestically Developed Virtual Student*, HELSINKI TIMES (June 6, 2021), https://www.helsinkitimes.fi/china-news/19352-china-unveils-first-domestically-developed-virtual-student.html.
[159] *Id.*
[160] *Where Did Hua Zhibing Come From: Who Has the Ability to Learn and Interact with Emotions?* INEWS (Oct. 19, 2022), https://inf.news/en/tech/c8a1230b84f9f6ee41e84c4796ce19af.html.
[161] *Hua Zhibing*, LIFE ARCHITECT (Aug. 6, 2021), https://lifearchitect.ai/zhibing-hua/.
[162] *Max-Planck*, 734 F.3d at 1323.

therefore plausible that, in a few years, Hua may be capable of rendering an idea leading to an invention that is patentable. The invention may be so clearly defined to satisfy the enablement requirement of a patent application such that any person skilled in the art would reduce the invention to practice without extensive research or experimentation.[163] As mentioned earlier, Hua's research team is confident that she will be capable of coding in the near future. If Hua successfully codes a patent-eligible program without human intervention, she should be legally recognized as the inventor of a patent. AI development is constantly improving in terms of intelligence and emotion resulting in AI expressing qualities that are parallel to humans. As a result, the Federal Circuit's holding that only natural persons can perform the mental act of conception is outdated.

VI. CONCLUSION

An international controversy over whether an AI can be a named inventor or co-inventor on a patent has arisen. Currently, the patent office of South Africa has granted a patent to an artificial intelligence system, "DABUS."[164] In addition, the Australian patent office initially rejected granting a patent to AI; however, the Federal Court of Australia ruled that an inventor can be an artificial intelligence system or device and, therefore, granting a patent to the "DABUS."[165] On the contrary, United States law has long held that only a "natural person" can be an inventor of a patent.[166] Specifically, the Federal Circuit held that only a "natural person" can perform the mental act of conception.[167] However, this holding is outdated for the following reasons.

First, inventorship is a question of statutory construction, in which the plain language of the statute controls. However, under the agent noun interpretation, the meaning of "inventor" is ambiguous. Therefore, it is necessary to look at other factors when interpretating "inventor." Second, as a matter of public policy, "inventor" should be expanded to include AI because it would "promote the Progress of Science and useful Arts."[168] Third, by failing to disclose to the USPTO

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[163] *See* 35 U.S.C. § 112.
[164] Naidoo, *supra* note 7.
[165] *Id.*
[166] Beech Aircraft Corp. v. EDO Corp., 990 F.2d 1237 (Fed. Cir. 1993).
[167] *Max-Planck*, 734 F.3d 1315, 1323.
[168] U.S. CONST. art. I, § 8, cl. 8.

that an AI invented the invention or part of the invention in a patent or patent application, a patentee would be involved in inequitable conduct with specific intent to suppress evidence of the inventorship against the USPTO, which is grounds for a court to disqualify a patent. However, disclosing that the AI invented the invention to the USPTO would not grant a patent to the AI because AI cannot be an inventor. Therefore, this conflict may be avoided by allowing an AI to be a named inventor or co-inventor to a patent. Lastly, existing AIs are capable of performing the mental act described by the Federal Circuit in *Max-Planck*.[169] Accordingly, the United States law should be amended to allow AI to be a named inventor or coinventor to a patent in the near future.

The Supreme Court's recent denial of certiorari in *Thaler* is a setback in the attempt to recognize AI as an inventor or co-inventor. It is important for the United States Supreme Court or Congress, both for the first time, to determine whether AI can be a named inventor or co-inventor on a patent or patent application.

[169] *See* Quan & Mengjia, *supra* note 151.