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## ROBOTS ARE PEOPLE TOO: INVENTORSHIP RIGHTS FOR ARTIFICIAL INTELLIGENCE MACHINES

*Brendan Morrison\**

*If Edison created an artificial intelligence machine that invented the lightbulb, would we truly view him in the same light that we do today? Thaler v. Hirshfeld and Thaler v. Vidal tackle an issue that the courts have never addressed thus far: Should artificial intelligence machines be granted inventorship credit for their original creations? Stephen Thaler, the inventor of DABUS, an artificial intelligence machine that created two of its own inventions, applied to the USPTO for those patents, listing DABUS as the inventor. The USPTO denied the application, reasoning that an inventor could only be a natural person. Ultimately, the court agreed, holding that the legislative intent behind the word “inventor” in the Patent Act exclusively referred to human beings. Additionally, the court kicked the can down the road. It passed the responsibility onto Congress, stating that artificial intelligence technology is not yet advanced enough for this to be an issue, and when that time does come, it should be up to the legislature to determine how the inventorship issue should be resolved.*

*This Note will argue that artificial intelligence machines should be credited for their inventions. A human should not be granted intellectual credit for an idea that was not their original brainchild. Artificial intelligence technology could theoretically far surpass the intellectual limits of a human being. Thus, humans who create these machines should be able to grant credit to artificial intelligence for ideas that were beyond their human capabilities in the first place. Further, this Note will argue that artificial intelligence should gain legal personhood status, like and slightly beyond the scope of that of a corporation. Lastly, this Note will propose a framework for*

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\* Candidate for J.D., Western New England School of Law (2024); B.B.A., University of Massachusetts Amherst (2021). I want to express a sincere thank you to Professor Stacey Lantagne. I would not have been able to write this Note without her guidance. I would also like to thank the Junior and Senior Staff of the *Western New England Law Review* for all their work throughout the production process. Lastly, I would like to thank my family and friends for their enormous and consistent moral support.

*determining whether a machine's contribution to the invention process is enough to reward it with intellectual credit for the invention.*

## INTRODUCTION

Under current patent law jurisprudence in the United States (U.S.), only natural persons may be granted inventorship credit for a patent.<sup>1</sup> Computer scientist Stephen Thaler applied to the U.S. Patent and Trademark Office (USPTO) for two patents that his artificial intelligence (AI) machine, “Device for the Autonomous Bootstrapping of Unified Sentience” (DABUS), invented on its own.<sup>2</sup> When filing the applications in 2019, Thaler listed DABUS as the sole inventor of each creation.<sup>3</sup> Additionally, Thaler listed himself as “the Applicant and the Assignor of the abovementioned application, as well as the owner of said Creativity Machine, DABUS.”<sup>4</sup> On the applications, Thaler also claimed that he would retain the intellectual property rights of DABUS’s inventions, stating “DABUS, being a machine and having no legal personality, does not have the capability to receive any consideration.”<sup>5</sup> Originally, the USPTO denied Thaler’s applications, stating that without a human inventor listed on the applications, they were incomplete and unacceptable.<sup>6</sup>

Consequently, Thaler filed suit in the U.S. District Court for the Eastern District of Virginia, seeking the approval of the applications by the court and a reversal of the USPTO’s denial.<sup>7</sup> However, the District

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1. Thaler v. Vidal, 43 F.4th 1207, 1213 (Fed. Cir. 2022), *cert. denied*, 143 S. Ct. 1783 (2023). The legal definition of a “natural person” is “a living human being.” *Natural Person*, CORNELL L. SCH., [https://www.law.cornell.edu/wex/natural\\_person](https://www.law.cornell.edu/wex/natural_person) [<https://perma.cc/3GRN-D22V>] (July 2023). A patent allows the owner of the patent the right to exclude other individuals from selling, using, importing, or making the patented invention or creation for a limited amount of time. *Patent*, CORNELL L. SCH., <https://www.law.cornell.edu/wex/patent> [<https://perma.cc/7TJX-HR59>]. In exchange for the patent rights, a patent owner must immediately disclose patented information of the invention to the USPTO, and once the limited period of protection ends, the patent holder’s invention becomes public domain. *Id.*

2. Blake Brittain, *U.S. Appeals Court Says Artificial Intelligence Can’t Be Patent Inventor*, REUTERS (Aug. 5, 2022), <https://www.reuters.com/legal/litigation/us-appeals-court-says-artificial-intelligence-cant-be-patent-inventor-2022-08-05/> [<https://perma.cc/8Y2C-DLJW>].

3. John Villasenor, *Patents and AI Inventions: Recent Court Rulings and Broader Policy Questions*, BROOKINGS (Aug. 25, 2022), <https://www.brookings.edu/blog/techtank/2022/08/25/patents-and-ai-inventions-recent-court-rulings-and-broader-policy-questions/> [<https://perma.cc/5RYJ-4TU5>].

4. Thaler v. Hirshfeld, 558 F. Supp. 3d 238, 241 (E.D. Va. 2021), *aff’d sub nom.* Thaler v. Vidal, 43 F.4th 1207 (Fed. Cir. 2022), *cert. denied*, 143 S. Ct. 1783 (2023).

5. *Id.* at 242.

6. Villasenor, *supra* note 3.

7. *Id.*

Court of Virginia ultimately agreed with the USPTO.<sup>8</sup> The court relied upon the plain language of the America Invents Act (Patent Act) in their reasoning, as the terms “inventor” and “joint inventor” are used interchangeably with the terms “individual” and “individuals” in the Act.<sup>9</sup> Further, the court analyzed the statutory meaning of “individual” based on prior Supreme Court interpretation of the term.<sup>10</sup> The Supreme Court, analyzing the Torture Victim Protection Act, had determined that the term refers to a “natural person.”<sup>11</sup> The court in *Thaler v. Hirshfeld* thus reasoned that only a natural person can be considered an inventor under the Patent Act.<sup>12</sup>

In addition to statutory interpretation of the term “individual,” the court in *Thaler v. Hirshfeld* compared the present case to cases involving state and corporate inventorship rights.<sup>13</sup> The court stated that although these cases do not specifically address the issue of AI inventorship, they reinforce the argument that under the Patent Act, only natural persons may be considered inventors.<sup>14</sup> Finally, the court sidestepped the potential policy ramifications of this case for several reasons.<sup>15</sup> First, the court reasons that AI technology is not yet advanced enough for this, as “intelligence akin to that possessed by humankind and beyond” is only a theoretical issue, and is not presently a reality.<sup>16</sup> Second, they assert that if Congress wished to, they could revise the patent law system to allow AI to gain inventorship credit.<sup>17</sup> The court believes that it is ultimately up to the legislature to determine whether AI machines should be credited with their own inventions, not the judiciary.<sup>18</sup> Congress could have included AI as inventors when they passed the Patent Act in 2011, as AI technology already existed at that time, yet they chose not to.<sup>19</sup>

Thaler appealed the District Court of Virginia’s judgment to the Court of Appeals for the Federal Circuit.<sup>20</sup> Similar to the District Court, the

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8. *Hirshfeld*, 558 F. Supp. 3d at 249.

9. *Id.* at 245–46; America Invents Act, 35 U.S.C. §§ 100(f)–(g).

10. *Hirshfeld*, 558 F. Supp. 3d at 246.

11. *Id.*

12. *Id.* at 249.

13. *Id.* at 242; *see Univ. of Utah v. Max-Planck-Gesellschaft*, 734 F.3d 1315, 1323 (Fed. Cir. 2013) (holding that a State cannot be considered an inventor because only a natural person is capable of the mental act of conception necessary in the invention process); *see also Beech Aircraft Corp. v. EDO Corp.*, 990 F.2d 1237, 1248 (Fed. Cir. 1993) (holding that a corporation cannot be an inventor, as a corporation cannot be a natural person, and only a natural person may be considered an inventor).

14. *Hirshfeld*, 558 F. Supp. 3d at 247.

15. *Id.* at 249.

16. *Id.*

17. *Id.*

18. *Id.*

19. *Id.*

20. Villaseñor, *supra* note 3.

Court of Appeals sidestepped any policy considerations relevant to this case, stating that “[i]n fact, however, we do not need to ponder these metaphysical matters. Instead, our task begins—and ends—with consideration of the applicable definition in the relevant statute.”<sup>21</sup> The Court of Appeals affirmed the District Court’s judgment, determining that the plain meaning of the word “individual” referred only to human beings, and agreed with the District Court that Congress intended to exclusively allow for humans to have inventorship rights under the Patent Act.<sup>22</sup> In response to Thaler’s argument that AI-generated inventions should be patentable to encourage public disclosure and innovation, the court claimed that this point was “speculative and lack[ed] a basis in the text of the Patent Act and in the record.”<sup>23</sup> Lastly, Thaler argued that allowing AI machines to have inventorship rights would support the purpose of patents under the Intellectual Property Clause of Article I of the Constitution.<sup>24</sup> However, the court dispensed with this claim, reasoning that this piece of the Constitution is merely a grant of power to Congress, and Congress has chosen to exercise that power by passing the Patent Act, which intended to exclude AI as inventors.<sup>25</sup> Thaler appealed to the Supreme Court, but the Court declined to grant certiorari.<sup>26</sup>

This Note proposes that AI machines should be given intellectual credit for their inventions, in accordance with Thaler’s arguments.<sup>27</sup> Further, a human inventor should have the option to refuse sole credit if the machine’s contribution to the invention process outweighed that of the natural person.<sup>28</sup> Alternatively, at the option of the human inventor of the AI machine in question, the AI could be given joint inventorship credit for their contributions instead of sole credit. This argument hinges entirely on fairness; why should someone who did not invent something be forced to take intellectual credit for it? If an AI created an invention, the human inventor did not conceive the idea themselves, and they do not want the credit for the idea, then the human should have the option to defer the inventorship rights to the AI.

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21. Thaler v. Vidal, 43 F.4th 1207, 1209 (Fed. Cir. 2022), *cert. denied*, 143 S. Ct. 1783 (2023).

22. *Id.* at 1211.

23. *Id.* at 1213.

24. *Id.* The Intellectual Property Clause states “The Congress shall have Power . . . To Promote the Progress of Science and Useful Arts, by securing for limited Times to . . . Inventors the exclusive Right to their respective . . . Discoveries.” U.S. CONST. art I, § 8, cl. 8.

25. *Vidal*, 43 F.4th at 1213.

26. Thaler v. Vidal, 143 S. Ct. 1783 (2023).

27. Russ Pearlman, *Recognizing Artificial Intelligence (AI) as Authors and Inventors Under U.S. Intellectual Property Law*, 24 RICH. J.L. & TECH. 2, 40 (2018).

28. Cf. Hubert Ning, Note, *Is It Fair? Is It Competitive? Is It Human?: Artificial Intelligence and the Extent to Which We Can Patent AI-Assisted Inventions*, 49 J. LEGIS. 421, 442 (2023).

First, Part I of this Note will examine the U.S. patent law system. It will discuss the Intellectual Property Clause and the intent of the framers in drafting this constitutional provision, as well as the purposes of the patent law system. Additionally, Part I will explore the Patent Act itself, specifically focusing on patent application procedures, as well as how inventorship is established.

Part II of this Note explores international patent law. This Part will delve into legal overviews of the patent law systems of three countries in particular: Australia, South Africa, and the United Kingdom (U.K.). It will further discuss Stephen Thaler's attempts to secure inventorship credit for DABUS's inventions in each of these countries and will compare each country's rationale to that of the U.S. courts.

Finally, Part III of this Note will propose several solutions to the issue of AI inventorship rights. AI should either be considered inventors or joint inventors for an invention if the creator of the AI permits it. This Part will examine current capabilities of AI technology and will argue that because of rapid technological advancements in AI technology, Congress should address the issue of AI inventorship rights immediately. The public policy issues in the case at hand should not be dismissed. AI machines do not currently possess a level of science fiction-like sentience possessed by fictional characters such as Arnold Schwarzenegger's Terminator.<sup>29</sup> However, Part III argues that AI technology is far enough along for courts and legislatures to seriously consider Stephen Thaler's arguments in favor of AI inventorship rights.

Further, Part III argues that Congress should either change the language of the Patent Act, or the courts should broaden the scope of its interpretation of the word "inventor" to include AI machines that are capable of invention. If necessary, in a legal dispute, courts could utilize a framework for inventorship credit regarding whether an AI would be considered an inventor. This framework could involve several factors, such as the amount of the AI's contribution in the invention process and the amount of human input required.<sup>30</sup> Lastly, this Part will propose that the inventor of such an AI machine should retain legal liability and reap economic benefits from AI-generated inventions by establishing a trust for the AI. Ultimately, this Part supports the assertion that granting AI inventorship credit would incentivize technological innovation, a major goal of the U.S. patent system.

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29. THE TERMINATOR (Orion Pictures 1984). Though the moral implications of granting AI inventorship rights or rights beyond this threshold, or hypothetical fictional scenarios that take place in films such as *The Terminator* are intriguing, this Note will not address these issues.

30. Cf. Ning, *supra* note 28.

## I. THE UNITED STATES PATENT LAW SYSTEM

The U.S. patent system rewards human efforts and stimulates innovation. The patent system encourages individuals to publish their inventions in order to promote the progress of science and useful arts, just as the framers intended.<sup>31</sup> In exchange for such utilitarian publication on the inventor's part, inventors are granted exclusive rights over their inventions for a limited amount of time, while the inventions are shielded by the government.<sup>32</sup> Subpart A discusses the Intellectual Property Clause of the Constitution, which is a grant of power to Congress, and the way that the framers set up the patent system.<sup>33</sup> It also explores the purpose and justifications of the U.S. patent law system. Next, Subpart B explains the Patent Act. The Patent Act establishes many aspects of the American patent system, including the application process, as well as how inventorship is established.<sup>34</sup>

### A. *The Intellectual Property Clause and the Purpose of U.S. Patent Law*

The Intellectual Property Clause of the Constitution states that “Congress shall have Power . . . To 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.”<sup>35</sup> The Intellectual Property Clause gave inventors and writers an economic incentive for creating their works, thus promoting innovation.<sup>36</sup> This grant of power to Congress over intellectual property was followed by patent and copyright legislation, laying the groundwork for modern intellectual property laws.<sup>37</sup> Congress has utilized its Intellectual Property Clause powers “to encourage technological innovation, advancement, or social benefit.”<sup>38</sup> The framers knew that protecting intellectual property was crucial, because protecting inventors’ ideas gives inventors an incentive to invent, thus stimulating the economy.<sup>39</sup>

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31. *ArtI.S8.C8.1 Overview of Congress’s Power over Intellectual Property*, CONST. ANN., [https://constitution.congress.gov/browse/essay/artI-S8-C8-1/ALDE\\_00013060/](https://constitution.congress.gov/browse/essay/artI-S8-C8-1/ALDE_00013060/) [hereinafter *Congress’s Power*].

32. James Yang, *Purpose of the Patent System*, OC PAT. LAW. (Apr. 11, 2018), <https://opatentlawyer.com/lesson/purpose-benefits-patent-system/> [https://perma.cc/5Q2N-82E5].

33. *The Origins of Patent and Copyright Law*, CONST. RTS. FOUND. (2008), <https://www.crf-usa.org/bill-of-rights-in-action/bria-23-4-a-the-origins-of-patent-and-copyright-law> [https://perma.cc/TDG2-JDDU].

34. See 35 U.S.C. §§ 101–118.

35. U.S. CONST. art I, § 8, cl. 8.

36. *The Origins of Patent and Copyright Law*, *supra* note 33.

37. *Id.*; *Congress’s Power*, *supra* note 31.

38. *Congress’s Power*, *supra* note 31.

39. *The Origins of Patent and Copyright Law*, *supra* note 33.

Exclusive rights in both patents and copyrights creates an incentive system for inventors.<sup>40</sup> Without such protections, inventors would be unable to reap the full economic benefits of their creations.<sup>41</sup> If an individual freely copied an original invention and reaped the economic benefits of another person's creation, why would an inventor bother putting forth the time and effort to create an original invention in the first place?<sup>42</sup> As such, the Intellectual Property Clause promotes technological innovation and protects inventors from such a possibility.<sup>43</sup> Thus, the Intellectual Property Clause represents the "economic philosophy" that "encouragement of individual effort by personal gain is the best way to advance public welfare through the talents of authors and inventors."<sup>44</sup>

The patent law system essentially balances the interests of inventors against the interests of the public, with inventors being rewarded the exclusive rights over their inventions in exchange for their technological advancements to society.<sup>45</sup> Consequently, patents safeguard inventors' research and development investments by protecting future potential revenue streams, thus providing an incentive for inventors to publicize their creations.<sup>46</sup> Inventors are required to show the public how to use and create their invention on the patent application.<sup>47</sup> Once the term of the patent expires, the invention may be recreated by others, and the public is thus allowed to take advantage of the inventor's technological advancement.<sup>48</sup> This "contract" between an inventor and the government benefits both the individual as well as society as a whole.<sup>49</sup> Ultimately, the Intellectual Property Clause of the Constitution serves to benefit society through the promotion of technological advancements.<sup>50</sup>

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40. *Congress's Power*, *supra* note 31.

41. *Id.*

42. *Id.*

43. *Id.*; see *Mazer v. Stein*, 347 U.S. 201, 219 (1954) (stating that "[t]he economic philosophy behind the [Intellectual Property] clause empowering Congress to grant patents and copyrights is the conviction that encouragement of individual effort by personal gain is the best way to advance public welfare through the talents of authors and inventors in 'Science and useful Arts.'"); see also Liza Vertinsky & Todd M. Rice, *Thinking About Thinking Machines: Implications of Machine Inventors for Patent Law*, 8 B.U. J. SCI. & TECH. L. 574, 585 (2002) (asserting that "[p]ublic beliefs about the justness and importance of rewarding human effort and stimulating the spark of human creativity embodied in invention have fuelled popular and political support for the Patent System.").

44. *Congress's Power*, *supra* note 31.

45. *Purpose of Patent Law*, RENTSCH PARTNER, <https://rentschpartner.ch/en/patent-law/overview-on-patent-law-in-switzerland/purpose-of-patent-law> [https://perma.cc/3Q3D-VS6J].

46. *Id.*; Yang, *supra* note 32.

47. Yang, *supra* note 32.

48. *Id.*

49. *Id.*

50. See *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 480 (1974) (stating that "patent laws promote . . . progress by offering a right of exclusion for a limited period as an incentive



Although the Intellectual Property Clause is a grant of power to Congress by the framers, it also places limits on Congress's power over copyright and patent law.<sup>51</sup> The Clause provides that Congress may only grant patent and copyright protections for a limited amount of time, though the term may still be for a significant period of time.<sup>52</sup> Additionally, Congress is required to use their Intellectual Property Clause powers "[t]o promote the Progress of Science and Useful Arts."<sup>53</sup> However, courts typically defer to Congress regarding how they choose to use their intellectual property powers to reach this goal.<sup>54</sup>

To be patentable, an invention's "inherent requisites" are "innovation [and] advancement" in addition to "add[ing] to the sum of useful knowledge."<sup>55</sup> Thus, an invention must be nonobvious and novel to be patentable.<sup>56</sup> Ultimately, to acquire the protection of patent law, an invention must have "substantial utility," thus achieving the desired goal of the Intellectual Property Clause, which is the promotion of "the Progress of . . . Useful Arts."<sup>57</sup> According to the Supreme Court in the *Brenner* case, if an invention does not possess substantial utility, then awarding the inventor a patent is unjustified.<sup>58</sup> This requirement merely means that an invention has a real use that can be demonstrated.<sup>59</sup> Further, the invention is not required to function perfectly to meet the utility requirement.<sup>60</sup> The invention must only work in the described way from the application and create some sort of minor social benefit.<sup>61</sup>

Though one may view the patent system as anti-competitive due to inventors being able to temporarily monopolize their inventions, this

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to inventors . . . . The productive effort thereby fostered will have a positive effect on society through the introduction of new products and processes of manufacture."); *see also* *Universal Oil Products Co. v. Global Oil Refining Co.*, 322 U.S. 471, 484 (1944) ("As a reward for inventions and to encourage their disclosure, the United States offers a seventeen-year monopoly to an inventor who refrains from keeping his invention a trade secret.").

51. *Congress's Power*, *supra* note 31.

52. *Id.* Protections for utility patents last for a term of twenty years following the date of filing, design patent protections are for a term of fourteen years after being granted, and plant patents are granted for a period of seventeen years after the date that the patent was granted. *Ning*, *supra* note 28, at 425–26.

53. U.S. CONST. art I, § 8, cl. 8; *Congress's Power*, *supra* note 31.

54. *Congress's Power*, *supra* note 31.

55. *Graham v. John Deere Co.*, 383 U.S. 1, 6 (1966).

56. *Congress's Power*, *supra* note 31.

57. *Brenner v. Manson*, 383 U.S. 519, 534–35 (1966) (stating that "the basic *quid pro quo* contemplated by the Constitution and the Congress for granting a patent monopoly is the benefit derived by the public from an invention with substantial utility"); *Congress's Power*, *supra* note 31; U.S. CONST. art I, § 8, cl. 8.

58. *Brenner*, 383 U.S. at 534–35.

59. *Utility Requirement for Patents*, JUSTIA, <https://www.justia.com/intellectual-property/patents/patentability-requirements/usefulness/> [<https://perma.cc/7AKZ-QCY7>].

60. *Id.*

61. *Id.*

argument is countered by the idea that the patent system incentivizes inventors to share their ideas with the public.<sup>62</sup> If the patent system disincentivized inventors from sharing their discoveries, technological innovations would be few and far between, and our society would rarely technologically progress.<sup>63</sup> As discussed previously, the “monopoly” aspect of the patent system is counterbalanced by the fact that the Intellectual Property Clause grants an inventor a monopoly over their creations for only a limited period of time.<sup>64</sup>

#### B. *The Patent Act*

The Patent Act lays the groundwork for modern U.S. patent law.<sup>65</sup> The Patent Act defines a patentable work as “any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof.”<sup>66</sup> Additionally, for an invention to be patentable, it must be “novel” or new.<sup>67</sup> A patentable invention must also be nonobvious.<sup>68</sup> Further, the test to determine whether an invention is obvious is “if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious . . . to a person having ordinary skill in the art.”<sup>69</sup> Lastly, there is an enablement requirement for patentable inventions.<sup>70</sup> The enablement requirement of the Patent Act states that an applicant must provide “a written description of the invention” containing a description of the creation process, as well as directions on how to use the invention, such that a “person skilled in the art to which [the invention] pertains” is able to use it or create it themselves.<sup>71</sup>

Under the Patent Act, an inventor is defined as “the individual or, if a joint invention, the individuals collectively who invented or discovered the subject matter of the invention.”<sup>72</sup> Further, the Patent Act states that a joint inventor is any of the individuals that discovered or invented the

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62. Amundsen Davis LLC, *The Purpose Behind Patent Law and What It Means for You*, JD SUPRA (Feb. 20, 2017), <https://www.jdsupra.com/legalnews/the-purpose-behind-patent-law-and-what-92379/> [<https://perma.cc/A3LQ-6QCV>].

63. *Id.*

64. Ning, *supra* note 28, at 425–26; Amundsen Davis LLC, *supra* note 62; see U.S. CONST. art I, § 8, cl. 8.

65. See generally Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (codified at 35 U.S.C. §§ 1–390).

66. 35 U.S.C. § 101.

67. 35 U.S.C. § 102.

68. 35 U.S.C. § 103.

69. *Id.*

70. *Patent*, *supra* note 1.

71. 35 U.S.C. § 112.

72. 35 U.S.C. § 100(f).

subject matter of an invention.<sup>73</sup> Under section 116 of the Patent Act, if two or more people create an invention together, they must apply for the patent together, and each of them must make the oath required under section 115 together.<sup>74</sup> Additionally, inventors are permitted to apply for the patent jointly even if they did not work together on the invention, if they did not work on the invention at the same time, if they did not make an equal contribution to the invention, or if they did not make contributions to each claim for the patent.<sup>75</sup> Thus, under the Patent Act, inventorship credit may be granted to more than one individual.<sup>76</sup>

To secure a patent, the inventor of the patented invention must complete a patent application.<sup>77</sup> The completed application includes the following: a specification of the invention with a written description (which is the enablement requirement of the Patent Act), a drawing of the invention, and a declaration or oath by the inventor.<sup>78</sup> The oath by the inventor includes statements that the application was authorized or filled out by the “affiant or declarant” and that “such individual believes himself or herself to be the original inventor or an original joint inventor of a claimed invention.”<sup>79</sup> Under certain circumstances, such as when an individual is deceased or is legally incapacitated and is thus unable to complete the oath or declaration required for a patent application, a substitute statement identifying the individual for which the statement applies may be submitted.<sup>80</sup> Additionally, if an inventor for a patent is deceased or legally incapacitated, legal representatives of such an inventor may submit the patent application on the inventor’s behalf.<sup>81</sup> Thus, under the Patent Act, an inventor need not file a patent application themselves.<sup>82</sup>

An inventor may assign another person to apply for a patent, and there are also instances where a person must assign an invention for an inventor.<sup>83</sup> In such instances, under section 118 of the Patent Act, a person that shows “sufficient proprietary interest in the matter” is able to submit

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73. 35 U.S.C. § 100(g).

74. 35 U.S.C. § 116(a). Under 35 U.S.C. § 102(f), any patent application containing improper inventorship must be rejected by the patent examiner. *PerSeptive Biosystems, Inc. v. Pharmacia Biotech, Inc.*, 225 F.3d 1315, 1321 (Fed. Cir. 2000).

75. 35 U.S.C. § 116(a).

76. 35 U.S.C. § 116.

77. 35 U.S.C. § 111(a)(1).

78. 35 U.S.C. § 111(a)(2).

79. 35 U.S.C. § 115(b).

80. 35 U.S.C. § 115(d).

81. 35 U.S.C. § 117.

82. *Id.* An individual that is awarded legal title to a patent is not required to be the inventor of the patented subject matter. *See Arachnid, Inc. v. Merit Indus., Inc.*, 939 F.2d 1574, 1578 n.2, (Fed. Cir. 1991); *see also Israel Bio-Engineering Project v. Amgen, Inc.*, 475 F.3d 1256, 1263 (Fed. Cir. 2007); *see also* 4 ROBERT A. MATTHEWS, JR., ANN. PAT. DIGEST § 26:2, Westlaw (database updated Oct. 2023).

83. 35 U.S.C. § 118.

a patent application on the inventor's behalf.<sup>84</sup> In such a circumstance, the person that is applying on behalf of the inventor must show that this is justified in order to "preserve the rights of the parties."<sup>85</sup> Consequently, if such a patent application is approved by the USPTO, the patent is granted to the interested party.<sup>86</sup> Essentially, section 118 of the Patent Act allows a third party that has an interest of ownership in an invention to apply for a patent on the inventor's behalf, and it preserves the rights of the inventor and the third party.<sup>87</sup> As discussed in this Part, the Patent Act has numerous important elements that lay the groundwork for the American patent law system. However, other countries' patent systems differ from the U.S. patent system, resulting in a variety of outcomes for Thaler. By implementing aspects of foreign patent law, the U.S. patent system could be significantly improved.

## II. INTERNATIONAL PATENT LAW

Aside from the U.S., Stephen Thaler has attempted to secure inventorship rights for DABUS's inventions in several other countries, including Australia, South Africa, and the U.K.<sup>88</sup> Initially, Thaler's attempt in Australia was successful, with a lower court approving DABUS as the inventor of each of its inventions on the applications.<sup>89</sup> However, on appeal, Thaler's attempts in Australia were unsuccessful, as a judge of a Federal Court of Australia overturned the lower court's judgment.<sup>90</sup> In South Africa, DABUS has been granted inventorship credit for both of its patents after a formal examination of the inventions.<sup>91</sup> Lastly, Thaler's applications for DABUS's inventions were denied in the U.K., with the

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84. *Id.* A proprietary interest as referenced under 35 U.S.C. § 118 is defined as one that suggests an "element of ownership or dominion." *Staeger v. Comm'r of Pats. & Trademarks*, No. Civ.A. 75-0815, 1976 WL 21078 at \*1-2 (D.D.C. Jan. 14, 1976).

85. 35 U.S.C. § 118.

86. *Id.*

87. *Id.*

88. Matthew Horton & Austin J. Kim, *Australia Appeal Decision Reverses Direction on AI Inventorship*, FOLEY & LARDNER LLP (Apr. 18, 2022), <https://www.foley.com/en/insights/publications/2022/04/australia-appeal-decision-reverses-ai-inventorship> [https://perma.cc/2JZD-C3E8]; Meshandren Naidoo, *In a World First, South Africa Grants a Patent to an Artificial Intelligence System*, QUARTZ AFR. (Aug. 9, 2021), <https://qz.com/africa/2044477/south-africa-grants-patent-to-an-ai-system-known-as-dabus> [https://perma.cc/M6FY-UUH7]; William Holmes, *AI Creativity Machine to Have Its Day in Supreme Court*, LEGAL CHEEK (Sept. 14, 2022, 10:08 AM), <https://www.legalcheek.com/2022/09/ai-creativity-machine-to-have-its-day-in-supreme-court/> [https://perma.cc/WDD9-QSEF].

89. *Thaler v Commissioner of Patents* [2021] FCA 879 (30 July 2021) (Austl.); Horton & Kim, *supra* note 88.

90. *Commissioner of Patents v Thaler* [2022] FCAFC 62 (13 April 2022) (Austl.); Horton & Kim, *supra* note 88.

91. Naidoo, *supra* note 88.

court using a similar rationale as the courts in the U.S.<sup>92</sup> Subpart A conducts a more in-depth examination of Australian patent law, in addition to the reasonings for the holdings of the Australian courts regarding Thaler's applications. Subpart B explores the current state of South African patent law, and how DABUS's applications were approved there. Finally, Subpart C analyzes patent law in the U.K., and why the courts concluded to deny Thaler's patent applications.

#### A. *Australian Patent Law and the Country's Views on AI Inventorship*

Among the countries that Stephen Thaler submitted patent applications for DABUS's inventions, Australia is among the most notable. In 2021, Australia was the first country in the world that employs a substantive patent examination where a court held that AI are entitled to inventorship credit under the country's patent law.<sup>93</sup> Initially, the Commissioner of Patents in Australia denied Thaler's application, employing the same argument as the USPTO that only natural persons can be considered inventors under the country's Patent Act.<sup>94</sup> Thaler appealed this decision before a Federal Court of Australia and succeeded on the initial appeal.<sup>95</sup>

In Thaler's case in the Federal Court of Australia, the court held that AI machines could be considered inventors under Australia's Patent Act of 1990, but they cannot retain actual ownership of the patents.<sup>96</sup> In determining that DABUS could be considered an inventor under Australian patent law, the court stated that "an inventor is an agent noun; an agent can be a person or a thing that invents" and that there was nothing explicitly codified in Australian patent law preventing an AI machine

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92. Thaler v. Comptroller General of Patents Trade Marks and Designs [2021] EWCA (Civ) 1374 (Eng.); Holmes, *supra* note 88.

93. Thaler v Commissioner of Patents [2021] FCA 879 (30 July 2021) (Austl.); Horton & Kim, *supra* note 88; Oliver Bell & Vito Petretti, *Australian Court Overturns AI Inventorship Ruling*, JD SUPRA (May 13, 2022), <https://www.jdsupra.com/legalnews/australian-court-overturns-ai-1320594/> [<https://perma.cc/2LJ5-BZPJ>].

94. *Allens Acts in Landmark AI-Inventorship Case Set for the High Court of Australia*, ALLENS (Sept. 21, 2022), <https://www.allens.com.au/insights-news/news/2022/09/allens-acts-in-landmark-ai-inventorship-case-set-for-the-high-court-of-australia/> [<https://perma.cc/BV8J-B9JW>] [hereinafter *Allens*].

95. *Id.*; Thaler v Commissioner of Patents [2021] FCA 879, [10] (30 July 2021) (Austl.); Horton & Kim, *supra* note 88; Bell & Petretti, *supra* note 93.

96. Thaler v Commissioner of Patents [2021] FCA 879, [10] (30 July 2021) (Austl.); *Allens*, *supra* note 94; *Can an AI System Be an Inventor? Full Court Says No*, CORRS (May 11, 2022), <https://www.corrs.com.au/insights/can-an-ai-system-be-an-inventor-full-court-says-no> [<https://perma.cc/BKU7-3ZAU>] [hereinafter *Can an AI System be an Inventor?*]. Maja Samardzic & Jonathan Harris, *Australia: Full Court Makes Its Decision on Non-Human Inventors of Patents*, MONDAQ (Sept. 14, 2022), <https://www.mondaq.com/australia/patent/1230014/full-court-makes-its-decision-on-non-human-inventors-of-patents—commissioner-of-patents-v-thaler-2022-fcafc-62> [<https://perma.cc/2SGV-PCYX>].

from being credited for an invention.<sup>97</sup> Additionally, the court acknowledged the public policy considerations that Thaler has asserted in his fight for establishing inventorship credit for AI machines such as his own.<sup>98</sup> More specifically, the court referred to the current technological feats of AI machines in the invention process and the benefits of these feats, such as AI that assist in the drug discovery process.<sup>99</sup>

Ultimately, the court reasoned that giving credit to AI machines for their inventions would align with the goal of Australia's Patent Act.<sup>100</sup> According to the court, the Patent Act "promotes economic wellbeing through technological innovation," which is among Stephen Thaler's main arguments.<sup>101</sup> However, on the Commissioner of Patents' appeal to the Full Court, this decision was overturned.<sup>102</sup>

On appeal, the Full Court deemed that only a natural person could be considered an inventor under Australian patent law.<sup>103</sup> The Full Court stated that the term "inventor" is never defined in the Patent Act.<sup>104</sup> However, the Full Court reasoned that typically, inventors must possess attributes of a human, such as the capability to describe the invention itself, and that Australian patent law operates on the assumption that inventors are people.<sup>105</sup> Additionally, the court held that an inventor must

97. *Thaler v Commissioner of Patents* [2021] FCA 879, [10] (30 July 2021) (Austl.); *Can an AI System be an Inventor?*, *supra* note 96; Horton & Kim, *supra* note 88.

98. *Thaler v Commissioner of Patents* [2021] FCA 879, [45] (30 July 2021) (Austl.); *Can an AI System be an Inventor?*, *supra* note 96.

99. *Thaler v Commissioner of Patents* [2021] FCA 879, [45] (30 July 2021) (Austl.); *Can an AI System be an Inventor?*, *supra* note 96; *see Allens*, *supra* note 94; *see also* Erica Fraser, *Computers as Inventors - Legal and Policy Implications of Artificial Intelligence on Patent Law*, 13 SCRIPTED 305, 318 (Dec. 2016), <https://script-ed.org/article/computers-as-inventors-legal-and-policy-implications-of-artificial-intelligence-on-patent-law/> [<https://perma.cc/M97N-Z5G2>].

100. *Thaler v Commissioner of Patents* [2021] FCA 879, [122] (30 July 2021) (Austl.); *Can an AI System be an Inventor?*, *supra* note 96.

101. *Thaler v Commissioner of Patents* [2021] FCA 879, [122] (30 July 2021) (Austl.); *Can an AI System be an Inventor?*, *supra* note 96; Horton & Kim, *supra* note 88; *see Thaler v. Vidal*, 43 F.4th 1207, 1213 (Fed. Cir. 2022).

102. *Commissioner of Patents v Thaler* [2022] FCAFC 62 (13 April 2022) (Austl.); *Can an AI System be an Inventor?*, *supra* note 96; Horton & Kim, *supra* note 88. The Full Court of the Federal Court of Australia is the second highest appeals court in Australia and hears matters on several different subjects. *Courts*, AUSTRALIAN GOVERNMENT ATTORNEY-GENERAL'S DEPARTMENT, <https://www.ag.gov.au/legal-system/courts>.

103. *Commissioner of Patents v Thaler* [2022] FCAFC 62, [105] (13 April 2022) (Austl.); *Can an AI System be an Inventor?*, *supra* note 96; Horton & Kim, *supra* note 88.

104. *Commissioner of Patents v Thaler* [2022] FCAFC 62, [100] (13 April 2022) (Austl.); *Can an AI System be an Inventor?*, *supra* note 96.

105. *Commissioner of Patents v Thaler* [2022] FCAFC 62, [87]–[99] (13 April 2022) (Austl.); *Can an AI System be an Inventor?*, *supra* note 96.

also possess a legal personality, being the person who is entitled to the grant of the patent.<sup>106</sup>

The Full Court also utilized statutory interpretation of the Patent Act in order to determine whether an AI could be considered an inventor.<sup>107</sup> According to the court, under Australia's Patent Act, an "inventor" is a person that contributes to the idea of the invention.<sup>108</sup> However, the Act does not explicitly define what an "inventor" is.<sup>109</sup> Under the Patent Act of 1990, a "person" may be granted a patent if they are the inventor, if they would "be entitled to have the patent assigned" to them when the patent is granted, if they "derive title to the invention," or if they are the legal representative of a deceased person falling under those three categories.<sup>110</sup> The court also stated that "the law relating to the entitlement of a person to the grant of a patent is premised upon an invention for the purposes of the Patents Act arising from the mind of a natural person or persons."<sup>111</sup> In addition to the mental aspect required for the inventive process, the court also concludes that the term "a person who is an inventor" in the context of the Australian Patent Act may only mean a natural person.<sup>112</sup> The Full Court held that ultimately, because of these reasons, an AI machine cannot be an inventor under Australian patent law.<sup>113</sup>

Though the Australian court held that only natural persons can be considered inventors, the court also seriously considered the potential policy implications of this case, stating that "the role that artificial intelligence may take within the scheme of the Patents Act and Regulations . . . is important and worthwhile."<sup>114</sup> They also pondered the potential grantees of these patents, including the owner of the AI machine,

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106. *Commissioner of Patents v Thaler* [2022] FCAFC 62, [87]–[99] (13 April 2022) (Austl.); *Can an AI System be an Inventor?*, *supra* note 96.

107. *Commissioner of Patents v Thaler* [2022] FCAFC 62, [100]–[105] (13 April 2022) (Austl.); *Can an AI System be an Inventor?*, *supra* note 96.

108. *Commissioner of Patents v Thaler* [2022] FCAFC 62, [100]–[105] (13 April 2022) (Austl.); *Patents Act 1990* (Cth) ch 2 pt 2 s 15 (Austl.); *Can an AI System be an Inventor?*, *supra* note 96.

109. *See Patents Act 1990* (Cth) ch 2 pt 2 s 15 (Austl.); *see also* Tracey Langdale, *How to Determine Who is An Inventor for a Patent Application*, MICHAEL BUCK IP (Aug. 12, 2022, 8:33 AM), <https://www.mbip.com.au/how-to-determine-who-is-an-inventor-for-a-patent-application/> [<https://perma.cc/C37C-3ZU6>].

110. *Patents Act 1990* (Cth) ch 2 pt 2 s 15 (Austl.).

111. *Commissioner of Patents v Thaler* [2022] FCAFC 62, [105] (13 April 2022) (Austl.); *Can an AI System be an Inventor?*, *supra* note 96; Bell & Petretti, *supra* note 93.

112. *Commissioner of Patents v Thaler* [2022] FCAFC 62, [106] (13 April 2022) (Austl.); *Can an AI System be an Inventor?*, *supra* note 96; Bell & Petretti, *supra* note 93.

113. *Commissioner of Patents v Thaler* [2022] FCAFC 62, [123] (13 April 2022) (Austl.); *Can an AI System be an Inventor?*, *supra* note 96; Horton & Kim, *supra* note 88.

114. *Commissioner of Patents v Thaler* [2022] FCAFC 62, [119] (13 April 2022) (Austl.); *Can an AI System be an Inventor?*, *supra* note 96.

the AI software developer, the copyright owner of the AI's source code, and the individual who inputs data into the AI machine that is necessary for the inventive process.<sup>115</sup> In the end, however, Thaler lost his case, and the High Court struck down his appeal as well.<sup>116</sup>

#### B. *South African Patent Law Permits AI as Inventors*

Thus far, South Africa is the only country that Stephen Thaler has experienced success in his efforts to secure inventorship rights for DABUS.<sup>117</sup> In 2021, the Companies and Intellectual Property Commission (CIPC), South Africa's patent office, approved Thaler's application for DABUS's inventions, granting DABUS sole inventorship credit.<sup>118</sup> The Commission has yet to explain its rationale for approving Thaler's applications, and would likely only do so if there has been a formal appeal of the application.<sup>119</sup>

Currently, South Africa's patent process is not nearly as thorough as other countries, as the country's patent office only conducts a formal examination of the patent.<sup>120</sup> Essentially, this process only consists of confirming that the patent forms have been submitted and completed.<sup>121</sup> This is unlike countries with substantive patent examinations such as the U.S., U.K., and Australia, where the patent office from each respective country grants patents based on the merits of the application.<sup>122</sup> Additionally, South African patent law does not contain a definition of the term "inventor," so this decision by the CIPC carries less weight than that of other countries' patent offices.<sup>123</sup> Regardless, this decision is of

115. *Commissioner of Patents v Thaler* [2022] FCAFC 62, [119] (13 April 2022) (Austl.); *Can an AI System be an Inventor?*, *supra* note 96.

116. Alex Dunlop et al., *High Court Denies Special Leave in AI Inventorship Case*, CORRS (Nov. 17, 2022), <https://www.corrs.com.au/insights/high-court-denies-special-leave-in-ai-inventorship-case> [<https://perma.cc/H9MW-N7RR>]. The High Court of Australia is the highest appeals court in Australia, equivalent to the Supreme Court of the United States. *See Courts*, *supra* note 102.

117. *DABUS Gets Its First Patent in South Africa Under Formalities Examination*, IPWATCHDOG (July 29, 2021, 8:13 AM), <https://www.ipwatchdog.com/2021/07/29/dabus-gets-first-patent-south-africa-formalities-examination/id=136116/#> [<https://perma.cc/DH79-F6UG>]; Villasenor, *supra* note 3.

118. Naidoo, *supra* note 88.

119. *Id.*

120. *Id.*; *see also*, Isobel Taylor & Jackie O'Brien, *The Year That Was for DABUS, the World's First AI 'Inventor'*, INSIDE TECH L. (Dec. 13, 2021), <https://www.insidetechlaw.com/blog/the-year-that-was-for-dabus-the-worlds-first-ai-inventor> [<https://perma.cc/5Q98-8XC3>]; *South Africa Issues World's First Patent Naming AI as Inventor*, MATHYS & SQUIRE (July 29, 2021), <https://www.mathys-squire.com/insights-and-events/news/south-africa-issues-worlds-first-patent-naming-ai-as-inventor/> [<https://perma.cc/6TX6-V7R6>].

121. Naidoo, *supra* note 88.

122. Villasenor, *supra* note 3.

123. *DABUS Gets Its First Patent in South Africa Under Formalities Examination*, *supra* note 119. South Africa's Patents Act states that a patent application may be made by the



historical significance, as South Africa remains the only country in the world to permit AI machines as inventors.<sup>124</sup>

However, the approval of Thaler's applications in South Africa does not come without caveats. Because South Africa's patent examination process lacks a substantive examination step, the grant of Thaler's patent does not necessarily mean that the CIPC has decided that AI can be named an inventor under South African patent law.<sup>125</sup> Theoretically, this issue would be for the courts to decide if the patents are ever challenged.<sup>126</sup> However, this does not necessarily mean that South Africa would refuse to recognize DABUS as an inventor if the patents faced a challenge. Based on recent patent law reform in the country, the government wishes to "increase innovation to solve the country's socioeconomic issues."<sup>127</sup> South Africa has struggled with lack of innovation as of late, and this is an issue that the government is in the process of addressing.<sup>128</sup> Thus, approving applications such as Thaler's aligns with the government's goals in this regard.<sup>129</sup>

### C. *United Kingdom Patent Law Denies Inventorship Rights for AI*

Yet another country that Thaler has attempted to secure inventorship rights for DABUS's inventions is the U.K. Similar to U.S. and Australian courts, the U.K. Court of Appeal determined that, under the country's Patents Act 1977, AI machines cannot be given inventorship credit for their original creations.<sup>130</sup> The United Kingdom Intellectual Property Office (UKIPO) rejected Thaler's application, reasoning that, under the Patents Act 1977, only natural persons can be inventors.<sup>131</sup>

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inventor of an invention or a person who had acquired the right to apply for the invention from the inventor. See Patents Act 57 of 1978 (S. Afr.). Additionally, joint inventors are entitled to an equal share for the patent of their invention. Patents Act 57 of 1978 (S. Afr.).

124. Villasenor, *supra* note 3.

125. *South Africa Issues World's First Patent Naming AI as Inventor*, *supra* note 120.

126. *Id.*

127. Naidoo, *supra* note 88.

128. *Id.*

129. *Id.*

130. *Thaler v. Comptroller General of Patents Trade Marks and Designs* [2021] EWCA (Civ) 1374 [51] (Eng.); Holmes, *supra* note 88; Angeline Premraj, Elizabeth Ferrill, & Frank A. Decosta III, *AI Can't Hold Patents to U.S. Inventions (for Now)*, REUTERS (Oct. 20, 2022, 11:50 AM), <https://www.reuters.com/legal/legalindustry/ai-cant-hold-patents-us-inventions-now-2022-10-20/> [<https://perma.cc/J8CK-VR2T>]; Kate Gaudry, Rodney Rothwell, Aarti Shah & Dario Machleidt, *Should We Require Human Inventorship? Submit Your Amicus Brief by March*, IPWATCHDOG (Feb. 11, 2021, 4:15 PM), <https://www.ipwatchdog.com/2021/02/11/require-human-inventorship-submit-amicus-brief-march/id=129922/> [<https://perma.cc/4FZP-NWP5>].

131. *UK: Patents Artificial Intelligence Machine Cannot Be Inventor*, BIRD & BIRD (Nov. 3, 2021), <https://www.twobirds.com/en/insights/2021/uk/uk-patents-artificial-intelligence->

The Patents Act 1977 states that any *person* is permitted to apply for a patent for themselves or jointly.<sup>132</sup> In the U.K., patents are exclusively granted to the inventor of the patented invention, one who is entitled to the property of the invention, or any successors in title.<sup>133</sup> Additionally, under the Patents Act 1977, an inventor is defined as the “actual deviser” of an invention.<sup>134</sup> The “actual deviser” of an invention traditionally has two requirements based on U.K. case law; the deviser is required to be a natural person, and they must have contributed to or devised the inventive concept.<sup>135</sup> Under U.K. patent law, a patent applicant must identify the person or persons that they believe is the inventor of the invention.<sup>136</sup> The application is withdrawn if this requirement is not met.<sup>137</sup>

Thaler argued that, because DABUS came up with each invention on its own, it is the “actual deviser” of each invention, and should be granted inventorship credit accordingly, with Thaler being assigned ownership of the patents.<sup>138</sup> Based on the Patents Act 1977 and precedent surrounding the requirements of the “actual deviser” of an invention, the U.K. Court of Appeal upheld the UKIPO’s rejection of Thaler’s applications, holding that only natural persons could be considered inventors and that AI machines are not natural persons.<sup>139</sup>

Although Thaler lost his appeal to the Court of Appeal, Lord Justice Birss dissented in his favor.<sup>140</sup> Lord Justice Birss stated that “the fact that the creator of the inventions in this case was a machine is no impediment to patents being granted to this applicant.”<sup>141</sup> Essentially, he argued that precedent regarding the meaning of the “actual deviser” under U.K. patent

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machine-cannot-be-inventor [https://perma.cc/527M-29R5]; Premraj et al., *supra* note 130; Holmes, *supra* note 88.

132. The Patents Act 1977, c. 37, § 7 (Eng.); *UK: Patents Artificial Intelligence Machine Cannot Be Inventor*, *supra* note 131.

133. The Patents Act 1977, c. 37, § 7 (Eng.); *UK: Patents Artificial Intelligence Machine Cannot Be Inventor*, *supra* note 131.

134. The Patents Act 1977, c. 37, § 7 (Eng.); *UK: Patents Artificial Intelligence Machine Cannot Be Inventor*, *supra* note 131.

135. *UK: Patents Artificial Intelligence Machine Cannot Be Inventor*, *supra* note 131; Gaudry et al., *supra* note 130.

136. The Patents Act 1977, c. 37, § 13 (Eng.); *UK: Patents Artificial Intelligence Machine Cannot Be Inventor*, *supra* note 131.

137. The Patents Act 1977, c. 37, § 13 (Eng.); *UK: Patents Artificial Intelligence Machine Cannot Be Inventor*, *supra* note 131.

138. Thaler v. Comptroller General of Patents Trade Marks and Designs [2021] EWCA (Civ) 1374 [24], [30] (Eng.); Holmes, *supra* note 88; The Patents Act 1977, c. 37, § 7 (Eng.).

139. Thaler v. Comptroller General of Patents Trade Marks and Designs [2021] EWCA (Civ) 1374 [51] (Eng.); Holmes, *supra* note 88; *UK: Patents Artificial Intelligence Machine Cannot Be Inventor*, *supra* note 131.

140. Thaler v. Comptroller General of Patents Trade Marks and Designs [2021] EWCA (Civ) 1374 [97] (Lord Justice Birss) (Eng.); Holmes, *supra* note 88.

141. Thaler v. Comptroller General of Patents Trade Marks and Designs [2021] EWCA (Civ) 1374 [97] (Lord Justice Birss) (Eng.); Holmes, *supra* note 88.

law was irrelevant and that being something other than a human should not preclude DABUS from being credited for its inventions.<sup>142</sup> However, like the U.S. courts, the U.K. court ultimately brushed aside the public policy implications of Thaler's fight for AI inventorship rights.<sup>143</sup>

### III. INVENTING SOLUTIONS

Thus far, Stephen Thaler has been widely unsuccessful in his efforts to gain inventorship rights for AI machines.<sup>144</sup> As of this publication, there has not been a single country with an in-depth patent application review process that has approved DABUS's applications.<sup>145</sup> In the U.S., U.K., and Australia, courts have denied the applications, with each country's judicial bodies reasoning that under their respective country's patent laws, only natural persons can be considered inventors.<sup>146</sup> This Part will discuss the rationale for permitting AI machines to receive inventorship credit.

Subpart A will discuss current capabilities of AI that partake in the invention process, such as those that assist in drug discovery. This Part will argue that because AI machines are as advanced as they are currently, the court in *Thaler v. Hirshfeld* incorrectly stated that this issue is not ripe for discussion.<sup>147</sup> Further, this Part will argue that because of the advancements of AI technology, either Congress should amend the Patent Act to allow inventorship rights to AI machines such as DABUS, or courts should interpret the Patent Act to include AI in the statutory definition of "inventor."

Subpart B will compare the patent laws of each of the three foreign countries to the U.S.'s Patent Act and explore how the U.S. could potentially incorporate patent law policies of these countries into their own patent laws. This Subpart will discuss international patents laws and court decisions of Australia, South Africa, and the U.K. in Subpart B, as referenced in Part II.<sup>148</sup> Additionally, this Subpart will compare the holdings of the U.S. courts and the Australian and U.K. courts, including the dissent of the U.K. decision and the holding of the lower court in Australia.

Subpart C of this Part will delve into several more nuanced aspects of U.S. patent law. First, this Subpart will discuss legal personhood of

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142. *Thaler v. Comptroller General of Patents Trade Marks and Designs* [2021] EWCA (Civ) 1374 [97] (Lord Justice Birss) (Eng.); Holmes, *supra* note 88.

143. *Thaler v. Comptroller General of Patents Trade Marks and Designs* [2021] EWCA (Civ) 1374 [55] (Eng.).

144. See discussion *supra* Part I; see discussion *supra* Part II.

145. See discussion *supra* Part I; see discussion *supra* Part II.

146. See discussion *supra* Part I; see also discussion *supra* Part II.

147. *Thaler v. Hirshfeld*, 558 F. Supp. 3d 238, 249 (E.D. Va. 2021).

148. See discussion *supra* Part II.

corporations and the rights of corporations to secure patents. Additionally, this Subpart will distinguish AI machines from corporations, and it will argue that AI should have expanded legal personhood rights compared to corporations, as corporations are not considered inventors under the Patent Act.<sup>149</sup>

Subpart C will also address potential issues with the possibility of AI inventorship, such as liability, economic benefit, and how courts may deal with questions of inventorship if the issue is litigated. Regarding liability and economic benefit, this Subpart will propose that the inventor or owner of the AI, which in the present case is Stephen Thaler, would have the ability to create a trust for the inventing AI. Further, the inventing AI would have inventorship rights to its inventions, while the trustee would both retain legal liability and reap the economic benefits of the AI's inventions.

Finally, Subpart C will propose a framework for courts to use in a future dispute regarding whether the AI should be considered an inventor. This framework would mainly consider the amount of human input that was required in the invention process, and how much the AI engaged in the process. If the finder of fact determines that the AI has contributed to the majority of the invention process, then the AI could be given inventorship credit.

#### A. *Technological Feats of AI Machines*

In recent years, AI technology has advanced rapidly.<sup>150</sup> Thus, it follows that the court in *Thaler v. Hirshfeld* incorrectly determined that the issue of granting AI inventorship credit for their own inventions is not yet an issue.<sup>151</sup> Although AI are not yet sentient beings akin to living creatures, Thaler's argument is ripe for discussion due to recent, hastening advancements in AI technology.<sup>152</sup>

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149. Justyn Millamena, Note and Comment, *How Artificial Intelligence Machines Can Legally Become Inventors: An Examination of and Solution to the Decision on DABUS*, 30 J.L. & POL'Y 270, 297–298 (2021); see *Beech Aircraft Corp. v. EDO Corp.*, 990 F.2d 1237, 1248 (Fed. Cir. 1993); see also *MBO Lab'ys, Inc. v. Becton, Dickinson & Co.*, 602 F.3d 1306, 1309 n.1 (Fed. Cir. 2010).

150. Notable recent advancements in AI technology include AI systems that can detect lung cancer with more precision than human radiologists, autopilot in Tesla automobiles, and Amazon's Alexa. Maithreyan Surya, *The Decade of Artificial Intelligence*, TOWARDS DATA SCI. (Dec. 31, 2019), <https://towardsdatascience.com/the-decade-of-artificial-intelligence-6fcdf2fae473> [<https://perma.cc/2HRT-RTGX>].

151. *Hirshfeld*, 558 F. Supp. 3d at 249.

152. See Stuart Rauch, *What Is Sentient AI and Is It Already Here?*, SIMPLILEARN (Feb. 9, 2023), <https://www.simplilearn.com/what-is-sentient-ai-article> [<https://perma.cc/KN45-H2P4>].

## 1. Artificial Authors

Presently, there is a wide variety of AI technology in existence, and not all AI machines are created equal. Some machines are simply far less advanced or complex than others. For example, there are AI, such as GPT-3, that assist authors in writing novels through mass word prediction.<sup>153</sup> With this technology, a human must input a significant amount of text, and GPT-3 will then take this text and predict the words that come next in the sequence, mimicking the prose of a human author.<sup>154</sup> Thus far, GPT-3 is able to perform basic arithmetic, write code, and translate languages, even though it has never been trained in any of these areas.<sup>155</sup>

Using GPT-3 to write a story is simple. First, the human author sketches the outline of the scene of the story that they want GPT-3 to assist with and inputs it into the program.<sup>156</sup> The program then gives the human the output of its own generated words, the author edits it, and then inputs the edited version back into the program.<sup>157</sup> If the author dislikes the direction that the AI machine takes, she could push it back in the right direction by writing a couple sentences of her own, inputting them, and then let the program run by itself once again.<sup>158</sup> Although this author-assisting AI technology is not as advanced as it could be yet, the author that uses GPT-3 believes that “based on the improvements [the author has] seen over the year she’s been using Sudowrite, she doesn’t doubt that it will get there eventually.”<sup>159</sup> However, GPT-3 is purportedly less advanced than Thaler’s own DABUS, as Thaler claims that DABUS created its two inventions “without any human intervention.”<sup>160</sup> Though this technology is still relatively novel, it will be interesting to see in which other creative areas AI can and will assist humans in the future.<sup>161</sup>

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153. Josh Dzieza, *The Great Fiction of AI: The Strange World of High-Speed Semi-Automated Genre Fiction*, THE VERGE (July 20, 2022, 10:00 AM), <https://www.theverge.com/c/23194235/ai-fiction-writing-amazon-kindle-sudowrite-jasper> [<https://perma.cc/M7HK-WL2K>].

154. *Id.*

155. *Id.*

156. *Id.*

157. *Id.*

158. *Id.*

159. *Id.*

160. Yogini Bhavsar-Jog, *Artificial Intelligence as an Inventor on Patents – The Global Divide and the Path Forward*, JD SUPRA (Dec. 22, 2021), <https://www.jdsupra.com/legalnews/artificial-intelligence-as-an-inventor-7892764/> [<https://perma.cc/NJ8C-XMS8>].

161. Sudowrite is a variation of the controversial ChatGPT, created by OpenAI. *Frequently Asked Questions*, SUDOWRITE, <https://www.sudowrite.com/FAQ> [<https://perma.cc/5XET-MKPV>]. Sudowrite does not claim any copyright ownership in its output. Paul Jenkins, *What Is Sudowrite (Fully Explained)*, BRILLIANTIO (Feb. 2, 2022), <https://brilliantio.com/what-is-sudowrite/> [<https://perma.cc/PU67-Y2R2>]. The OpenAI terms of service also state that the consumer that uses their services owns all input, and that they assign

## 2. Artificial Neural Networks

Aside from assisting authors writing novels, AI technology can also assist with drug discovery.<sup>162</sup> Pharmaceutical companies utilize this technology to identify potentially useful drug designs.<sup>163</sup> Additionally, this AI pattern recognition software is capable of analyzing patients' molecular characteristics, thus helping scientists to select the proper treatment for the patient.<sup>164</sup> These types of AI machines are known as Artificial Neural Networks (ANNs), and they can generate new ideas.<sup>165</sup> DABUS is an example of such an AI.<sup>166</sup>

ANNs are utilized to screen compounds for new types of drugs, in addition to discovering new uses for drugs already in existence.<sup>167</sup> These AI can predict drug activities, thus assisting in prioritization of experiments, reducing the need for such experimental work.<sup>168</sup> The experimental work involved in this process is typically arduous, time-consuming, and in some cases, impossible for human beings.<sup>169</sup> However, with the assistance of these ANNs, the drug discovery process can be accelerated, costs of the process can be reduced, and the quality and variety of outcomes are improved.<sup>170</sup> Advancements in this massively

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the consumer ownership of the AI's output as well. *Terms of Use*, OPENAI, <https://openai.com/terms/> [<https://perma.cc/4L2R-5UEM>]. Though the issue of whether an AI should be credited with the intellectual credit for a copyright is intriguing, it exceeds the scope of this Note.

162. Matthew Bultman, *Patents and Artificial Intelligence: An 'Obvious' Slippery Slope*, BL (Oct. 8, 2021, 8:03 AM), <https://news.bloomberglaw.com/ip-law/patents-and-artificial-intelligence-an-obvious-slippery-slope> [<https://perma.cc/6EJK-M2XT>]; Fraser, *supra* note 99, at 318.

163. Bultman, *supra* note 162.

164. *Id.*

165. Fraser, *supra* note 99, at 317; Larry Hardesty, *Explained: Neural Networks*, MASS. INST. OF TECH. (Apr. 14, 2017), <https://news.mit.edu/2017/explained-neural-networks-deep-learning-0414> [<https://perma.cc/PY85-2RP7>]. ANNs "are a subset of machine learning and are at the heart of deep learning algorithms. Their name and structure are inspired by the human brain, mimicking the way that biological neurons signal to one another." *What Are Neural Networks?*, IBM, <https://www.ibm.com/topics/neural-networks> [<https://perma.cc/Z3EP-QZPT>].

166. Fraser, *supra* note 99, at 317.

167. Fraser, *supra* note 99, at 318; *see* Hardesty, *supra* note 165; *see* *What Are Neural Networks?*, *supra* note 165.

168. Fraser, *supra* note 99, at 318; *see* Hardesty, *supra* note 165; *see* *What Are Neural Networks?*, *supra* note 165.

169. Fraser, *supra* note 99, at 318; *see* Hardesty, *supra* note 165; *see* *What Are Neural Networks?*, *supra* note 165.

170. Fraser, *supra* note 99, at 318; *see* Hardesty, *supra* note 165; *see* *What Are Neural Networks?*, *supra* note 165.

innovative area of AI technology would significantly improve the health care and pharmaceutical industries, thus benefiting human health.<sup>171</sup>

ANNs contain “collections of binary switches that simulate neurons in a biological brain.”<sup>172</sup> The neurons contained within ANNs process data inputted by humans, and have several layers that process such data.<sup>173</sup> Essentially, as the data is processed through each of the ANN’s layers, the ANN will apply “weighting functions” to the data based on fine features that the network detects.<sup>174</sup> Further, the ANN will set weighting functions to data when “trained” in pattern recognition, enabling the network to spot any differences in the data and then respond accordingly.<sup>175</sup>

ANNs can be trained either supervised or unsupervised.<sup>176</sup> With supervision, these AI are provided with labelled data to learn from, whereas with unsupervised training, ANNs are able to interpret data that is not labelled on their own.<sup>177</sup> Once the ANN is trained, it feeds seed information into an input layer which applies different weights to the data, and the data is then passed on to another layer.<sup>178</sup> This process repeats until it reaches the final layer, where the data becomes transformed into output, which can then be utilized by a human.<sup>179</sup>

DABUS’s existence proves that ANNs can be used for more than just drug discovery.<sup>180</sup> The two inventions at issue in Thaler’s case are known as the “fractal container” and the “neural flame.”<sup>181</sup> The fractal container is “[a] container for use, for example, for beverages, has a wall with and external surface and an internal wall of substantially uniform

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171. Fraser, *supra* note 99, at 318; see Hardesty, *supra* note 165; see *What Are Neural Networks?*, *supra* note 165.

172. Fraser, *supra* note 99, at 317; see Hardesty, *supra* note 165; see *What Are Neural Networks?*, *supra* note 165.

173. Fraser, *supra* note 99, at 317; see Hardesty, *supra* note 165; see *What Are Neural Networks?*, *supra* note 165.

174. Fraser, *supra* note 99, at 317; see Hardesty, *supra* note 165; see *What Are Neural Networks?*, *supra* note 165.

175. Fraser, *supra* note 99, at 317; see Hardesty, *supra* note 165; see *What Are Neural Networks?*, *supra* note 165.

176. Fraser, *supra* note 99, at 317; see Hardesty, *supra* note 165; see *What Are Neural Networks?*, *supra* note 165.

177. Fraser, *supra* note 99, at 317 see Hardesty, *supra* note 165; see *What Are Neural Networks?*, *supra* note 165.

178. Fraser, *supra* note 99, at 317; see Hardesty, *supra* note 165; see *What Are Neural Networks?*, *supra* note 165.

179. Fraser, *supra* note 99, at 317; see Hardesty, *supra* note 165; see *What Are Neural Networks?*, *supra* note 165.

180. Fraser, *supra* note 99, at 317; see Hardesty, *supra* note 165; see *What Are Neural Networks?*, *supra* note 165.

181. *Patents and Applications*, ARTIFICIAL INVENTOR, <https://artificialinventor.com/patent-applications/> [<https://perma.cc/UH7E-UXGL>].

thickness.”<sup>182</sup> The neural flame is a device in which “a neural flame emitted from at least one controllable light source as a result of the lacunar pulse train is adapted to serve as a uniquely—identifiable signal beacon over potentially—competing attention sources by selectively triggering human or artificial anomaly-detection filters, thereby attracting enhanced attention.”<sup>183</sup> In order to create these inventions, DABUS utilizes two ANNs; one of the ANNs generates the output, and then the other ANN determines value within the output based on criteria that is set by a person operating the machine.<sup>184</sup> Accordingly, the ANN that determines the value of the output modifies disturbances in the ANN that generates the output, which thus optimizes the process, making the final output more useful or meaningful.<sup>185</sup>

### 3. Genetic Programming

Another form of invention-generating AI technology is known as genetic programming (GP).<sup>186</sup> The GP algorithm serves to solve high-level issues, and it does this “by improving upon a set of candidate solutions of known performance.”<sup>187</sup> Essentially, GP creates solutions to problems in a manner similar to biological evolution, applying various functions to a given problem.<sup>188</sup> The algorithm repeats the problem-solving process until it “reproduces” a solution or meets a “termination criteria,” which a human operator specifies the parameters of.<sup>189</sup> Although human operators have some level of input in this process, such as determination of the termination criteria, there is rarely human intervention while the problem-solving process takes place.<sup>190</sup> While GP will not usually massively contribute to the inventive process, these algorithms can be utilized in notable ways, and have been used by NASA for the creation of the antenna for miniature satellites.<sup>191</sup>

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182. *Id.* The fractal container is primarily used for storing food or beverages. *See id.*

183. *Id.* Essentially, the neural flame is utilized as a flare. *See id.*

184. Fraser, *supra* note 99, at 317; *see* Hardesty, *supra* note 165; *see* *What Are Neural Networks?*, *supra* note 165.

185. Fraser, *supra* note 99, at 317; *see* Hardesty, *supra* note 165; *see* *What Are Neural Networks?*, *supra* note 165.

186. Fraser, *supra* note 99, at 316; *Genetic Programming*, DEEPAI, <https://deepai.org/machine-learning-glossary-and-terms/genetic-programming>; *About Genetic Programming*, GENETIC PROGRAMMING, <https://geneticprogramming.com/> [<https://perma.cc/4AN3-6777>].

187. Fraser, *supra* note 99, at 316.

188. Fraser, *supra* note 99, at 316; *Genetic Programming*, *supra* note 186; *About Genetic Programming*, *supra* note 186.

189. Fraser, *supra* note 99, at 316; *Genetic Programming*, *supra* note 186.

190. Fraser, *supra* note 99, at 316.

191. *Id.* at 316–17.



Even though AI technology is fairly advanced currently, human input and ingenuity is still required in order to properly utilize AI in the invention process.<sup>192</sup> However, although AI has assisted with the inventive process in regard to patents for decades, this area of technology is rapidly advancing.<sup>193</sup> AI algorithms are faster and more efficient than their human counterparts in the invention process, making significant and complex technological advancements more common.<sup>194</sup>

Due to the recent technological advancements and the increased rate of such advancements in this area, AI will become crucial in regards to innovation in areas such as “electronics, robotics, health and pharmaceuticals, materials, and nanotechnology.”<sup>195</sup> The field is growing quickly; there have been significant increases in venture capital investments for this AI technology in addition to of big tech companies apportioning research budgets to the area.<sup>196</sup> As such, patented inventions created by AI like DABUS should be encouraged by allowing AI to be credited for their own inventions, thus promoting technological innovation, ultimately serving a greater utilitarian purpose for society. In the future, there are bound to be others like Stephen Thaler that would not want intellectual credit for inventions that were not their direct brainchild. Thus, a patent system that allows AI to receive credit for their inventions would incentivize inventors like Thaler to apply for these patents.

#### B. *Adopting International Patent Law Policies*

Though Stephen Thaler has been unsuccessful in every country aside from South Africa,<sup>197</sup> it is worthwhile to examine international patent laws and the reasoning of international courts in these cases, using these laws and holdings as comparison tools to the U.S. Although the U.K. courts struck down Thaler’s patent applications because an inventor, or the “actual deviser,” may only be a natural person, there is an argument to be made that DABUS should be given inventorship credit under the U.K.’s Patents Act 1977.<sup>198</sup> As discussed in Part II, according to precedent, the actual deviser is a natural person that must have conceptualized the invention.<sup>199</sup> Though not a natural person, it logically follows that in the

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192. *Id.* at 315.

193. *Id.*

194. *Id.*

195. *Id.*

196. *Id.* at 323.

197. Naidoo, *supra* note 88.

198. Thaler v. Comptroller General of Patents Trade Marks and Designs [2021] EWCA (Civ) 1374 [51] (Eng.); *UK: Patents Artificial Intelligence Machine Cannot Be Inventor*, *supra* note 131.

199. Thaler v. Comptroller General of Patents Trade Marks and Designs [2021] EWCA (Civ) 1374 [51] (Eng.); *UK: Patents Artificial Intelligence Machine Cannot Be Inventor*, *supra* note 131; *see discussion supra* Part II.

case of Thaler's patent applications, DABUS was clearly the "actual deviser" of both inventions, as the machine in fact conceptualized each invention.<sup>200</sup>

The U.K. courts, similar to U.S. courts, failed to appropriately consider the public policy considerations here and used outdated precedent that should be changed accordingly. For fairness purposes, Congress could theoretically adopt the language of the U.K.'s Patents Act 1977, allowing the "actual deviser" of an invention to be given inventorship credit.<sup>201</sup> Naturally, this would be accompanied by the caveat that the scope of "actual deviser" be expanded beyond the scope of merely natural persons to include AI machines.

Australia's patent system is supported by the country's Patents Act 1990.<sup>202</sup> The Patents Act 1990 states that a "person" may be granted patent if they are: (a) the inventor, (b) "would, on the grant of a patent for the invention, be entitled to have the patent assigned to the person," (c) "derives title to the invention from the inventor or a person mentioned in paragraph (b)," or, (d) "is the legal representative of a deceased person mentioned in paragraph (a), (b) or (c)."<sup>203</sup> If the U.S. legislature adopted this language, an AI such as DABUS could be considered the inventor under section (a), and DABUS would be given inventorship credit according to this statutory language.<sup>204</sup> Then, under section (b), the owner of the AI, which in this case is Stephen Thaler, would be the assignee of the patent.<sup>205</sup> Ultimately, in this scenario, DABUS would be given inventorship credit, and Thaler would retain any and all legal benefits and detriments attached to the patents.<sup>206</sup>

Though there has been no judicial review of DABUS's approved patent applications in South Africa, the country has its own Patents Act.<sup>207</sup> The South African Patents Act of 1978 states that "[a]n application for a patent in respect of an invention may be made by the inventor or by any other person acquiring from him the right to apply or by both such inventor and such other person."<sup>208</sup> This statutory language is similar to patent laws of other countries such as the U.S.<sup>209</sup> As such, the U.S. Patent Act would not benefit or change significantly from adopting South African patent law language.

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200. See Bhavsar-Jog, *supra* note 160.

201. The Patents Act 1977, c. 37, § 7 (Eng.).

202. *Patents Act 1990* (Cth) (Austl.).

203. *Id.*

204. See *id.*

205. See *id.*

206. See *id.*

207. See Naidoo, *supra* note 88; Patents Act 57 of 1978 (S. Afr.).

208. Patents Act 57 of 1978 (S. Afr.).

209. See *id.*; see also The Patent Act, 35 U.S.C. §§ 1–390.

In addition to the possible international patent legislation language that Congress could utilize to amend the Patent Act, there are several opinions by international courts in Thaler's cases that should be taken into consideration by U.S. courts. In the U.K.'s High Court decision, Lord Justice Birss dissented, arguing that DABUS was the actual creator of the inventions, and that the applications should still be granted.<sup>210</sup> This is a point that the U.S. courts failed to consider; Thaler did not actually invent the patented creations here—DABUS did.<sup>211</sup> As the British Lord Justice argues, because of this, Thaler's patent applications should be approved.<sup>212</sup>

Lastly, the Federal Court of Australia originally reversed the Australian patent office's rejection of Thaler's applications for several reasons.<sup>213</sup> First, the court reasoned that an "inventor" can either be a thing that invents or a person.<sup>214</sup> Second, the court held that in a situation such as Thaler's, it is illogical to conclude that Thaler or a human in Thaler's position could be considered the inventor of these creations.<sup>215</sup> Lastly, the court concluded that there was nothing in Australia's Patents Act 1990 that explicitly precluded the decision to grant an AI inventorship credit.<sup>216</sup> The court reasoned that denying AI inventorship credit would directly contradict the country's goal of promoting technological innovation.<sup>217</sup> These points are public policy arguments that the U.S. courts have thus far failed to properly consider, and should consider immediately. As such, Thaler's case should be reexamined by considering this rationale and should be overturned accordingly.

### C. Corporations, The Patent Act, and Proposed Legislation

As established in Subpart A, AI technology is advancing rapidly, thus making Thaler's arguments in favor of AI inventorship ripe for the legislature to incorporate into the Patent Act. Because the issue of AI inventorship is becoming more prevalent, and the problem cannot be

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210. Thaler v. Comptroller General of Patents Trade Marks and Designs [2021] EWCA (Civ) 1374 [97] (Lord Justice Birss) (Eng.); Holmes, *supra* note 88.

211. Bhavsar-Jog, *supra* note 160.

212. Thaler v. Comptroller General of Patents Trade Marks and Designs [2021] EWCA (Civ) 1374 [98] (Lord Justice Birss) (Eng.); see Holmes, *supra* note 88.

213. Thaler v Commissioner of Patents [2021] FCA 879 (30 July 2021) (Austl.); see Bhavsar-Jog, *supra* note 160.

214. Thaler v Commissioner of Patents [2021] FCA 879, [10] (30 July 2021) (Austl.); Bhavsar-Jog, *supra* note 160.

215. Thaler v Commissioner of Patents [2021] FCA 879, [10] (30 July 2021) (Austl.); see also Bhavsar-Jog, *supra* note 160.

216. Thaler v Commissioner of Patents [2021] FCA 879, [10] (30 July 2021) (Austl.); see also Bhavsar-Jog, *supra* note 160.

217. Thaler v Commissioner of Patents [2021] FCA 879, [122] (30 July 2021) (Austl.); Horton & Kim, *supra* note 88.

solved as things currently stand in the U.S., Congress should consider either amending the Patent Act or passing new legislation to address the public policy considerations discussed above. One avenue for Congress to permit AI machines to possess inventorship rights would be to grant the machines limited legal personhood rights.<sup>218</sup> Alternatively, if Congress does not take action to allow AI machines to be considered inventors, U.S. courts should simply interpret the Patent Act in a manner that includes non-humans, such as DABUS, in the statutory definition of “inventor.”

In the event that AI are granted inventorship rights, Congress must consider passing legislation to address several issues that could arise. This legislation could include an avenue for human inventors to set up a trust for their AI’s inventions, as well as granting the inventors beneficial tax treatment for profits earned from the AI’s inventions to encourage technological innovation. Ideally, these tax benefits would be for the person who reaps the economic benefits of the AI’s invention. The point of this tax scheme is that it incentivizes people to give AI proper inventorship credit. Finally, if AI machines gain inventorship rights for patents, then the courts should establish a framework to determine whether the AI should be granted credit in a legal dispute on a case-by-case basis.

### 1. Legal Personhood

Corporate personhood is a doctrine that grants corporations legal rights, and it further states that corporations are separate from the people that form them.<sup>219</sup> The U.S. Supreme Court has determined that corporations “must exist by means of a natural person.”<sup>220</sup> Over time, corporate personhood protections and rights have expanded.<sup>221</sup> Protections and rights of a legal person that have been granted to corporations include the right to political speech protection, the right of religious freedom, and the right to contract and to be bound by contracts that the corporation enters into.<sup>222</sup>

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218. Millamena, *supra* note 149, at 299.

219. Bank of the U.S. v. Deveaux, 9 U.S. 61, 65 (1809). As they were not considered American citizens or legal persons and were not protected by the Constitution, enslaved people could not hold patents for many years. See Shontavia Jackson Johnson, *The Colorblind Patent System and Black Inventors*, A.B.A., [https://www.americanbar.org/groups/intellectual\\_property\\_law/publications/landslide/2018-19/march-april/colorblind-patent-system-black-inventors/](https://www.americanbar.org/groups/intellectual_property_law/publications/landslide/2018-19/march-april/colorblind-patent-system-black-inventors/) [https://perma.cc/99UD-LC94]. However, this Note will not address the moral implications of AI as a legal person in this manner.

220. See Thomas F. Cocchi, Jr., “Corporations Are People, My Friend:” *The Merits of the Expansion of Corporate First Amendment Rights in the Modern Era*, 17 DUQ. BUS. L. J. 25, 26 (2015).

221. Briana Hopes, Note, *Rights for Robots? U.S. Courts and Patent Offices Must Consider Recognizing Artificial Intelligence Systems as Patent Inventors*, 23 TUL. J. TECH. & INTELL. PROP. 119, 132 (2021).

222. *Id.*

In addition to the right to contract, freedom of speech, and the right to religious freedom, corporations retain some intellectual property rights.<sup>223</sup> Corporations may own patents; however, corporations cannot be considered an “inventor” under the Patent Act.<sup>224</sup> However, there is a distinction between AI machines and corporations; AI such as DABUS actually contribute to the inventive process, unlike corporations. Corporations are merely entities that are “separate in identity from the natural persons who form them.”<sup>225</sup> Corporations cannot devise new ideas, but AI machines can. Thus, AI could be granted limited legal personhood status that is distinct from that of a corporation, such as the right to be listed as an inventor of a patent.<sup>226</sup> However, this legal personhood status should not be an all-encompassing grant of rights.<sup>227</sup> For example, AI have no capability or need to enter into a contract at this moment in time, nor can they speak or practice religion. As such, they should not be granted these same rights that have been previously granted to corporations.

## 2. Reinterpreting the Patent Act

An alternative solution to the AI inventorship issue would be for the courts to re-interpret the Patent Act’s language. Under the Patent Act, an individual is required to submit a statement on the patent application that they believe themselves to be the “original inventor” or an “original joint inventor” of the invention.<sup>228</sup> Further, if such an individual is unable to submit this statement due to legal incapacity, then a substitute statement may be submitted on the original inventor’s behalf.<sup>229</sup> Common uses of the term “legal incapacity” include “[a] lack of physical or mental/cognitive ability that results in a person’s inability to manage their own personal care, property, or finances” in addition to “[a] lack of ability to understand one’s actions when making a will or other legal document.”<sup>230</sup>

Given that AI machines lack physical and mental ability, courts should determine that, under the Patent Act, the original inventor of the AI would be considered the declarant for the purposes of the

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223. *Id.*

224. *See* *Beech Aircraft Corp. v. EDO Corp.*, 990 F.2d 1237, 1248 (Fed. Cir. 1993); *see also* *MBO Lab’ys, Inc. v. Becton, Dickinson & Co.*, 602 F.3d 1306, 1309 n.1 (Fed. Cir. 2010) (reasoning that “individuals, not corporations, create inventions”).

225. *Hopes*, *supra* note 221, at 132.

226. *Millamena*, *supra* note 149, at 299.

227. *Id.*

228. 35 U.S.C. § 115(b).

229. 35 U.S.C. § 115(d).

230. *Incapacity*, CORNELL L. SCH., <https://www.law.cornell.edu/wex/incapacity> [<https://perma.cc/U36P-RWXZ>].

application.<sup>231</sup> Further, the AI that invented the creation would be considered the original inventor of the claimed invention.<sup>232</sup> Additionally, based on the examples of legal incapacity, the inventor of the AI would be permitted to submit a substitute statement on behalf of the AI.<sup>233</sup> For example, AI machines are unable to create a will or any other legal document.<sup>234</sup> In summation, because an AI would be considered legally incapacitated, the creator of the AI could submit the application on the machine's behalf, while also retaining inventorship credit for the AI.<sup>235</sup>

In addition to the incapacity argument, an inventor of a creation-generating AI could list the AI as a joint inventor on a patent application.<sup>236</sup> This would be a simple compromise to a convoluted problem; the human would receive credit for their AI creating something on its own, and the actual inventor, the AI, also gets its due credit. Of course, in this scenario, the AI would merely receive inventorship credit, and the human inventor would both retain legal liability and reap the economic benefits stemming from the invention. This may be the most equitable solution, as the Patent Act states that an "inventor" is an individual that "invented or discovered the subject matter of the invention."<sup>237</sup> Clearly, in the case of DABUS, Stephen Thaler did not discover the subject matter of the patented inventions in question.<sup>238</sup> As such, courts should interpret the Patent Act to award AI like DABUS at least joint inventorship credit. This solution would neither unfairly prejudice the true inventor of an invention, nor would it create any sort of unnecessary burden on the patent system.

### 3. New Legislation for Patents

An AI machine has no use for the economic benefits of its creations, nor could it be held legally liable for damages that its inventions cause. Thus, if the creator of such an AI chose to give the AI intellectual credit for its invention on the patent application, the creator would be required to set up a trust for the AI, retaining all legal liability and economic benefits in place of the machine. As such, if an AI-generated invention injures a person, then the injured party could sue the AI's trustee. Consequently, the trustee would be susceptible to any claims on the assets

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231. See Millamena, *supra* note 152, at 299–300; see *Incapacity*, *supra* note 230; see 35 U.S.C. § 115(b).

232. Millamena, *supra* note 149, at 302.

233. See *id.* at 300; see 35 U.S.C. § 115(d).

234. See *Incapacity*, *supra* note 230.

235. Millamena, *supra* note 149, at 299–302.

236. 35 U.S.C. § 116.

237. 35 U.S.C. § 100(f).

238. Bhavsar-Jog, *supra* note 160.

of the trust in this scenario.<sup>239</sup> In the alternative, if the AI has a claim against another person or entity, the trustee would then be able to pursue a cause of action against that person or entity. In this scenario, the owner of the AI would step into the shoes of the AI as the inventor of the invention. Consequently, the owner would be the representative of the AI in a hypothetical lawsuit for patent infringement. Thus, an AI would have standing to sue another party if such a party injures the AI.

The current liability system was designed at a time when humans caused injuries, and when a human causes an injury, it is easily traceable back to them.<sup>240</sup> However, regarding AI, injuries may happen without human intervention or input.<sup>241</sup> Without a proper liability system in place for AI-generated inventions, it could discourage people from utilizing such AI technology.<sup>242</sup> Ultimately, the trustee inventor or owner of the AI should retain liability and be susceptible to claims stemming from the AI's inventions.<sup>243</sup> Currently, there is no need for an AI to reap the economic benefits of their patented inventions. Because AI are not sentient, their patents would need to be assigned to a human in some form, and this would likely be the most effective way to do so.<sup>244</sup> Finally, the trustee inventor would need to appoint a successor trustee<sup>245</sup> to prevent any confusion or disruption in probate courts.

Another consideration regarding the economics of such AI patents is the tax implications. A beneficial tax treatment strategy would be to tax the profits generated from these inventions at a lower rate to encourage AI-tech advancements, thus potentially increasing technological innovation overall. Inventors of these AI would be further encouraged to improve this area of technology, leading to advancements in AI technology. Taxing these inventions at a lower rate could discourage individuals from coming up with their own inventions, thus potentially limiting innovation on an individual level. However, even if the individual is hypothetically discouraged from inventing on their own, the societal benefits of technological advancements of machines such as

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239. The complexities of the potential problems regarding liability of these trusts if they are created as asset protection trusts or have spendthrift clauses are beyond the scope of this Note.

240. George Maliha & Ravi B. Parikh, *Who Is Liable When AI Kills?*, SCI. AM. (June 29, 2022), <https://www.scientificamerican.com/article/who-is-liable-when-ai-kills/> [https://perma.cc/P7GT-WZBP].

241. *Id.*

242. *Id.*

243. This issue could be a Note topic by itself. However, the complexities of this issue, such the implications of a scenario where such an AI trust exists as an asset protection trust, will not be discussed in further detail in this Note.

244. See Rauch, *supra* note 152.

245. *Successor Trustee*, CORNELL L. SCH., [https://www.law.cornell.edu/wex/successor\\_trustee](https://www.law.cornell.edu/wex/successor_trustee) [https://perma.cc/EN4Y-FNX6].

ANNs, rather than more controversial AI writing assistants such as GPT, outweigh this drawback.<sup>246</sup>

Finally, if Congress amends the Patent Act to grant AI inventorship rights, or if the courts interpret the Patent Act to include AI under the definition of “inventor,” a framework should be established in the case of AI inventorship being questioned in a court of law. This framework would mainly consider the amount of human input that was required in the invention process, and how much the AI actually contributed to the process.<sup>247</sup> If the finder of fact determines that the AI contributed to the majority of the invention process, then the AI could be given inventorship credit. The finder of fact would determine the meaning of “contribution” in this context on a case-by-case basis. In the alternative, if the AI contributed to less than half of the invention process or if the machine required a significant amount of manual input by the human inventor, then the machine would receive no intellectual credit for the patented invention.<sup>248</sup> Lastly, Congress could simply provide AI such as DABUS with sui generis protection, creating an entirely separate classification for these machines altogether, instead of trying to meld AI-generated inventions into the current system.<sup>249</sup> Regardless of the avenue that Congress decides to take to fix it, this issue must be resolved by the legislature or the courts.

#### CONCLUSION

AI machines should be given inventorship credit for their own creations. Because of the rapid present and future advancements in AI technology such as ANNs and GP algorithms, the court in *Thaler v. Hirshfeld* incorrectly sidestepped the public policy implications of Stephen Thaler’s attempts to secure inventorship rights for AI machines.<sup>250</sup> This is a pressing and ever-changing issue. The courts should respond accordingly if given the opportunity, and Congress should amend the Patent Act to include AI machines as inventors. Under the revised Patent Act, creators of machines such as DABUS should be given the option to credit the AI machine fully or jointly for its own inventions. The owner of the AI would retain any legal liability and reap economic benefits of the machine’s inventions by forming a trust for the AI. Our world will continue to change significantly, and the American legal

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246. Fraser, *supra* note 99, at 317; see Dzieza, *supra* note 153.

247. Cf. Ning, *supra* note 28, at 442.

248. *Id.*

249. Trevor F. Ward, *DABUS, an Artificial Intelligence Machine, Invented Something New and Useful, but the USPTO Is Not Buying It*, 75 ME. L. REV. 71, 91 (2023). The legal definition of “sui generis” is “an independent legal classification.” *Sui Generis*, CORNELL L. SCH., [https://www.law.cornell.edu/wex/sui\\_generis](https://www.law.cornell.edu/wex/sui_generis) [<https://perma.cc/383D-DWWW>].

250. *Thaler v. Hirshfeld*, 558 F. Supp. 3d 238, 249 (E.D. Va. 2021).



system should evolve along with technology accordingly, or else society risks being left behind. Ultimately, this issue will need to be re-examined periodically as AI technology advances. The proposals in this Note are not a fix-all to this complex issue. However, legislatures and courts must address the AI inventorship conundrum as soon as possible.