

Goodmans^{LLP} Update

Can an Artificial Intelligence System be an Inventor?

As artificial intelligence (AI) increases in prominence, it is unsurprising patent offices around the globe are pondering the question of inventorship. According to the European Patent Office (EPO) and the UK Intellectual Property Office (UKIPO), an AI system cannot be an inventor. The EPO and UKIPO have recently rejected two patent applications that sought to designate an AI system as the named inventor. Aligned with the EPO and UKIPO's approach, human inventorship is necessary for patent protection in the US and Canada.

Patents currently exist in Canada, the US and elsewhere where the human owners of AI-generated inventions are named as inventors.¹ However, under existing patent law systems, and at least for now, the global consensus is that AI is a tool used by human inventors but AI is not, in itself, an inventor. Initially these protections were put in place to avoid corporations being named as inventors. However, this may change in the not-too-distant future. In economic terms, investments in research and development tend to favour predictability as to the boundaries of one's patent protection and there has been an expressed desire to accelerate AI research and development and protect AI inventions.

EPO and UKIPO's Refusal of DABUS Patent Applications

The EPO recently published its grounds² for refusing two patent applications, [EP 18 275 163](#) (“**163 patent application**”) and [EP 18 275 174](#) (“**174 patent application**”), that designated an AI system as the inventor.

Both applications were filed by one applicant on behalf of an AI system known as “DABUS”³, created by Stephen Thaler. The applicant is part of a group known as the [Artificial Inventor Project](#), which seeks to obtain intellectual property rights for owners of AI for any AI-generated inventions.

The 163 patent application is directed to a food container with walls that provide for fractal designs on the interior and exterior surfaces, and with pits and bulges along its profile that allow multiple containers to be coupled more tightly. The food container has robotic arms to handle the containers more easily. The 174 patent application is directed to devices and methods for attracting enhanced attention that comprise producing pulses of light at a frequency determined by fractal rhythms that make it hard to ignore. Both patent applications were filed in the fall of 2018, but no inventor was named.

Since the time they were filed with the EPO, the two patent applications have sparked a number of discussions on whether the present patent system is outdated. In the fall of 2019, a spokesperson for the EPO

¹ Stephen Thaler, the applicant of the two patent applications discussed further below, is the inventor of such patents. See for example, US Patent No. 5,852,815, “Neural Network Based Prototyping System and Method” (https://worldwide.espacenet.com/publicationDetails/originalDocument?CC=US&NR=5852815A&KC=A&FT=D&ND=3&date=19981222&DB=&locale=en_EP#) and Canadian Patent No. 2,243,120, “Neural Network Based Data Examining System and Method” (https://brevets-patents.ic.gc.ca/opic-cipo/cpd/eng/patent/2243120/summary.html?type=number_search&tabs1Index=tabs1_1)

² EP 18 275 1163 Decision:
<https://register.epo.org/application?documentId=E4B63SD62191498&number=EP18275163&lng=en&npl=false>

EP 18 275 174 Decision:
<https://register.epo.org/application?documentId=E4B630B12076498&number=EP18275174&lng=en&npl=false>

³DABUS stands for “Device for the Autonomous Bootstrapping of Unified Sentience”.

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indicated there was a “global consensus that an inventor can only be a person who makes a contribution to the invention’s conception in the form of devising an idea or a plan in the mind”, but that the matter was complex.⁴

During the prosecution of the two patent applications, the applicant maintained that the machine “identified the novelty on its own idea before a natural person did” and argued that the applicant acquired rights to the patents from DABUS by being its successor in title and owner. As such, the applicant was assigned any intellectual property rights created by DABUS.

In rejecting the applications, the EPO considered the legal framework under the EU patent system for whether an inventor must be a natural person. The EPO concluded that a machine cannot be an inventor and, therefore, the applications were contrary to the requirements of Article 81 and Rule 19(1) of the European Patent Convention (EPC), which prescribe the designation of at least one inventor. Providing names to machines is insufficient to meet these requirements. The EPO concluded that this determination is consistent with the legislative history for the term “inventor” under the EPC, and that this understanding of the inventor as necessarily being a natural person is an internationally accepted standard by various national courts that considered the issue.

The EPO also indicated that the designation of an inventor in a patent application is mandatory and is a formal requirement with legal consequences. In particular, there must be assurances that the named inventor is a person who can have rights from which he or she can derive a benefit and that can be exercised. Thus, for a named inventor to have the legal capacity to benefit from, and to exercise, the rights owing to him or her, the inventor must have a legal personality: AI systems do not.

The EPO decisions to refuse the patent applications are subject to appeal to the Boards of Appeal.

The DABUS patent applications were also filed with the UKIPO. In the UK, a “person” is required for inventorship. The DABUS patent applications prompted the UKIPO to update its “Formalities Manual” for patent examiners in October 2019, by adding “An AI inventor is not acceptable as this does not identify ‘a person’”.⁵

In December 2019, the UKIPO refused the DABUS applications on the basis that a machine was not a natural person and, therefore, could not be regarded as an inventor.⁶ Furthermore, since DABUS has no legal personality or independent rights to the inventions, it was not clear how the applicant derived its rights to the inventions. There is no law in the UK that allows the transfer of ownership from a machine inventor, which is incapable of holding property, to the applicant of a patent application.

In its final observations, the UKIPO recognized that the present patent system does not “cater for such inventions and it was never anticipated that it would, but times have changed and technology has moved on”. The hearing officer encouraged debate and potential changes in the law.

The UKIPO decision has been appealed by the applicant.

Inventorship in the US and Canada

The US Code defines “inventor” as an “individual”⁷ and states that only a “person shall be entitled to a patent”⁸. This has been understood to mean that only natural persons can be named as inventors.

⁴BBC News: “AI system ‘should be recognized as inventor’” by Leo Kelion dated August 1, 2019: <https://www.bbc.com/news/technology-49191645>

⁵UKIPO’s Formalities Manual, s. 3.05: <https://www.gov.uk/guidance/formalities-manual-online-version/chapter-3-the-inventor>

⁶UKIPO decision dated December 4, 2019 re GB1816909.4 and GB1818161.0: <https://www.ipo.gov.uk/p-challenge-decision-results/o74119.pdf>

⁷35 U.S. Code § 100: <https://www.law.cornell.edu/uscode/text/35/100>

⁸35 U.S. Code § 102: <https://www.law.cornell.edu/uscode/text/35/102>

In April 2018, during the Senate Committee on the Judiciary, United States Patent and Trademark Office (USPTO) Director Andrei Iancu expressed his view that AI algorithms that are the result of human ingenuity are “very different” from mathematical equations that simply represent naturally occurring phenomenon, and are, thus, the subject of patent protection.⁹ Following his comments, the USPTO held an event titled “Artificial Intelligence: Intellectual Property Policy Considerations”.¹⁰ The issues discussed included how AI-related inventions can be protected and the challenges that face inventors and rights holders.

In August 2019, the USPTO asked for comments on how AI-related patent applications are to be treated, including who or what can qualify as an inventor and who owns AI-created inventions.¹¹ No updates with respect to the comments has yet been published.

In Canada, any human individual contributing to the conception and reduction to practice of an invention claimed in a patent application is deemed an inventor. Subsection 27(1) of the Patent Act provides that a patent shall be granted to “the inventor or the inventor’s legal representative” if all other requirements for the issuance of a patent are met. The term “legal representative” is defined in the *Patent Act* to include, among other things, heirs and executors, but “inventor” is not defined. The Supreme Court in *Apotex Inc. v. Wellcome Foundation Ltd.* interpreted “inventor” to mean “the person or persons who conceived of” the invention;¹² the ultimate question being, “who is responsible for the inventive concept?”. Accordingly, an inventor in Canada must be a “person”.

The Future of Inventorship

Current patent systems are not equipped to handle inventions that are created by AI systems with very little to no human intervention. The question of whether an AI system or machine can be a “person” who is an inventor or co-inventor has yet to be squarely addressed in the US or Canada, and it remains unclear whether a machine has the legal capacity to own or assign property. While the EPO and UKIPO have refused patent applications that do not name natural persons as inventors, the UKIPO and the USPTO have expressed a desire for potential changes. Such a debate is inevitable in Canada.

Should the definition of “inventor” be expanded to include AI and machines, it would have far-reaching implications beyond patent law, to copyright, civil liability and data protection, and it will also have significant economic repercussions, including not only the economic value of owning patent-protected AI technologies, but also possibly incentivizing the push for AI.

For further information related to patents and inventorship, please contact the author or any member of our [Litigation Group](#).

All Updates are available at www.goodmans.ca. This Update is intended to provide general comment only and should not be relied upon as legal advice.
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⁹See starting at 32:50 and 1:03:00 – USPTO Director Andrei Iancu’s testimony on the “Oversight of the U.S. Patent and Trademark Office”: <https://www.judiciary.senate.gov/meetings/oversight-of-the-us-patent-and-trademark-office>

¹⁰USPTO, “Artificial Intelligence: Intellectual Property Policy Considerations”: <https://www.uspto.gov/about-us/events/artificial-intelligence-intellectual-property-policy-considerations>

¹¹USPTO, Federal Register dated August 27, 2019: <https://www.federalregister.gov/documents/2019/08/27/2019-18443/request-for-comments-on-patenting-artificial-intelligence-inventions>. Comments closed on October 11, 2019.

¹²See *Apotex Inc. v. Wellcome Foundation Ltd.*, 2002 SCC 77 at para. 96: <https://www.canlii.org/en/ca/scc/doc/2002/2002scc77/2002scc77.html#par96>