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Artificial Intelligence Inventions Are Patentable Under U.S. Patent Law, Even if Artificial Intelligence Cannot Be an Inventor

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In *Thaler v. Vidal*,[1] the U.S. Court of Appeals for the Federal Circuit affirmed that only natural persons (i.e., human beings) can be named inventors on U.S. patents, thereby excluding artificial intelligence (AI) from being listed as an inventor per se. Most courts around the world have ruled similarly.

PATENTABILITY

But this does not mean that AI inventions, including inventions developed with AI as a tool and inventions directed to AI subject matters, are not patentable. To the contrary, according to the U.S. Patent & Trademark Office's (USPTO's) October 2020 Public Views on Artificial Intelligence and Intellectual Property Policy Report (2020 Report),[2] academics and practitioners generally agree that AI can represent a subset of computer-implemented technology that can be a subject matter of an invention or used to assist with other inventions.[3] Current stakeholders generally agree that the U.S. laws are calibrated to address AI inventions.[4]

In fact, U.S. inventorship law is well-positioned to handle AI-assisted inventions on a fact-specific case-by-case basis, according to a majority consensus of policymakers.[5] Currently, an AI system's work is driven by a human researcher/inventor. Regardless of whether an AI system is used as a tool to develop an invention, consideration of activities by a natural person that would ordinarily qualify as conception of the invention should be unaffected by such use.[6]

For example, in AI-based drug discovery, AI may help to identify promising compounds, but human input is still required to develop syntheses of the compounds and then test compounds in vitro. By analogy, therapeutic antibody discovery proceeds by inducing an immune response to an antigen in exposed animals or cells, thereby producing antibodies that are subsequently optimized by human research scientists who are named as the inventors; no attempt has been made to confer inventorship to an animal or cell line exposed to an antigen.

Natural person(s) also can be named as inventors of AI inventions for the natural person(s)' contributions where the contributions include designing AI algorithms, implementing hardware to enhance an algorithm, applying methods of preparing inputs for an algorithm, or developing an AI system.[7] For now, patent applications should not rely solely on AI programs as inventors. Rather, inventorship should be

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predicated upon the human inventive acts that are using AI as tools.

Inventions directed to AI subject matters have been examined at the U.S. Patent and Trademark Office (USPTO) and issued as patents for many years already. For example, the number of U.S. patent applications for AI-based chemical inventions more than doubled from 2009 to 2019, and issued U.S. patents in the same subject area more than tripled during the same time period. Currently, AI-related inventions typically encompass advances in the AI architecture, computational techniques, hardware/material components, and specific uses of AI.

DISCLOSURE

No unique disclosure requirements currently exist for a patent application claiming an AI-based invention, and practitioners should refer to the principles in the USPTO's examiner training materials for computer-implemented inventions.[8] The training materials are as applicable to AI-related inventions as to conventional algorithmic inventions. Written description support for an AI-based invention generally requires sufficient disclosure of at least an algorithm and computer hardware. Further, the description should detail the AI process, including how the AI process is used, and how the AI improves an overall technical process or solves a technical problem. If an inventive aspect includes training an AI process or using a trained AI software, examples of training data sets input into an AI module, how the AI module processes and transform the input, and the data output by the AI process should each be described. The figures should illustrate the hardware and include flowcharts for the AI process to accompany the specification discussion. With respect to enablement, the commercial value of most current AI systems is predicated on the predictable behavior of the systems in practical applications.[9] Therefore, the patent applications should include an enabling description of the AI inventions taking into consideration the degree to which the inventions are considered no more inherently unpredictable than the underlying AI algorithms.[10]

Claims covering AI inventions need not be treated any differently than other computer-implemented inventions currently examined by the USPTO, and practitioners should consult the January 2019 Section 112 Guidance covering examination of computer-implemented inventions when preparing claims to AI inventions. However, patent drafters should focus on avoiding patent eligibility rejections, by ensuring that claims fall within a statutory category of patentable subject matter[11] and striving to meet the two-part *Alice* eligibility test.[12] AI inventions have a greater likelihood of being found patentable if claims are directed to how AI is architecturally integrated into a system, the sources of data used as input for an AI system, how AI is distinguishable from other systems, or particular operations within an AI system. By contrast, claims reciting building and testing the use of AI or running an AI algorithm on data are more challenging to qualify as patentable subject matter.[13]

KEY TAKEAWAYS

- AI inventions have been examined and issued as U.S. patents for many years.
- Current U.S. patent inventorship law remains capable of addressing inventions incorporating AI.
- The *Alice* test persists as a viable standard for assessing the eligibility of patent claims directed to AI inventions.

Notes

1. Thaler v. Vidal, 43 F.4th 1207 (Fed. Cir. 2022).
2. https://www.uspto.gov/sites/default/files/documents/USPTO_AI-Report_2020-10-07.pdf.
3. 2020 Report, at iii.
4. 2020 Report, at iii.
5. 2020 Report, at 3.
6. 2020 Report, at 5.
7. 2020 Report, at 2.
8. https://www.uspto.gov/video/cbt/exmcmptrimpfnctclmlmt/index.html.
9. 2020 Report, at 11.
10. 2020 Report, at 11.
11. https://www.law.cornell.edu/uscode/text/35/101.
12. https://supreme.justia.com/cases/federal/us/573/208/.
13. 2020 Report, at 3.