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New Developments Help Clarify Intersection of Patent Law and Artificial Intelligence

Two recent developments, one in the U.S. and one in the U.K., have shed further light on the intersection of patent law and artificial intelligence (AI), particularly with respect to whether AI-generated inventions can be patented.

USPTO Guidance

In February 2024, the U.S. Patent and Trademark Office (USPTO or Office) published new guidance on the patent inventorship analysis for AI-assisted inventions.[1] The guidance provides that "while AI-assisted inventions are not categorically unpatentable, the inventorship analysis should focus on human contributions, as patents function to incentivize and reward human ingenuity." To that end, the guidance focuses on whether a natural person provided a "significant contribution" to the invention, despite using an AI system in connection with the invention process. Although not legally binding, the guidance offers inventors, patent law practitioners and other stakeholders a framework for anticipating how the USPTO will consider patent applications where AI played a role and for understanding their continued obligations before the Office.

Background

The USPTO issued the guidance pursuant to the October 2023 Biden administration "Executive Order on the Safe, Secure, and Trustworthy Development and Use of Artificial Intelligence" (Executive Order). Section 5.2(c)(i) of the Executive Order instructed the USPTO to issue guidance "addressing inventorship and the use of AI" and to provide "illustrative examples" of how AI can factor into the inventorship process and how such examples should be analyzed.

Prior to this guidance, the Federal Circuit recognized that there was an open question of whether inventions made by human beings with the assistance of AI were patent eligible. Specifically, in *Thaler v. Vidal,* 43 F.4th 1207, 1211 (Fed. Cir. 2022), the Federal Circuit commented that it was not confronting "the question of whether inventions made by human beings with the *assistance* of AI are eligible for patent protection." There, the Federal Circuit reviewed the USPTO's denial of petitions to name an AI system as an inventor and held that "only a natural person can be an inventor, so AI cannot be." The Federal Circuit reasoned that 35 U.S.C. 100(f) defines "inventor" as "the *individual* or, if a joint invention, the *individuals* collectively who invented or discovered the subject matter of the invention." Under Supreme Court precedent, "individual" means human

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[1] *See* "Inventorship Guidance for AI-Assisted Inventions," February 13, 2024; *see also* the USPTO's supporting PowerPoint presentation, March 5, 2024.

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beings unless there is some indication that Congress intended otherwise.[2] The Federal Circuit found no such indication; to the contrary, it found that the Patent Act supports the conclusion that "individual" refers to human beings.

While an AI system cannot be listed as an inventor on a patent application, the USPTO guidance instructs that a natural person's use of AI in the inventive process does not preclude the invention from patentability "if the natural person(s) contributed significantly to the claimed invention."

In addressing what constitutes a "significant contribution," the guidance discusses the factors articulated in *Pannu v. Iolab Corp.*, 155 F.3d 1344, 1351 (Fed. Cir. 1998), to assess human inventorship, which state that each inventor must:

1. contribute in some significant manner to the conception or reduction to practice of the invention

2. make a contribution to the claimed invention that is not insignificant in quality, when that contribution is measured against the dimension of the full invention, and

3. do more than merely explain to the real inventors well-known concepts and/or the current state of the art.

According to the guidance, a natural person who utilizes AI assistance in the inventive process must meet the significant contribution standards specified by *Pannu*. Moreover, the guidance notes that while one inventor need not contribute to every claim in a patent or application, each claim must have been invented by at least one inventor. In other words, a human inventor must have significantly contributed to each claim in the patent. As such, in an application involving one or more human inventors assisted by artificial intelligence, the *Pannu* factors must be applied to each claim to ensure that each one of the human inventors made a significant contribution to each. The guidance cautions that "applicants should take extra care" to make sure of this "[g]iven the increasing use of AI systems in the invention creation process."

The USPTO sets forth five guiding principles to assist applicants in determining whether an inventor's contribution was significant:

- First, using AI does not negate a person's contributions as an inventor. This means that the mere use of AI in the invention process does not automatically preclude patent protection.

- Second, merely presenting a problem to an AI system is generally not enough for a natural person to be considered the "inventor" of the output. However, significant contribution can be found in the prompt construction process, particularly where the person constructs the prompt in view of a specific problem to elicit a particular solution from the AI system.

- Notably, this differs from the Copyright Office's position that a natural person's entry of prompts into an AI system, even if the prompts are themselves creative and honed through an iterative process, is generally insufficient creative work for the natural person to claim they are the author of the generated output.[3]

- Third, mere reduction of an invention to practice is not a significant contribution that rises to the level of inventorship. As such, one cannot simply take the output of an AI system, the utility of which is apparent to those of ordinary skill in the art, and claim inventorship. However, a person can be a proper inventor if they make a significant contribution to the output of an AI system to create an invention.

- Fourth, a person who develops "an essential building block from which the claimed invention is derived" may have provided a "significant contribution" even if they do not participate in each step of the invention. As such, one who builds an AI system for a specific purpose can be considered the inventor of the output that results from applying the system to that purpose where the designing, building or training of the AI system is a significant contribution to the invention created with the AI system.

- Fifth, merely owning or overseeing an AI system does not qualify a person as an inventor unless they also provided a significant contribution to the conception of the invention. This principle clarifies that a person's mere ownership or development of an AI system used in the creation of an invention does not, standing alone, make that person an inventor.

The thread running through all these principles is the requirement for active participation of the human inventor, distinguishable from the operation of the AI system.

Along with this guidance, the USPTO has posted two sets of instructive examples further demonstrating how these principles apply in hypothetical scenarios.[4] In one example, a human, claiming to be an inventor, used an AI-generated schematic to build a "transaxle" but then built that invention using materials not specified in the AI-generated schematic. Applying the third guiding principle, the USPTO noted that the human is not the "inventor" as she has merely reduced the output of the AI to practice. The USPTO also explained that the fact that the human used a different but common material was not a "significant contribution" under the first Pannu factor. In contrast, in a different scenario offered by the USPTO, the human inventors did make significant contributions to the transaxle invention and then asked the AI system for manufacturing suggestions. The AI system suggested aluminum, and the human

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[2] *Mohamad v. Palestinian Auth.*, 566 U.S. 449, 455 (2012)

[3] See our March 16, 2023, client alert "Copyright Office Issues Guidance on AI-Generated Works, Stressing Human Authorship Requirement."

[4] Note that the second set of examples relates to use of an AI system in developing novel drug compounds to treat cancer and is likely to be of particular interest to companies in the life sciences industry.

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inventors included a claim that incorporated by reference the claim for which they were properly inventors but specified "the casing is made out of aluminum." The USPTO noted that the use of AI for this manufacturing suggestion did not negate their substantial contribution.

The guidance goes on to explain that it is applicable to plant and design patents as well as utility patents. It further discusses *Thaler* and concludes that an AI system cannot be listed as a joint or co-inventor either. Finally, the guidance notes that it does not change the duties of disclosure and reasonable inquiry owed to the USPTO but offers instruction on how these apply in the relatively novel context of AI-assisted invention.

UK Supreme Court Decision on Whether an AI System Can Be an Inventor

The U.K. Supreme Court also recently addressed the patentability of inventions created by an AI system. The plaintiff, Dr. Stephen Thaler, has so far been unsuccessful in his attempts to have an AI machine he created, DABUS, listed as the creator of a copyrighted work in the U.S. or the inventor of a patent in the U.S., Europe or Australia.[5]

The U.K. case concerned two 2018 patent applications submitted by Dr. Thaler, one for a food and beverage container and one for an emergency light. In each case, Dr. Thaler's application made clear there was no human inventor but contended that he was entitled to patent protection as the owner of the DABUS AI machine. Dr. Thaler's filing was rejected by the U.K. Intellectual Property Office, the Patents Court and the Court of Appeals, in each case for the same reasons: Dr. Thaler had not named a natural person as the inventor as required under the U.K. Patents Act 1977, and he had failed to establish his right to apply for, let alone be granted, the two patents at issue.

The Supreme Court agreed, holding that it was clear from numerous sections of the Patents Act 1977 that an inventor must be a natural person, and since DABUS was a machine, it could not be the inventor. The court acknowledged that the result might be different if Dr. Thaler had used DABUS as a "highly sophisticated tool" to enhance his own work.

The court also rejected Dr. Thaler's theory that the inventions were "the fruits of" the DABUS machine and that since he developed DABUS, he was entitled to ownership under the doctrine of accession. According to the court, this doctrine only applies to new tangible property produced by existing tangible property. Here, however, the issue was not tangible property but rather "concepts for new and non-obvious devices and methods, and descriptions of ways to put them to into practice."

The Supreme Court noted that it was not opining on the broader questions as to whether technical advances generated by AI should be patentable or whether the meaning of the term "inventor" should be expanded to include AI systems. The court stated that these were policy questions beyond the scope of Dr. Thaler's appeal and that needed to take into account the balance between the awarding of a monopoly (under a patent grant) and the benefits to the public from disclosure of the invention.

Takeaways

While the USPTO has acknowledged that it expects AI usage to play an increased role in the inventive process, it has made clear that in the U.S., inventorship will continue to focus on substantial contributions by natural persons. The decision by the U.K. Supreme Court in *Thaler* highlights that, for now, other countries are taking a similar approach.

The application of the *Pannu* factors in conjunction with the AI-specific principles laid out in the USPTO guidance gives inventors and practitioners a solid framework against which they can measure inventor contribution. However, in the context of patent examination or litigation, the analysis will be done on a case-by-case and claim-by-claim basis. And even with this guidance, disputes are expected as to whether there was sufficient human contribution any time an AI system was used in connection with the invention process. The USPTO will accept comments on the guidance until May 13, 2024, which may lead the Office to further clarify its stance. Additionally, the USPTO will be holding a public symposium on artificial intelligence and intellectual property on March 27, 2024.

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[5] *Thaler v. Comptroller-General of Patents, Designs and Trade Marks*, Judgment dated December 20, 2023.