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PERSPECTIVE

## USPTO cannot handle ‘artificial inventors.’ Now what?

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For some, the concept of artificial intelligence systems that design, develop, or construct novel inventions without human input may sound like part of the plot of a sci-fi blockbuster coming soon to a theatre near you. But “artificial inventors,” as they are called, are not some far-off hypothetical. They exist in the here and now and will continue to proliferate for a number of reasons: Artificial inventors have essentially unlimited processing power and storage capacity, so they can achieve results not humanly possibly; and even when results are humanly possible, artificial inventors can sometimes reach the results more quickly or more cheaply.

In our article last year, “Can the US Patent Office handle ‘artificial inventors?’” (Sept. 30, 2019), we pointed out that the current patent statutes in the United States allow only human inventors. Despite the clarity of the patent statutes, an applicant filed an application that listed only an artificial inventor called “DABUS.” See U.S. Patent Application No. 16/524,350, filed at the United States Patent Office on July 29, 2019. In an unsurprising decision by the USPTO on April 20, 2020, the office pointed out the language in many patent statutes and decisions of the U.S. Court of Appeals for the Federal Circuit that require human inventors. Because the application had no human inventors, the application was denied, regardless of the novelty

of the claimed invention. To date, patent offices around the world have reached the same conclusion with their own patent laws.

Because current patent laws do not allow artificial inventors, we address two questions: (1) What can we do right now if a development process includes artificial inventors? And (2) in what ways could U.S. patent law evolve to allow artificial inventors?

### What can we do now if we have artificial inventors?

When development includes artificial inventors, *create an inventive process that includes at least one*

ample, consider a life sciences scenario where there are millions or billions of potential molecules that might work to perform a specific function. An AI system may be able to sift through the huge number of options to identify a small number of good quality candidate molecules (*e.g.*, less than 10). If one or more human inventors then evaluate the small number of candidates and/or set up live animal tests, the human inventors can be listed on a patent application. Such a process optimizes the AI system to evaluate more options than humanly possible while keeping people in the inventive process.

set a good starting point can have a significant impact on the final result. In other cases, human-selected design parameters can limit the materials, structures or processes based on knowledge about what is desired. In some cases, such design parameters can mean the difference between a problem that is tractable versus a problem with exponential complexity that exceeds even the best available computer technology. In these ways, humans can provide a significant contribution to an invention, even with an AI system that does some heavy lifting.

### In what ways can patent law evolve to allow artificial inventors?

The proper way to frame the question of artificial inventors is to look at the constitutional and legislative goal “to promote the Progress of Science and useful Arts.” See U.S. Constitution, Article I, Section 8, Clause 8 and 35 U.S.C. Section 200. Because AI systems extend the inventive power of corporations (*e.g.*, searching for COVID-19 treatments and vaccines), inventions created by artificial inventors fall squarely within the realm of what the patent system is intended to achieve.

We suggested a first adaption in our earlier article. This adaptation allows a human surrogate to sign assignment and declaration documents on behalf of an artificial inventor. Like current declarations, the human surrogate is subject to criminal penalties for perjury. In particular, the human surrogate must declare that the artificial inventor did not take or acquire the invention from any external source.

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*non-trivial human inventor.* That is, even if an artificial intelligence system has a substantial role in the inventive process, make sure to include at least one person who can be identified as an inventor when filing a patent application. For ex-

Another important role for human inventiveness is setting the design parameters for the AI system. In some cases, the AI system needs starting parameters, and the AI system evolves an optimal design. In this case, having a human

The human surrogate must be sufficiently knowledgeable about the artificial inventor to make a meaningful declaration. Placing such a burden on a human surrogate would create an incentive for AI platform developers to make their systems transparent. Because inventions by AI will occur (and potentially in a very big way over time), an incentive to create transparency is preferable to ignoring the issue or attempting to deny the reality of AI inventors.

A second adaptation is to replace “person having ordinary skill in the art [PHOSITA]” with “ordinary skill in the art [OSITA],” which is relevant to analysis under both 35 U.S.C. Section 103 and 35 U.S.C. Section 112. The standard of skill in the art inherently evolves as available tools improve, so evolving the standard further to accommodate artificial inventors is not a radical change.

Ordinary skill in the art should be based on both human inventors

and artificial inventors. In many cases, the inventive strengths of artificial inventors are different from human inventors. For example, an AI system with lots of processing power can evaluate millions of options to identify good solutions. Defining OSITA in such a case would be based on artificial inventors, not human inventors, because humans could not do that. On the other hand, humans probably still have the upper hand at creative combinations of unexpected elements.

In cases where artificial inventors compete directly with human inventors, defining OSITA should be based on both. The patent system should not apply a lower standard for human inventors if artificial inventors could easily do the same thing.

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