



Patentability of AI Inventions

By

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Abstract :

As AI becomes a bigger part of the way new ideas and inventions develop, it's changing how we think about the creative process — especially when it comes to who should be recognized for those ideas. This paper looks at how patent laws are changing, or sometimes having a hard time keeping up, with the growth of inventions made by AI, especially when no people are directly involved in creating those inventions¹.

Basically, the main idea is that many legal systems still think only people can be true inventors.

Cases like the DABUS applications are really starting to challenge that idea.

Looking at how countries like those in the European Union, the U.S., and India are dealing with these issues, the paper points out both legal problems and practical challenges they face.

It also takes another look at the classic rules for getting a patent—things like being new, having some invention step, and being useful for industry—considering how AI can scan huge amounts of data, spot patterns, and even imitate how humans think.

This paper looks at what it means to be a "skilled person" in patent law now, especially with AI involved. It also considers if we should have tighter rules for sharing how AI contributes to creativity when applying for patents.

People are suggesting ideas like raising the bar for what's considered a real invention and making laws around the world more in sync.

The main point of the paper is that we should keep humans responsible for decisions, but at the same time, we need to recognize how AI is changing the way we innovate in big ways.

Keywords:

Artificial Intelligence, Patent Law, Human Inventorship, DABUS, Inventive Step, Intellectual Property, AI Disclosure, Patentability, International Harmonization, Patent Flooding.

¹ WIPO, *Technology Trends 2019: Artificial Intelligence*, World Intellectual Property Organization, available at <https://www.wipo.int/publications/en/details.jsp?id=4386> (last visited May 23, 2025).

1. Introduction

Artificial intelligence (AI) is rapidly transforming numerous industries, especially in the field of technology development. AI can simply be explained as the simulation of human intelligence in machines that are designed to make decisions, learn, and reason². The range of AI technologies includes rule-based systems and advanced machine learning and deep learning models, which are able to perform such activities as language processing, data analysis, pattern recognition, and autonomous control.

While AI systems become more capable of generating solutions independently that can be considered innovative, several questions arise about the patentability standards and the fundamental requirement of human authorship. This paper aims to discuss the fundamental legal and practical challenges raised by inventions created by AI, clarifying the evolving standards of patentability and the controversial question of inventorship.

The discussion examines critically the tacit presupposition that inventions are the result of human ingenuity, a necessity both in theoretical critique and in standard legal demands. In the discussion of these questions, we examine significant case studies, with particular emphasis on the DABUS experiments, and examine global viewpoints, specifically within the context of European patent law, USPTO legislation, and corresponding discussions on legal personality in artificial intelligence. Artificial intelligence (AI) is rapidly transforming numerous industries, especially in the field of technology development. AI can simply be explained as the simulation of human intelligence in machines that are designed to make decisions, learn, and reason. The range of AI technologies includes rule-based systems and advanced machine learning and deep learning models, which are able to perform such activities as language processing, data analysis, pattern recognition, and autonomous control.

2. Patentability criteria for AI inventions

Patentability is still one of the most important means of encouraging protection of innovation and research and development. The essential patentability requirements for inventions have long been novelty, inventive step (or non-obviousness), and industrial applicability. For inventions developed by AI, these requirements need to be reassessed for a number of reasons:

² *Guidelines for Examination in the European Patent Office*, Part G – Patentability, EPO, available at <https://www.epo.org/law-practice/legal-texts/guidelines.html> (last visited May 23, 2025).

A. Novelty and Inventive Step.

Originality of inventions created by artificial intelligences can be a function of the processes employed by advanced algorithms that can efficiently sort through large amounts of prior art. As an example, when an algorithm employs inherent indeterminacy or utilizes multiple data sources, the resulting output can satisfy the novelty requirement. But if the same algorithm generates similar output for repeated use, it will fail the novelty requirement. Likewise, assessment of the inventive step is classically done by determining if or not the invention would be obvious to a person skilled in the subject matter. As AI systems continue to become stronger to overcome human ability for searching and synthesizing pertinent literature and making connections, it may be necessary to reframe the degree of what amounts to an inventive step³.

B. Industrial Applicability.

Along with novelty and inventive step examination, an invention should also be useful in a specific industrial sector. Artificial Intelligence inventions, whether in civilian applications—like personalized medicine or industrial automation—or defense applications, must ultimately be able to be translated into physical products or processes with commercial or social benefits.

C. Implied Requirement of Human Inventorship.

In classical patent juridical systems, it is assumed that the inventor is human. This *de facto* condition is even upheld in the patentability criteria. European patent law⁴, for instance, assumes that there must be a human inventor who can prove that the invention is made by human creativity and ingenuity. Therefore, despite the growing autonomy of AI in the development of inventive ideas, such inventions are bound to be seriously challenged if they are not provided with the necessary human creative contribution.

3 .Legal Framework and Human Inventorship

³ USPTO, *Decision on Petition: In re Application of Stephen Thaler*, Application No. 16/524,350 (April 27, 2020).

4 *European Patent Convention* (1973), Art. 81 and Rule 19

4.1 Legal Assumptions of Human Inventorship

The unstated presumption of the majority of patent legislations, particularly those of Europe and the United States, is that inventorship is a human-exclusive activity. European patent legislation incorporates the human inventorship requirement explicitly or implicitly into its legislative framework. The European Patent Convention (EPC) and global conventions function on the assumption that inventions arise due to extraordinary human ingenuity. In these perspectives, human inventorship is essential not merely for establishing the existence of an invention but also establishing its inventive step⁵.

The underlying legal rationale for anticipating human authorship is:

- **Human Ingenuity and Intervention:** For a creation to be patentable, it has to be the result of human intellectual effort and ingenuity.
- **Formal Patent Requirements:** The name, address, and personal identification of the inventor requirement is to ensure that the system of patents assigns rights to human beings. In cases such as DABUS, where an AI was named as the inventor, patent offices have rejected the application on the basis of failure to identify a natural person.
- **Procedural Barriers:** Inability to identify a human inventor creates a procedural barrier to conducting substantive analysis and results in rejection of patent applications.

4.2 International Perspectives and Case Law

In the United Kingdom, the British Intellectual Property Office (IPO) acknowledged that an artificial intelligence system, like DABUS, can invent; however, statutory requirements for a human inventor led to the denial of the patent application. Similarly, the United States Patent and Trademark Office (USPTO) has claimed that invention is fundamentally a cognitive process—an activity that can only be attributed to humans,

which can be identified by the use of personal pronouns like "himself" or "herself" in legal briefs. Judicial bodies have continued to assert the idea that the legal notion of the inventive process has to be rooted in human cognition and not machine independence.

European institutions, being aware of the technical feasibility of AI, adhere to human inventorship in both the formal rules as well as the underlying substantive legal philosophies. This position stresses not only procedural conditions but also wider theoretical underpinnings relating to the nature of innovation itself.

^{3 5} *European Patent Convention (1973), Art. 81 and Rule 19, available at <https://www.epo.org/law-practice/legal-texts/epc.html> (last visited May 23, 2025).*

4. Case Studies and Jurisdictional Comparisons

4.1 The DABUS Case: A Landmark Debate

Among the most significant developments in recent years was the DABUS case. In the case, artificial intelligence software known as DABUS was named as the inventor in patent applications made across different jurisdictions. The case brought into context the tension between technological innovation and the legal requirement of human inventorship. The major implications are:

- European Patent Office (EPO): The EPO had refused the DABUS applications on grounds of impossibility to fulfill statutory and formal conditions, i.e., to give the surname of the inventor, first name, and physical address where the inventor is an artificial intelligence⁶.
- The United Kingdom initial public offering announced that relevant law provided that an inventor should be a natural person and hence ruled out the possibility of DABUS being a legal inventor.
- United States: USPTO rulings reiterated that invention as a mental process of creativity cannot be attributed to an entity that does not possess human personality or consciousness.
- India: Although there is no direct case law where Indian courts mentioned AI as an inventor, *Ferid Allani v. Union of India* (2019) is still the closest precedent for AI patentability. Indian law is still based on human inventorship, and software/algorithms are granted patents only if they reflect a technical contribution. At present, AI cannot be attributed as an inventor in India, but the legal situation can change as technology and global pressure keep evolving.

^{5 6} EPO, *Press Release on DABUS Decision*, 2020, available at <https://www.epo.org/news-events/news/2020/20200128.html> (last visited May 23, 2025).

5. Challenges in assessing inventiveness in the age of AI:

5.1 Redefining the Notion of the “Skilled Person”:

One of the key challenges in determining patentability in contemporary scenarios is defining a person skilled in the relevant art. In the classical approach, this hypothetical individual is presumed to possess the knowledge and experience of the concerned field. With the advent of AI systems that can contribute significantly to creative endeavors, a number of problems are raised:

Enhanced Abilities: Artificial Intelligence is able to understand enormous amounts of data, combine multiple sources, and reconcile different bodies of knowledge. It renders it unclear to determine whether an invention would be obvious to someone who is skilled in the art and now employs such technological tools⁷.

Setting a Higher Standard for Creativity: The higher computational capability and insight that artificial intelligence offers could necessitate a new threshold for assessing non-obviousness. Therefore, assuming that every inventor will be employing AI tools, the underlying test for assessing inventive steps might need to be reexamined to include these innovative features.

5.2 Disclosure Requirements and Transparency

To counter the challenges brought about by AI's use in invention creation, various proposals have been made:

- **Compulsory Disclosure:** The patent filers should be required to analyze the degree to which AI systems were utilized in the inventive process. This should entail marking the steps that were automated or supported by AI, and the way in which human creative activity engaged with these systems.
- **Transparency as a Gatekeeping Mechanism:** This type of disclosure can serve as an obligatory check to ensure that the resulting invention will still be a product of human creativity, whereby artificial intelligence involvement does not interfere with the causal link between human input and the final inventive outcome⁸.

5.3 Patent Floods and Market Impact

AI's ability to produce so many inventions with little human interaction also creates concerns regarding patent floods—a condition where so many patent applications would flood patent offices and perhaps crush good innovation. Concerns are:

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^{5 7} Graham Dutfield, “Artificial Intelligence and the Person Skilled in the Art,” (2022) *Journal of World Intellectual Property* 25(1).

- **Quality over Quantity:** Too many patents can decrease the overall quality of the protected inventions, thus diluting the incentive for truly original and non-obvious inventions.
- **Market Competition:** Protection that is too broad, or conversely, too diluted patent rights can disturb market equilibriums. Policymakers must balance amending protection durations or raising levels of inventiveness to create a balanced innovation environment.

- Economic Impacts: Patent thickets can arise, preventing new entrants and obstructing subsequent technological progress. Avoidance of such effects must be a fine balance between protecting innovation and competitive markets⁹.

6. Proposed reforms and disclosure requirements

6.1 Adjusting Formal Patent Requirements

One of the most important suggested changes is the requirement for patent applicants to disclose the specific extent and nature of artificial intelligence involvement in the invention-making process. This would include:

- Thorough Documentation: The applicants should give a correct depiction of the technical challenge overcome, the function played by artificial intelligence in recognizing and creating the solution, as well as the actions taken by human creators to organize, guide, or enhance the outcome. The depiction may be incorporated in the technical description section of the patent application pursuant to established procedures, for instance, Rule 42¹⁰.
- Verification Mechanisms: Patent offices must create stringent mechanisms to evaluate disclosures for AI interaction. This can involve additional documentation or audits to ensure that the invention is actually the result of collaborative human-AI interaction and that human creative endeavors are predominant.

6.2 Raising the Standards of Inventiveness

To ensure that the increase in patents created by artificial intelligence doesn't stifle innovation, the following steps are being considered:

⁸ WIPO, *Disclosure Requirements for AI-Generated Inventions*, 2020.

⁹ Colleen Chien, "Patent Assertion Entities," (2013) *Texas Law Review* 91(2): 283–366.

¹⁰ *Guidelines for Examination in the European Patent Office*, Rule 42, EPO.

- Increased Levels of Inventiveness: The arrival of AI-assisted invention may establish a higher threshold for assessing an inventive step¹¹. That is, taking into consideration the increased computer power at the disposal of the "person skilled in the art" towards ensuring the resultant inventions were not the results of advanced data processing facilities.
- Periodic Review and Dynamic Criteria: Given the fast pace of technological changes, it is important that patent law is reviewed periodically and updated to match contemporary developments and industry practices. Dynamic criteria of patentability can be employed to manage the balance between encouraging AI-generated inventions and upholding stringent standards of novelty and usefulness.

6.3 Enhancing International Harmonization

Since various jurisdictions have handled AI inventorship differently, there is an increasingly apparent need for international harmonization:

- Global Norms for AI Inventions: Having uniform rules in place that ensure AI's involvement is publicly announced and rigorously tested can help to bring inventors on an equal footing across the globe. Harmonization will serve to reduce disparities between patent offices and give inventors and

applicants clearer directions as well¹².

- Cross-Jurisdictional Cooperation: Increased cooperation between international patent offices, along with dialogue among legal scholars and policymakers, can foster the development of a unified framework that balances innovation incentives with legal clarity.

^{6 11} European Parliament, *AI and IP Reform Recommendations*, 2020.

¹² G. Dinwoodie, "A Harmonized Patent System for the World," (2009) *Vanderbilt Journal of Transnational Law* 42(4): 1041–1082.

7. Policy implications and Innovation incentives

The intersection of patent law and artificial intelligence raises not only difficult legal questions but also engenders wide-ranging policy discussions about the best way to promote innovation and preserve competitive markets.

7.1 Balancing Innovation Incentives

Strong patent protection has a dual purpose: it incentivizes inventors and facilitates public disclosure of invention concepts. But with greater AI use:

- Promoting High-Quality Innovation: Patent rules that are too lax risk flooding the system with inferior-quality inventions, potentially ruining the high-quality incentive system. Extremely strict requirements, however, may exclude the entry of truly innovative technologies into the marketplace¹³.
- Economic equity in competition requires reform initiatives such as lengthening the term of patents or raising inventive step thresholds to consider the impact on mature companies as well as budding startups. The objective is to protect genuine innovation without creating monopoly hurdles.

7.2 Ethical and Normative Considerations

The AI inventorship controversies also resonate with longer-term ethical concerns:

- Accountability and Recognition: Issuance of patents to human inventors only is partially based on the premise of accountability. A human inventor is accountable for mistakes or exploitation, but assignment of rights and duties to an AI system creates a multitude of difficult problems of legal personality and accountability.
- Transparency and Trust: The obligation to report the contribution of artificial intelligence encourages transparency in the innovation process. Such greater transparency not only encourages public trust in technological advancement but also supports stronger patent examination practices, thus harmonizing with broader ethical standards on the responsible application of AI¹⁴.

^{7 13} Michael Burstein, "Rules for Patents, Standards, and Competition," (2010) *Hastings Law Journal* 61: 621.

¹⁴ Jane Ginsburg, "Author, Creator, Inventor: Human Agency and Intellectual Property," (2020) *Columbia Public Law Research Paper* No. 14-660.

8. Conclusion

Artificial intelligence, upon its entry into the creation of new ideas, presents a massive challenge to the patent system. Legal systems, hitherto requiring human authorship, are now faced with the reality that AI can play a pivotal role in determining patentable results.

- **Human Inventorship as a Cornerstone:**

The existing European and global patent systems implicitly demand that an invention is a product of human endeavor and creativity. The demand is taken from procedural requirements as well as deeper philosophical assumptions regarding intellectual property.

- **Artificial Intelligence and the Creative Process**

Although AI systems are capable of processing prior art at orders of magnitude higher than are accessible to humans, such contribution does not obviate the need for human touch. This does provide for ensuring the legal system imposes accountability and congruence with statutory provisions.

- **Case Study – DABUS:**

The case of DABUS is a classic instance of the complexities of attributing inventorship in the era of inventive concepts with the aid of AI. Across jurisdictions, the absence of a natural person as the inventor's name has led to the rejection of patent applications generated through AI, affirming the legal necessity of human inventorship.

- **Challenges to the Status Quo:**

The AI role also poses serious issues of redefining inventive step benchmark and the ability of the "person skilled in the art." Upkeeping patent standards with technology advancements will involve continuous adjustment and possibly a higher bar for determining inventiveness.

- **Recommended Changes:**

Reforms including mandatory disclosure of AI interaction, improved verification processes, and standardization of patent standards globally are called for. These actions would establish the limits of AI assistance without restricting patent protection to human creative output.

- **Policy Implications:**

Balancing the incentives to innovate with protection against patent floods and maintaining fair competition is of vital importance. By bringing in ethical considerations, responsibility, and transparency in proposals for change, policymakers can ensure a healthy and fair patent system.

Key Findings:

- Human inventorship remains a central element of the patentability determination process.
- AI-generated inventions challenge traditional patent systems, necessitating disclosure and inventive step examination reforms.
- World jurisdictions consistently deny AI as an inventor, emphasizing the necessity of a consistent approach in patent law.
- Proposed reforms are mandatory disclosure of AI contributions and increasing the standard for establishing non-obviousness.
- Policy interventions have to weigh the advantages of fast-paced innovation against the dangers of patent over-supply and monopolization of markets.

Briefly put, as artificial intelligence expands and becomes more involved in the process of innovation, it is imperative that legal frameworks adapt without compromising the inherent foundations of intellectual property rights. Ensuring the patent system remains human-effort-centered, but clearly defining AI inputs, is of utmost importance not only from a legal perspective but as a valuable approach towards creating responsible and sustainable innovation.