

Standing Committee on the Law of Patents

Thirty-Fifth Session
Geneva, October 16 to 20, 2023

SUMMARY OF DOCUMENT SCP/35/7: ARTIFICIAL INTELLIGENCE (AI) AND INVENTORSHIP

Document prepared by the Secretariat

INTRODUCTION

1. At its thirty-fourth session, held in Geneva from September 26 to 30, 2022, the Standing Committee on the Law of Patents (SCP) decided that the Secretariat would produce a compilation on how jurisdictions around the world address the issue of artificial intelligence (AI) inventorship, through jurisprudence, legislation and practice to be updated on a regular basis, and present it at the thirty-fifth session of the SCP (see document SCP/34/8 paragraph 25).
2. Consequently, the Annex to SCP/35/7 contains the said compilation of information for the Committee's discussion at its thirty-fifth session, which will be held in Geneva from October 16 to 20, 2023. This document constitutes a summary of that document. Due to the limited word count available for the summary, full references to court cases and citations are omitted from the summary.

ARTIFICIAL INTELLIGENCE: A BRIEF OVERVIEW AND UNDERLYING TECHNOLOGY

3. For the purposes of this document, artificial intelligence (AI) system shall be understood as learning systems, i.e., machines that can learn and through this, become better at tasks, which are typically performed by humans. Machine learning is the dominant AI technique. A brief introduction to machine learning, neural networks and deep learning is provided in document SCP/30/5.
4. More recently, generative AI models, which are machine learning models that are capable of "creating" new output data once trained, have attracted attention. They have been used not only for generating new texts, but also for e.g., designing new chemical compounds.

Nevertheless, only weak AI systems that require human interaction currently exist. It is also humans who evaluate the AI outputs, based on what the humans wish to achieve.

HUMAN-AI INTERACTION IN THE INVENTION PROCESS

5. With the rapid development of AI technology, a reflection about how this interaction between humans and AI tools could evolve, and whether AI would play a role that is beyond being a “tool” in the innovation process, has been taking place. For the consideration of inventorship, the interaction between humans and AI may take place in different ways, at least in theory. For example: (i) either one or more persons invent inventions; (ii) human inventors are assisted by AI tools; (iii) a human inventor and AI jointly create inventions; (iv) AI conceives inventions, while humans assist it; and (v) completely autonomous AI creates inventions.

6. Therefore, it seems necessary to look into the fundamental question: what is the notion behind the term “inventor” and how it is determined? Although both a factual legal inquiry (how the rules on inventorship under the current patent law is applied to AI inventions) and a policy question (what rules should be applied to AI inventions in the future) are important, document SCP/35/7 focuses on the first question, as a baseline to be clarified before any further analysis and debate.

HISTORY OF INVENTORSHIP

7. Between the 14th and 16th century, monarchs in Europe were granting privileges in the form of letters patent, often favoring the courts and royal supports. In 1623, the British Parliament enacted the Statute of Monopolies, which prohibited the granting of privileges by the Crown, apart from patents for the “first and true inventor” of a new manufacture.

8. The Statute of Monopoly saw patents as a “social contract” between the patentee and society that acknowledged the individual and its ingenuity. The idea that human ingenuity promotes progress of science and creation of useful inventions for society, for which natural law requires the granting of a reward in the form of an exclusive right to a specific person, rendered the inventor central to patent law.

INTERNATIONAL LEGAL FRAMEWORK RELATING TO INVENTORSHIP

9. Article 4^{ter} of the Paris Convention states that “[t]he inventor shall have the right to be mentioned as such in the patent.” The provision established moral rights of the inventor, entailing the right of recognition. The inventor may waive the right to be mentioned, unless national legislation prescribes otherwise. The issue of inventorship as such and how exactly the moral rights of the inventor may be exercised is a matter of national law, as the Paris Convention does not elaborate on these matters.

10. Under Article 4(1)(v) of the Patent Cooperation Treaty (PCT) and Rule 4.6 of the Regulations under the PCT, the request part of an international application shall indicate the name and address of the inventor(s). The names of natural persons shall be indicated by the person’s family name and given name(s), the family name being indicated before the given name(s) (PCT Rule 4.4(a)). As to the addresses, they shall satisfy the customary requirements for prompt post delivery at the indicated address (PCT Rule 4.4(c)). Legal consequences of failure to indicate in the request the name and other prescribed data concerning the inventor are provided in PCT Article 4(4). Furthermore, the international application may contain certain declarations with respect to the identity of the inventor, the applicant’s entitlement to a patent and the inventorship (PCT Rule 4.17). In accordance with Article 6(1) and (2) of the Patent Law Treaty (PLT), the requirements relating to form or contents of a PCT international application, including those relating to inventors, are incorporated by reference into the PLT.

11. The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement) itself does not contain a provision regarding inventorship. However, in accordance with Article 2.1 of the TRIPS Agreement, members of the World Trade Organization (WTO) shall implement, *inter alia*, Article 4^{ter} of the Paris Convention.

NATIONAL/REGIONAL LEGAL FRAMEWORKS RELATING TO INVENTORSHIP

Inventor's Right to a Patent

12. Inventorship is a “static” concept, i.e., once established, it does not change over time. It relates to the originator of the invention, focusing on identifying the person behind the conception of the invention. The concept of ownership of a patent differs from the concept of inventorship, as ownership relates to the *legal possession* over the invention. It is a dynamic concept, as patent rights may be assigned or transferred.

13. Yet under modern patent law, the concepts of inventorship and ownership are closely related. National/regional patent laws often stipulate that, in principle, “the right to a patent shall belong to the inventor or his successor in title”. In other words, in principle, once an invention is created, in the first place, it is the inventor of the invention who is entitled to claim the right to obtain a patent, and if obtained, to enjoy patent protection of the invention. An inventor may assign such a right to another person (i.e., a successor in title), who may be a natural person or a legal person. According to the Australian Patent Act, in addition to an inventor or an assignee, a patent may be granted to a person who derived title to the invention from the inventor or assignee, or the legal representative of a deceased person.

14. As the exceptions to the general principle, many national and regional laws provide a separate set of rules if an invention is made within the employer-employee relationship and/or a creation of an invention is commissioned. In addition, in some countries, specific rules may apply if inventions are made with the assistance of governments.

15. Some jurisdictions require that the inventor(s) submit(s) a formal statement, declaring that they believe that they are the inventor (or the joint inventor) of the claimed invention. In addition, if the inventor is not the applicant, many jurisdictions require the submission of a declaration or a document, showing the applicant’s entitlement to a patent.

Moral Rights

16. In implementing Article 4^{ter} of the Paris Convention, national laws provide rules on the moral rights of inventors, i.e., the right to be mentioned in a patent. Many national/regional laws stipulate that a transfer of moral rights is not possible, although an inventor may waive those rights.

Personhood of Inventors

17. Under patent law, protectable inventions need to meet the industrial applicability/utility requirement. Patentable inventions are often characterized as technical solutions to specific problems. Therefore, the notion of “inventions” under the patent law reflects humanity and societal needs. To that end, an inventor carries out a process that leads to an invention – recognizing a problem, searching for an answer, and identifying a solution.

18. In several jurisdictions, statutory provisions define inventors as “natural persons”, or secondary legislation explain the term “inventor” as a natural person.

19. Some countries rely on case law or a contextual reading of the term “inventor” to interpret that term. Many of those jurisdictions that have certain guidance on the interpretation of the term point out that an inventor has to be a natural person.

20. Beyond the policy justification of the patent system as a mechanism providing an incentive to innovate, the legislative provisions regarding the inventor's moral rights, the right to a patent being originated with the inventor, the option of assignment of the right to a patent from the inventor to a successor in title as well as the requirement to indicate the name of the inventor in a patent application (in the form of a given name and a surname) are often considered as important clues that lead to such an interpretation. Analysis on the personhood of inventors made by some national/regional IP Offices and courts are also found in the compilation of their decisions relating to the DABUS applications (see Section VI.B of document SCP/35/7).

Determination of an "Inventor"

21. Inventorship is established differently in each jurisdiction, but common themes exist. In general, an inventor makes a creative contribution to technological advancement, which results in an invention. Thus, it is generally accepted that persons who merely indicated a goal to be achieved, merely carried out execution tasks or routine work, merely coordinated research work or merely provided funds and facilities are not inventors.

22. For example, in the United States of America, according to established case law, a person must participate in the conception of the invention to qualify as an inventor. The term "conception" is understood as a mental process and further defined as the "completion of the mental part of the invention". The reduction to practice is *per se* irrelevant for determining an inventor.

23. The Patents Act of the United Kingdom defines an inventor as an "actual devisor of the invention". In determining inventorship, courts have held that one must first identify the inventive concept and then determine who devised that concept. The notion of the inventive concept has been developed by numerous cases. Similarly, in Australia, an "inventor" has been held a "person who makes or devises the process or product". It is a person who materially contributes to the inventive concept that is discerned from the whole of the specification.

24. In the patent laws of, e.g., China and the Czech Republic, an approach for establishing inventorship is found in the requirement of "creative activity" of the inventor. In Japan, it is generally accepted that the inventor must have actually contributed to the act of creation of the technical idea. In general, Japanese courts evaluate a person's substantive contribution to the "distinctive part" of the invention (those that overcome technical problems and produce the technical effects of the invention) within the process towards the "completion of the invention".

25. In France, a person is recognized as an inventor if he/she played an active or essential role at the stage of formalization, technical development, and finalization of the invention or in the analysis of the problem to be solved and the technical solution to be provided. Under German law, the act of creating the invention requires a creative contribution to finding the solution to a technical problem, whereby this needs to be examined by considering the entire invention protected by the patent. An invention is only complete if the teaching on which it is based, is technically executable, i.e., if the average person skilled in the art can work successfully according to the inventor's specifications.

Establishing Joint Inventorship

26. In general, the establishment of joint inventorship is guided by the considerations surrounding the determination of inventorship in general: who made what contribution to the invention. One US court referred to joint inventorship as "one of the muddiest concepts in the muddy metaphysics of patent law". The establishment of joint inventorship differs among jurisdictions.

27. The law of the United States of America indicates that some form of "working together" and "type of contribution" among the joint inventors is necessary. One of the examples of joint

behavior is a “collaboration or working under common direction, one inventor seeing a relevant report and building upon it or hearing another’s suggestion at a meeting”. Joint inventors must each contribute to the conception of the claimed subject matter.

28. In Germany, it is established that the standard for establishing co-inventorship covers the entire invention as described in the patent application, including the way in which it came about. Anyone who has made a sufficiently significant contribution to the invention is considered a joint inventor. The contribution of the co-inventor, however, does not need to be inventive itself.

29. According to case law in France, it is considered necessary to determine whether the person claiming the status of co-inventor has demonstrated, with regard to the claims of the filed patent, a creative contribution. Furthermore, any person, who played an active role within a team and intervened at the stage of formalization, technical development and finalization of the invention, was considered to be an inventor. Similarly, in Japan, the key concepts for the determination of the inventorship as indicated above, such as the substantive “contribution to the distinctive part” of the invention in the process of the “completion of the invention”, also apply to the determination of joint inventors.

30. With respect to co-ownership of a patent, jurisdictions across the world have found different approaches to fine-tune often conflicting interests of co-owners on the use of the patented invention, licensing, transfer of ownership, and enforcement of the patent. Approaches oscillate between positions that favor exploitation of the patents by the single co-owner and more cautious approaches that give the group of co-owners more control over the exploitation. Examples of some jurisdictions are provided in document SCP/35/7.

Employee Inventors

31. Patent law aims to strike a balance between the legitimate interest of the employee as the original inventor claiming inventorship, and the legitimate interest of the employer who provided the infrastructure, funding and often the collective experience and direction, on which the invention was built. Applicable laws of many countries generally address three scenarios: (i) an invention created in the course of the employment duty; (ii) an invention created outside the employment duty; and (iii) an invention created outside the employment duty, but the inventor used the infrastructure or fund for the creation of the invention. Document SCP/35/7 contains examples of approaches from some jurisdictions.

Legal Consequences of Inaccurate Designation of Inventors

32. If the applicant fails to provide the names of the inventors or indicates the wrong inventors (either in good faith or intentionally), there can be different consequences to the application and different kinds of remedies may be available, depending on the applicable law. Document SCP/35/7 illustrates different scenarios and provides information from some jurisdictions about the procedures for correcting inaccurate designation of inventors and legal consequences in case of non-compliance with the relevant requirements.

THE “DABUS CASE”

33. Two patent applications, which indicated the AI system “Device for the Autonomous Bootstrapping of Unified Science” (DABUS) as the name of the inventor, were filed by Stephen Thaler. The applications were initially filed with the European Patent Office (EPO) and the Intellectual Property Office of the United Kingdom (UKIPO) and reportedly, were subsequently filed in 15 additional jurisdictions. The International Bureau of the World Intellectual Property Organization (WIPO) received a PCT international application that indicated DABUS as the inventor (PCT/IB2019/057809).

34. Various IP Offices received one or more of these DABUS applications either via the PCT application entering in the national phases or by direct filing. The IP Offices that already processed the applications predominantly rejected them, on the grounds that the name of a natural person was not indicated as the name of the inventor. In many instances, the applicant appealed these decisions to courts.

35. Document SCP/35/7 outlined the decisions of IP Offices and courts (if available) from Australia, Brazil, Canada, Germany, India, New Zealand, the Republic of Korea, South Africa, the United Kingdom, the United States of America and the European Patent Office (EPO).

CONCEPT OF INVENTORSHIP IN RELATION TO AI INVENTIONS

36. Although it is generally believed that AI technology has not reached to the point where AI systems can autonomously create inventions, some scholars have advanced their thoughts on whether inventions created by AI should be protected under patent law, and if so, how it should be framed. Document SCP/35/7 provides a non-exhaustive overview of theories relating to patent protection of inventions created by AI.

37. In relation to the DABUS applications, IP Offices predominantly looked at the question as to whether indicating the AI system as an inventor on a patent application meets the formality requirement under the applicable law. Extended analysis carried out by some patent offices and courts, however, show that the question can touch upon much fundamental issues that have been the cornerstones of the modern patent law. These include:

- (i) the inventor's right to a patent (in principle), which may be assigned to a successor in title (issues relating to the lack of legal capacity of AI systems, establishment of a chain of title and ownership, compliance with the formality requirements, including declarations or statements on inventorship and the applicant's entitlement to a patent);
- (ii) moral rights of inventors (the rationale behind the moral rights of inventors and naming the inventor, and indication of the name of the inventors in a patent application);
- (iii) definition and interpretation of the terms "inventor" and "joint inventor" (the notion of "inventions" under patent law and an inventor being an originator of the invention, whether an inventor shall be a natural person, and qualification and determination of an "inventor" and a "joint inventor");
- (iv) inaccurate designation of an inventor, including usurpation (mechanisms to correct inaccurate designation of an inventor, legal consequences of non-submission or inaccurate designation of an inventor, including the cases where inventorship is falsely claimed by a third party, and possible remedies in case of usurpation).

As to various employee invention models under national laws, the lack of legal personality of AI systems would be a significant hurdle for applying these models.

38. The legal frameworks addressing these issues are naturally led by the rationale and policy objectives of the patent system, which are commonly described as promoting inventive activities and transfer of technology by setting a mechanism for providing incentives to innovate, protecting inventions and facilitating dissemination of new technological information and technologies. The policy and legal analysis of these intertwined issues in the context of the AI is beyond the scope of document SCP/35/7. However, the compilation of the national/regional law and decisions of patent offices and courts point more to certain issues than others, as indicated in the previous paragraph.

39. Interaction between a human and an AI system during the invention process may take different forms. That could be a reason why discussions on AI inventorship have already been started, even if humans continue to participate in the invention process. For example, multiple persons may be involved in the conception of an invention using an AI system, or both humans and an AI system might substantively contribute to the invention process.

40. Some countries have started stakeholder consultations that address the issues around intellectual property and AI, including the questions relating to inventorship. For example, the government of the United Kingdom sought evidence and views on a range of options relating to, *inter alia*, patent protection for AI-devised inventions. The government issued a consultation outcome paper entitled "Artificial Intelligence and Intellectual Property: Copyright and Patents: Government response to consultation". Similarly, the USPTO launched a request for public comments regarding artificial intelligence and inventorship, which contains a number of questions relating to the current state of AI technologies, contribution to the conception of an invention by non-humans and joint inventorship, ownership issues, and future directions on the matters relating to inventorship. In this regard, it also organized Listening Sessions on these issues, during which the USPTO presented hypothetical cases.

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