The Ownership of Invention Patent Rights for Generative Artificial Intelligence

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Abstract: With the development of computer technology, generative artificial intelligence technology has gradually matured. This has brought significant challenges to China's existing patent law. This article collates current patent law provisions, judicial decisions, and relevant doctrines in China and foreign jurisdictions. Under China's domestic patent law, there are four categories of patent ownership for inventions: ownership of non-service inventions, ownership of service inventions, ownership of commissioned inventions, and ownership of joint inventions. The two pre-dominant doctrines recognized in Chinese academia are the User Doctrine and the Investor Doctrine. Regarding foreign jurisdictions, this article examines patent ownership regulations in Japan, the United Kingdom, and the United States. In terms of judicial practice, the DABUS case serves as an entry point to explore whether AI systems can qualify as legal patent holders. Among foreign academic theories, the Investor Doctrine and User Doctrine also hold significant recognition.

1 INTRODUCTION

Artificial intelligence technology is defined through four dimensions: task execution, decision-making scheme formulation, predictive anticipation, and autonomous capability. It is conceptualized as a tangible capacity that mimics human-like abilities to perform real-world tasks and engage in communicative interactions (Homero, Manuel, Timilehin. 2024). In the contemporary era, alongside China's high-quality economic development and sustained advancement in technological capabilities, generative artificial intelligence (AI) technology has entered a phase of vigorous growth. This progress has catalyzed significant quantitative and qualitative leaps across industries. According to the Generative Artificial Intelligence Application Development Report, China has preliminarily established a comprehensive AI industrial ecosystem (CNNIC, 2024). Current statistics indicate that the number of related enterprises exceeds 4,500, with the core industry scale approaching 600 billion RMB. The industrial chain extensively covers upstream and downstream critical segments, including chips, algorithms, data, platforms, and applications, demonstrating robust momentum and immense developmental potential (CNNIC, 2024). The emergence of China's generative AI system Deepseek in 2025 marks the nation's successful entry into the AI era, with technological capabilities reaching world-leading levels. Deepseek's achievements underscore that computational efficiency, rather than sheer scale of computing power, plays a decisive role in AI advancement (Gibney, 2025). However, as generative AI continues to evolve, its learning and algorithmic capacities have achieved unprecedented enhancement, enabling widespread applications across domains. It not only assists humans in creative endeavors but also independently completes inventions or innovations under certain circumstances. By leveraging human-input instructions and content, AI autonomously generates creative solutions through powerful data mining and decision-making capabilities. Remarkably, AI technology can even facilitate profound emotional exchanges with humans, redefining and reconstructing diverse social relationships (Mark, Charlie, 2022). These transformations have ignited intense legal debates over whether AI-generated content qualifies for patent rights and how such rights should be allocated. Currently, China's Patent Law lacks explicit provisions regarding the patent ownership of generative AI outputs, and academia remains divided on this issue. Against this backdrop, this paper systematically categorizes and evaluates existing scholarly perspectives on patent ownership

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of AI-generated content. Through this research, the author aims to reconcile conflicts between AI and traditional patent frameworks while providing readers with a comprehensive understanding of research gaps and advancements. Ultimately, this study seeks to offer actionable insights for future theoretical exploration and practical implementation.

2 PATENT OF INVENTIONS BY GENERATIVE ARTIFICIAL INTELLIGENCE

Among the six circumstances listed in the Patent Law where patents are not granted, the provision on "rules and methods for intellectual activities" is most likely to hinder artificial intelligence-generated works from becoming objects of patent law. Technical solutions generated by artificial intelligence are the results of computer program algorithms and do not fall under the category of rules and methods for intellectual activities (Chen, Xu, 2022). Specifically, artificial intelligence's processing of basic data through deep learning already constitutes a modification of existing technologies. Through comprehensive retrieval and screening, it can create technologies with features differing from existing ones to a certain extent. Second, the complexity of artificial intelligence has minimal impact on the feasibility of technical solutions, and usage levels and value judgments are unaffected by changes in subjectivity (Liu, Wei, 2019). Third, artificial intelligence can generate original and positively effective inventions based on user instructions, leveraging its powerful data retrieval, analysis, and learning capabilities. Therefore, invention technical solutions generated by artificial intelligence fully meet the eligibility requirements for patent rights.

3 OWNERSHIP OF PATENT RIGHTS FOR INVENTIONS BY ARTIFICIAL INTELLIGENCE

3.1 Current Situation of the Ownership of Patent Rights for Inventions by Artificial Intelligence in China

3.1.1 Current Situation of Legislation

Currently, there are four provisions in China's legal system regarding the arrangement of the ownership of patent rights: the ownership of patents for non-service inventions, the ownership of patent rights for service inventions, the ownership of patent rights for commissioned inventions, and the ownership of patent rights for cooperative inventions.

The General Provisions of the Civil Code of China clearly stipulate that civil legal subjects are divided into natural persons, legal persons, and unincorporated organizations, and artificial intelligence is not granted such status. Since intellectual property is a kind of private right, and the law of intellectual property is mainly a special civil law, the civil law governs various individual intellectual property laws. This means that the legal subjects in the Patent Law are the same as those in the Civil Law, namely natural persons, legal persons, and unincorporated organizations. Similarly, artificial intelligence is not granted the subject qualification of a patentee.

China's patent system stipulates that for non-service inventions and creations, the right to apply for a patent belongs to the inventor; after the application is approved, the inventor shall be the patentee. In free inventions, the inventor enjoys the qualifications of both the patent applicant and the patentee. According to Article 13 of the Implementing Regulations of the Patent Law, an inventor refers to a person who has made a creative contribution to the essential characteristics of the invention or creation (The State Council of the People's Republic of China, 2023). Secondly, according to the provisions in the "Guidelines for Patent Applications Related to Artificial Intelligence (Draft for Solicitation of Comments)" issued by the National Intellectual Property Administration in 2024, the inventor whose name is signed in the patent document must be a natural person, and artificial intelligence systems and other non-natural persons shall not be regarded as inventors. This means that no matter how significant a role artificial intelligence plays in the process of invention and creation. It cannot be signed as an inventor. Only a natural person who has made a creative contribution to the essential characteristics of the invention or creation can be recognized as an inventor and signed. It can be seen that in the case of service inventions, when an inventor uses artificial intelligence to generate an invention, the patent right of the invention is likely to be granted to the inventor.

According to the provisions of China's Patent Law, service inventions are divided into two categories. The first category is inventions and creations completed in the performance of tasks assigned by the entity, and the second category is inventions and creations mainly completed by using

the material conditions of the entity (The Standing Committee of the National People's Congress,2020). In the first case, if an employee of the entity uses artificial intelligence to complete the invention and creation as part of the work task assigned by the entity, obviously the patentee of the invention belongs to the entity. In the second case, if an employee uses the artificial intelligence equipment owned by the entity to complete the invention, the patent right may belong to the entity. It can be seen that in service inventions, although the inventor has contributed a great deal of wisdom and cost, the patent right still belongs to the entity.

A commissioned invention means entrusting others to complete the invention and creation in the manner agreed upon in the contract. Regarding the ownership of the patent right for this type of invention, both China's Patent Law and Contract Law adopt the principle of contract priority, that is, the patentee is determined according to the content agreed upon in the contract. If the contract agreement is unclear or there is no arrangement regarding the ownership of the patent right, generally the principle of giving priority to the entrusting party (i.e., the inventor) is adopted, and the inventor shall enjoy the patent right. In the case of a cooperative invention, usually the patent right is jointly owned by all inventors.

3.1.2 Current Situation of Domestic Theoretical Research

Facing the diverse subjects of patent rights, the Chinese academic community generally adopts the "user theory" and the "investor theory" for the arrangement of the patent rights of the generated inventions.

The internal logic of the operation of artificial intelligence is to display the inner thoughts and concepts of users through its own powerful capabilities of information retrieval, resource integration, and advanced deep learning ability, based on the language and instructions input by users. During the operation of artificial intelligence, users also need to continuously modify and correct the generated content to achieve the original expectations. Throughout the whole process, users need to spend a lot of time and energy. Evidently, users have made outstanding and substantial contributions to the output of the generated products, which conforms to the definition of an inventor in China's Patent Law.

Therefore, many scholars in the academic community believe that users have carried out a large amount of preparatory work in the process of artificial intelligence invention and creation, and have made substantial contributions to the output of the content, so they should be eligible as patent right holders. Liu Youhua and Wei Yuanshan believe that users have collected, screened, integrated, and optimized the relevant information content before operating artificial intelligence. The resulting technical solution is essentially a manifestation of the user's wisdom and makes a substantial contribution to the output technical solution (Liu, Wei, 2019). Yang Lihua believes that users of artificial intelligence are deeply involved in every stage of invention and creation, making huge and substantial contributions to the generation of invention and creation. They are closely linked to the invention and creation of artificial intelligence in terms of time and space. Moreover, this can prevent patent rights from being monopolized by investment companies with strong capital, promote the sharing of artificial intelligence patent achievements among individuals, and contribute to the balance of social public interests (Yang, 2023). Wang Zhengzhong believes that users will provide certain data samples, material and financial resources, as well as technical support to the program during the invention and creation process of artificial intelligence. At the same time, the direct use of artificial intelligence inventions and creations by users can better face the market, reduce many intermediate links, save a large amount of time, manpower, and technical costs, and better apply and promote them in the market, thus promoting the prosperous development of the economic society. It can also more efficiently combine with traditional enterprises, promote the digital transformation and upgrading of traditional enterprises, and thus generate more applicable technical achievements (Wang, 2019). Liu Youhua and Li Yangfan believe that if there is an agreement on the ownership of the patent rights of the generated products of artificial intelligence in advance, it shall be subject to the agreement. If there is no agreement, it shall be analyzed according to the theory of creative contribution. The operation of artificial intelligence is carried out under the user's instructions and makes a contribution to the output of the generated products. Therefore, the patent rights of the generated products should belong to the users of artificial intelligence (Liu, Li, 2023).

The author believes that as the operator of artificial intelligence, the user has his own concepts and assumptions about the outstanding features and functions of the generated product. In fact, the user regards artificial intelligence as a production tool and

objectively expresses his own innovative ideas through certain means. Secondly, the instruction information input into artificial intelligence is basically screened, integrated, optimized, and modified by the user. Without a large amount of materials provided by the user, artificial intelligence will not be able to generate a technical solution with novelty and integrity. It can be seen that the generated product is essentially the intellectual achievement of the user and makes a substantial contribution to the output of the generated product, and thus belongs to the inventor in the Patent Law. Therefore, it is a reasonable choice to grant the patent rights of the generated product to the user in the case of a non-service invention.

Article 1 of China's Patent Law stipulates: This Law is formulated in order to protect the legitimate rights and interests of patent right holders, encourage invention and creation, promote the application of invention and creation, enhance the ability of innovation, and boost the progress of science and technology as well as the development of the economic society (The Standing Committee of the National People's Congress, 2020). It can be seen that one of the purposes of China's patent system is to enhance the ability of scientific and technological innovation and stimulate the output of inventions and creations. However, the manufacturing and training of generative artificial intelligence often require high capital costs, which are generally borne by investors (also known as owners). Therefore, it is somewhat reasonable to confer patent rights on investors as a form of return. At the same time, it is conducive to encouraging more investors to invest in the scientific and technological innovation industry, continuously promoting the generation of more products of invention, and filling the society with creative vitality.

Among them, Chen Quanzhen and Xu Difeng believe that when artificial intelligence inventions meet the patentability requirements, a system for the ownership of patent rights for artificial intelligence inventions can be established, with artificial intelligence investors (generally owners) as the patent right holders, supplemented by the principle of autonomy of will (Chen, Xu, 2022). Zhu Xuezhong and Zhang Guangwei hold that investors in artificial intelligence should be the default patent right holders, which can better promote and stimulate innovation. Because usually, the owners of artificial intelligence will invest a large amount of resources and costs in developing and promoting core technologies, playing a major and constructive role. Granting patent rights to the owners is in line with the principle of fairness in the patent system (Zhu, Zhang, 2018).

The author believes that the purpose of China's Patent Law is to protect the intellectual achievements of inventors and encourage natural persons and organizations with the intention of invention and creation to actively innovate and produce more scientific and technological achievements. People who use investment as a means to obtain economic returns obviously run counter to China's patent system. Moreover, once investors with a large amount of capital possess a large number of patent rights, there is a high possibility of causing a technology monopoly, which will then enable them to control the industrial market, exclude the orderly and free competition in the market, and is not conducive to inspiring the public to carry out innovation.

3.2 Current Situation of Overseas Research on the Ownership of Patent Rights

3.2.1 Current Situation of Overseas Legislation

Some countries have made relevant legal provisions regarding inventions generated by artificial intelligence (AI). Japan takes a negative attitude towards AI as the subject of patent rights. Its Patent Law stipulates that only "natural persons who have actually made the invention" can become inventors and patent applicants.

The UK Intellectual Property Office has pointed out that the current patent legal framework faces institutional challenges in dealing with AI-generated inventions. According to the policy statement issued by this institution, the existing patent system is still unable to properly regulate the situation where AI acts as the subject of invention. The reason is that the existing laws clearly stipulate that patent applicants must be natural persons or legal entities. Although it is possible to adapt to technological development through special legislation or the revision of examination standards in the future, currently, there are still legal vacuums in the intellectual property system regarding key issues such as determining the creative contributions, rights ownership, and ethical boundaries of inventions independently generated by AI.

In addition, in the current patent laws and regulations of the United States, a large number of words such as "individual" and "person" are used to describe inventors. The Manual of Patent Examining Procedure (MPEP) in the United States also stipulates

that inventors must have ideas about the invention, that is, "a complete manifestation of the spiritual part of the inventive act", and words such as "conscious" are used to clearly state that inventors can only be natural persons (An, Pa, 2020). In judicial precedents, U.S. courts also do not recognize the status of AI as an inventor, and instead, they more often grant patent rights to investors and inventors (Wang, Xu, 2021). Moreover, according to the provisions of the Australian Patent Law, it can be inferred that its attitude towards inventions generated by AI is similar to that of the United States, that is, it does not recognize the legal status of AI as a patent right holder (Wei, Peng, Mao, 2022).

It can be seen that although the patent law systems of many foreign countries do not explicitly specify the subject to which inventions generated by AI are granted, it can be inferred from the language expressions that foreign countries do not recognize the subject qualification of AI in patent law, which is basically the common understanding in the laws of most countries.

3.2.2 Current Situation of Overseas Judicial Practice

In 2018, Dr. Thaler launched a landmark legal practice globally (Liu, Ren, 2022). He filed patent applications in more than a dozen jurisdictions, including the United States Patent and Trademark Office (USPTO) and the European Patent Office (EPO). The core demand of his application was to list the DABUS system as a patent inventor. The DABUS system is an autonomous cognitive system formed by simulating the neural network structure of the human brain and training with massive amounts of data. It is capable of independently completing the entire invention and creation process, from conceptualization to the formation of technical solutions.

This claim has triggered major discussions in the field of intellectual property. Different countries have made different arrangements regarding the application requests. Except for South Africa, institutions such as the USPTO, the UK Intellectual Property Office, the UK High Court, the EPO, the German Patent Office, and the Korean Intellectual Property Office have successively rejected the patent application of DABUS based on the principle that "the inventor should be a natural person", clearly ruling that artificial intelligence does not have the qualification to be an inventor (Yang, 2023).

This series of decisions indicates that under the existing judicial frameworks of most countries and regions, artificial intelligence is still unable to obtain the same status as a natural person as the subject of patent invention, even if the technical invention is completely created relying on the powerful algorithmic capabilities of artificial intelligence.

3.2.3 Current Situation of Overseas Theoretical Research

When faced with the practical dilemma of the ownership of rights brought about by the rapid development of artificial intelligence, foreign scholars have mainly proposed the "designer theory", the "investor theory", and the "owner theory".

The designer theory holds that before the artificial intelligence system is completely created, it requires a large amount of algorithm setting, program modification, and massive data input. These technically difficult preparatory works need to be completed independently by the designers. Designers have made outstanding and substantial contributions to the creation of the complex artificial intelligence system (Darin, 2001). Moreover, granting designers the patent rights for the generated inventions is conducive to motivating the design subjects to continue innovating and promoting the development of science and technology. Otherwise, designers may keep the artificial intelligence system confidential in the form of trade secrets and not make it public. Obviously, this approach is not conducive to the continuous development of the industrial science and technology (Pamela, 1986).

The author believes that the contribution of designers only lies in the development of the artificial intelligence computing system itself. Their contribution cannot be extended to the generated technical solutions, as designers do not invest specific efforts and costs in the creation of technical solutions. Secondly, designers can obtain legal protection by applying for the patent rights of the artificial intelligence system, safeguarding their patent achievements, and thus promoting the development of the science and technology industry.

Scholars who hold the owner theory, from the perspective of the proportion of input costs, believe that the owners have invested the most costs in the activity of creating artificial intelligence systems, and they should be compensated for their invested costs through certain forms of returns. Mengyu Wa believes that the creation of artificial intelligence has provided a large amount of resource costs, such as funds, technology, and talents, etc. It has made contributions to a certain extent to the creation of artificial intelligence and has a powerful promoting

effect on the development of the artificial intelligence industry. Granting the patent rights to the owners can boost the development of the artificial intelligence technology industry (Wang, 2019).

However, the author believes that owners generally possess a large amount of capital strength. If the ownership of patent rights is granted to the owners, it is very likely to cause a monopoly of patent technologies, resulting in the inability of patent achievements to be shared by society, thus hindering the progress of scientific and technological innovation.

The user theory holds that in the current social context, artificial intelligence is still an ordinary production tool. Essentially, when users use artificial intelligence to generate inventions, they are creating inventions by taking advantage of the conditions of existing production tool technologies (Evan, 1989). Moreover, inventions and creations made by artificial intelligence can be regarded as the external creative behaviors of the users' expressions of intent, which have made important contributions to the output of inventions.

The author believes that it is reasonable to regard generative artificial intelligence as a production tool. In the era of weak artificial intelligence, although generative artificial intelligence has made great breakthroughs in technologies such as algorithmic computing, it still needs to be improved in some aspects. It cannot completely generate relatively mature technical solutions independently without human intervention. It still requires humans to input certain precise information to complete the generation of technical solutions.

4 CONCLUSION

Currently, the academic community's focus on the issue of the ownership of patent rights for artificial intelligence-generated products mainly lies in stimulating innovation and balancing the relationships among various relevant stakeholders, so as to determine the corresponding pattern of interest distribution. However, the fundamental original intention of promoting the in-depth development of artificial intelligence is to benefit all mankind, enabling people around the world to share the development dividends brought about by artificial intelligence, fully meeting the needs of social public interests, and helping humanity create a better life. Looking ahead, relevant research could take satisfying public interests as the core objective, starting from the standpoint of enhancing the well-being of all mankind, and continuously and deeply improve the issue of the ownership of rights for artificial intelligence-generated products. This would encourage more subjects to participate in sharing the remarkable achievements created by artificial intelligence.

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