Exclusive Protective Study of Programs Based on Computer Fundamentals

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Abstract. In recent years, due to the booming development of computer industry and communication industry, the application of computer has been deeply penetrated in all walks of life, including people's daily life and industrial production applications. And computer programs, as the core of computer productivity, there are many technological innovations that need to be protected in new fields such as big data and the Internet. At present, computer program technology is protected by the following three protection models together: trade secret protection model, copyright protection model and patent protection model. The trade secret model is an extremely strict protection model, and the copyright law protects the expression form of ideas, which cannot maximize the rights and interests of computer program developers, thus patent protection for computer programs is imminent, and brings unprecedented challenges to the current patent protection system in China. This thesis examines the current status of patent protection for computer programs and proposes suggestions to improve the existing patent protection system on this basis, with a view to promoting the technological protection and sustainable development of the computer program-related industries.

Keywords: Computer Foundations · Intelligent Computing · Computer Industry · Intelligent Methods

1 Introduction

The computer program related industry is an increasingly important industry as the core of future productivity today's society with an aging population trend. At the same time, economic development has led to a booming computer program industry, which, as a highly reproducible, fast, the efficient and abstract industry, is bound to continue to challenge the existing patent protection system [1]. How to better protect the core technology of a fast-growing industry from copying is a topic that the State Intellectual Property Office and patent-related laws cannot get around. At the same time, only a flexible and standardized patent examination system can meet the needs of such a fast-growing industry and better protect the personal interests of inventors and the commercial

interests of enterprises. Patent law, as a protection of the existence of patent ownership, also cannot cause abuse of the law because of excessive protection of technical solutions, then it is also worth thinking about how to weigh the rights and interests between subjects of interest and between subjects of interest and the public [2]. In the field of patent law, more and more scholars are beginning to study and analyse the enormous challenges posed by the rapid development of the computer program industry to existing patent protection.

2   Suggestions for Patent Protection of Computer Programs

Nowadays, under the background of rapid economic and technological development, whether the intellectual property rights of computer program technology can be effectively protected and whether the infringement can be effectively punished will greatly affect the development and application of computer program technology in China [3]. The problem of object determination and the problem of triality determination can occur when computer program-related programs are reviewed, resulting in the computer program-related programs not being effectively reviewed. While patents have monopoly rights, there is a public demand for patented technology, and it is necessary to have better protection for companies' functional inventions to encourage innovation. Thus, there is a need to balance the rights and interests of the patentee and the public, and to give the technical information to other interested parties or society to use, and the interests of each party are relatively balanced [4]. This chapter will make suggestions for optimizing the current examination system and patent system from two parts: suggestions for protection in the examination of computer program patents and suggestions for legislative protection of computer program patents, with a view to solving the problems of computer program patents proposed in Chapter 2 and protecting computer program patents more effectively.

3   Recommendations for Protection in the Examination of Computer Program Patents

3.1   Suggestions for Object Review of Computer Program Patents

According to the first section of Chapter 2, it is clear in the actual examination process, computer program-related solutions of algorithmic features, business rules and method features are easily found not to be the object of patent protection because they are not technical solutions [5]. The following are suggestions for examining the subject matter of computer program patents, using the cases of algorithmic feature computer programs and business rule and method feature computer programs, in order to avoid the situation where a computer program-related scheme is judged not to be the subject matter of patent protection and thus cannot be granted. Thus, it cannot effectively protect computer programs with algorithmic features, business rules and methodological features, and reduce the R&D enthusiasm of inventors and enterprises.

3.2 Suggestions for a Three-Sex Review of Computer Program Patents

3.2.1 Create Relevant Database

Patent quality plays a pivotal role in the national intellectual property development strategy. An objective and scientific evaluation of patent quality is of great significance in promoting the transfer of patented technologies and technological achievements, as well as improving the independent innovation capacity of individuals, social and the country.

The growth in the number of computer program technology applications and the fact that computer program technology may involve opening source code and commercial code has made it more difficult to search and determine prior art, resulting in a failure of the novelty standard. The following recommendations are therefore made to address the failure of the novelty criterion [6].

Establishing a code review database will result in examiners needing to spend more time searching to determine prior art, and now that the number of computer program application files filed is growing, the computer industry usually expects that patent examinations related to computer program technology can be more efficient and high speed, otherwise there cannot be a better protection for the development of the computer industry.

China has established some examination systems, such as the priority examination system and the pre-trial system to deal with the problem of slow patent examination and failure to protect patents in a timely manner [7]. However, the requirements of these systems are relatively high for the fields, and the priority review caseload of different fields is uneven, resulting in some fields still need to go through a long review cycle. And requires the patent applicant to take the initiative to file an application, but some patent applicants may be unaware of these special systems, and although the technical solutions of computer programs meet the requirements of these special systems, they are still examined in accordance with the normal patent examination process, which is not conducive to the innovation and development of technology.

4 Suggestions for Legislative Protection of Computer Program Patents

4.1 Clarify the Rights and Obligations Between Subjects of Interest

The essence of a computer program is the sum of program code and data structures with an algorithmic nature, and its development and operation cannot be achieved without the support of algorithms and business rules and methods [8]. Therefore, the process of computer program development has a larger number of personnel involved compared with the traditional industry, but if the rights and obligations of interest subjects are not clearly defined, it will inevitably affect the implementation of computer program patents; therefore, the rights of joint research and development personnel should be clearly allocated, and the rights and obligations between interest subjects should be clearly defined.

4.1.1 Respect for Autonomous Agreement Between Subjects of Interest

The allocation of patent rights for inventions and creations related to computer programs shall respect the independent agreement among the subjects of interest [9]. A computer program technical solution generally involves multiple subjects of interest, which can mobilize the initiative of negotiation among subjects of interest, and determine the rights and obligations of subjects of interest according to the agreement, which can allow subjects of interest to exert their subjective initiative, actively fight for patent rights, obtain the economic benefits brought by patent rights, and realize the balance of interests among subjects of interest as much as possible. However, it is also undesirable to determine the rights and obligations of the subjects of interest exclusively according to the agreement, because this can lead to the infringement of the interests of other subjects of interest by those who want to obtain more economic benefits, and thus hinder the goal of balancing the interests among subjects of interest [10]. Therefore, it is necessary to register the substantial contributions made by the subjects of interest, and to regulate the rights of some subjects of interest with excessive rights through legislation, as to avoid damaging the interests of others and to ensure the scientific and operable design of the legal system, so that private law autonomy can play its natural legitimacy advantage.

4.1.2 Clarify the Substantive Contribution of the Interest Subject

In the absence of an agreement in advance to determine the rights and obligations of the subject of interest, the issue of attribution of invention rights and the allocation of benefits shall be confirmed on the premise of clarifying the substantive contribution of the research and development personnel to the computer program. The employee's substantial contribution to the inventiveness of the job invention is a prerequisite for the employee to be an inventor and the basis for obtaining the distribution of benefits of the job invention. In terms of fairness, when a patent has multiple inventors, it is an ideal way to allocate benefits based on the size of the inventor's substantial contribution. However, in actual cases, it is very difficult to quantify the substantial contribution. Therefore, in practice, the court will calculate the benefit distribution according to the equal distribution on the ground that the inventor or the unit cannot provide strong evidence to prove the size of each inventor's contribution. Therefore, the inventor or the company should, as far as possible, confirm in writing the actual size of the contribution and the specific details of the benefit distribution before filing the patent application, in order to avoid disputes and losses arising from the imbalance of benefit distribution at a later stage, in addition to stipulating by agreement or regulations that the contribution will be distributed according to the size of the contribution.

4.1.3 Dynamic Adjustment of the Scope of Rights of Subjects of Interest

The scope of patent grant should take in account the contribution made by the subject of interest on basis of prior art, and it should be substantial, to prevent those who have not made substantial contribution from acquiring rights, and to make the genuine inventors more motivated to innovate. However, in order to adapt the computer program technology to the extensive market demand, the computer program technology is updated and iterated faster, then the rights and obligations of the relevant subjects of interest may also be

completely unbalanced afterwards, then it is necessary to dynamically adjust the scope of the rights of the subjects of interest according to the original rights and obligations of the subjects of interest, the substantial contribution made by the subjects of interest and the market changes, so that the patent right can balance to a certain extent In this way, the patent right can balance the private interests of the right holder and the public interests of the society to a certain extent. Moreover, the scope of rights of the subject of interest should be gradually expanded and adjusted, and while slowly adjusting, it should always pay attention to the market changes and the response of the public and adjust as soon as possible, so that the interests of the patent owner and other relevant subjects of interest as well as the public can be balanced, and the benefits of the patent owner and other subjects of interest can be rewarded with greater benefits, thus encouraging innovation and promoting social progress. After the steady advancement of the patent protection policy for computer programs, it not only promotes the development of China's computer industry, but also allows the inventions related to computer programs to be promoted to the world through patent layout.

4.1.4   Define the Tort Liability of the Subject of Interest

Computer program patent infringement refers to patent infringement between inventions related to computer programs and inventions completed by other computer programs. The situation of patent infringement of computer programs involves the division of responsibilities among multiple subjects of interesting, thus a reasonable division of responsibilities is extremely important and urgent in order to solve the problem of patent infringement. Liability for infringement should be divided among the inventor, the patentee, the original programmer and other relevant subject of interest. It is necessary not only to clarify the operation principle of computer programs and understand the actual source of infringement risk, but also to further analyse the reasonable application of the principle of direct infringement or indirect infringement based on the principle of uniformity of rights and responsibilities. The patent infringement of computer programs is not regulated by the patent law, which will endanger the rights of relevant interest subjects and damage the market order, and gradually will affect the development of innovation in China.

4.2   Balancing the Rights of the Patentee and the Public

4.2.1   Avoiding the Monopoly of Abstract Ideas

The imbalance between the rights and interests of computer program patentees and the public is mainly caused by the misuse of intellectual property rights. As a new and fast-growing industry, how to develop the examination system of computer program-related patents to adapt to the special characteristics of this industry is the key to safeguard the balance between patent rights and public interests.

The 2014 case of Alice Corporation of America v. CLS International Bank for infringement is the first U.S. Supreme Court case since 2010 regarding patent eligibility for software-related inventions (Table 1).

After the Alice Corporation patent case, the United States established a two-step test for determining whether a software patent is patentable under U.S. patent law.1 And its

Table 1. 2014 Alice Corporation of America v. CLS International Bank Infringement

Case Details	Alice alleges that CLS Bank has infringed four of Alice's patents on electronic methods and computer programs for reducing third-party "settlement risk": US5,970,479, US6,912,510, US7,725,375, US5,970,479, the claims of which cover a third-party electronic escrow service that reduces the risk of financial transactions by ensuring that both parties to the transaction realize their respective obligations in the financial transaction. The claims cover a third-party electronic escrow service that reduces the risk of financial transactions by ensuring that both parties to the transaction realize their respective obligations in the financial transaction.
Verdict	Plaintiff Alice's four patents were for abstract concepts that could only be implemented on a computer and could not be patented. The original patents were invalidated.

core lies in the abstract nature of computer software to prevent overly broad abstract concepts from being patented, resulting in a monopoly of abstract ideas that would infringe on the public interest and be detrimental to the development of the computer industry.

4.2.2 Regulate the Scope of Protection of Computer Program Products

Foreign countries have not reached a unified consensus on the scope of protection of computer program products, and there are no clear regulations on the scope of protection of computer program products in China at present, so it is necessary to further clarify the scope of protection corresponding to devices, electronic devices, and storage media. Only by clarifying the scope of protection of computer program products can the rights and interests of the patentee and the public be balanced, and the patented computer program technology and technical achievements can flow in the market, making the computer program methods and products obtain the corresponding economic value.

5   Conclusion

Computer program patent examination Computer program-related industries, as the core of future productivity, are an increasingly important industry today's society with a serious trend of aging population. At the same time, economic development has led to a booming computer program industry, which, as a highly reproducible, fast, the efficient and abstract industry, is bound to continue to challenge the existing patent protection system. How to better protect the core technology of a fast-growing industry from copying is a topic that the State Intellectual Property Office and patent-related laws cannot get around. At the same time, only a flexible and standardized patent examination system can meet the needs of such a fast-growing industry and better protect the personal interests of inventors and the commercial interests of enterprises. Patent law, as a protection of the existence of patent ownership, also cannot cause abuse of the law because of excessive protection of technical solutions, then it is also worth thinking about how to weigh the

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