

Perception of the Objectives of Intellectual Property Legal System, the Essence of a Patent and the Missions of Patent Institution——in Aspect of Low Rate of Patented Technology Commercialization in China

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Abstract

In China, the low rate of technology commercialization has been an indisputable fact for a long time, and up to now, no effective way to solve such a problem has been found. There are many reasons and one of them is that the accurate implication of the objectives of Intellectual property legal system, which are merely regarded as “protection for holders’ interests”, may have not been recognized, and the patent’s nature which is a kind of private property right serving for commercial activities and the missions of the patent institution (to promote the commercialization of the patented technologies) have been distorted. Therefore, it is of great significance to scientifically and precisely understand and grasp the objectives of establishing the intellectual property legal system, the patent’s essence and the missions of patent institution, and on the basis of these knowledge, China shall consummate the intellectual property legal system to respect the market-oriented rules and their power of decision-making for applying patents, and adjust the patent funding policies to prevent the blindly advocacy of patent applications, and create good environments for improving patents quality and enhancing technology commercialization rate.

Key words: patent, patent institution, missions of the patent’s institution, commercialization rate of the patented technologies

1. Introduction

The commercialization of scientific achievements, mainly related to patented technologies, particularly those produced in universities and research and development (R&D) institutes, has been an serious issue ever since 1990s’ in China, but so far no effective solution has been found. "Outline of the National Intellectual Property Strategy of People’s Republic of China" promulgated on June 5th, 2008 by the State Council defined its purpose as “improving China's capacity to create, utilize, protect and administer intellectual property, making China an innovative country and attaining the goal of building a moderately prosperous society in all respects”and described intellectual property system in a more scientific way, highlighting the focus of intellectual property institution on four aspects, not only on protection. ¹The strategy especially has set a proper position for the use and implementation of intellectual property, which is complied with the inherent nature and objectives of intellectual property laws, that is, to apply technologies and to promote the technology transfer and dissemination for motivating the social and economic development.

Since the commercialization of patented technologies is one of the critical reflections of intellectual property applications, it is fundamental and urgent to solve such issues. In order to provide proper guidance and theoretical basis for the relevant policies and laws on patent commercialization, some theoretical issues involved shall be explored. According to a study accomplished by Ministry of Science and Technology of China, there are 30,000 scientific achievements annually at provincial and ministerial level but only 10%-15% of these items are suitable for large-scale commercialization. The annual number of patented technologies reaches more than 70,000, but the commercialization rate is just about 10%. The contribution rate of technological progress to economic growth is about 39%, of which the high-tech contribution rate is just 20%, far below that of 60% in developed countries. It is undoubtedly a huge waste of scientific and technological resources.

¹ For detailed content of the Outline, please see *Outline of the National Intellectual Property Strategy 2008*, issued by the State Council of People’s Republic of China, at <http://ip.people.com.cn/GB/152255/156799/9965192.html>.

² But from the data collected by the author from some universities and relevant governmental departments, it can be seen that the patented technologies commercialization rate in universities and R&D institutes is far below the data mentioned previously. The companies (especially the private enterprises) usually pay great attention to the commercialization of patented technologies due to their own business characteristics, thus they are rational to comply with the so-called “technological achievements” which may not bring commercial profit and would not be applied for a patent. Among the R&D institutes, those who have been restructured to meet market requirements or had a close combination with industrial business have made their average commercialization rate of patented technologies reach 73%. For the former, the typical examples of the institutes are the ones in Guangdong Province restructured since 1998 who have largely been transformed to be subsidiaries of enterprises;³ and the latter example is that the commercialization rate in Guiyang Aluminum Magnesium Design & Research Institute has reached up to 90%.

⁴ It's not difficult to conclude that, despite the low rate of patented technology commercialization in China, it seems easier for institutes to solve such problems from the experience of successful restructuring and combination with industry and it is the system for R&D institutes re-design that may possibly raise the rate of patented technology commercialization. However, for universities, because of their special missions and functions, they should be given more attention to and issue proper policies for raising the commercialization rate. Whatever happens, a scientific understanding of the objectives of intellectual property legal system as well as the nature of a patent and missions of patent legal system is crucial. Based on the data above, in this paper, the author is intended to give a reanalysis of the objectives of intellectual property legal system and the nature and mission of patent legal system, in hope of helping people to form an accurate understanding of this issue and find a fundamental solution for the issue on low rate of patented technology commercialization.

2. The Direct Objectives of Intellectual Property Legal System: to Promote the Technology Transfer and Commercialization

2.1 The Interpretation of the Objectives of Intellectual Property Legal System in TRIPS Agreement

In the aspect of the objectives of Intellectual Property Legal System, “to protect” has long been considered as its main or even “only” purpose in China, while the real missions and values of Intellectual Property Legal System itself have been ignored. This may directly lead to an insufficient attention to the patented technology transfer, in another word; it is uncommon for people to form the awareness of patent technology transfer or commercialization and to put it into action. Even now, it remains a major problem in China's economic development. In fact, the protection for Intellectual Property is merely a means just as a holder's acquisition of an exclusive right of a intellectual property, which provides a premise for transfer or commercialization; its missions, values, and objectives mainly consist in promoting technology transfer and diffusion, making the access easier for more people to share the welfare of human creativity and knowledge, and further promoting the social and economic progress and development which ultimately raise the people's living standard. These implications are defined explicitly in “Agreement on Trade-Related Aspects of Intellectual Property Rights” (hereinafter referred to as “TRIPS Agreement”).

TRIPs agreement provides that intellectual property rights (IPRs) are private rights,⁵ which sets the foundation for intellectual property transfer and diffusion on the basis of private proprietary, for the private rights are directly related to personal interests and when they are transferred or traded, the holder will usually gain considerations from the other party. However, IPRs are quite different from other private rights, because their values often fail to be materialized if they could not be transferred, licensed or commercialized. Therefore, the IPR legal system has never been inseparable from the activity of transferring, licensing and commercialization ever since it was established, and as the research and development is becoming more and more independent and R&D organizations or fellows have developed into a separate power in the industries and their achievements have begun to be kinds of “commercial products”, licensing, assigning, or transferring grows more prominent.

² See Hualing Tan: “The Analysis on the Reasons and Countermeasure for the Low Rate of Technology Commercialization”, 2 *Journal of China Collective Economies*, 2009.

³ Dongliang Li: “The Analysis and Countermeasures on the Technology Commercialization of the Research Institutes in Guangdong Province”, 10 *Journal of Science and Technology Management Research*, 2007.

⁴ Chengke Huang, Chaochao Liu: The commercialization rate in Guiyang Aluminum Magnesium Design & Research Institute has reached up to 90%”, *Guiyang Daily*, January 4, 2007.

⁵ See Preamble of TRIPS Agreement.

The preamble and the notes to TRIPS Agreement are the integral parts of the agreement, which act as the condensed expression of the agreement's objectives and principles. The agreement says the protection for IPRs shall be effective and adequate, which implies that the inadequate protection of intellectual property rights may lead to trade-distorting, but over protection may also cause the same result. Paragraph 5 and 6 of TRIPs agreement reflect the need of giving particular concern to both developing countries and least-developed countries; actually, they may adopt flexible measures to provide protections for intellectual property rights, including by the effective enforcement of the courts and the administrative of a member, in accordance with TRIPs agreement. In this regard, the members are aware of the fact that there should be some flexibility in the performance of TRIPS Agreement for the parties involved to contribute to the realization of national development goals.⁶ The purpose of intellectual property legal system is also pointed out right at the beginning of the "preamble", that is, desiring to reduce distortions and impediments to international trade, and taking into account the need to promote effective and adequate protection of intellectual property rights, and to ensure that measures and procedures to enforce intellectual property rights do not themselves become barriers to legitimate trade, members should recognize the underlying public policy objectives of national systems for the protection of intellectual property, including developmental and technological objectives, and the special needs of the least-developed country Members in respect of maximum flexibility in the domestic implementation of laws and regulations in order to enable them to create a sound and viable technological base.

⁷To this end, the members may establish a mutually supportive relationship through the TRIPS Agreement. Even though protection for IPR is one of the important tasks and main content of TRIPS Agreement, it is not the objective of the intellectual property legal system, much less it is all or the only content of the intellectual property legal system, which can be seen indirectly from the name of TRIPS Agreement In which there is no word of "protection". In fact, it should be considered as the due aims of protecting IPR to promote the world's economic development, technological progress and to create the technological base for the least-developed nations; namely, protection is just a means, while the target is to develop economy and technology and to help technologically underdeveloped countries to establish their technological base and build their capacities. In line with this, technology transfer is an indispensable core of IPR legal system and protection is at most a means to serve for realizing the objectives. To this end, the "objective" clause of TRIPS Agreement clearly stipulates that the protection and enforcement of IPRs should contribute to the promotion of technological innovation and to transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge and in a manner conducive to social and economic welfare, and to a balance of rights and obligations.

⁸ In the "principle" clause, it stipulates that members may, in formulating or amending their laws and regulations, adopt measures necessary to protect public health and nutrition, and to promote the public interest in sectors of vital importance to their socio-economic and technological development; and appropriate measures, provided that they are consistent with the provisions of this Agreement, may be needed to prevent the abuse of intellectual property rights by right holders or the resort to practices which unreasonably restrain trade or adversely affect the international transfer of technology.⁹ Given a careful analysis, it can be seen that there are 4 objectives of intellectual property system: to promote technology transfer, to advance technological innovation, to propel social development and to balance interests of right holders and public interests; and it is obvious that promotion of technology transfer and dissemination is the kernel of the "objectives" and "principles" of TRIPS Agreement. It is beyond doubt that the main and immediate purpose of intellectual property legal system is to promote technology transfer and dissemination, and the others may be derived from it, for the later three objectives can be seen as the expansion of "the promotion of technological innovation and to the transfer and dissemination of technology". In other words, the later objectives would not be achieved without the first one."To the mutual advantage of producers and users of technological knowledge" is the direct impact and concrete manifestation of technology transfer and dissemination; the later two objectives further clarify the meaning of the purpose of the system from the perspective of the protection and the way of implementation;

⁶ Daniel Gevias, *The TRIPS Agreement Drafting History and Analysis*, (2nd Edition), Thomson Sweet and Maxwell, 2003, p.37.

⁷ See Preamble of TRIPS Agreement.

⁸ See Article 7 of TRIPS Agreement.

⁹ See Article 8 of TRIPS Agreement.

“in a manner conducive to social and economic welfare” is the final goal of this system, but the way to achieve it should be derived from the system’s direct purpose of “technology transfer and dissemination”. By stating “in a manner conducive to social and economic welfare”, it means that one party can not unilaterally emphasize the protection of its own interests, but should seek to find a legitimate and appropriate balance of rights and obligations between the parties concerned, which may depend on the basic category of “technology transfer and dissemination” to obtain its realization. Moreover, in the “principles”, TRIPs agreement states that in order to prevent the abuse of intellectual property rights by right holders or the resort to practices which unreasonably restrain trade or adversely affect the international transfer of technology, appropriate measures may be taken, provided that they are consistent with the provisions of this Agreement; the basis of the statement is also to promote technology transfer, however, its emphasis is on the international technology transfer.

2.2. The Development of Intellectual Property Legal System

The cognition of the objectives of IPR legal system described in TRIPs agreement has experienced a long history since the system emerged and developed. Protection was the key point in the early days, which can be seen from the names of different treaties, such as the 1883 "Paris Convention for the Protection of Industrial Property", 1886 "Protection of Literary and Artistic Works of the Berne Convention" and the 1961 "Protection of Performers, sound recordings and broadcasting organizations by international conventions", etc. In that historical period, IPRs were mainly utilized by the holders own and the cases of transferring and licensing intellectual property seldom occurred. Considering the limitations of the technological development then (technical solutions were relatively simple, and the products were relatively less systematic and complex), and the technologies were not interdependent deeply and did not have close correlations; within a certain range the right holders could independently complete a system's or a product’s technical programs relying on his own technical capacity, and they largely depended on the implementation if their own intellectual properties to gain profits.

Therefore, as a major tool to achieve interests and win competitive advantage in the market, the right holders were most concerned about the protection in case of infringement (such as others were not permitted to use their intellectual properties for commercial purpose without permission). As a result, to protect the interests of the right holders became the most important mission in the early period of this system, and to prevent others from unauthorized using of intellectual property rights became the first prerequisite of the system. With the rapid progress of technological development and the gradual formation of economic globalization, as well as the increasingly close relationship between intellectual property and trade on goods and services, and the emergence of public issues, such as environmental protection, disease, climate change, and so on, which produced more and more seriously negative economic externality, and the growth of technological complexity and interdependence, it has become increasingly important to take advantage of technology resources to meet such new challenges to advance human well-being and improve living condition.

The word “protection” has been used fewer and fewer in International treaties on intellectual property, for example, there is no “protection” word in the name of the following treaties: Treaty on Intellectual Property in Respect of Integrated Circuits in 1989, TRIPs Agreement in 1994, WIPO Copyright Treaty and WIPO Performances Phonograms Treaty in 1996. This is designed to remind people that the current intellectual property legal system is different from intellectual property protection, although protection still acts as one of its important missions. What’s more, these treaties all strengthen the importance of the balance between protection for right holders’ interests and the public interests. A reflection of maintaining the balance in the treaties is that protection should not be over-emphasized, and the system should create a fair and reasonable environment to let others share the technological advances brought by the right holders. These changes show that with the progress of human civilization and the development of technology and economic globalization, the mission of intellectual property legal system should not be merely limited to the so-called “protection”, but the transfer and dissemination of intellectual property should become a major content of this system under the conditions at present.

¹⁰ For example, Article 6 “The Scope of the Protection” of Treaty on Intellectual Property in Respect of Integrated Circuits, 1989 enumerates three cases of protection, namely, “acts requiring the authorization of the holder of the right”, “acts not requiring the authorization of the holder of the right” and “measures concerning use without the consent of the holder of the right”. The purpose of this provision is to balance the interests between the right holder and the public. Both WIPO Copyright Treaty and WIPO Performances Phonograms Treaty concluded in 1996 clearly stated in their preambles that the balance between protection for the right holders and the public interests should be reflected in the treaties.

In addition, with R&D institutes growing more independent and their technical achievements regarded as a commodity, the transactions and flow of technological achievements have become more important in the field of intellectual property. Just as the development of civil law, in the early time much attention was paid to rights acquired, but later on transactions of properties (such as selling and buying, leasing, assigning and so on) were valued much more, for only in the transactions and flow of properties, could properties increased in value and the owner realize the purpose of making profits by them. As a special property which is intangible, the mobility of intellectual property is a necessary condition for the holders to realize its value. Therefore, it is inevitable to put emphasis on “technology transfer and dissemination” in the “objectives” and “principles” of TRIPS Agreement. The public problems which human beings are now faced with and the increasing technological difficulties make the people on the globe inevitably work together to find solutions.

In field of intellectual property, cooperation is very crucial because there is no one corporation or individual having abilities to resolve all the technical issues existing in a field or a complicate product. Therefore, technology transfer is inseparable for both constructing human’s ecological environment to combat climate change, other environmental pollutions and other public issues and establishing an innovative society; and it has become a link to achieve the objectives of TRIPS agreement aforementioned. The mission of TRIPS Agreement in the era of knowledge-based economy may be read as the following: guiding by the objectives and principles in legislation, to serve for technology transfer and dissemination by means of protection, to enable human beings to share the benefit of technical advances and improve the level of development of mankind as a whole.

2.3. The Objectives of Intellectual Property Legal System and China’s IPR System

TRIPS Agreement constitutes the general legal framework of intellectual property and provides legislative basis and principles for its members, and as a member of the Agreement, China shall make or revise the IPR institutions in compliance with it. China’s legislation on IPRs should emphasize on the comprehensive missions of utilization, transfer and dissemination of technologies, but not limit the scope to the static “granting rights and protecting them.” However, China’s current legislation has not yet reflected the above mentioned “tenets” to meet the developing trend. A case in point is that the existing laws on IPR, without exception, take “protection for IPR” as their primary objective and fundamental doctrine. If carefully reading the relevant laws, we can find that “protection for intellectual property” is listed as the prime purpose of them.

For instance, Patent Law provides that it is “enacted for the purpose of protecting the legitimate rights and interests of patentees, encouraging inventions, giving an impetus to the application of inventions, improving the innovative capabilities, and promoting scientific and technological progress as well as the economic and social development”;¹¹ Copyright Law provides that it is enacted for the purpose of protecting the copyright of authors in their literary, artistic and scientific works and the rights and interests related to copyright, encouraging the creation and dissemination of works conducive to the building of a socialist society ...”;¹² Regulations on Computers Software Protection describes that the regulations are formulated ...for the purposes of protecting the rights and interests of copyright owners of computer software, regulating the relationship of interests generated in the development, dissemination and use of computer software, encouraging the development and application of computer software, and promoting the development of software industry and the informatization of national economy;¹³ and “Trademark Law” stipulates that it’s “enacted for purpose of ...protecting the exclusive right to the use of a trademark, and encouraging producers and dealers to guarantee the quality of their goods and services and preserve the credibility of trademarks...”.¹⁴ Other laws or regulations of China are not enumerated here.

From those listed articles; we can find that there are some differences on legislative purpose between China’s laws and TRIPS Agreement. Therefore, it is not difficult to understand why Chinese people’s first reaction to intellectual property legal system is “to protect” IPR when the system is talked about, either in daily life, studies or work, or in the process of the administrative’s enforcement of IPR laws besides judicial trials. As mentioned above, protection is not the system’s purpose but the means and pre-condition for achieving holders’ purpose of gaining profits, and the system’s true objective is to promote technology transfer and licensing, and then to enhance and improve the social innovation capability.

¹¹ See Article 1 of Patent Law of P.R.China (2008), at http://www.wipo.int/wipolex/en/text.jsp?file_id=178664.

¹² See Article 1 of Copyright Law P.R.China (2010), http://www.wipo.int/wipolex/en/text.jsp?file_id=186569.

¹³ See Article 1 of Regulations on Computers Software Protection, http://www.wipo.int/wipolex/en/text.jsp?file_id=131055

¹⁴ Article 1 of Trademark Law of P.R.China, at http://www.wipo.int/wipolex/en/text.jsp?file_id=131395.

In my opinion, it is the deviation of understanding and interpreting the objectives and principles of TRIPS agreement that resulted in the present state of legislation---taking “protection” as the most significant objective; we have not grasped the essence of TRIPS Agreement. Actually, since the late 20th Century, with the further specific division of labor in society, companies and enterprises have invested more and more on R&D, and a large number of research fellows have been produced. Furthermore, the government-funded projects, as well as the independent research institutes, groups or even individuals, have made great contribution to increasing the number of research population. These research fellows have formed a typical and independent class in a society and their intellect achievements have become special “commodities” for trading. Thus, the story on IPRs in these days is quite different from that of their early birth times, at which time, IPRs were mainly used by right holders themselves. At present, technologies and other intellectual achievements have become kinds of commodities, which may not be utilized by the holders and could not bring tangible wealth such as machines or equipment, medicines or foods.

They should be commercialized and then can be turned into real productive power. So the importance of technology licensing or transfer has increased quickly; or they shall be perfectly combined with tangible commodities, such as the use of trademark involved in the sale of high-tech products, software licensing and other technical services packaged to sell in trades of machines or equipment, and the mode of franchise and chain stores which involves IPRs has grown fast in the service sector. These indicate that the independence of intellectual property as property is growing more and more prominent. In this context, the mission of IPR system shall shifted swiftly from “protection” to “management, implementation, use and transfer”, for the right holders no longer need to do everything from the very start of the industrial chain (which demands a large quantity of costs such as to build factories, hire staff, and to purchase equipment) to the end of the chain to realize their purpose of making profits. The right holders can segregate the steps of value realization from other activities occurring in industrial chains. Up to now, the corresponding changes have been made to meet the requirements of the time and the main objectives of intellectual property legal system have changed, which have been reflected in Article 7 of TRIPS Agreement.

Nevertheless, China’s relevant laws have made no adjustment in this aspect, which shows that there’re great efforts for it to make in view of taking full use of the provisions in international IPR treaties or agreements in favor of developing countries with reasonable interpretation and exploration to them. We should not only see the provisions in the treaties that expressly set obligations for developing countries, such as the terms of intellectual property protection, the scope of subject matter for patents and so on, but also find the provisions that could be beneficial to developing countries and exploit them in a fully justified way in order to safeguard national interests. General speaking, in order to implement the national strategy for intellectual property in the new era, we shall promote the activities of revising China’s intellectual property laws to make them consummate with the focus on accelerating technology transfer in accordance with the essence of establishing intellectual property legal system.

3. The Essence of a Patent and the Missions of its Institution

The patent refers a set of exclusive rights¹⁵ granted by a state (national government) to an inventor or their assignee for a limited period of time in exchange for a public disclosure of an invention based on the Patent Law after review and approval,¹⁶ and then the patentee could hold and exploit himself or transfer to others for implementing the invention with commercial purpose. Its nature is a kind of intangible property rights, but its value in wealth and economy is not a reality or actually tangible property; and it is a potential property, which must be commercialized through certain means such as exploitation or licensing to others for transforming. Thus, in its realization, it is essentially different from a tangible property: the latter need not to be converted or commercialized and can bring economic benefits or wealth to the right holder directly. Usually, without the permission of the patentee, patented technologies could not be implemented for commercial use within the validity period of the patent. The institution of patent is a management system to protect, encourage inventions, and promote technological progress through legal and economic means.

¹⁵ In Anglo-Saxon law, an exclusive right is a de facto, non-tangible prerogative existing in law (that is, the power or, in a wider sense, right) to perform an action or acquire a benefit and to permit or deny others the right to perform the same action or to acquire the same benefit. Which is a "prerogative" is in effect an exclusive right, the term is restricted for use for official state or sovereign (i.e., constitutional) powers. Exclusive rights are a form of monopoly. See “Exclusive rights” at http://en.wikipedia.org/wiki/Exclusive_right.

¹⁶ See “Patent” at <http://en.wikipedia.org/wiki/Patent>.

It is based on specific laws such as the Patent Law, by granting inventors or assignees for the exclusive rights on the invention, to protect and encourage innovation, thereby to promote scientific and technological progress and economic development.¹⁷ On one hand, it is a legal means to protect the owners of new technologies; on the other hand, it encourages the owners to disclose the new technologies to the public as soon as possible, which could avoid overlapping of research and development, and the potential licensees may find chances to get the technology by transfer contract and then the new technology could be used in the social production more widely, and promote socio-economic development. So the core content of the patent legal system is to disclose the invention completely to the public in accordance with the law, and the authorities provide the inventor with a certain period of exclusive rights.

In general, the patent institution can be divided into two stages. The first is the application and authorization stage, which is the basis and premise for patented technologies application and transfer, and the core task at this stage is to grant exclusive rights to patentees, and to create conditions for protection and transfer. The second stage is to exploit or implement (for promoting national economic development) patented technologies, which will not be proceeded without protection; only at this stage, the purposes and objectives of the patent institution will be realized and the value of the patent institution will be demonstrated. However, it is the missions of patent institution at this stage have been widely ignored in China. Strictly speaking, in logic, there should not exist the serious problem on the low rate of patented technologies commercialization, for they themselves are required to be exploited for business purpose in the future. If patented technologies can not be transformed into practical productive forces, then the following question shall emerged: are they real patented technologies or are they worthy of being granted technologies?. Therefore, we shall grasp and use the patent institution completely and accurately.

The typical features of the patent institution are: first, the patent institution is based on market-oriented economy. After obtaining the patented rights, the patentee shall only apply the invention to commercial production in order to get a return for his investment in R&D. The market is like litmus and can select the technologies that meet people's demand and keep them alive in the market, but it will drive those which do not meet customers' needs out of the market. The market is a decisive force for a technology or invention to be a patented one or not and the values of patent institution shall reflect this in order to encourage inventors to invent technologies to meet market demands. Second, the patent institution can promote the diffusion, transfer and application of inventions, because only through this way could the patentees make more profits in return. In short, the patent institution must concentrate on two issues: one is to safeguard and improve the quality of patented technologies, and the other is to promote or accelerate dissemination and transfer of patented technologies. The implicit meaning we can get from this description is that a big state with a large number of patents does not connote that it is a powerful one with strong innovation (only one valuable patented technology is much better than 1 million junk patents). In a word, the essence of patent institution shall be to make a state hold a great many high-quality patents which can be commercialized and transferred into productive power and create wealth for the country, and at last it can enhance and highlight national innovation capacity.

From the above discussion, we can see that in fact the mission of the patent institution is to protect the patentees' rights initially and then is intended to affirm patentees business monopoly for a certain period while to require patentees to pay certain costs (such as to disclose information of inventions and to pay maintenance costs), so that it could promote the commercial utilization of inventions as soon as possible, that is, patentees may use patented technologies to manufacture, produce and provide services by himself for commercial gains, or they may permit others to use or transfer the patented technologies in order to gain his own interests. Under ordinary circumstances, granting a patent to an applicant does not mean that he can commercialize the patented technology immediately and directly get profits and properties. On most occasions, there is still a long way ahead for him to achieve the commercial purpose by commercialization, particularly for the patentees in universities and R&D institutes. The main purpose of the patent institution is devised for giving the patentees priorities to gain an advantage that they can occupy the market share to get return on the investment when commercializing condition is ripe in the future. Moreover, a pure patented technology does not always bring mature, specific and satisfactory performance to products. To achieve desired results, the relevant know-how is frequently needed which is what the patent institution can not deal with. As we all know, the three substantive requirements for granting a patent are novelty, inventiveness step (non-obviousness) and practical applicability.

¹⁷ See Qiping Tan, *Research on Patent System*, Law Press China, 2005, pp.10,16-18.

Practical applicability here refers to the invention or utility model can be made or used and can produce effective results;¹⁸ but here “effective results” would not realized immediately and it is not a synonymous word to “actual use” in reality and patent examiners could only make judgments in accordance with some certain rules or experiences, that an invention or a utility model is probably usefulness or has the possibility to be manufactured in the future and they could not require the applicants to come up with real mature product in the process of reviewing the patent-pending technology solution. Therefore, it is not difficult to understand why a number of patented technologies should still need the process of commercialization when transferred into practical productive forces. In short, the patented technologies are only potential for bringing certain benefits and products manufactured, and they are not sure to bring products which meet the market demands immediately. This point is perhaps easy to be neglected when the policies on measures for funding patent applications are made widely in China. In fact, obtaining exclusive rights in a patent is only the first step toward the market, and whether the purposes of a patentee’s being granted such rights could be achieved shall depend on many conditions; especially on the channels to be communicated with the industry for commercially exploited.

So the policies shall not be laid down to focus on application for a patent but on commercialization of a patented technology. For a high-qualified patented technology, the earlier it is implemented, the more chances of turning it into productive forces and the more competitive advantages the patentee will gain. A well-known saying of Lincoln, “The Patent System added the fuel of interest to the fire of genius”,¹⁹ has made a good annotation to the nature of a patent and mission of patent institution. The purpose of the patent institution is to promote and inspire innovation and give impetus or stimulate enthusiasm to genius inventor, which finally depends on the realization of the benefits. There are two ways to realize the objectives of gaining benefits: the patentee himself uses it by obtaining a legal monopoly for profits through the patent institution; or he reaches his goals of getting benefits through technology transfer. In different periods, patentees exercise the rights in different ways: in the early days, they achieved the value of technologies by his own invention, own application and own sales channels; later, with the more specific division of labor, sales or distributions were gradually separated and some corporations tended to focus on research and manufacturing.

To the era of knowledge-based economy, with the emergence of independent research institutes and organizations, technologies seem to become completely independent from the equipment and have been turned into commodities. As research workers or fellows become an independent class, technology transfer will inevitably become much more frequently.²⁰ Thus, in the era of knowledge-based economy, patented technologies (especially those in universities and research institutes) technology transfer is inseparable from the relative legal system and shall be emphasized. In this regard, it’s not difficult to understand why the United States has formulated and promulgated more than 20 acts and regulations relating to technology transfer since the 1980s. If analyzing the provisions of federal or national patent laws in the United States and other relevant countries, we can also find that the purposes of their patent institution all lie in commercial or industrial production.

There is a detailed description in the chapter “Patent Rights in Inventions Made with Federal Assistance” of United States Patent Law, which says that It is the policy and objective of the Congress to use the patent system to promote the utilization of inventions arising from federally supported research or development; to encourage maximum participation of small business firms in federally supported research and development efforts; to promote collaboration between commercial concerns and nonprofit organizations, including universities; to ensure that inventions made by nonprofit organizations and small business firms are used in a manner to promote free competition and enterprise without unduly encumbering future research and discovery; to promote the commercialization and public availability of inventions made in the United States by United States industry and labor; to ensure that the Government obtains sufficient rights in federally supported inventions to meet the needs of the Government and protect the public against nonuse or unreasonable use of inventions; and to minimize the costs of administering policies in this area.”

¹⁸ See Article 22 of Patent Law of P.R.China (2008), at http://www.wipo.int/wipolex/en/text.jsp?file_id=178664.

¹⁹ See Abraham Lincoln, Lecture on Discoveries and Inventions, <http://showcase.netins.net/web/creative/lincoln/speeches/discoveries.htm>.

²⁰ Zhongfa Ma: “Theoretical Studies and Practical Research on the Legal System of International Technology Transfer” Law Press China, 2007, p.309.

²¹ This part was added to Patent Law on December 12, 1980, and revised in the November of 2000.

It clearly defines that the kernel mission of the United States patent law was protection at the beginning, but late in 1980s, patented technologies were not commercialized smoothly, especially for the patents granted on the basis of federal assistance, so the key points of patent law began to turn to promoting the application and commercialization of patented technologies. This fundamental provision has founded a basis for later formulating and promulgating acts on transfer of technology in the United States.

Then let us see the Patent Law of Japan, whose first article states clearly that the purpose of this Law is, through promoting the protection and the use of inventions, to encourage inventions, and thereby to contribute to the development of industry.²² Obviously, protection and utilization is not its purpose but a means, the purpose is to “encourage inventing, and promote industrial development”. The Patent Law of German provides that “patents shall be granted for inventions that are new, involve inventive step and are susceptible of industrial application, and an invention shall be considered susceptible of industrial application if it can be made or used in any kind of industry, including agriculture,²³ and we may conclude that if an invention is not to be commercialized, it will not be subject to patent protection; which means that protection is not the purpose, but commercialization is.

4 The problems on the implementation of the patent system in China

Since the first patent was issued and the patent system was created, patented technology has linked to business which could produce commercial benefits. And to the Patentees, the cost of gaining exclusive rights and commercialization is to disclose technology information and pay maintenance costs; to the state and society, the cost is to give the patentees rights of commercial monopoly over a certain period, during which patentees might permit others to exploit their technologies for commercial purpose in the manner of technology transfer (assigning or licensing technologies) to get royalties, and when the term is over, the patented technologies shall enter into public domain to be shared by everyone at free. This is a commercial exchange between the state and the individuals (patentees), that is, patent system is a purely commercial phenomenon between patentees and a state and the patentees' inputs, outputs and commercial operations of patent issues largely belong to private activities according to statutory provisions; once the state authorities confer a patentee exclusive rights to his technology, it shall not intervene more for making the patent system complied with smoothly and efficiently.

If there is any violation of this rule, for example, the government assumes some obligations which should be born by the applicants or patentees, such as application fees, annual patent maintenance fees, or even some investments and so on, there would be a dissimilation or alienation to the patent system: the patentees would not cherish patented rights in such a way, and they would not consider the real purpose for getting exclusive rights contained in a patent and they would not care for gaining returns by exploiting or licensing or assigning patents for commercialization. However, in China, most provincial governments or other local governments have made funding policies for supporting the applications for patents or even for awarding applicants to encourage people applying for patents. Under such current incorrect guidelines for applying for patents, most applicants would only be satisfied with the state that they are the holders of the so-called "static patents" (which are dormant or sleeping patents) which may make them gain good fame and post promotion in the current evaluation system on achievements; and the formalism of application activities (the purpose of applicants is just for being granted exclusive rights and they do not care for other issues such as licensing and commercializing) has been in vogue by which a lot of junk patents have been created.

This result has not only failed to promote social and economic development, but also wasted a large number of social resources. Accurately understanding the nature of a patent the missions of patent system is a valuable reference to studies on China's policy on patented technologies commercialization. We shall consider whether the patent nature and the missions of patent system should be taken into account when governments provide funding support for R&D programs in universities and R&D institutes? Should the commercialization potentiality of the patented technologies or technical achievements be concerned when universities and institutes applying for support funds from governments who delegate tax payers to make decisions? Is it possible to take commercialization as an important indicator of researchers' promotion in profession?

²¹ See Section 200 in Chapter 18 — Paten Rights in Inventions Made with Federal Assistance of United States Code Title 35 – Patents, http://www.wipo.int/wipolex/en/text.jsp?file_id=130082.

²² See article 1 of Japan Patent Act (2005), http://www.wipo.int/wipolex/en/text.jsp?file_id=138595

²³ See Article 1 and 5 of Patent Law of Germany, http://www.wipo.int/wipolex/en/text.jsp?file_id=126259.

So we shall not understand the patent institution at the first step, that is, we shall not only concern the issues on “granting patents”, but comprehensively grasp and perceive the patent institution, especially attach much more importance to promoting the exploiting and commercializing patented technologies to make them contribute to social development. The commercialization of patented technologies can create more employment opportunities, or even establish a completely new industry, and thereby increase taxes, and then repay for the taxpayer's investment in R&D. If a patented technology could not be commercialized, especially the research results from R&D institutes and universities who spend taxes paid by taxpayers, it would be a tremendous waste of social wealth. In order to avoid this negative result and provide good guidance to R&D activities of universities and research institutes, relevant policies in China shall be adjusted, such as, we shall not encourage universities to apply for patents, but help them to cooperate with the corporations to deal with applications, for corporations are “businessman” while universities and research institutes are not. We shall observe the following rule: Let market decide what should be decided by it. In my opinions, the applications for patents shall be determined by the market and the governments should not give too much “concern” or undue policy influence on commercial activities, such as providing funding for application or giving awards to patentees, etc.

In this aspect, the governments shall not intervene too much and the rule that “give emperor the things that are the emperor's, and to God the things that are God's” should be observed. We should not treat the numbers of patent application and granting as a main requirement or standard for one's promotion or gaining rewards. Generally speaking, the effects on or contribution to the social and economic development rather than virtual or abstract quantity shall be the final standards for evaluating the scientific research achievements. Otherwise, the activities of the violation of the economic laws will eventually run the opposite direction to the expectations and the good intentions which are conveyed in governments policies. The current policies in China (such as the funding policy for patent application and awarding) were misunderstood and implemented by some short-sighted people: they ignored the proprietary essence of a patent which value will be reflected by commercialization and the missions and objectives of patent system, and treated number of patents and applications as their abstract symbol of performance achievement or conditions for their promotions in professional careers. They blindly encourage the universities, research institutes and other organizations to apply for patents while paying no attention to whether the so-called patents could be utilized in business. The commercial activities shall be determined by the market but in China, the applications for and granting patents have been distorted by inappropriate funding policies. So it is easy for us to understand why plenty of patents with poor quality have been produced in the past years, which could not be transformed into real properties and bring huge wastes of patent examiners' work and other social resources and affect the granting and commercialization of highly-qualified patents. Meanwhile, more people may be further misled to know and realize patent and patent system.

All of these will eventually be detrimental to build an innovation-oriented nation. In China, the problem on commercialization of patented technologies held by universities and research institutes is the most serious. So the changes of the current policies shall help to solve it. The requirements for governmental-funding R&D programs completed by universities and research institutes should be adjusted as follows: if an intellectual achievement is planned to apply for a patent, it shall be able to meet the demands of dynamic market and potential customers; and the commercialization rate, rather than the static number of “academic papers”, or even the so-called patents that will never be able to commercialized, shall be regarded as a key index for innovation depth and social contribution. It is stated clearly in the “Outline of the National Intellectual Property Strategy” that the intellectual property system is the basic system for the development and using of knowledge resources; through rationally determining the rights of knowledge and other information that people own to, it adjusts the interests of different parties which generate during the process of creating and using knowledge and information, so as to stimulate innovation and promote economic and social progress. Nowadays, with the further development of knowledge economy and globalization, intellectual property has increasingly become a strategic resource for national development and a core element of international competitiveness, and even a significant support to build an innovation-oriented country and a key to taking the initiative of development.²⁴ This point of view can be seen as an accurate and objective position and description of the value of intellectual property system and lay a great foundation for revising the current policies on funding application for patents.

²⁴ “Outline of the National Intellectual Property Strategy”, issued by the State Council of People's Republic of China, [Available online: <http://ip.people.com.cn/GB/152255/156799/9965192.html>].

5. Conclusion

Under the premise of grasping the accurate knowledge of the Intellectual property legal system's objective and the patent's essence, we shall reconsider the legislation on patent and related policies in China and get enlightenments from foreign countries' experiences for revising related laws. We shall clarify and rebuild the goal of the Intellectual property legal system in China, consummate the patent legal system and revise patent-funding policies to focus on commercialization, transfer and diffusion of patented technologies with the purpose of preventing the blindly avocation of the patent application. It shall be universally accepted that the applications for patents be mainly determined by the market power, rather than by the funding from the governments. If we can do so, the number of applications and granted patents will dwindle on a large scale and the number of high-quality patents will increase, which will surely create favorable conditions for improving the rate of patented technology commercialization in China.

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