Reconsideration of the Essence of a Patent and the Missions of Patent Institution: Low Rate of Patented Technology Commercialization in China

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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 nature of a patent, which is a kind of private property rights serving for commercial activities, and the missions of the patent institution, which are to promote the commercialization of the patented technologies, have been misunderstood or distorted. Therefore, it is of great significance both scientifically and to precisely grasp the essence of a patent and the missions of the patent institution; and in order to create favorable environment for improving patent quality and increasing technology commercialization rate, on the basis of the common recognition, China shall improve its patent legal system to respect the market-oriented rules which are the decisive factors for an inventor to apply for patents, and adjust the current patent funding policies to contain the activities of blind patent applications.

Keywords: Essence of a patent, patent institution, missions of the patent institution, commercialization rate of patented technologies

The commercialization of scientific achievements, mainly related to patented technologies, particularly those produced by the research fellows from universities and research and development (R&D) institutes, has been a serious issue ever in China since 1990s, but so far no effective solution has been found. ‘Outline of the National Intellectual Property Strategy of People’s Republic of China’ (the Strategy) promulgated by the State Council on 5 June 2008, defined its purpose as ‘improving China's capacity to create, utilize, protect and administer intellectual property rights, and making China an innovative-oriented country and attaining the goal of building a moderately prosperous society in all respects’. And it further described intellectual property system in a more scientific way, highlighting the focuses of intellectual property institution on four issues, not only on protection. The Strategy especially has set a proper position for the use and enforcement of intellectual property rights, which is complied with the inherent nature and objectives of intellectual property legal system expressed in Articles 7 & 8 of the TRIPS Agreement, 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 under the current context of making China an innovative country. In order to provide proper guidance and theoretical basis for the relevant policies and laws on commercialization of patented technologies from the universities and R&D institutes, some theoretical issues involved shall be explored and expounded.

According to a study accomplished by the Ministry of Science and Technology of China, there are about 30,000 scientific achievements annually at provincial and ministerial level, but only about 10%-15% of these items are suitable for large-scale commercialization. The annual number of patented technologies reaches more than 70,000, but just about 10% of them are commercialized. The contribution rate of technological progress to economic growth is about 39%, of which the high-technology contribution rate is just 20%, far below that of 60% in developed countries. It is undoubtedly a huge waste of scientific and technological resources. In September 2011, Mrs Chen Zhili, Vice Chairperson of the National People’s Congress, made a speech at a conference held in Beijing, and she said in her speech that the rate of commercialization of scientific achievements was
merely about 5% and situations of commercializing scientific achievements had not improved and even had deteriorated in some fields in the past several years.  

However, the situations of universities and most R&D institutes in this field may be much worse. From the data collected from some universities and relevant governmental departments, it can be found that the patented technologies commercialization rate in universities and R&D institutes is much less than that mentioned earlier. 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’ and for those that may not produce commercial profits, the company will not apply patents in the State Intellectual Property Office. Among the R&D institutes, those that 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 restructured R&D institutes, the typical examples are the ones in Guangdong Province that have begun to reform since 1998 and have largely been transformed to be subsidiaries of enterprises; and as to those cooperating with industries, the example is that the commercialization rate in Guiyang Aluminum Magnesium Design & Research Institute has reached up to 90%. It is 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 re-analysis of the nature of a patent and the missions of patent legal system, in hope of helping readers to form an accurate understanding of the issue and find a fundamental solution to the problem on low rate of patented technology commercialization.

The Essence of a Patent and the Missions of the Patent Institution

Essence of a Patent

A patent refers to a set of exclusive rights 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. In most countries, a patent may be granted effectively giving the patentee the exclusive rights … for a period of 20 years from the date of the original application. 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. For a patent, it is universally accepted that exclusive rights are a form of monopoly which can be further interpreted as the rights to exclude others from making, using, marketing, selling, offering to sale, or importing an invention for a specified period, granted by the government, and the patentee could hold and exploit such rights by himself or transfer or license them to others for implementing the invention with commercial purpose. Thus, the essence of a patent is a set of granted commercial rights to exclude others from utilizing and enjoying such rights and any activity of using or exploiting such rights without patentee’s authorization shall be regarded as infringement. Usually, without the permission of the patentee, patented technologies could not be implemented for commercial use within the validity period of the patent.

As the main part of intellectual property, a patented technology is obviously a property, and its most distinguished feature is that its holder has the right to consume, sell, rent, mortgage, transfer, exchange or abandon it, or to exclude others from doing these things for the purpose of making profits (especially economic ones) or solving the scarcity problem. Briefly, as a property, it shall be utilized in economic or commercial aspects to meet demands of people, for only when items are relatively scarce with respect to people's desires, do they become property. Its second most remarkable nature is that it is a kind of intangible property right, that is, its value in wealth and economy is not a reality or actually tangible property. It is a potential property and its economic values will only be realized by commercialization
through certain means such as exploitation by the right holder himself or by licensees or assignees that get the rights of using the patent on the basis of different agreements. Thus it is essentially different from a tangible property, for the economic values of the latter do not need to be converted or commercialized and it can bring economic benefits or wealth to its owner directly.

The Features and the Missions of Patent Institution

Patent Institution

The patent institution is a legal system of providing protection and encouragement to inventions to stimulate technological innovation through legal and economic means. It is based on specific laws such as the patent law, by granting inventors or assignees the exclusive rights on the invention and protecting them to promote scientific and technological progress and economic development. On one hand, it is a legal means to protect the exclusive rights of patented technologies holders; on the other hand, it encourages the holders 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 or license agreement and then the new technology could be used in the social production more widely, and finally promote socio-economic development. So the core content of the patent legal system is to completely disseminate the information of inventions to be granted patents to the public and make patented technologies public goods in the public domain after their expiration in accordance with the law, while the authorities provide inventors with a certain period of exclusive rights.

In general, the patent institution can be divided into two stages. The first is the application and granting 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, which creates advantageous conditions for protection and utilization of patents. 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, will the purposes and objectives of the patent institution be realized and will the value of the patent institution be demonstrated. However, it is the missions of patent institution at this stage that have been widely ignored in China. Strictly speaking, in logic, there should not exist the serious problems 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’ could not be transformed into practical productive forces, namely, they could not be utilized to create fortunes, and then on the basis of the definitions of ‘property’ and ‘patent’, the following question should be raised: are they real patented technologies or are they worthy of being granted the exclusive rights as patents to the applicants?

The Features of the Patent Institution

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 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 out those that do not meet customers’ needs out of the market. The market is a decisive force for a technology or invention to be patented or not, and the values of patent institution shall reflect this in order to encourage inventors to invent technologies so as to meet market demands.

Secondly, the patent institution shall make great contribution to promoting diffusion, application and transfer of inventions by patentees themselves or by licensees or assignees, for 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 is that a big country with a huge number of patents does not connote that it is a powerful one with strong innovation, for one valuable patented technology is much worthier than one million junk patents. The key issue for a country is to hold more and more high-quality patents, not to hold more and more number of patents, as quality is the key to a bright patent future. 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.
The Missions of Patent Institution

From the above discussion, it can be seen that in fact the missions of the patent institution are to protect the patentees’ rights initially and then 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 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 to devise a mechanism 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 cannot deal with. Article 22 of the Patent Law of PR China, the three substantive requirements for granting a patent novelty, inventiveness step (creativity or non-obviousness) and practical applicability. Practical applicability here refers to the invention or utility model can be made or used and can produce effective results; but here ‘effective results’ would not be 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 useful 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 making certain benefits and manufacturing products or providing services, 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 towards market, and whether the purpose 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 commercial exploitation. 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 get.

A well-known saying of Lincoln, ‘The patent system added the fuel of interest to the fire of genius’, has made a good annotation to the nature of a patent and the missions 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 economic 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 the different periods of the patent history, patentees exercise the rights in different ways: in the early days, they achieved the value of technologies mainly by their 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. Thus, in the era of knowledge-based economy, patented technologies (especially those in universities and research institutes) 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 federal acts and regulations relating to technology transfer since the 1980s.

**Typical Legislations from the United States, Japan and Germany reflecting the Missions of Patent Institution**

Analysis of the provisions of federal or national patent laws in the United States and other relevant countries showed 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 (2011), 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 US by the United States industry and labour; 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. This part was added to patent law on 12 December 1980, and revised in November 2000. It clearly defines that the kernel mission of the US 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 found a basis for later formulating and promulgating acts on transfer of technology in the US.

In the Patent Act (Act No. 121 of 13 April 1959, as last amended in 2008) of Japan, Article 1 states clearly that the purpose of this law is, to promote the protection and use of inventions, encourage inventions, and thereby contribute to the development of industry. Obviously, protecting and utilizing a patented technology is not the purpose of the Act, but a means to realize the purpose which is to ‘encourage invention and promote industrial development’. The Article 24 of the Japanese Patent Act 2008, also provides that an inventor of an invention that is industrially applicable may be entitled to obtain a patent for the said invention; and this means that if an invention could not be applied in an industry, it would not be regarded as meeting the requirements or conditions for patentability. So in Japan, industrial applicability is the fundamental condition for an invention to be granted a patent and this has been defined and confirmed by its patent institution.

Article 1 of the Patent Law of Germany (as amended by the Act on Improvement of Enforcement of Intellectual Property Rights of 31 July 2009) provides that ‘patents shall be granted for inventions that are new, involve inventive step and are susceptible of industrial application’, that is, an invention without the nature of industrial application shall not be granted exclusive rights as a patent. Article 5 of the Patent Act further describes the criterion of susceptibility of industrial application, namely, an invention shall be considered susceptible of industrial application if it can be made or used in any kind of industry, including agriculture. Therefore, it can be concluded that if an invention is not to be commercialized, it will not be subject to patent protection. These provisions laid down in the fundamental Act of the patent institution reflect the essence of a patent and imply that protection is not the purpose of the patent institution, but commercialization is.

In conclusion, a patent is a product of commodity economy and it is a commodity itself; if it could not be commercialized to make contributions to economic development, it would not be regarded as a real patent. The fundamental mission of patent institution is mainly to help the patentees to realize their commercial purpose by encouraging patentees to exploit patents by themselves or to transfer patented technologies to others for making profits, and its next mission is to bring patented technologies into full play in social and economic development.

**Problems on the Implementation of the Patent System in China and the Solution**

**Problems on the Implementation of the Patent System in China**

Since the first patent was granted to the Florentine architect Filippo Brunelleschi for a three-year period for a barge with hoisting gear in 1421 (ref.18) and the
The patent system in the modern sense was created with a decree on patents enacted by the Republic of Venice in 1474 as an origination point, patented technologies have linked to business with the purpose of producing commercial benefits. Under the patent institution, 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 of protection has expired, the patented technologies shall enter into public domain and will be shared by everyone at free. This is a commercial exchange between the state and the individuals (patentees), that is, patent system is purely a ‘product’ in commodity economy, which is established to regulate relationships between patentees and a state in commercial aspect, and the patentees’ inputs, outputs and commercial operations of patent issues largely belong to private activities according to statutory provisions. In the process of patent applications, in order to make the patent system enforced smoothly and efficiently, the state authorities shall not intervene in such activities. If there is any violation of this rule, for example, the government assumes some obligations which should be borne by the applicants or patentees, such as application fees, annual patent maintenance fees, or even some investments and so on, there would be a dissimulation or alienation to the patent system: the patentees would not cherish patent 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, the Article 1 of the Patent Law (2008) provides that its purpose is to protect the lawful rights and interests of patentees, encourage invention-creation, promote the application of invention-creation, enhance innovation capability and promote advancement of science and technology and the economic and social development. According to this provision, the patent law expressly states its five purposes and 'to promote the application of a patent' is only one of them which ranks the third among the five objectives of the patent law, while 'to protect the lawful rights and interests of patentees' is the primary one ranking the first. This may produce negative impacts on enforcing patent law, especially on the attitudes and recognition of a patent essence and the missions of patent institution, for protection of rights and interests of patentees, shall not be regarded as one of the purposes, let alone with high significance among the five purposes, but be a means or way to secure the realization of the objectives of patent law-promoting application of patents and others. The fact that funding policies for patent applications and granting have widely been issued and implemented is a typical case. Most provincial governments or other local governments have made funding policies to encourage inventors or related people to apply for patents by supporting them to file applications for patents or even by awarding the applicants who file patent applications or who are granted patents, while neglecting the state of patents commercialization or industrial applicability. Under such guidelines for applying for patents, most applicants would only be satisfied with the situations that they are the holders of the so-called ‘static patents’ (namely dormant or sleeping patents) which may make them gain good fames and academic titles (such as ‘professor’) or job promotions in the current evaluation system on scientific 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 patented technologies) has been flooded, and consequently a lot of junk patents have been created. The policies may bring the following pessimistic consequences: (1) the real creative invention will not be reviewed or granted the exclusive rights promptly because of a huge number of applications, and then they will not be commercialized timely, which indirectly fail to promote social and economic development as they should; (2) a large number of social resources, such as patent examiners’ work, will be wasted in the activities of junk patents application and granting; and (3) the innovation enthusiasm of those researchers, whose research achievements for certain projects which need long time with deep concentration cannot be gained in a short time, or who really devote themselves to theoretical research, will be injured. Meanwhile, more people may be further misled to know and realize patent and patent system. All of these will gradually develop the environments unfavorable to innovation and creation.
When the governments at different levels in China issued these policies, their first motivation was to encourage inventors to apply for patents if they regarded their inventions worthy of being granted patents, for in a long time, many inventors, especially those doing research in universities and R&D institutes, did not have awareness of patent applications for their inventions and were unwilling to apply for patents; and the second motivation was to help the inventors who did not have sufficient money to proceed patent applications for their valuable inventions. However, the policies were misunderstood and taken advantage of by the short-sighted people who ignored the proprietary essence of a patent (the value of which would be realized by commercialization) and the missions of the patent system and treated number of patents and applications as their symbol of performance achievements or conditions for their promotions in professional careers. Then, objectively, the policies were implemented to 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 applications for and granting patents, which in essence are commercial activities and shall be determined by the market, have been distorted by inappropriate funding policies. So it is easy for us to understand why plenty of patents with poor quality, which could not be transformed into real properties, have been granted in the past years.

Solution to the Problems on the Implementation of the Patent System in China

To understand the nature of the patent, the mission of patent system is a valuable reference to the studies on China’s policy on patented technologies commercialization. Should the patent nature and the missions of patent system 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 R&D institutes applying for the projects financially supported by the governments which delegate tax payers to make decisions? Is it possible to take commercialization as an important indicator of researchers’ promotion in their career? So the patent institution should not just be enforced at the first step, namely, should not only concern the issues on ‘granting patentees exclusive rights’, but comprehensively grasp and perceive the patent institution, especially attach much more importance to promoting, 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 which spend a great many money 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 should be adjusted, such as, universities should not be randomly encouraged to apply for patents, but helped to cooperate with the corporations to jointly undertake patent applications, for corporations are ‘businessmen’ while universities and research institutes are not.

The applications for patents should 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. The number of patent applications and granting should not be treated 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 should be the final standards for evaluating the scientific research achievements. Otherwise, the activities of the violation of the economic laws will eventually run in the opposite direction to the expectations and the good intentions which are conveyed in the government policies.

In China, currently, the problem on commercialization of patented technologies held by universities and research institutes is the most serious. So the adjustments of the current policies may 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
In accordance with the contracts signed between the different groups of persons in the process of creating a system, regulations and balances the interests among certain knowledge and other information, the IP resources. By reasonably determining people’s rights in the field of patent application and utilization, there is a need to firmly uphold the principle of ‘giving to Caesar what is Caesar’s, and to God what is God’s’. If it can be done, 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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References
7. 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’, http://en.wikipedia.org/wiki/Exclusive_right.
9. This idea is very similar to the provisions of Article L613-3 of Intellectual Property Code of France. It’s provided that the following shall be prohibited, save consent by the owner of the patent: (a)Making, offering, putting on the market or using a product which is the subject matter of the patent, or importing or stocking a product for such purposes; (b)Using a process which is the subject matter of the patent or, when the third party knows, or it is obvious in the circumstances, that the use of the process is prohibited without the consent of the owner of the patent, offering the process for use on French territory; (c)Offering, putting on the market or using the product obtained directly by a process which is the subject matter of the patent or importing or stocking for such purposes.
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14 In 2010 and 2011, the numbers of domestic patent applications are respectively 1,109,428 and 1504670, and ranked the first in the world in both years; the number of granted patents in 2011 is 883,861 ranking the first in the world and the number of invention patents is 172,113 ranking the third in the world (the data are cited from Monthly Statistics Report of SIPO Patent Professional Work and Comprehensive Management, December, 2011 at http://www.sipo.gov.cn/ghfzs/zltj/tjyb/tjyb2011/201201/t201201_641058.html). But this does not mean that China has already had strong capacity to innovation. Professor Wan Gang, the Minister of the Ministry of Science and Technology of PR China, said that we did not have sufficient capacities in the field of technology innovation and at present, we lacked the abilities to lead the tendency and tides of technological development. See Wan Gang, The number of granted invention patents ranked the third in the world in 2011, but technology innovation does not match it, http://news.xinmin.cn/rollnews/2012/03/18/14077227.html.


