

Research on patent Transfer in China's two top universities

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Abstract: This paper analyzes and discusses the patent transfer status and existing problems in China's double first-class universities, and the research shows that there are still many problems in patent transformation in China's double first-class universities, such as low conversion efficiency and uneven geographical distribution. This paper puts forward some suggestions from many aspects to improve the patent transfer.

Key words: patent; Transfer of patent; Double top;

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I. INTRODUCTION

A patent is an invention that enjoys the protection of national laws and regulations. An invention-creation that is submitted to the examination and approval authority for a patent is granted to the applicant for a patent within the time limit prescribed in the country after passing the examination according to law, and the applicant for a patent is required to pay an annual fee regularly to maintain the state of protection [1]. Patent transfer refers to the business act in which the patentee transfers the right to use or ownership of the patented technology to another party within the area authorized by the Patent Law to obtain the corresponding consideration. Enterprises' application of patents can improve product quality, improve technical content, reduce production costs, promote product upgrading and promote enterprise development [2].

Colleges and universities are one of the important innovation subjects in China. Scientific research and teaching are two important tasks shoulded by colleges and universities today. Colleges and universities have a large number of scientific and educational personnel, rich research resources, and a large number of research achievements, while patent technology is the main carrier of scientific and technological achievements [3][4]. The two first-class universities play an important role in leading and supporting patent research and development and authorization. Double best plan is to make some colleges can speed up the modernization of higher education management system and management ability, improve the level of higher school personnel training, scientific research innovation aspects play a role of lead and take the lead in demonstrations [5], an important force in knowledge discovery and scientific and technological innovation, in promoting all kinds of high quality talents training, support national innovation driven development strategy, service economic and social development play a big role [6].

In recent years, China has issued laws and policies such as the Law on Promoting the Transformation of Scientific and Technological Achievements, and local provinces and cities have also published relevant Regulations on Transformation. Under the current situation, it is worth university officials, teachers and students to think deeply about how to apply a large number of patent technologies in colleges and universities to improve productivity, let college patents out of the campus, improve the level of colleges and universities serving the society as scientific research institutions, and realize the intellectual value of patents [7].

II. DATA SOURCES

All announcements about the transfer of patents can be viewed on the official website of the State Intellectual Property Office and its published documents. The announcement information accurately records complete information about the parties, time and content of the transfer of patents, which provides detailed and complete basic patent data for this paper. The data related to patent transfer in this paper are from the patent announcement on the website of the State Intellectual Property Office. The data in this paper is the sum of the patent data of 42 first-class universities in 2019.

As for the calculation of patent conversion rate, there is no uniform calculation method for patent conversion rate in China [8]. This paper adopted two kinds of calculation methods, the first is to use the announcement for standards, announced that the transfer of the patent or the patent, the ratio of computation method: published patent conversion rate is equal to the transfer of patents than published patents, can be a rough measure of the patent into work, but it is difficult to reflect the dynamic changes of the patent marketization level; The second is to use the number of applications as the standard. The ratio of transferred

patents in the current year to the number of applied patents. Calculation method: The conversion rate of applied patents is equal to the number of transferred patents compared to the number of applied patents, which can better show the level of patent marketization, but lacks accuracy.

III. TRANSFER OF PATENT TECHNOLOGY

Patent Transfer in China's Double First-class Universities in 2019

Location	Colleges and Universities	Number of patents filed	Number of open patents	Number of patents transferred	Application for Patent Conversion	Publication of patent conversion rates
Heilongjiang	Harbin Institute of Technology	3247	5189	490	15.09%	9.44%
Beijing	Tsinghua University	4623	7894	474	10.25%	6.00%
Sichuan	University of Electronic Science and Technology	8797	12986	405	4.60%	3.12%
Zhejiang Province	Zhejiang University	5544	8808	327	5.90%	3.71%
Guangdong	South China University of Technology	3929	6341	295	7.51%	4.65%
Hubei Province	Wuhan University	2434	3740	219	9.00%	5.86%
Shanghai	Shanghai Jiaotong University	2970	4749	211	7.10%	4.44%
Shaanxi Province	Xi'an Jiaotong University	3902	5082	190	4.87%	3.74%
Chongqing	Chongqing University	2177	3252	178	8.18%	5.47%
Jilin Province	Jilin University	4024	5209	177	4.40%	3.40%
Beijing	Beijing Institute of Technology	3212	4758	159	4.95%	3.34%
Hunan	Central South University	3527	5217	146	4.14%	2.80%
Shaanxi Province	Northwest Polytechnic University	2813	4434	145	5.15%	3.27%
Jiangsu Province	Southeast University	3568	5653	144	4.04%	2.55%
Beijing	Peking University	1592	3100	139	8.73%	4.48%
Sichuan	Sichuan University	2669	4210	130	4.87%	3.09%
Jiangsu Province	Nanjing University	1209	2161	100	8.27%	4.63%
Guangdong	Sun Yat-sen University	2052	3097	98	4.78%	3.16%
Shanghai	Tongji University	2084	2999	97	4.65%	3.23%
Shanghai	Fudan University	1177	2006	82	6.97%	4.09%
Tianjin	Tianjin University	4216	6056	77	1.83%	1.27%
Hubei Province	Huazhong University of Science and Technology	4006	6099	76	1.90%	1.25%
Anhui Province	China University of Science and Technology	1173	1601	74	6.31%	4.62%
Beijing	Beijing University of Aeronautics and Astronautics	2342	3763	72	3.07%	1.91%
Fujian Province	Xiamen University	1297	2254	72	5.55%	3.19%
Henan Province	Zhengzhou University	2432	3206	62	2.55%	1.93%
Gansu Province	Lanzhou University	687	1098	60	8.73%	5.46%
Beijing	Agricultural University of China	979	1624	59	6.03%	3.63%
Liaoning	Dalian University of Technology	3748	5256	57	1.52%	1.08%
Shanghai	East China Normal University	720	995	55	7.64%	5.53%
Hunan	Hunan University	1141	1558	52	4.56%	3.34%
Liaoning	Northeast University	2370	3618	41	1.73%	1.13%
Shaanxi	Northwest University of	709	1373	25	3.53%	1.82%

Province	Agriculture and Forestry Science and Technology					
Tianjin	Nankai University	542	768	24	4.43%	3.13%
Hunan	University of Defence Science and Technology	1132	1326	22	1.94%	1.66%
Shandong Province	Ocean University of China	634	963	16	2.52%	1.66%
Shandong Province	Shandong University	2892	4264	11	0.38%	0.26%
Yunnan	Yunnan University	439	573	10	2.28%	1.75%
Beijing	Renmin University of China	80	105	7	8.75%	6.67%
Beijing	Beijing Normal University	312	609	6	1.92%	0.99%
Xinjiang	Xinjiang University	265	292	6	2.26%	2.05%
Beijing	Central University for Nationalities	64	80	1	1.56%	1.25%
Total		97730	148366	5091	5.21%	3.43%

With the continuous growth of patent applications, China's top universities and research institutions are actively exploring ways to improve the efficiency of technology transfer by building laboratories and providing technical consulting services to companies. However, the current patent transfer situation of the two first-class universities is still severe, mainly in the following aspects: In 2019, 42 first-class universities have applied for a total of 97,730 patents, published 148,366 patents, and transferred a total of 5091 patents in total, with a conversion rate of 5.21% for patent applications and 3.43% for public patents. Patent transfer several top universities for Harbin industrial university, 490, the highest number of patent was at the university of electronic science and technology, 8797, public university and university of electronic science and technology of the highest number of patents, 12986, the highest conversion rate for Harbin industrial university to apply for a patent, at 15.09%, published patent transfer of the highest rate of Harbin industrial university, was 9.44%.

In general, the number of patent applications and the number of published patents has been very large, indicating that the investment in scientific research of the two first-class universities has achieved remarkable results. However, in general, a large number of patent achievements have not been transferred from schools to social production, and the conversion rate of patents is low, which has not promoted the improvement of productivity.

The knowledge transformation from universities to enterprises is restricted by geographical location. Because double first-class university innovation at the university of regional distribution and the innovation of the technology to the local economy development ability has significant improvement, so that colleges and universities patent transfer and licensing are mainly distributed in economically developed areas, due to the double top colleges and universities to focus on a few cities, also affect the transfer of patent situation of different provinces and cities, provinces and cities within the patent license is the transfer of the mainstream, so double first-class universities patent transfer number number of areas are often too much.

Beijing has the largest number of top-tier universities and the largest number of patent transfers, which make a great contribution to Beijing's economy. University of Electronic Science and Technology in Sichuan province and Harbin Institute of Technology in Heilongjiang Province are the main sources of local patent transfers, indicating the importance of these two institutions in related industries, and the strong performance of institutions in professional fields can also greatly boost economic development. Other universities also have their own situation, such as remote location and backward economy, resulting in low number of patent transfers and patent conversion rate.

IV. CONCLUSIONS AND RECOMMENDATIONS

1. Conclusion

Due to the differences in management measures, emphasis and scientific research level, the patent conversion rate of specific colleges and universities is differentiated, and there is an imbalance in regional distribution. University of Electronic Science and Technology of China (UESTC) and Harbin Institute of Technology (Harbin Institute of Technology) have played an important leading role in the patent transformation. Other universities, such as Tianjin University and University of Electronic Science and Technology of China (UESTC), have the potential for further improvement. The number of transferred patents is too low compared with the number of published patents. Economically developed regions have sufficient funds, numerous universities and scientific research personnel, and a high level of science and technology in China, so patent transfer activities are frequent.

Policy and economic conditions have created imbalances of transfer between regions. Since the reform and opening up, the coastal areas have rapidly risen economically by relying on their geographical advantages

and relevant policies and measures, and have been ahead of the central and western regions for a long time, resulting in unbalanced development among regions. If we want to promote the balanced and coordinated development of regions, we need to use financial and economic means to regulate and develop different regions according to local conditions. The scientific research achievements of universities and colleges play an important role in promoting high-quality economic development. In general, the double first-class plan has played an important role in scientific research and patent transformation in China.

2. Suggest

The number of patent applications of the two first-class universities is large, the number of published patents is large, but the patent conversion rate is low, so it is necessary to strengthen the application of high-quality patents. The quality of patent development in universities lies in the effective transformation. It can be seen from the data in this paper that the patent conversion rate is still low even in the top two universities, and there are many problems. After the investigation, the following suggestions are proposed:

(1) Improve the patent transformation effect assessment system

Many universities pay much attention to the specification of quantity and form in the setting of patent assessment index, but often neglect the quality and practical application of patent. Many first-class universities regard the number of authorized patents as the evaluation standard of scientific researchers' titles and the basis of scientific research achievements, which leads to the blind pursuit of the number of patents and large-scale patent applications by university researchers. But college and department is the lack of specific transformation of patent system, in colleges and universities in the transformation of achievements, there are many problems, cause the transformation of patent's enthusiasm is not high, so set up scientific system of patent evaluation, so as to turn the patent results into the evaluation system, improve teachers' enthusiasm, let the researchers more care about patent transformation.

(2) To set up a special patent administration department

At present, researchers pay more attention to the property rights in the form of papers and works, and have not realized the importance of patents. A large number of new technologies are publicized at home and abroad through publication of papers, appraisal of achievements, academic journals, etc., leading to the disclosure of some patented technologies because they are not protected by law. At the same time, due to the fact that there is no payment due or the patent is still held due to risks, a special management department should be set up to provide information support and financial support for the university's scientific researchers. Docking school research and development and enterprise demand, improve patent utilization efficiency.

(3) To build a professional patent conversion communication platform

Traditional business model of patent intermediary does not meet today's market demand. The existing property rights trading platform has not played its due role in coordinating the needs of enterprises and patent information of colleges and universities. In the patent transfer market, enterprises with strong technology often do not need the transaction information provided by intermediaries, mainly because their transaction objects are very limited, and only a few institutions may be able to provide the new technologies needed by enterprises, while the patent information of these scientific research institutions is mostly open and can be inquired through the Internet. Therefore, it is necessary to adjust the coordination and communication function of the patent conversion platform according to the market needs, and use a more professional platform to better serve enterprises and universities.

(4) Conduct patent research and development based on marketization

The main motivation of scientific research in colleges and universities is a country and needs, to the attention of the scientific research of scientific research in colleges and universities is mainly derived from the state financial appropriation of funds, so the university scientific research often does not accord with the demand of the market, unable to effectively communicate cooperation and links, which seriously hindered the transformation of scientific and technological achievements and the speed of industrialization and level. In the process of patent marketization, because researchers only act as specific researchers to introduce and explain the technology, and patent ownership belongs to the school, the patent lacks active promotion. Due to the increasing number of scientific and technological achievements, the lack of patent promotion of university management, coupled with the absence of patent agencies and patent into productivity has become a process of low efficiency, need a long time, so to strengthen the communication with the needs of the enterprises can truly improve the conversion rate of patent, patent real to service in various industries, embody the value of knowledge.

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