ATLANTIS PRESS
Advances in Social Science, Education and Humanities Research (ASSEHR), volume 300
2018 International Workshop on Education Reform and Social Sciences (ERSS 2018)

Research on the Puzzlement of Patent Conversion in Vocational Colleges

Jinling Zhang
Sichuan Vocational College of Information Technology Sichuan China
108013372@qq.com

Abstract. Based on the research on the patent transformation content of vocational colleges, through the field investigation of patent transformation work in many vocational colleges across the country, the paper analyzes the confusion in the patent transformation of vocational colleges. The research process uses a large amount of data to analyze the current status of patent transformation in vocational colleges. Systematic analysis of the obstacles encountered in the patent transformation of vocational colleges, such as imperfect patent law and legal policy system, patent conversion service system is not matched. It also proposes to improve the patent transformation of vocational colleges and improve the ability of patent transformation services in vocational colleges. This kind of targeted suggestion promotes the development of patent transformation in vocational colleges in China.

Keywords: Vocational college; Patent; Patent conversion; Patent application.

1. Introduction

Due to the blind pursuit of patent applications by vocational colleges in China, a perfect patent conversion legal policy system has not been established. There are many shortcomings in patent investment financing, industry-university-research cooperation mechanism construction, and technology intermediary service capabilities. The number of patent applications in vocational colleges is large and the quality is not high. The patent waiver is serious and the conversion rate is low [1, 2]. The change in the status quo of patent conversion requires the improvement of the national legal policy system. This also requires the reform of patent management methods in vocational colleges [3, -5].

There are three problems in combining patent research in vocational colleges. First, the current research, especially the domestic research, is based on the transformation of scientific and technological achievements in vocational colleges. There is no unified concept for the transformation of patent results, which is not detailed enough. When it comes to analyzing problems and making countermeasures, it is not targeted and lacks persuasiveness. Second, the evaluation or calculation made is an estimate made through local economic development. Some questionnaire surveys were conducted, and there were no statistics on the results of science and technology related to actual output. Third, the research results of the transformation of scientific and technological achievements in vocational colleges are still weak, and further research is needed [6-8].

2. Current Status of Patent Transformation in Vocational Colleges

Vocational colleges are rich in scientific and technological resources. In order to better enhance the independent innovation ability of vocational colleges, the colleges and universities will enhance the ability of intellectual property creation, application, protection and management of colleges and universities, and promote the transformation of patent technology achievements. It is necessary to deeply study the status quo and problems of patent technology transformation in vocational colleges, and on this basis, put forward relevant suggestions and countermeasures, and provide policy support and theoretical support for the transformation of patent technology achievements in vocational colleges. The specific process is shown in Figure 1.

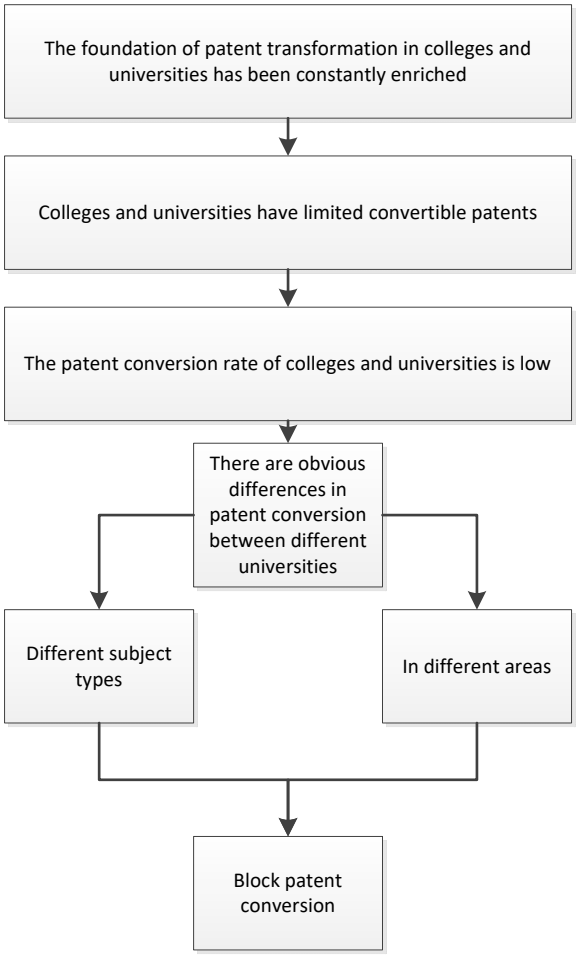

Figure.1 Patent transformation and development in vocational colleges

From 2010 to 2016, the total number of patent applications in vocational colleges in China was 826,238, including 541,186 invention patent applications (65.5%), utility model patent applications (20162) (24.4%), and design patent applications 83,450. (10.10%). The number of patent applications from 2010 to 2016 is shown in Table 2.

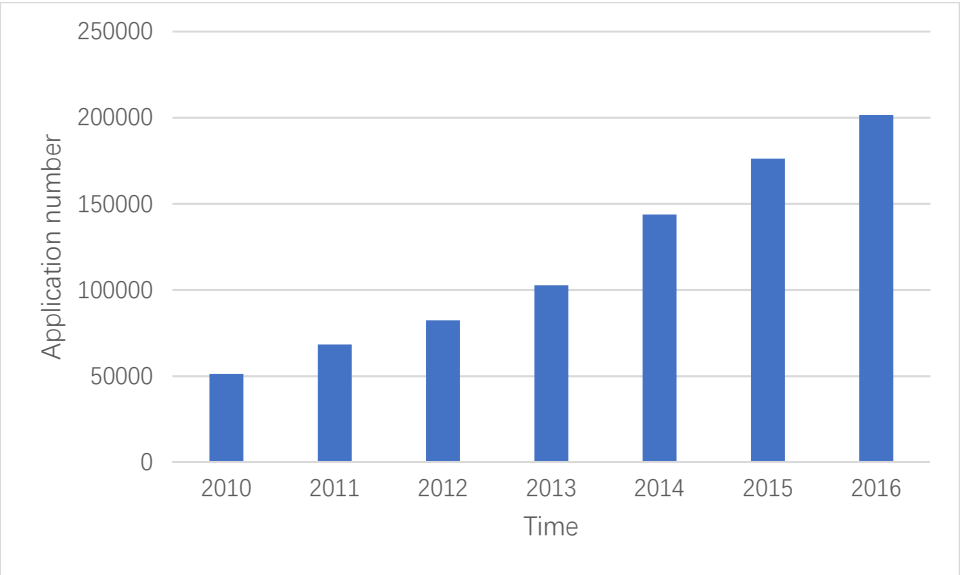

Figure.2 Changes in patent filings between 2010 and 2016

Under the current system in China, the number of patents in vocational colleges is an important indicator for the distribution of the proportion of scientific and technological resources invested by

vocational colleges and the efficiency of scientific and technological output of vocational colleges. The government administration uses the number of patents to evaluate the academic status of the profession, the status quo of research, and contributions to society. It is not scientific to make college patent applications a signal indicator to guide the government to allocate scientific and technological resources. Under this circumstance, the institutions will not pay attention to assessing the development prospects and application value of patents, but will apply for patents regardless of the cost of technology. Institutions apply for patents for scientific research results that are completely worthless, and waste limited scientific and technological resources on patents that have no meaning at all. It further exacerbates the expansion of the number of patents.

Counting the number of patent applications from Chinese vocational colleges during the five years from 2010 to 2016, invention patents accounted for 52%, far higher than the number of utility models and designs. as shown in Table 3. This shows that the invention patents created by the vocational colleges in China that have practical applications and have a promising future account for a large proportion. Although invention patents account for a large proportion, the amount that can be implemented is not as optimistic as the proportion.

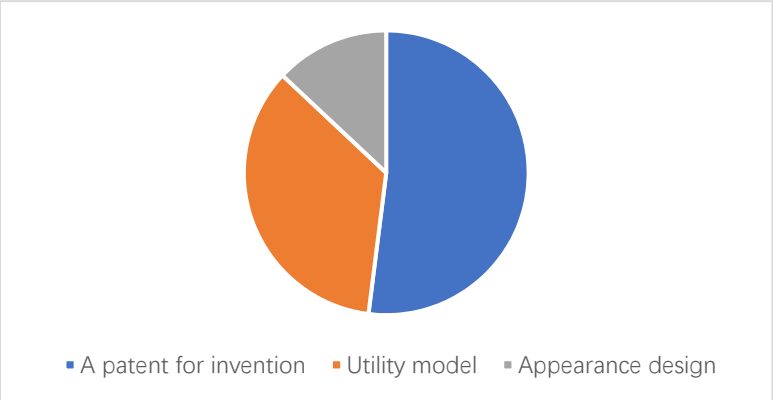

Figure.3 The proportion of different types of patent applications in vocational colleges from 2010 to 2016

A detailed analysis of the actual value of patents in vocational colleges in China from 2010 to 2016 can not only see the number of applications and the increase in research funding. It is also necessary to pay attention to the market value of the patent application, the amount of patent transfer or the amount of technology implementation. From 2010 to 2016, the number of annual patent sales in vocational colleges was 1,573, 1,746, 2,155, 2,357, 2,534, 2,786 and 2,357, respectively, with conversion rates of 6.4%, 5.0%, 4.4%, 3.5%, 2.9%, 2.7%, 2.5%.

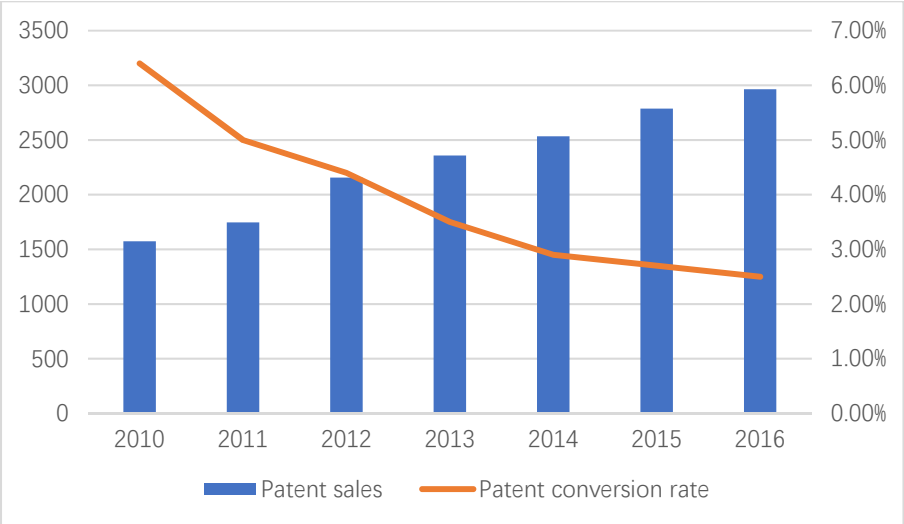

Figure.4 From 2010 to 2016, patent sales and conversion rate of vocational colleges

It shows that Chinese vocational colleges have not used the transfer of patent technology to obtain market funds. To a certain extent, it reflects that the transformation model of vocational colleges is still dominated by the government. And there is less realization of industrialization and marketization. According to the 2016 national patent survey data, the implementation rate of patents in colleges and universities is less than 30%.

In recent years, the number of patents in vocational colleges in China has soared. And the quality of patents has increased year by year. However, the development of patent industrialization in domestic vocational colleges is still very slow. And there are large differences in regional and inter-school development. The data in Table 5 shows that there are great differences in the production and transformation of patents in vocational colleges of different disciplines in China.

Table 1. 2010-2016 patent authorization and sales of different universities in China

Time		Institution type			
		Engineering colleges	Agricultural and forestry colleges	Medical colleges	Normal colleges
2010	Authorized number	18530	887	593	877
	Sale number	865	98	28	67
2011	Authorized number	19735	1423	623	1355
	Sale number	984	97	27	74
2012	Authorized number	26850	2583	746	1532
	Sale number	1287	121	25	82
2013	Authorized number	34960	3025	832	1744
	Sale number	1386	126	23	92
2014	Authorized number	40998	4523	1234	2466
	Sale number	1425	136	23	118
2015	Authorized number	45913	5378	1532	2834
	Sale number	1498	144	22	136
2016	Authorized number	49845	6023	1689	3054
	Sale number	1536	157	21	138

From the point of view of different regions, due to the unbalanced economic development in China, there are great differences in patent transformation between different regions. China's patent output is relatively large, and the vocational colleges with higher level of patent transformation are mainly concentrated in Beijing, Shanghai, Guangdong and coastal provinces and cities in the southeast. China's regional economic development is very unbalanced, and the market environment of patent transformation of Vocational Colleges in different regions is also unbalanced. All these reflect the urgent need for policy and law to guide the patent transformation of Vocational Colleges in China. It also indicates that the patent supporting services of Vocational Colleges in China need to be further improved.

3. Reasons for Obstructing Patent Conversion in Vocational Colleges

3.1 Patent Conversion Legal Policy System is not Perfect

The unclear attribution of rights is one of the important factors that affect the enthusiasm of the staff of vocational colleges in China for patent transformation. Most of the patent achievements of vocational colleges are classified as job inventions. Although vocational colleges have invested a large amount of funds, equipment and information resources in the process of patent technology

development. But the intellectual resources invested by the inventors are indispensable, and even the most important part of the R&D process.

Although there are already some incentives for patent conversion in China's current legislation. For example, the "CPC Central Committee and the State Council's Decision on Accelerating Scientific and Technological Progress" proposed that the income from the transfer of scientific and technological achievements enjoys the preferential tax reduction and exemption and the state's contribution to the transformation of scientific and technological achievements and the development of high-tech industries. However, the patent incentive mechanism currently implemented in China cannot effectively improve the enthusiasm of patent applicants for conversion. Existing rewards will still be constrained by factors such as the small scope of patent conversion rewards and the rigid form of rewards. Moreover, in the implementation of the incentive policy, it has not been thoroughly implemented and implemented.

3.2 Patent Transformation Service System is Incompatible

In Chinese vocational colleges, there are very few professionals specializing in patent management in vocational colleges. Because the patent work requires a compound talent who understands both the law and the technology. The staff of the Science and Technology Department of the general vocational colleges belong to the administrative staff. The administrative staff is not able to understand the patent technology well, and it is even more difficult to know the patent prospects and other aspects related to patent conversion. Therefore, they cannot really participate in the patent conversion work of vocational colleges, and can only carry out preliminary and procedural management work.

4. Measures for Improving Patent Conversion in Vocational Colleges

4.1 Perfecting Patent Transfer in Vocational Colleges

In recent years, in order to build an innovative country, China has placed the development of science and technology in an important position of economic and social development. In order to construct the national innovation system, the government has increased the investment in human and material resources for scientific and technological innovation. Its effect is obvious, and the total amount of scientific and technological achievements in China has increased substantially. In order to transform new scientific and technological achievements into commodities with market value in time. Our government has promulgated a series of laws, regulations and policies. Finally, we will promote the orderly transformation of scientific and technological achievements.

Our country should improve the ownership of financial projects in legislation. Our existing laws cannot highlight the private property of intellectual property rights. It is necessary to stipulate in the special intellectual property law the ownership of the right to produce scientific research results for financially funded projects. For example, relevant provisions are made in the Patent Law. On this basis, we should further improve the definition of ownership of job-related inventions. The inventor, not the unit, should be the subject of the patent right. The industry-university-research cooperation between Vocational Colleges and enterprises can effectively combine the scientific research strength of Vocational Colleges with the economic strength of enterprises. Jointly promote patent transformation work smoothly, so the best mode of patent transformation in vocational colleges is industry-university-research alliance.

4.2 Improve the Ability of Patent Transformation Services in Vocational Colleges

At present, the construction of the scientific and technological achievements transformation service system is not complete. Science and technology intermediaries are not closely related to vocational colleges and enterprises. In the case of small scale and low-quality personnel. It is necessary for vocational colleges to improve the level of transformation of their own scientific and technological achievements and integrate their own resources. Strengthen the service of transforming scientific and technological achievements within the school.

The state should guide vocational colleges in the system to shift the focus of patent management work to patent conversion work. More laws and policies have been introduced, which has led to the establishment of more patent institutions in vocational colleges that can promote the combination of industry, education and research. Then, with the institutional guarantee of the state and vocational colleges themselves, the quality of intellectual property management personnel in vocational colleges should be improved accordingly. Finally, the intellectual property management personnel of vocational colleges serve as a bridge between the leadership of vocational colleges and researchers. Undertake the task of specifically managing and operating intellectual property work in vocational colleges. The level of intellectual property awareness directly affects the development of intellectual property work in vocational colleges.

5. Conclusion

The number of patent applications in vocational colleges in China has been significantly improved. This is inseparable from a series of related measures introduced by China in order to adapt to the world's science and technology competition. However, the quality of patents in Chinese universities is not high. There is no doubt about the current state of implementation difficulties. To this end, we should constantly improve our legal policy system and technology service system. Continuous improvement in industry-university-research cooperation, investment financing, intermediary services, and self-management of vocational colleges, and promote the transformation of patent achievements in vocational colleges.

References

[1]. Zhu, Kai, P. Sun, and X. Zhao. "Study on the Cultivation Models of “Grey Collar” Talents in Vocational Colleges." Acta Microbiologica Polonica (2014):109-111.

[2]. Chikaishi, Y, H. Uramoto, and F. Tanaka. "Construction and Practice about the Education of students' Professional Quality System in Higher Vocational Colleges."Journal of Southern Vocational Education31.12(2011):4451-4456.

[3]. Mukherjee, K. C. "A study of performance evaluation of the libraries in higher vocational colleges in Ningbo." Journal of Academic Library & Information Science 18.2(2012):552-580.

[4]. Davis, Angela R., V. Eyer, and N. J. Butkovich. "Analysis of the Conversion of U.S. Engineering Doctoral Dissertations into U.S. Patent Applications." Science & Technology Libraries 35.2(2016):1-10.

[5]. Drivas, Kyriakos, and A. Panagopoulos. "Using the patent term changes in assessing the evolution of patent valuation from filing to maturity." Working Papers 19.4(2016):528-546.

[6]. Mitra-Kahn, Benjamin, et al. "Intellectual Property Government Open Data: Australian Business Number Links to All Intellectual Property Data in Australia." Australian Economic Review 49.1(2016):96–104.

[7]. Shen, Yichen, et al. "Broadband angular selectivity of light at the nanoscale: Progress, applications, and outlook." Applied Physics Reviews 3.1(2016):1679-637.

[8]. Souliotis, M., et al. "Integrated collector storage solar water heaters: survey and recent developments." Energy Systems 7.1(2016):49-72.