ISSN: 2637-6067 DOI: 10.6918/IJOSSER.202212_5(12).0007

Problems and Suggestions on Patent Transfer and Licensing in Colleges and Universities

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Abstract

University patent transfer and licensing is an important link in the construction of an innovative country. University patent authorization and effective patents is rich, but the implementation effect of patent transfer and licensing in colleges and universities is not good. This paper uses the empirical analysis method, take mining and analysis to the national universities patent transfer data from 2013 to 2020, study the current situation of patent transfer and licensing in colleges and universities from various dimensions, such as valid invention patents number, patent ownership assignment and license number, patent ownership transfer and licensing income, analyze the key factors restricting patent transformation in colleges and universities. Countermeasures and suggestions are put forward from the aspects of improving the evaluation system of scientific research in colleges and universities, increasing the connection with enterprises and market demands, and establishing and perfecting the management organization of scientific and technological achievements transformation.

Keywords

Colleges and Universities; Patent Transfer and Licensing.

1. Introduction

Patent transfer is an important basis for evaluating the innovation ability and quality of scientific research achievements in colleges and universities, and also an important way for the transformation of scientific and technological achievements in colleges and universities. From 2012 to 2021, the number of patents granted by colleges and universities in China increased from 69,000 to 308,000, an increase of nearly 3.5 times, and the authorization rate increased from 65.1 percent to 83.9 percent. The number of patent transfer and licensing contracts increased from more than 2,000 to more than 15,000, and the amount of patent conversion increased from 820 million yuan to 8.89 billion yuan[1]. However, while the number of university patents is increasing rapidly, the index of patent transformation is not ideal. By May 2020, the number of invention patents granted by colleges and universities accounted for 23% of the national total, but the patent transfer and licensing ratio of colleges and universities was only 3.42%, while the patent conversion rate of colleges and universities in European and American countries reached 70%[2]. The main reason is that there are many difficulties in university patent transformation due to the influence of scientific research evaluation system, matching degree with enterprise demand and patent quality.

The goal of university patent transformation is to transform scientific research achievements into real productivity. It is very important to fully exploit university patent resources to improve the patent conversion rate. Therefore, how to improve the quality of university patents, promote patent transfer and licensing, and promote university scientific research results to strongly support national innovation and development has become an important issue to be solved urgently.

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2. the Role of Universities in the National Patent Transformation Analysis

In order to explore the path of patent transformation in colleges and universities, this paper analyzes the number of effective invention patents, patent ownership transfer and licensing number, patent ownership transfer and licensing income, and finds out the problems and shortcomings of patent transformation in colleges and universities.

2.1. Valid Invention Patents of Universities in China

The number of valid invention patents is a direct reflection of the patent output of universities, and to some extent reflects the degree of scientific and technological innovation activity and innovation ability of universities. From 2013 to 2020, the number of valid invention patents in colleges and universities increased significantly, from 139,000 to 493,000, an increase of more than 2.5 times, which reflects the enhancement of the patent output capacity of colleges and universities. However, the proportion of the number of valid invention patents of universities in the whole country did not rise, hovering around 22%. This shows that the contribution of universities in the national invention patent output has not been significantly improved.

2.2. Patent Ownership Transfer and Licensing of Universities Nationwide

Patent ownership transfer and licensing are important indicators to measure whether patents can be transformed into productivity[3-5]. From 2013 to 2020, the number of patent ownership transfer and licensing in colleges and universities increased significantly in total, from 2344 in 2013 to 15288 in 2020, an increase of more than 5.5 times. Moreover, the proportion of patent ownership transfer and licensing in colleges and universities in the whole country showed an upward trend. In 2020, it accounted for nearly half of the total, indicating that the patent ownership transfer and licensing number of universities across the country increased significantly.

In terms of patent ownership transfer and licensing income, from 2013 to 2020, the patent ownership transfer and licensing income of universities in China increased significantly in total, from 436.24 million yuan in 2013 to 248323 million yuan in 2020, an increase of more than 4.6 times. However, the proportion of patent ownership transfer and licensing revenue in colleges and universities across the country is obviously low, the highest proportion is only 1.38% in 2017, and the proportion is on a downward trend, from 0.77% in 2013 to 0.66% in 2020. Combined with patent ownership transfer and licensing number, you can see that the number of patent ownership transfer and licensing in colleges and universities is not low in the country, however, patent ownership transfer and licensing income is obviously low, suggesting that the transfer and licensing income of single patent in colleges and universities is low, indicates patent achievements of colleges and universities have not effectively connected with the market demand, and the market recognition needs to be strengthened.

It can be seen from the above analysis, from 2013 to 2020, the national colleges and universities in the valid number of invention patents, patent ownership transfer and licensing number, patent ownership transfer and licensing income keep growing, but relative to the national proportion did not rise significantly, and part of the index declined, this suggests that the patent transformation ability of national universities needs to be improved, which is urgent to take effective measures to solve it.

3. Analysis of Reasons for Low Patent Conversion Rate in Universities

Under the situation of low patent conversion rate of colleges and universities in our country, the role of patent as the link between college innovation and enterprise demand has not been fully paid attention, and the huge potential of patent transformation still needs to be further explored.

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3.1. the Importance of Patent Transformation in the Evaluation System of University Scientific Research is Not Strong

At present, the main indicators of the evaluation system of scientific research in colleges and universities are papers, books, research projects, awards, etc., and few colleges and universities take patent transformation as the focus of assessment, resulting in a lack of power to promote patent transformation in colleges and universities [6,7]. Under the scientific research evaluation index of "Heavy paper light patent" in colleges and universities, the value of patent transformation is not taken seriously in the evaluation system of scientific research. Besides teaching, college teachers pay more attention to the assessment indicators of professional title promotion and so on, generally attach great importance to the project application, paper, book publishing, and award the application, etc., not enough attention is paid to patent transformation. Most of the patents formed by some teachers based on teaching tasks and scientific research projects are in the laboratory stage, and the technology maturity is insufficient. The applied patent has low market value and is not suit for transfer and transformation. Moreover, in the realization of project acceptance or professional title evaluation and employment target is often no longer renewed maintenance.

3.2. Low Degree of Integration Between University Patent Application and Enterprise and Market Demand

The core index to measure the value of patent is whether it can be recognized by enterprises and the market, and whether it can be transformed into economic and social benefits. Due to the insufficient understanding of enterprises and market demand information, insufficient demand docking, unimpeded communication channels and insufficient services for regional economic and social development between colleges and universities, patents applied by colleges and universities cannot effectively meet the needs of enterprises and market [8]. The patent achievements produced by some university teachers are only to meet their own needs such as year-end assessment, performance awards, project completion, professional promotion and so on, while ignoring the actual needs of enterprises and the market. Some patents applied for have problems of low application value and low transformation level. Some university teachers pay more attention to the breakthrough in theoretical research and method innovation, but do not carry out industrialization analysis and market research in the application and promotion, it is difficult to meet the actual needs of enterprises and the market, it is difficult to achieve patent transfer and transformation and application promotion.

3.3. University Patent Transfer and Licensing Lack of Professional Management Institutions and Management Personnel

Patent transformation in colleges and universities is inseparable from professional management institutions and management talents[9]. At present, Many domestic universities have not set up independent patent transformation management institutions, many functions of the transformation of scientific and technological achievements of colleges and universities in the academy (place), can mainly be responsible for the formulation, patent registration, patent licensing, such as transaction, existing staff, professional degree is not high, on the popularization of patent assignment and licensing enthusiasm is not high. The lack of understanding of patent application prospect and technical value restricts the effect of patent transfer and licensing in universities. In addition, the transfer and licensing of patents need interdisciplinary management talents who understand technology, market and law. Many administrative departments of the transformation of scientific and technological achievements in universities have not effectively cooperated with social third-party institutions, which restrict the effective implementation of the transfer and licensing of patents in universities.

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4. Countermeasures and Suggestions to Promote Patent Transformation in Universities

Combined with the above analysis, it is suggested to promote university patent transformation from the following aspects. The first is to guide universities to further highlight patent transformation in the scientific research evaluation system, and promote university teachers to pay attention to the quality of patent application. Second, we will conduct in-depth research on enterprise and market demand, strengthen industry-university-research cooperation and innovation, and effectively align university patent applications with enterprise and market demand. Third, we should establish and improve the management institutions for the transformation of scientific and technological achievements in colleges and universities, strengthen and supplement the talents for the management of patent transfer and transformation in colleges and universities, and strengthen the cooperation with social third-party service institutions.

4.1. Accelerate the Improvement of University Scientific Research Evaluation System and Highlight Patent Transformation Indicators

Universities and colleges should speed up the improvement of the evaluation index system for scientific research, highlight the incentive mechanism for patent transfer and transformation, incorporate patent transformation into the indicators of job assessment and professional title evaluation, and enhance the enthusiasm of researchers in patent transformation. The university scientific research should change from the number of papers, the level of projects, the level of awards and the number of patents to pay more attention to the innovation ability, the influence of achievements and the conversion rate of achievements. The university scientific research award should change from attaching importance to paper publication, project approval and scientific research awards to attaching importance to the transformation of scientific and technological achievements, patent transfer and licensing benefits, and research team transformation benefits[10]. We should give full play to the baton role of examination and reward, professional title promotion, and establish and improve the scientific research evaluation index system that is conducive to improving the quality of patent applications and strengthening the application of patents. Universities should reduce the "front-end incentive" for patent authorization and increase the "back-end incentive" for patent transfer, so as to encourage university teachers to actively participate in patent transformation.

4.2. Meet the Needs of Enterprises and the Market, Improve the Quality and Effective Supply of University Patents

Colleges and universities should strengthen the demand orientation of patent application and transformation, promote the organic connection between patent application and patent transformation, scientific and technological innovation and market demand, and form a high-value patent output system that combines production, education and research and is oriented by enterprise and market demand, centering on the strategic industries and advantageous industries developed by the state. Create a number of high-value patents and patent groups with high innovation level and strong market competitiveness in important "bottleneck" fields, so as to provide high-value effective patent supply for high-quality transformation and development of enterprises[11]. Qualified universities can establish a high-quality patent screening mechanism, carry out pre-application evaluation or scientific and technological novelty search, accurately identify and fund patents that meet market needs, and effectively improve the quality of patent applications. Universities should promote technological transformation, patent applications should meet the needs of enterprises, and give full play to the maximum economic benefits of patents.

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4.3. Establish a Management Agency for the Transformation of Scientific and Technological Achievements, and Strengthen Cooperation with Third-party Intellectual Property Service Agencies

Colleges and universities should set up special management institutions for the transformation of scientific and technological achievements, build specialized patent transformation platforms, strengthen the introduction, training and incentive of patent transformation talents, and carry out activities such as the docking and promotion of patent achievements. Universities and colleges can establish patent transformation institutions or platforms with clear positioning, clear responsibilities and distinctive characteristics in combination with their disciplinary advantages and industry characteristics, which are specially responsible for the collection, demonstration, screening, release, docking, promotion and transfer of patent transformation projects[12]. Early patent layout should be carried out for advantageous research teams and key research projects, reserve for effective patent applications, conduct preliminary evaluation and market promotion of authorized patents, and formulate management measures to promote patent transformation. Universities and colleges should cooperate with third-party intellectual property service institutions, relying on their online and offline platforms and patent management, evaluation, technology and other professionals, to carry out patent transfer docking and communication, and provide university teachers with full-chain services of patent application, maintenance and transfer. It has been proved that the number of patent transfers and licenses increased rapidly after universities such as Tsinghua University, South China University of Technology and Nanjing University of Technology established special centers for the transformation of scientific and technological achievements.

5. Conclusion

Patent transformation is an important support for universities to support the construction of an innovation-oriented country. In recent years, universities have begun to attach importance to patent transfer and transformation, which has made important contributions to the transformation of scientific and technological achievements into real productive forces. But through the analysis of 2013-2020 national college patent data, the multi-dimensional analysis is carried out from the perspectives of the number of effective invention patents, patent ownership transfer and licensing number, patent ownership transfer and licensing income. It can be seen that the nation's colleges and universities patent transformation ability needs to be improved, and there is still a gap between the transformation of scientific and technological achievements in colleges and universities and the national needs.

In order to become a powerful country in science and technology, universities need to pay great attention to the improvement of patent quality, improve the evaluation system of scientific research, connect with the needs of enterprises and the market, and effectively improve the efficiency of patent transformation. And patent value and quality of ascension is a long and complicated work, it is necessary for colleges and universities to strengthen the reform of patent transformation system and mechanism, give play to the role of patent transformation management institutions and intellectual property management personnel in colleges and universities, improve patent quality from all aspects, strengthen the cooperation with social third-party service institutions, and achieve a comprehensive breakthrough in patent transformation work.

Acknowledgments

The research results of this thesis were funded by “Yuyou Talent Support Program Project of North China University of Technology (20XN213/011)”.

ISSN: 2637-6067 DOI: 10.6918/IJOSSER.202212_5(12).0007

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