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Research on the Ownership Issues of National Defense Patents in China

-- Based on the Reform of the Ownership of Work-related Technological Achievements

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Abstract

The commercialization of national defense patents is of significant importance for enhancing the nation's technological strength and national defense capabilities. It helps promote the transfer of key technologies to the civilian sector and achieves efficient utilization of military-civilian resources. By reviewing the reform process of ownership for work-related technological achievements in China, drawing on its successful experiences, and considering the unique characteristics of national defense patents, such as confidentiality and exclusivity, this paper proposes an optimized ownership configuration for national defense patents. Under the premise of ensuring national security, measures such as clarifying ownership rights, simplifying management processes, and implementing tiered management are suggested. These efforts aim to enhance innovation incentives, accelerate the transformation of achievements, and promote deeper military-civilian integration and the effective implementation of the innovation-driven strategy.

Keywords

Work-Related Technological Achievements; National Defense Patents; Ownership Rights.

1. Introduction

With the continuous advancement of China’s scientific and technological system reforms, especially in the configuration of ownership for work-related technological achievements, ownership and long-term usage rights have gradually been delegated to project-bearing units and researchers. This reform has led to significant progress in intellectual property protection and utilization, effectively stimulating the innovation vitality of researchers and institutions, and promoting the efficient transformation of work-related technological achievements. However, national defense patents, due to their involvement in national security and their high levels of confidentiality and exclusivity, present a more complex issue in terms of ownership configuration. How to reasonably allocate the ownership rights of national defense patents, while ensuring national security, stimulating innovation among researchers, and accelerating the transformation and application of technological achievements, has become a critical issue that urgently needs to be addressed in current policy reforms.

Therefore, based on the successful experiences of recent reforms in the ownership of work-related technological achievements in China, and considering the unique requirements of national defense patents, this paper analyzes the main issues currently faced in the ownership configuration of national defense patents. It also proposes corresponding improvement suggestions, aiming to further promote the rational allocation and efficient transformation of

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national defense patents, foster deeper military-civilian integration, and ensure the effective implementation of the innovation-driven strategy.

2. The Reform Process of Technology Achievement Ownership

In recent years, with the deepening implementation of China's innovation-driven development strategy, the ownership configuration of work-related technological achievements has undergone a reform process from centralized state management to gradual decentralization. Through legislative adjustments and pilot practices, China has gradually formed an ownership structure for work-related technological achievements that is suited to the national context. This reform has significantly increased the innovation enthusiasm of research institutions and researchers, providing a solid institutional foundation for the transformation of technological achievements.

2.1. Legislative Adjustments: Gradual Decentralization and Clear Ownership of Intellectual Property

In the process of reforming the ownership of work-related technological achievements, legislative adjustments were the first step in the gradual decentralization of rights. The revision of the Science and Technology Progress Law of the People's Republic of China in 2007 marked the beginning of this process. This law was the first to explicitly state that the results of research projects funded by government financial support (including invention patents, software copyrights, integrated circuit layout design rights, new plant varieties, etc.) would belong to the project-bearing units. This move is considered China's version of the "Bayh-Dole Act" in the United States[1]. Through this legislative adjustment, the ownership of work-related technological achievements was gradually shifted from centralized state control to project-bearing units, granting these units greater autonomy to incentivize research innovation and promote the efficient transformation of technological achievements. This legislative change not only provided legal support for research institutions and individuals but also laid the institutional foundation for further promoting innovation.

On this basis, the Technology Transfer Promotion Law of 2015 further deepened the decentralization process, granting project-bearing units three rights-the right to use, the right to benefit, and the right to dispose of the results. This law allowed units to independently choose how to commercialize the results and allocate profits, while also simplifying approval processes and reducing administrative interference. The law also explicitly stipulated that the benefits from the commercialization of work-related technological achievements should be distributed primarily to the researchers, further enhancing the innovation enthusiasm and participation willingness of researchers.

However, despite the legal framework granting ownership of work-related technological achievements to the units and clearly outlining their rights to use, dispose of, and benefit from the achievements, the actual results in terms of technology transformation have not met expectations. For example, the "Nine Universities Alliance," represented by Tsinghua University, saw less than a 1% year-over-year increase in the number of technological achievements converted into practical use in 2016, and there was no significant increase in the number of invention patents[2]. Although the ownership of work-related technological achievements has been decentralized to the units, they are still regarded as state-owned assets and are subject to strict oversight by the "Interim Provisions on the Supervision and Administration of State-Owned Assets of Enterprises" and the "Interim Measures for the Management of State-Owned Assets of Public Institutions." Under this management model, the asset approval process and profit distribution in the technology transfer process face numerous restrictions, making it difficult to fully stimulate the enthusiasm of researchers and creating bureaucratic obstacles that limit the efficiency of technology transformation within the units [3].

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2.2. Pilot Practice Exploration: Further Empowering Individuals

Building on the gradual decentralization of ownership through legislation, some universities and research institutions have launched pilot reforms to explore models that further devolve ownership to individual researchers. Taking Southwest Jiaotong University as an example, in 2016, the university proposed a "confirm ownership before transformation" model, granting partial or full ownership of certain technological achievements directly to the inventors. They also implemented a revenue-sharing mechanism of "70:20:10," with 70% of the revenue allocated to the research team, 20% to the university, and 10% to the faculty. This distribution method effectively incentivized the innovation enthusiasm of researchers. By the end of 2019, Southwest Jiaotong University's intellectual property holdings had exceeded 170 million yuan, driving over 800 million yuan in social investment, demonstrating the effectiveness of this model in optimizing innovation incentives and promoting the transformation of achievements[4].

The pilot experience at Southwest Jiaotong University has gradually been promoted across the country. In June 2017, the Wuhan East Lake New Technology Development Zone in Hubei Province released a Policy List to Support Innovation and Entrepreneurship in the New Economy, which included specific measures for mixed ownership reform of technological achievement ownership. The policy granted work-related inventors more autonomy in transforming their achievements, encouraging various stakeholders to innovate and pursue entrepreneurship, thus stimulating the development of the new economy and cultivating new growth drivers[5].

Similarly, in November 2019, Beijing introduced the Beijing Regulations on Promoting the Transformation of Scientific and Technological Achievements, which made innovative explorations in the reform of technology achievement ownership. The regulations allowed government-established universities and research institutes to assign part or all of the technological achievements formed through state-owned capital investment to the inventors. It also expanded the universities' and research institutes' rights to independently manage their technological achievements. The regulations further stipulated a time limit for the transformation of technological achievements and government-mandated licensing to protect the legitimate rights and interests of innovators and improve the efficiency of technology transformation[6]. After the implementation of these regulations, Beijing further launched the "Pilot Scheme for Granting Ownership or Long-term Use Rights of Work-related Technological Achievements to Researchers in Zhongguancun National Independent Innovation Demonstration Zone," which encouraged researchers to independently implement the transformation of achievements. By optimizing the transformation ecosystem and strengthening public services, the policy aimed to stimulate innovation across all sectors. In 2019, Beijing's technology contract transaction volume reached 569.53 billion yuan, accounting for 25.4% of the national total, providing valuable experience for technology achievement ownership reforms in other regions[7].

Based on practices across various regions, in May 2020, the Ministry of Science and Technology and nine other departments jointly released the "Pilot Implementation Plan for Granting Ownership or Long-term Use Rights of Work-related Technological Achievements to Researchers." This plan focused on the issue of "separation of ownership and inventors for work-related inventions, leading to insufficient innovation motivation." It aimed to select 40 universities and research institutions across the country for pilot projects to explore new mechanisms for technology achievement transformation through "moderate decentralization." [8] The goal of this policy is to encourage researchers to actively participate in the transformation of scientific and technological achievements and maximize the practical value of technological innovation, marking a new stage in the reform of work-related technological achievement ownership.

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In conclusion, the reform process of work-related technological achievement ownership in China shows that, while decentralizing ownership to institutions has achieved certain results, it is only by further devolving ownership to individual researchers that the transformation efficiency of achievements can be significantly improved. This process provides important insights for the reform of national defense patent ownership: under the premise of safeguarding national interests, reasonable decentralization of ownership and a scientific revenue-sharing mechanism are key factors in stimulating researchers' enthusiasm and achieving efficient transformation of results.

3. The Current Status and Issues of Defense Patent Ownership Configuration in China

The ownership configuration of defense patents in China is primarily based on relevant laws and regulations, such as the National Defense Law and the Regulations on Defense Patents. Defense patents are intellectual property results created for national security purposes, and their ownership involves the intersection of civil and military rights. Since defense patents are related to national security and interests, they are often treated as exceptional cases under special management, and only a few laws and policies explicitly address them. However, these policies still contain ambiguities and even conflicts.

3.1. Unclear Ownership

Although Article 40 of the National Defense Law stipulates that “technological achievements formed through direct funding for national defense scientific research and production belong to the state,” the ownership of most defense patents naturally belongs to the state, since they are largely funded by the government. However, what happens to the ownership of defense patents that are not funded by the state? Moreover, Article 6, Paragraph 2 of the Regulations on Defense Patents states that the patent owner can be an organization or an individual, but it does not specify under what conditions ownership is granted to an organization or individual. This inconsistency causes confusion over the ownership attribution and weakens the effective management of the patents.

3.2. Inconsistent Use and Disposal Rights

Current laws on the use and disposal rights of defense patents are inconsistent. Article 42 of the National Defense Law states that the disposal rights of national defense assets belong exclusively to the state, and that the use of these assets cannot change the purpose of their use for national defense without approval from relevant institutions. On the other hand, Article 24 of the Regulations on Defense Patents grants the patent owner the rights to use and dispose of the patent. For example, the patent owner may implement or license the patent domestically without approval, but foreign licensing requires approval. These inconsistent regulations complicate the processes and reduce the efficiency of the actual transformation, affecting the market application of the patents.

3.3. Lack of Incentive in Revenue Distribution

Current policies generally acknowledge that the revenue from defense patents belongs to the institution, but the actual transformation results have been unsatisfactory. Articles 43 and 44 of the Law on Promoting the Transformation of Scientific and Technological Achievements stipulate that the revenue from achievement transformation belongs to the institution and should be allocated as agreed. Similarly, Article 25 of the Regulations on Defense Patents requires payment for the use of defense patents by others, but if the funds for the development of the patent align with the intended use, only necessary implementation fees may be charged. This vague revenue distribution mechanism leads to hesitation on the part of institutions in the

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transformation process, reducing the incentives and affecting the enthusiasm for achieving results.

4. Lessons and Limitations of the Reform of Work-related Technological Achievement Ownership

China's reform of work-related technological achievement ownership has accumulated valuable experience that can inform the optimization of defense patent ownership. However, due to the special nature of defense patents, the direct application of reform experiences is not feasible and requires analysis and adjustment based on specific issues.

4.1. Reform Lessons

4.1.1. Incentivizing Innovation and Enhancing Researcher Motivation

The reform of work-related technological achievement ownership effectively incentivized innovation by granting researchers and institutions more usage and revenue rights. In the defense sector, it is feasible to moderately apply this experience by increasing researchers' share in the revenue distribution, allowing them to receive greater returns during the research and transformation of defense patents. Such adjustments would not only encourage researchers to be more actively involved in defense innovation but also provide stronger technical support for national security.

4.1.2. Simplifying Processes and Accelerating Patent Applications

The reform of work-related technological achievements simplified approval processes and devolved the right to dispose of achievements, significantly increasing the speed of commercialization. In the defense patent field, although security remains the top priority, defense patents could be categorized based on factors such as classification, technological characteristics, confidentiality level, and market demand. For dual-use technologies with lower classification, a process similar to simplified approval could be introduced to optimize the transformation procedures, granting research institutions more autonomy, accelerating the civilian application of defense patents, and increasing the patents' practical application rates.

4.1.3. Promoting Civil-Military Integration and Optimizing Resource Allocation

The reform of work-related technological achievement ownership effectively stimulated market vitality by encouraging social capital to participate in the transformation and application of research results. In the defense patent field, this experience could be applied by reducing administrative intervention within the framework of civil-military integration, facilitating the orderly transformation of dual-use defense patents into civilian markets. This approach not only promotes the collaborative use of civil and military resources but also provides momentum for technological progress in the civilian sector, potentially achieving joint development in both defense and civilian industries.

4.2. Challenges

4.2.1. Confidentiality and Specialization Restrictions

Defense patents often arise from sensitive fields such as weaponry, military communications, etc., and must strictly adhere to confidentiality and security standards. Their specialized and highly confidential nature makes it difficult to directly apply flexible transformation and revenue-sharing models from work-related technological achievement reforms. When drawing lessons, specific defense needs must be considered to cautiously formulate transformation strategies, preventing potential security risks, such as the leakage of technology.

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4.2.2. Coexistence of Technical and Market Risks

The market transformation of defense patents faces dual challenges from both technical and market perspectives. On the one hand, defense patents often require secondary development to meet civilian needs, but the differences in technical standards and management systems between the military and civilian sectors increase the likelihood of transformation failure. On the other hand, although some defense patent technologies are advanced in the military domain, civilian markets focus not only on technology but also on cost-effectiveness. Therefore, these technologies may face a cold reception in the market due to their poor cost-performance ratio. Additionally, the fast-changing demand in the civilian market increases the market risks in transformation.

4.2.3. Strict State-owned Asset Management

While work-related technological achievement reforms have granted research institutions and individuals greater rights of use and disposal, such policies are not fully applicable to the defense sector. As strategic assets related to national security, defense patents must comply with strict state-owned asset management systems to prevent their misuse, which could harm national defense interests. Thus, the commercialization of defense patents is limited by stringent asset management constraints, making the transformation process more challenging. When drawing lessons from the reform of work-related technological achievements, the special nature of defense technology achievements must be fully considered to ensure the transformation process complies with state-owned asset management regulations.

The experience from the reform of work-related technological achievement ownership provides valuable insights for the optimization of defense patent ownership configuration. However, due to the unique nature of defense technology achievements, directly applying this reform model is not feasible. Future defense patent ownership reforms should gradually build a system framework that suits the transformation of defense patents, drawing on successful experiences from work-related technological achievement reforms, while balancing researcher innovation incentives and the efficient transformation of results, all under the premise of safeguarding national security.

5. Recommendations for Advancing the Reform of Defense Patent Ownership Configuration in China

Based on the analysis above and drawing from the practical experience of the reform of work-related technological achievements in China, it is possible to further optimize the ownership configuration of defense patents, considering their confidentiality and specialized nature. This can be achieved by appropriately decentralizing authority and establishing a reasonable profit-sharing mechanism, all while ensuring national security.

5.1. Clarify the Ownership of Defense Patents and Balance Stakeholder Interests

Following the development trajectory of the work-related technological achievement ownership system, it is important to gradually advance a policy of "moderate decentralization." While ensuring national interests are not compromised, the ownership of defense patents should be clearly defined to balance the interests of the state, research institutions, and researchers. The key aspects include:

Ownership Belongs to the State: Since defense patents are directly related to national security and defense interests, it is necessary for the state to have effective control over them. For defense patents developed with private or corporate funds, the state should provide a one-time financial compensation to cover the development costs, thereby ensuring the state owns the

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patent. This arrangement maintains state control over core patents while ensuring clear and standardized ownership attribution.

Reasonable Allocation of Use and Disposal Rights: The use and disposal rights of defense patents should be jointly held by the institution and the individual inventor, with appropriate restrictions based on the patent's classification. For patents that are still classified or only partially declassified, their development and application should be restricted to military use. For fully declassified patents, civilian market development should be allowed to maximize their economic benefits. Joint ownership of use and disposal rights by the institution and the researcher helps balance the motivation of researchers and the efficiency of transformation. It also ensures collaboration between research units and mitigates the lack of management expertise in non-specialized areas.

Reasonable Sharing of Revenue Rights: The revenue from defense patents should be shared among the state, the research institution, and the researcher. The state typically provides funding and policy support during the research and commercialization phases, so it should receive a share of the revenue. At the same time, increasing the researcher's share of the revenue can significantly enhance their motivation for innovation. This will also provide the institution with incentives for transformation, creating a more efficient patent commercialization system.

5.2. Strengthen Tiered Management and Simplify Administrative Processes to Improve Transformation Efficiency

Considering the special nature of defense patents, tiered management should be implemented based on the degree of confidentiality, technical domain, and commercialization needs. This will involve formulating optimized approval processes for different types of patents to effectively improve transformation efficiency. For high-security patents, strict centralized management should be implemented to ensure national security. However, for lower-classified patents with dual-use potential, management restrictions can be eased to allow them to enter the civilian market. Specifically, administrative processes for lower-classified patents should be simplified, allowing research institutions to autonomously promote market transformation under the premise of ensuring security. This would help reduce administrative intervention, optimize processes, and enable researchers and institutions to conduct more efficient transformations. The combination of tiered management and simplified procedures will not only advance civil-military integration but also unlock the market potential of patents, maximizing their technical and economic value.

5.3. Establish Pilot Reforms to Explore a "Mixed Use and Profit Sharing" Model

In select defense research institutions, pilot projects based on the proposed ownership configurations should be established to explore a "mixed use and profit-sharing" model. A systematic evaluation mechanism should be created during the pilot phase to regularly assess progress and results, making adjustments as necessary. By collecting and analyzing data and experiences from these pilot projects, the profit-sharing and transformation processes can be continuously optimized, ensuring the scientific rigor and effectiveness of the reform. The results of the pilot phase will provide solid data support and practical experience for broader implementation, ultimately improving the commercialization efficiency of defense patents and stimulating innovation, while contributing to the effective application and transformation of defense technologies.

5.4. Improve Laws and Regulations to Provide Legal Support for Reforms

Firstly, the relationships between the National Defense Law, the Regulations on Defense Patents, and other relevant laws and regulations should be clarified to eliminate conflicts or redundancies. Top-level design should be strengthened to unify guiding principles and

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construct a complete intellectual property value chain from innovation to transformation. This will help standardize and legalize civil-military integration. At the same time, the ownership configuration, profit-sharing, and transformation processes should be further detailed to clarify the rights and profit guarantees for research institutions and researchers involved in patent commercialization, reducing uncertainty and legal risks. A comprehensive legal framework will reduce resistance to reforms, enhance the reform's operability and compliance, and provide robust legal support for the commercialization of defense patents.

6. Conclusion

In 2020, President Xi Jinping emphasized during the 25th collective study of the Political Bureau that China is transitioning from a major importer of intellectual property to a major creator, stressing the importance of facilitating the effective use of intellectual property. This makes the study of defense patent ownership critical for improving China’s technological innovation capacity, optimizing intellectual property utilization, and promoting civil-military integration. By systematically reviewing the history of work-related technological achievement reforms, summarizing effective experiences in incentive mechanisms, ownership attribution, and transformation models, and considering the special nature of defense patents, this paper provides recommendations to optimize the ownership configuration of defense patents, including clarifying ownership attribution, simplifying management processes, implementing tiered management, and improving legal regulations. The aim is to enhance innovation incentives and facilitate the efficient transformation of results while safeguarding national security.

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