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Analysis of Green Intellectual Property Issues and Countermeasures from the Perspective of International Law

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Abstract

As an advanced form of productivity driven by green technological innovation, there exists a natural fit and close connection between new quality productivity and green intellectual property rights. Legal protection is the cornerstone of the development of new productivity, in which the comprehensive protection of intellectual property rights is particularly crucial: green intellectual property rights, as a key force to adhere to sustainable development and promote scientific and technological progress and economic growth, has a central role to play in incentivizing environmental protection as the core of independent innovation, thus becoming an indispensable institutional guarantee for the development of new productivity. This institutional guarantee ensures the legitimate rights and interests of innovation achievements, and is a powerful driving force and a long-term solution for the continuous progress of productive forces. At present, the field of intellectual property cooperation is encountering diversified challenges and problems: the unilateralization caused by some developed countries, the rigidity of international rules on intellectual property, the stagnation behind the digital age, and the imbalance in the distribution of existing international benefits of intellectual property, which should be paid close attention to. In order to effectively promote green technological innovation and escort the green intellectual property protection system to a stable and far-reaching future, countries and enterprises should face the current challenges rationally, correctly understand the differences and conflicts between green intellectual property rights and ordinary intellectual property rights, gain a deeper understanding of the existing relevant international law foundations, and promptly solve the green intellectual property rights issues, improve the relevant international conventions and treaties, strengthen the coordination and cooperation of international organizations, and establish a fair and reasonable green technology patent protection mechanism. fair and reasonable patent protection mechanism for green technology. Only when countries join hands to improve the green intellectual property protection mechanism, jointly combat transnational infringement and maintain a fair market competition environment can the legitimate rights and interests of innovators be safeguarded.

Keywords

Green Technological Innovation; Green Intellectual Property Rights; International Law; Transnational Infringement.

1. Introductory

Against the backdrop of rapid global industrialization and urbanization, environmental problems such as climate change, atmospheric pollution, water scarcity and the decline of biodiversity have increasingly become global issues that transcend national borders, posing a serious challenge to all humankind. In the face of these complex environmental crises, international cooperation and collective action have become indispensable solutions. In this process, green intellectual property rights (IPRs), as the core driving force to stimulate green

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technological innovation and strengthen environmental protection strategies, are of particular strategic value, and are a key element in promoting global progress towards the goal of sustainable development. By strengthening the protection and utilization of green intellectual property rights, we can not only stimulate more innovative vitality and promote the research, development and application of environmental protection technologies, but also build a more synergistic and efficient environmental governance system globally, and jointly safeguard the Earth's homeland on which we depend for our survival.

As a result, with global economic integration and the dynamic development of international trade, the transnational diffusion of green technologies and the cross-border flow of intellectual property rights have become increasingly significant. However, this trend is also accompanied by a rise in the risk of transnational infringement. In view of the differences in the legal systems, enforcement effectiveness and protection standards of various countries, coupled with the fact that many parts of the existing international law provisions related to the protection of green intellectual property rights are still to be perfected, and the green intellectual property rights enforcement mechanism is insufficient, green intellectual property rights are facing even more serious infringement challenges when they cross the national borders: infringement of trademarks, patents, or copyrights, unilateralization, and transfer of technology between developed and developing countries. With the aggravation of transnational infringement problems, the existing international legal system shows an obvious disconnect, and a unified protection standard has not yet been formed globally, and there are significant differences in the strength of enforcement. At the same time, international organizations have encountered difficulties in clearly defining their jurisdictions, coordination and cooperation mechanisms have yet to be improved, and resource constraints are becoming more and more prominent.

In the face of the increasingly prominent problem of transnational infringement of rights, we must adopt a more prudent and resolute attitude to analyze and actively respond to this global challenge. Strengthening international cooperation is an indispensable part of this, and we need to actively promote synergies and harmonization of standards among national legal systems in order to enhance the effectiveness of law enforcement and ensure the effectiveness of law implementation. In addition, we need to strengthen and harmonize international standards for intellectual property protection to ensure the steady progress of green technologies, thereby laying a solid legal foundation for the prosperity of green innovation and effectively promoting the development of international cooperation to a higher level.

The core objective of this study is to reveal the unique value and existing problems of green intellectual property rights in the field of international law. Through in-depth analysis of the implementation status and problems encountered in the existing relevant international laws and international organizations, we will strive to identify and fill the potential loopholes in the intellectual property rights legal system, and then optimize the global legal framework of intellectual property rights and improve the mechanism of intellectual property rights protection to provide stronger safeguards for green technological innovation in the new era and under new circumstances. We aim to identify and remedy potential loopholes in the IPR legal system, optimize the global IPR legal framework, and improve the IPR protection mechanism, so as to provide stronger protection for green technological innovation in the new era and new situation. We expect that this study will stimulate extensive attention and in-depth discussions among academics, policy makers and all sectors of society, and that we will pool our wisdom around the topic of green intellectual property protection, so as to contribute to the great journey of building a community of human destiny.

ISSN: 2688-8653

2. Formulation of the problem

2.1. Technology transfer issues and unilateralization

In February 2023, Huawei launched legal charges against Xiaomi involving patent infringement. Huawei claimed that Xiaomi infringed four of its patents, covering the field of wireless communications and cell phone photo unlocking technology. [7] This case was the first major administrative adjudication of a patent infringement dispute accepted by the State Intellectual Property Office (SIPO) in 2023, and is regarded as an important milestone in China's intellectual property (IP) protection, demonstrating the maturity and advancement of domestic companies in terms of IP. This case also demonstrates the importance of intellectual property rights in the field of high technology, especially green technology.

In recent times, from the world's leading treaty agreements on intellectual property rights to the TRIPs Agreement, the internationalized governance of intellectual property rights has shown a trend of integration. However, in recent years, the integration process has encountered many serious challenges and obstacles: under the domination of developed countries, this trend has gradually turned to unilateralization, and the "North-South contradiction" of intellectual property rights has become more starry-eyed. Although China's work on intellectual property started relatively late, with the steady growth of China's comprehensive national power, the need and urgency to participate in international rule-making on intellectual property has been increasing.

Against the backdrop of global economic integration, unilateralized U.S. measures on intellectual property have had a significant impact on the international business environment. The Protecting America's Intellectual Property Act of 2022 (PAIPA), signed by U.S. President Joe Biden in January 2023, expands the extraterritorial application of U.S. trade secret law - PAIPA allows the U.S. executive branch to influence the mechanisms for protecting trade secrets occurring outside of the U.S. by non-U.S. subjects, particularly in countries that maintain close trade relations with the Countries that maintain close trade relations with the U.S., such as China, are facing unprecedented challenges to the integrationist trend in the globalization process.

In order to deeply analyze the complex difficulties encountered by developing countries in the context of economic globalization, especially with regard to the inequality in technology transfer and the unilateralist tendency of developed countries, it is urgent for us to strengthen our research and explore key measures, such as improving the green intellectual property rights protection mechanism. This paper takes this as its starting point, aiming to provide theoretical support and practical paths for solving the above problems.

2.2. Intellectual Property Cooperation Issues and the Need for Green Innovative Technologies in China

Green technological innovation is crucial to both environmental protection and high-quality development; it is not only the basis for improving the environment and building a beautiful China, but also leads the development of new productivity. It occupies an important position in the global industrial revolution and technological wave. However, China's green technology innovation still needs to be improved, and enterprises face problems such as insufficient protection of intellectual property rights, weak crackdowns, and neglect of their achievements, which affects their motivation to innovate. [3] By the end of 2022, the number of effective patents in the field of green low-carbon in China has reached 218,000, but only accounted for 5.2% of the total number of invention patents, which highlights that there is still a huge space for exploration and enhancement in the field of green technological innovation. [8] In order for enterprises to respond positively to the strategic plan in the report of the 20th Party Congress, and deepen the reform of science and technology system, we need to strengthen the legal

ISSN: 2688-8653

protection system of intellectual property rights so as to build a more solid innovation cornerstone system, fully stimulate the innovation vitality of green technology, and promote the sustainable development of the economy and society. Intellectual property protection is the shield of technological innovation, strong protection of intellectual property rights can reduce the loss of innovative achievements, stimulate the innovation power of enterprises [1], strengthen the innovation activities of enterprises in the field of green technology and intellectual property protection mechanism for accelerating the process of green and low-carbon transformation is of pivotal significance: this initiative not only can stimulate the innovation potential of enterprises, to promote the research and development of green technology and its application, but also effectively protect the legitimate rights and interests of innovation achievements, and effectively protect the legal rights and interests of innovation achievements. This initiative can not only stimulate the innovation potential of enterprises to promote the R&D and application of green technologies, but also effectively protect the legitimate rights and interests of innovation achievements, laying a solid foundation for the sustainable development of green low-carbon economy. .

3. Differences in the legal protection mechanisms of green IPRs and ordinary IPRs

General intellectual property rights typically refer to a wide range of innovations, including but not limited to traditional technologies, artistic works and trademarks. The protection of these IPRs is not specific to environmental protection or sustainable development objectives. In contrast, according to the Green Technology Patent Classification System issued by the Office of the State Intellectual Property Office (SIPO), which emphasizes the importance of green innovative technologies in the intellectual property system, it is clear that the construction of the Green Patent Classification System is aimed at carrying out the core concept of green development in depth, and serves as the cornerstone of the strategy for the promotion of the ambitious goals of carbon peaking and carbon neutrality. By clearly defining the patent scope of green technologies, the system promotes the orderly development of green innovation activities and provides strong support for the exploration of low-carbon economy and sustainable development path. Therefore, green intellectual property rights is a tool for intellectual property rights protection of green technological innovation under the concept of focusing on environmental protection and sustainable development. In terms of scope, the latter has a wider scope than the former, i.e., the legal protection mechanism of green intellectual property rights is more targeted - oriented to the field of green technological innovation; in terms of focus, green intellectual property rights focus more on the environmental protection and resource conservation of technologies. In terms of focus, green intellectual property rights focus more on the environmental protection, resource conservation and sustainability of technologies, such as "green patents" which mainly focus on technological innovation in the fields of new energy, energy conservation and emission reduction, while ordinary intellectual property rights focus more on the protection of the legitimate rights and interests of innovators, the promotion of the transformation and application of innovative achievements, and the promotion of the overall technological progress and innovation of the society.

With the intensification of global environmental problems, such as climate change, air and water pollution, and loss of biodiversity, many countries are seeking to transition from a traditional high-carbon economy to a low-carbon economy, and green technologies have become the key to realizing this transition, reducing environmental damage and combating climate change.

ISSN: 2688-8653

4. The International Law Basis for Green Intellectual Property Rights

4.1. Existing international conventions and treaties

Major international conventions on intellectual property include the TRIPs Agreement, the Paris Convention, the Berne Convention, the Patent Cooperation Treaty, the Convention for the Protection of Performers' Phonograms and Broadcasting Organizations, and the International Convention for the Protection of New Varieties of Plants. The following section highlights the problems of green IP protection in light of the impact and shortcomings of the TRIPs Agreement, the Berne Convention and the Paris Convention, respectively.

4.1.1. Berne and Paris Conventions

The Berne Convention, as an international treaty on copyright protection, complements the Paris Convention for the Protection of Industrial Property, which together form the basis for the dual protection of global economic "hard power" and cultural "soft power". Under the framework of the Paris Convention, industrial property rights have been widely and specifically protected, which covers patents, utility models, designs, trademarks, service marks, trade names, appellations of origin, and the prohibition of unfair competition, the scope of which is clear and focused, but in the disciplinary measures show a certain degree of flexibility and non-compulsory, highlighting the nature of the guidance of the legal regulations. [9] These international agreements are specific to the protection of a certain area of local agreements, and there is no more favorable agreement in the field of green technological innovation.

4.1.2. TRIPs protocol

The TRIPs Agreement is the most influential and comprehensive multilateral treaty in the field of intellectual property. It supplements and amends the previous international intellectual property conventions, the Paris and Berne Conventions, linking intellectual property and trade, and not only proposes that intellectual property protection is an international issue, but also amends a large number of substantive elements, including intellectual property rights enforcement and mandatory dispute settlement mechanisms", "The TRIPs Agreement requires that All members, whether developed or developing countries, to provide patent protection for food, drugs, chemicals and microorganisms, and copyright protection for computer software."

However, in the negotiation process of the TRIPs Agreement, the United States exerted pressure on developing countries through trade sanctions and other means, forcing the vast number of developing countries to accept intellectual property protection rules that are not in line with their level of national development. Therefore, to a certain extent, the TRIPs Agreement has embodied to a certain extent the position and demands of the developed countries, and has become a manifestation of their will in the field of international intellectual property rights. The unilateralization of intellectual property rights has blocked the realization of international intellectual property rights fair interests, and widened the gap between the intellectual property rights advantageous countries and the disadvantageous countries. [4]

Article 31(1)(c) of the TRIPS Agreement imposes clear limitations on the scope and duration of patent compulsory licenses, with special emphasis on the fact that in the field of semiconductor technology, compulsory licenses may be justified only if there is a restriction of competition as determined by judicial or administrative proceedings. This provision is unique in that it is the only specific area of the TRIPS Agreement that directly and specifically limits the grounds for granting a compulsory license, enhancing the logical rigor and practical guidance of intellectual property protection. It means that any other technology can be subject to a compulsory license for any reason under national legislation. The limitation on the grounds for granting compulsory licenses in the case of "semiconductor technology" contained in Article 31(1)(c) of the TRIPS Agreement was the only substantive change made to the text of the Agreement in December 1993 at the request of the United States. Even though Article 31(1)(c) intentionally

ISSN: 2688-8653

raised the threshold for the application of compulsory licensing, the United States, as the lead party that personally designed and structured the Uruguay Round negotiations, argued for TRIPS reforms against compulsory licensing and in favor of voluntary licensing, which is contrary to the order of cross-border intellectual property transactions that the TRIPS Agreement was intended to establish.[10]

4.2. Role of international organizations

4.2.1. WTO status and problems

In the grand blueprint of global economic governance, the World Trade Organization (WTO) occupies a pivotal position, which is not only a solid support for multilateralism, but also an indispensable platform for economic dialogue in the global governance system. However, in recent years, the WTO has been subjected to the fierce impact of unilateralism and protectionism, and the issue of its reform has been pushed to the forefront, which is particularly urgent.

The Appellate Body, the centerpiece of the WTO's dispute settlement mechanism, was once the key to the fair adjudication of trade disputes among member states. Unfortunately, since 2017, the obstructionist tactics of the United States have led to the obstruction of the appointment of new judges, and as the incumbent judges step down one after another, the Appellate Body will come to a functional standstill by the end of 2019 due to the insufficient number of judges. Against this backdrop, the long-term weakening of the ICJ's function and the WTO Appellate Body's stagnation together highlight the new challenges faced by China's enterprises in the protection of intellectual property rights overseas, forcing us to explore the urgency of utilizing the International Investment Arbitration Platform (IIAP) as an alternative path. [11]

At the same time, China actively integrates into the global free trade system, and deeply participates in the Regional Comprehensive Economic Partnership (RCEP) and Comprehensive and Progressive Trans-Pacific Partnership(CPTPP) and other high-level FTA negotiations, which involves the TRIPS-Plus standard, although the implementation of the WTO framework has been blocked, but for the free trade agreements embedded in the investment arbitration mechanism provides a broad application space, indicating that this mechanism may become a new frontier for the settlement of intellectual property disputes. Although the implementation of the TRIPS-Plus standard has been blocked under the WTO framework, it provides a broad application space for the investment arbitration mechanism embedded in FTAs, which signals that this mechanism may become a new frontier for the settlement of intellectual property disputes.

Looking back at history, since China's accession to the WTO, there have been many encounters with European and American countries in the field of intellectual property rights, and the Dispute Settlement Body (DSB) has served as an important battleground. Nowadays, the stagnation of DSB has prompted us to re-examine the potential and significance of investment arbitration as a new arena for intellectual property games between China and the U.S. as well as China and the EU, which is not only a supplement to the established dispute settlement system, but also an innovative exploration of the international cooperation model of intellectual property protection in the era of globalization. [5]

4.2.2. Status and Role of WIPO

The World Intellectual Property Organization (WIPO), established under the WIPO Convention, as the specialized agency for intellectual property protection within the United Nations system, is committed to exploring and practicing synergistic paths in the field of green innovation and intellectual property to stimulate green innovation and promote related investments through enhanced regional and international cooperation among intellectual property offices. Since 2013, WIPO has launched the WIPO GREEN program, which aims to accelerate the pace of green

ISSN: 2688-8653

technology innovation and promote its efficient transfer, thereby expanding the market penetration and application of environmentally friendly technologies and providing solid support for the transition to a low-carbon economy.

The WIPO GREEN Platform serves as a bridge between pioneering green technology innovators, those seeking solutions for the green transition, public and private sector entities committed to promoting climate-friendly technologies, and experts and scholars in the field of green innovation. Through this platform, WIPO and its partners offer a range of practical and effective solutions to facilitate the development, adoption and widespread deployment of green technology solutions for a greener and more sustainable future.

5. Problems with Green Intellectual Property Rights from an International Law Perspective

5.1. Imbalance in patent protection for green technologies

5.1.1. Unilateralization of intellectual property rights

The global governance of intellectual property is undergoing a transformation. On the one hand, there is a growing trend towards unilateralism, with certain countries or regions tending to formulate and implement intellectual property policies independently. On the other hand, the governance system is also characterized by "fragmentation", and the rules and mechanisms in different regions and fields are complicated and lack uniform coordination.[12] Some developed countries (mainly the European Union and the United States) have tried to take advantage of the fact that they have no control over intellectual property rights. [Some developed countries (mainly the European Union and the United States) have tried to take advantage of their economic and technological superiority to adopt unilateral trade sanctions and disseminate their intellectual property standards abroad through a variety of coercive mechanisms, including at least two kinds of means, namely, treaty-making and coercion. This is mainly manifested during the formulation of international treaties, and despite the fact that the agreement is called a multilateral trade agreement, its nature is still a process of transition from the multilateralization mechanism under the current WTO system to the unilateralization mechanism centered on the interests of the United States and other developed countries, which constitutes a substantial damage to the multilateral mechanism of the WTO, impedes international cooperation and free trade and causes great damages to the international public interests and the interests of the developing countries. It has caused great damage to international public interests and the interests of developing countries. [6]

The tendency to unilaterally strengthen intellectual property rights tends to exacerbate cross-border trade tensions, quietly brewing trade conflicts, and unilaterally raising protection barriers and adopting punitive measures, which in fact erode the cornerstone of fairness and openness advocated by international trade and pose a potential threat to the stability of the global trading system. Such practices not only undermine the economic interests and well-being of participating countries, but also shake the solid foundation of the multilateral trading framework and weaken its function as the central guiding and coordinating mechanism of global economic governance, which, in the long run, further deepens the economic gap with developing countries, magnifies inequalities in the international economic arena and poses a challenge to the construction of an inclusive and sustainable global trading order.

5.1.2. Technology transfer issues for developed and developing countries

As the global climate environment continues to deteriorate, "green economy" and "low-carbon technology" have become the core issues on which the international community generally focuses. In the face of common environmental challenges, there is a significant gap between the accumulation and innovation capacity of developing countries in the field of green technology

ISSN: 2688-8653

and the long-accumulated advantages of developed countries, and it is difficult to fill this gap rapidly in the short term. Therefore, strengthening international cooperation and promoting technology transfer and sharing has become a key path to promote global green transformation and mitigate the impact of climate change. The urgency of technological innovation and the technology gap are important driving forces for international green technology cooperation and collaborative innovation. In addition to this, the international migration of green technologies faces multiple barriers, including the control of developed countries over the core patents of developing countries, which greatly restricts the access of developing countries to advanced technologies and increases the difficulty and cost of realizing the green transition.

A number of international conventions and multilateral agreements, such as the United Nations Framework Convention on Climate Change, the Asia-Pacific Partnership for Clean Development and Climate Change, and the China-EU Joint Declaration on Climate Change, consider green technology cooperation as one of the core issues, and have elaborated cooperation frameworks. These agreements advocate the provision of necessary financial assistance and technical support by developed countries to developing countries, while encouraging all States parties to work together to carry out in-depth cooperation in key areas such as technology research and development, innovation, application and transfer, with the aim of accelerating the pace of the global deployment and development of a low-carbon economy, and to jointly respond to the serious challenge of climate change.

5.1.3. The issue of the technology gap between developing and developed countries

In the process of global green transformation, the divergence of interests between developed and developing countries is unavoidable and has become one of the notable challenges. According to in-depth studies by authoritative organizations such as UNEP, a small number of developed countries such as the United States, Germany, Japan and the United Kingdom have concentrated on controlling about 80 per cent of the world's patents on low-carbon core technologies, forming a significant technological monopoly, while the remaining countries have relatively few technological reserves in this field, highlighting the severity of the North-South technological divide.

Further analysis shows that large enterprises in developed countries that hold core patented technologies tend to be conservative about licensing technology to potential competitors for the sake of maintaining their dominant position in the market. This makes it difficult for developing-country firms to access cutting-edge low-carbon technologies directly, and in most cases they can only rely on cooperation with SMEs to acquire technological resources indirectly. However, such a model may limit the effective dissemination and deepening of technological tacit knowledge, i.e. valuable knowledge that is undocumented and highly dependent on experience and practice, which constitutes an additional barrier for developing country firms to fully enhance their technological absorptive and innovative capabilities. [2]Studies or research by some scholars have found that high licensing fees or other unreasonable licensing conditions imposed by patentees in a technological advantageous position have hindered the smooth transfer of low-carbon technologies.

5.2. The Ambiguity and Absence of International Rules on Green Intellectual Property

Most existing international rules on green intellectual property include provisions for the provision of compulsory licenses, but there is a lack of clarity as to when and in which specific areas compulsory licenses apply and how disputes arising from compulsory licenses are to be resolved. For example:

ISSN: 2688-8653

5.2.1. TRIPs protocol

Within the framework of the TRIPS Agreement, Article 31 does cover the authorization mechanism for compulsory licensing, however, there is a certain ambiguity in its formulation that requires further interpretation and clarification. Although this provision provides a legal basis for Member States to implement compulsory licensing under specific conditions, the broadness of its wording requires careful interpretation in the context of specific situations in actual operation. Article 31(b) states that "[i]n all cases, such use shall be subject to the following conditions: ...(b) the licensed use shall be limited to the public necessity of an emergency or other special circumstance, or the purpose of such use shall be for public non-commercial use, including the development of governmental use as provided for by the laws and regulations of a Member State in the individual case arising therefrom. governmental use as provided for in the laws and regulations of a Member State." The phrase "public necessity in emergency or other exceptional circumstances" is one of the conditions used to define when a compulsory license may be granted, which, in the absence of a specific definition, is left to different interpretations by Member States in the light of their own circumstances; also, in Article 31(f), the phrase "any decision to grant a compulsory license or to determine its terms and conditions" is used. Any procedure for deciding on a compulsory license or for determining its terms and conditions shall provide sufficient opportunity for the patent holder to express its views and shall be decided after taking into account the views provided. Furthermore, such decisions shall be based on the condition that the public need will be served by the use in question." Its "public need" is another key term used to describe the purpose of a compulsory license. Again, the notion of "public need" is not explained in detail and therefore may be ambiguous in practical application. This ambiguity may affect international norms on green intellectual property rights, in particular when deciding when and how to compulsorily license green technologies in the public interest.

5.2.2. Paris agreement

Article 4(5) of the Paris Agreement states that "Developed countries shall continue to undertake their existing obligations and, in accordance with Article 11, the provision of necessary support to enhance the capacity of developing countries to take action to mitigate climate change is essential. Particularly for the least developed countries, small island developing States and African countries, additional assistance should be provided to facilitate the adoption of effective measures to address the challenges of climate change. to achieve the objectives of this Agreement, taking into account their needs and priorities." The obligation of developed countries to transfer climate-friendly technologies to developing countries is emphasized, but the specific rules on how to achieve this and the provisions for compulsory licensing are not clear, especially as they relate to intellectual property rights and compulsory licensing remain unclear. This requires further explanatory documents, guidelines or international cooperation to fill this gap.

5.3. Deficiencies in green intellectual property enforcement mechanisms

Transnational intellectual property crimes often involve multiple countries and regions and require joint collaboration among customs authorities of various countries in order to be effectively combated. Due to the differences in the legal systems, law enforcement standards and cultural backgrounds of various countries, the improvement of the green intellectual property enforcement mechanism faces many challenges and difficulties: there are significant differences in the law enforcement systems of different countries and regions, resulting in different standards for the protection of intellectual property rights and the determination of infringement standards, which makes it difficult to form a unified law enforcement standard. Therefore, strengthening international law enforcement cooperation and jointly combating

ISSN: 2688-8653

transnational intellectual property rights infringement has become an urgent need for customs of all countries.

6. International law responses to address green intellectual property rights

6.1. Improvement of international conventions and treaties

At present, the international community has established a series of multilateral and unilateral agreements, including the Convention on International Intellectual Property Organization (WIPO), the Patent Cooperation Treaty (PCT), the Paris Convention and the Berne Convention, etc., which are aimed at strengthening the protection system of green intellectual property rights. However, given the diversity of national legal frameworks, the differences in the stages of economic development, and the potential inconsistencies in IP protection standards between different agreements, the actual coverage and enforcement of these agreements are still insufficient and need to be further strengthened. In addition, there are many gaps and imperfections in the existing intellectual property protection framework for the cutting-edge field of green technology innovation, which need to be filled and improved through international cooperation and institutional innovation to ensure that the continuous innovation and development of green technology can be adequately protected by law.

The establishment of a fairer and more equitable international legal system for intellectual property is the basic demand of most members of the international community, and in response to the problem of unilateralization of intellectual property rights, we should build a system of intellectual property protection that matches the economic and technological strength of each country. This requires us to take into full consideration the specific national conditions and development stages of each country when formulating and implementing intellectual property policies, so as to ensure that the intellectual property system can effectively incentivize innovation and promote fair competition and the smooth conduct of international trade. By flexibly adjusting IP policies to better meet the actual needs and development direction of each country, and thus avoiding the unfairness and obstacles brought about by a single standard, it is a reasonable choice for the whole world to follow the path of sustainable development, so as to turn the goal of the IP system to promote innovation and improve the welfare of the people into a reality. RCEP is a successful example, which is not a case of high level of IPR protection but a case of It is not an example of a high level of intellectual property protection, but rather one that takes into account the differences in the development levels of its members and gives them more room for flexible implementation of the agreement, with a number of incentives and the scientific and rational expression of the Chinese proposal.

6.2. Enhancing coordination and cooperation among international organizations

6.2.1. Establishment of coordination mechanisms

In order to promote the protection of green intellectual property rights, it is necessary to establish a coordinating mechanism, including the establishment of a specialized agency to define its responsibilities, the development of cooperation frameworks and standards, the enhancement of information-sharing and cross-sectoral synergies, and the emphasis on human resources cultivation and training, so as to pool efforts to effectively safeguard the fruits of green innovation.

6.2.2. Strengthening law enforcement cooperation

We must establish an intersectoral cooperation mechanism and deepen cooperation to implement international law on green intellectual property rights; strengthen international dialogues and exchanges; and enhance the prosecution and sanctioning of related illegal

ISSN: 2688-8653

infringement activities. In addition to this, countries must actively promote public and media regulatory activities, foster broad participation, and create comprehensive green protection mechanisms that will help us to effectively respond to threats to green innovations and sustainably improve the environment for green technological innovation.

6.2.3. Promoting international cooperation rule-making

To promote international cooperation and rule-making to protect green intellectual property rights, it is necessary to clarify the objectives of cooperation, strengthen international communication and consultation, formulate and implement relevant rules, and at the same time improve the legal framework, strengthen law enforcement cooperation and establish a monitoring mechanism to ensure the effectiveness of implementation, so as to promote green technological innovation and sustainable development.

6.3. Establishment of a fair and reasonable patent protection mechanism for green technologies

The patent protection system for green technologies is central to promoting the vitality of technological innovation, accelerating the process of sustainable development, and addressing the challenges of global climate change - it stimulates innovators to conduct in-depth research and development by granting them exclusive rights, and it accelerates the widespread dissemination and practical application of green technologies, thus driving a wave of technological innovation. At the same time, the green patent protection mechanism can also accelerate the widespread dissemination and practical application of green technologies, optimize the efficiency of resource allocation, and drive a wave of technological innovation.

The key to building such a system lies in achieving a delicate balance between the protection of the rights and interests of innovators and the diffusion of technology. To this end, it is necessary to establish clear and explicit patent granting criteria, optimize the approval process to improve efficiency, and deepen international cooperation to promote the sharing of knowledge resources across borders; it is also necessary to set up a reasonable fee structure and the validity period of patents, so as to not only effectively stimulate the vitality of green innovation, but also to promote the universal application of technological achievements. It is also necessary to set up a reasonable fee structure and patent term, which can effectively stimulate the vigor of green innovation and promote the universal application of technological achievements, so that the citizens of the world can join hands to meet the serious challenges of the environmental crisis.

7. Concluding remarks

As the core driving force of sustainable development, green innovation technology not only effectively reduces the environmental load, but also significantly improves the efficiency of resource utilization, and promotes the vigorous emergence of new industries. Attention to green technological innovation greatly enhances the competitiveness of the international market, while the protection of green intellectual property rights will become the cornerstone for stimulating innovation potential, maintaining the order of fair competition in the market as well as accelerating the circulation and application of technology, and providing strong support for The protection of green intellectual property rights will be the cornerstone for stimulating innovation potential, maintaining fair competition order in the market and accelerating the circulation and application of technology, as well as providing a solid legal barrier for innovators and strong support for defending the fruits of their hard work. These two elements are closely intertwined - green innovative technologies continue to energize the IPR protection system, while strong IPR protection acts as a solid shield to ensure the widespread diffusion and healthy growth of green technologies, and they complement each other in leading the global

ISSN: 2688-8653

green transition, allowing us to actively address environmental challenges and contribute to sustainable development. Both are complementary to each other, and together they will lead the global green transformation, allowing us to actively address environmental challenges and contribute to the ambitious goal of sustainable development.

With the deepening development of economic globalization, transnational infringement poses new challenges to green innovative technologies and intellectual property rights, and strengthening international cooperation has become particularly crucial. Countries need to work closely together to improve the international legal framework, crack down on transnational infringement to maintain a fair and transparent market competition environment, and effectively safeguard the legitimate rights and interests of innovation subjects. Enterprises also need to elevate intellectual property protection to a strategic level, establish a sound green intellectual property protection system, strengthen internal management, and improve risk prevention and control mechanisms, so as to ensure the healthy and steady advancement and development of green innovative technologies on a global scale.

References

[1] LIU Yu, ZHANG Shuo, LIANG Dong. Intellectual property protection, technological distance and the "incremental quality" of enterprises' green technological innovation[J]. Environmental Economics Research, 2024, 9(02): 18-41. DOI:10.19511/j.cnki.jee.2024.02.002.

[2] Sun Jianfeng. Research on the Reform of Intellectual Property Management in Green and Low-carbon Industries under the Background of Big Data[J]. Industrial Innovation Research, 2024, (10): 16-18.

[3] Tian Xiaoyi. Strengthening intellectual property protection and promoting green technology innovation[J]. Environmental Economy, 2023, (18): 66-69.

[4] Lin Xiuqin, Su Zeru. Challenges and Responses of International Cooperation on Intellectual Property Rights under the "Belt and Road" Initiative--Taking the Theory of Interaction Behavior as a Perspective[J/OL]. Journal of Hainan University (Humanities and Social Sciences Edition), 1-13[2024-08-28]. https://doi.org/10.15886/j.cnki.hnus.202303.0147.

[5] Li Jiguang, Zheng Yuli, Tian Feng. An economic analysis of the reform of the WTO dispute settlement mechanism[J]. Asia-Pacific Economy, 2023, (02): 46-56. DOI:10.16407/j.cnki.1000-6052.2023.02.014.

[6] WU Zhaofeng. Empirical Study on State Sovereignty Issues in WTO Dispute Settlement Practice [D]. East China University of Politics and Law,2017.

[7] Song H. N. Statistics and Trend Analysis of Global Patent Transactions in Recent Years - An Examination with the U.S. Patent Transaction Market as the Main Focus [J]. Technology and law, 2015, (04): 812-843.

[8] MA Yongqiang, ZHAO Liangkai, YANG Huayue, et al. Air Pollution and Corporate Green Innovation - Empirical Evidence Based on A-share Listed Companies in China's Heavy Pollution Industry[J]. Industrial Economics Research, 2021, (06): 116-128. DOI:10.13269/j.cnki.ier.2021.06.009.

[9] Lv Fenchao. Research on the Legal Application of Foreign Trademark Right Infringement in Cross-border E-commerce Environment [D]. Huaqiao University,2019.

[10] GUO Shoukang, SHI Xueqing. The First Revision of WTO Agreements-Amendment of Article 31 of the Trips Agreement[J]. Journal of Hainan University (Humanities and Social Sciences Edition), 2009, 27(01): 38-44. DOI:10.15886/j.cnki.hnus.2009.01.002.

[11] ZHANG Huibin, HE Yiping. The Way Out of International Intellectual Property Dispute Settlement in the Context of WTO Appellate Body Suspension--Analysis Based on ISDS Practice[J]. Journal of International Economic Law, 2023, (03): 127-142.

[12] Ma Yide. The Construction of a Strong Intellectual Property Country under the Overall Situation of Global Governance[J]. Intellectual Property, 2021, (10): 41-54.