

The Application Dilemma and Rule Reconstruction of Injunction——Taking 5G Standard Essential Patents as an Example

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Abstract: *Within the global governance framework of Standard Essential Patents (SEPs), the injunction system with significant extraterritorial effects has become a core issue of sustained attention in international law circles regarding its functional positioning and institutional application. This study focuses on 5G SEPs, employing multidimensional methodologies including literature analysis, comparative law research, and empirical case studies to systematically explore the challenges faced by injunctions in transnational intellectual property disputes and pathways for regulatory restructuring. The research identifies three dilemmas in injunctions during litigation: first, conflicts between jurisdictional authority and judicial sovereignty; second, disagreements over the interpretation of the FRAND principle; and third, discrepancies in global licensing fee calculation methods. To address these challenges, the paper proposes three pathways for reconstructing injunction rules: Firstly, a governance framework centered on the core concept of technology as a public good should be established, emphasizing the public interest nature of technical standards. Secondly, international organizations should be encouraged to jointly develop unified institutional norms, thereby enhancing the universality and authority of the rules. Thirdly, on the basis of ensuring the reasonable exercise of judicial sovereignty, a comprehensive process management of disputes should be achieved through the institutionalization of the "prevention-resolution-integration" principle within international etiquette and multilateral cooperation mechanisms. By safeguarding the rational exercise of judicial sovereignty, this approach facilitates smooth global circulation of technical standards, providing a practical solution for global governance of 5G SEP disputes.*

Keywords: *Injunctions; 5G Standard Essential Patents (SEPs); Jurisdictional Conflicts*

1. Introduction

The Anti-Suit Injunction, a jurisdictional remedy with extraterritorial effect in Anglo-American legal systems, is an enforceable order issued by a domestic court to prevent foreign parties from initiating parallel litigation proceedings in foreign courts that substantially relate to an ongoing domestic lawsuit[1].The legal rationale for this mechanism can be traced back to 15th-century jurisdictional disputes between English common courts and ecclesiastical courts, with formal codification in the 18th-century U.S. Anti-Injunction Act. In contrast, EU member states led by Germany, guided by the "First Court of Appeal Principle" established under Brussels Regulation I[2],generally reject recognition of Anglo-American injunctions as constituting violations of judicial sovereignty[3].Even in France, a civil law jurisdiction, injunctions are applied only in exceptional circumstances.[4]Currently, China's legal system has not yet institutionalized anti-suit injunctions. In judicial practice, functional substitution is primarily achieved through a broad interpretation of the behavioral preservation system under Article 101 of the Civil Procedure Law. Amid intense international market competition, as shown in Table 1, the number of anti-suit injunction cases has been rising, reflecting a growing trend of international parallel litigation in intellectual property disputes. Chinese enterprises are also increasingly facing challenges related to anti-suit injunctions.

Table 1 Summary of transnational/global injunction cases issued by Chinese courts

time	Title of a cause	Type of case	Content of injunction
2020.8.28	Huawei v. Kamenson	SEP licensing fee disputes	Wang Comenson was barred from enforcing a first trial ruling by a court in Dusseldorf, Germany
2020.9.23	Xiaomi v	SEP Global	IDC is prohibited from applying for a

	IDC	licensing rate dispute	global injunction
2020.9.28	Zte v. Kang Wenson	SEP Global licensing rate dispute	Wikipedia is barred from applying for an anti-injunction worldwide
2020.10.16	Samsung v Ericsson	SEP licensing disputes	Ericsson is barred from applying for an anti-injunction worldwide
2020.12.25	OPPO v. Sharp	SEP Global licensing rate dispute	Sharp is barred from applying for a global injunction

2. Problem Statement

In the context of the widespread application of 5th Generation Mobile Communication Technology (5G), the number of 5G SEP patents had exceeded 56,000 by early 2025. The 3G/4G/5G communication standards led by international technology alliances have become core components of modern wireless communication infrastructure[5]. This phenomenon confirms the increasingly intense competition between the globalization of technical standards and intellectual property jurisdiction. The frequent use of injunctions as a judicial remedy in standard essential patent (SEP) licensing disputes has made the application of jurisdictional principles and the Fair, Reasonable and Non-Discriminatory (FRAND) principle challenging. Judicial disputes between different jurisdictions continue to intensify. Chinese courts territorial jurisdiction based on FRAND commitments shows significant differences from the EUs advocated global rate-based adjudication. This contradiction has sparked disputes over Chinas WTO complaint regarding abuse of injunctions[6]. On the other hand, the tension between the public nature of technical standards and private protection of intellectual property has further deepened the differences in understanding and applying the FRAND principle. Although existing research has outlined the importance of international comity principles in handling such disputes, there remains room for deeper exploration of the injunction system. Building on this foundation, this paper aims to construct a framework for an injunction system guided by the principle of reciprocity and bounded by international comity. The framework establishes a scientific and rational standard for reviewing injunctions while maintaining flexible application mechanisms. This approach effectively balances the global demand for standardized technical specifications with the proper exercise of judicial jurisdictional sovereignty. Specifically, this paper thoroughly analyzes the application challenges of injunction systems in 5G standard essential patent (SEP) disputes. Through theoretical analysis, it proposes practical solutions and recommendations for regulatory restructuring to address these issues.

3. The dilemma of the application of injunction in 5G standard essential patents

3.1 Conflict of jurisdiction and judicial sovereignty

A jurisdictional injunction essentially constitutes a court-ordered restriction of foreign jurisdiction by a party, with its legitimacy being the focal point in debates over international judicial boundaries. In the UK Supreme Courts landmark "Unwired Planet" case, the court expanded jurisdictional authority based on the European Telecommunications Standards Institutes (ETSI) financial policies and institutional standards. In practice, this has led to excessive jurisdictional overreach and unilateral jurisdiction practices. As the foundation for global personal life and national economic development, 5G standard essential patents (SEP) possess dual attributes of technical standards and licensing agreements. These patents exhibit geographical characteristics and cross-border homogeneity[7]. With the increasing complexity of 5G SEP disputes, these negative effects have been further amplified, exacerbating conflicts and confusion in international judicial jurisdiction.

The continuous integration of technical standards and patent rights systems is the core of modern industrial development, which is essentially a dynamic public governance process. IPlytics released 115,000 5G standards in 2023. Technical standards include two types: de facto standards (De Facto Standards) and de jure standards (De Jure Standards). De facto standards are established by standard-setting organizations ("SSOs") through the formulation of standard agreements, such as the 3rd Generation Partnership Project (3GPP), an international authoritative organization, which has formulated relevant 5G SEP content; Legal standards are established by governments or public organizations. In the early stages of patent law establishment, provisions regarding SEP were not included. Today, licensing serves as a prerequisite for implementing multiple technical standards, with royalty fees charged to standard users during implementation to directly address risks of violating interests. Therefore, we face the question of whether to prioritize the public welfare nature of internal

standards within standard-setting organizations or to emphasize the interests of patent holders. Different standard-setting organizations adopt different strategies, such as the World Wide Web (WWW) which stipulates default free licensing. Most organizations adopt the FRAND principle for royalty collection.[8]In the 2020 "Huawei v. Kang Wenxun" case, Huawei, based on the FRAND principle, filed a lawsuit with the Nanjing Intermediate Peoples Court...The Peoples Court filed a lawsuit; meanwhile, Kang Wensen initiated a patent infringement lawsuit in the German court. According to the Düsseldorf Court, Huawei and its German subsidiary face two dilemmas: either be forced to withdraw from the German market or accept the 18.3 times licensing fee stipulated by the Düsseldorf Court[9].

Under the territorial principle of the Paris Convention, patent rights are confined to the jurisdiction of the issuing country[10]. However, the expansive application of injunctions has undermined this foundation. Three pathways can breach injunctions: First, courts may prevent parties from filing claims for identical technology patents in other countries through injunctions, thereby extending the validity of patents that are only effective in one country to other jurisdictions. Second, domestic litigation may recognize the litigability of foreign patents, indirectly acknowledging their extraterritorial effect. Such institutional breaches not only violate the territorial principle of intellectual property but also increase litigation complexity. Third, while injunctions target domestic parties, they exert strong constraints on infringement through complex mechanisms like criminal sanctions, civil damages, and asset enforcement, creating "indirect extraterritorial effects." Currently, international standardization organizations have established unified technical standards for Standard Essential Patents (SEPs), but these remain confined to technical aspects without altering the geographical nature of patents. As British courts noted in relevant rulings, Article 6.1 of the European Telecommunications Standards Institutes Intellectual Property Policy stipulates that patent owners FRAND obligations carry international validity[11],though their scope remains limited to licensing obligations.Since it does not possess international characteristics and does not deny regional features, wireless communication companies operating across borders must address these issues during the era of 5G standardization [12]and industry standard formulation[13].

In the field of 5G SEP licensing, the patent application mechanism based on the Paris Convention has created a "patent family" phenomenon. Courts in various countries exercise exclusive jurisdiction over SEP dispute conflicts according to territorial jurisdiction principles, creating institutional space for selective litigation by parties[14]. The ambiguity and lack of clarity in the international comity principle have led to differences in adjudication standards across nations. British courts apply the "natural jurisdiction principle" when foreign injunctions violate domestic public order; the EU established a jurisdictional cooperation mechanism under the Brussels Regulation, excluding the application of injunctions; while the United States developed a dual-track approach combining liberal and conservative approaches. Consequently, to maximize benefits, parties often initiate lawsuits based on the most favorable judicial inclination while simultaneously launching cross-border litigation procedures. These systemic disparities heighten risks of confrontation with multiple national jurisdictions and fragment global jurisdictional frameworks. When nations pressure litigation negotiations to expand markets, normal operations of multinational corporations and the international intellectual property protection order become compromised.

3.2 FRAND principle explains differences

As the core governance rule in the SEP system, FRAND principle aims to balance the interests between patentees and standard implementers. However, due to the ambiguity of its principled expression, there are significant differences among countries on its legal nature and application issues[15].

Judicial practices across countries show that there are three main approaches to adjudicating global FRAND licensing rates: conservative, open, and compromise. Taking the United States, the United Kingdom, and China as examples. U.S. courts adopt a relatively conservative stance. In the 2017 PanOptis v. Huawei case, PanOptis sought to confirm that its global licensing agreement with Huawei complied with FRAND principles but was rejected[16].As such cases involve foreign patent infringement claims requiring foreign law application, U.S. courts exclude adjudication of global FRAND licensing rates when parties have not reached jurisdictional consensus, limiting the scope to U.S. patent FRAND licensing conditions within the United States. British courts demonstrate the most open attitude. In the Vringo v. ZTE case, although Judge Birss of the UK High Court of Patent Law deemed global licensing more consistent with FRAND principles[17],he maintained neutrality regarding whether parties should accept global licensing, nor excluded regional licensing options. Chinese courts adopt a middle-ground approach between U.S. and British approaches. In the OPPO v.

Sharp case, Shenzhen Intermediate Peoples Court first explicitly recognized its jurisdiction to adjudicate global FRAND licensing conditions[18]. The Supreme Court affirmed this in its final ruling, adopting a judgment standard centered on "parties intent" and the "principle of closer connection"[29]. "Specifically, when parties demonstrate intent to establish global licensing agreements and the case has closer ties to Chinese courts, Chinese courts may adjudicate global licensing conditions[20].

There are significant differences in the attitudes of judicial practices across countries regarding the global FRAND license rate rulings in 5GSEP disputes. If parties reach a jurisdictional agreement, courts in various countries will recognize the legitimacy of FRAND license rate judicial rulings. However, without mutual consent, judicial positions vary across different jurisdictions. U.S. courts only intervene in licensing fee rulings when explicitly agreed upon by the parties. British courts possess extensive judicial jurisdiction and may exercise case jurisdiction even without mutual consent. When making rulings, Chinese courts must simultaneously consider the parties intentions and the constraints of the "principle of closer connection".

From a theoretical perspective, the legal attributes of the FRAND principle vary fundamentally across different jurisdictions. In the Anglo-American legal system, the FRAND principle is typically described as a contract with third-party interests, where standard implementers have the right to require patent holders to fulfill contractual obligations under this principle. As seen in the "Soft Company v. Motorola" case, U.S. courts explicitly established the contractual validity of the FRAND principle, limiting patent holders right to seek injunctions and all implementers willing to pay reasonable licensing fees under FRAND terms. They emphasized the necessity of granting patent licenses. Civil law countries tend to view the FRAND principle as an invitation to offer, thereby transforming it into a duty of good faith negotiation between patent holders and implementers. As demonstrated in the "Huawei v. ZTE" case, the EU Court of Justice ruled that the FRAND principle constitutes a commitment, recognizing implementers reasonable expectation to obtain FRAND-compliant licenses, but rejected direct contractual claims against implementers.

Overall, there remains no unified understanding of the legal characteristics of the FRAND principle. In civil law contexts, its attributes are interpreted through various lenses, including unilateral legal acts, offers, acceptances, invitations to offer, contracts benefiting third parties, and mandatory contractual obligations. Within patent law frameworks, it is often interpreted as an implied license. From both legal and economic perspectives, the FRAND principle is classified as an incomplete contract. This theoretical divergence intertwines with practical judicial discrepancies, further complicating the resolution of 5 G SEP disputes and amplifying their inherent uncertainties[21].

3.3 Conflicts in the calculation of global licensing rates

With the increasing adoption of 5G technology in daily life, FRAND licensing fees have become a focal point for global tech companies and legal practices. The calculation method directly impacts the balance of interests between patent holders and standard-setting organizations. However, different countries adopt varying approaches to FRAND licensing rates in both theory and practice, including top-down methods, bottom-up methods, and comparable rate methodologies.

The top-down approach calculates patent licensing rates using the industrys cumulative rate. The percentage of standard essential patents owned by patent holders determines the required licensing rates[22]. This methodology prioritizes R&D investment by patent holders while maintaining innovation momentum, avoiding excessive enforcement burdens through cumulative rate allocation. In the TCL v Ericsson case, U.S. courts applied this approach using the formula: "Patent holder licensing fee = cumulative rate × number of valid SEP patents/total SEP patents × regional power ratio" to determine rates for 2G, 3G, and 4G technologies. While ensuring fair and reasonable industry-wide pricing, this method risks undervaluing high-quality patents contributions by failing to accurately assess individual patents technical significance[23].

The bottom-up approach, also known as the value-added method, is a technique for determining fair patent licensing fees by calculating the added value of patented technologies to a products total value.

At its core, this method evaluates the independent contribution of individual patents to product value, disregarding the combined value of identical standards or other SEP holders within the same product. Its legal basis can be traced back to Section 284 of the U.S. Patent Act, which stipulates that if a jury determines facts favorable to the plaintiff, the court shall award appropriate compensation for damages suffered due to patent infringement, provided such compensation is lower than the reasonable

licensing fees necessary for infringers to implement the invention[24]. The "factor analysis method" proposed in the 1971 Georgia Pacific v. U.S. Plywood case further supported this approach. This methodology involves analyzing consideration factors to assess the importance of standard essential patents to standards and products, ultimately determining FRAND licensing fees[25]. The advantage of this method lies in its ability to accurately evaluate individual patents technical value, thereby aligning with the genuine intent expressed by market entities. However, it neglects the holistic management of standard essential patent licensing fees, instead conducting unilateral assessments of each patents contribution to product value. Such singularity may lead to rate stacking issues and potential patent hijacking[26].

The core of the comparable rate method is to use existing FRAND rates as a reference to calculate the rates that patent holders should request in cases, while emphasizing the "non-discriminatory" nature of the rates. The operational steps of this method mainly include screening comparable license agreements and more reasonably determining the licensing rate through mutual verification among multiple comparable agreements[27]. The sources of comparable rates mainly include two aspects. The first is the rates determined by patent holders or implementers in standard essential patent license agreements that were previously signed with others. The second is the rates determined by valid rulings. For example, the Guangdong Provincial High Peoples Court once issued an effective judgment in the Huawei vs. IDC case that Huawei should pay Interactive Digital Payment 4G (LTE) China a rate of 0.019%[28]. This rate screening based on existing contracts or judgments can provide a clear reference basis for cases. The advantage of this method lies in its ability to reflect the market value of SEP technologies and better align with the genuine intentions of market entities, thereby ensuring the fairness and reasonableness of charges to some extent and avoiding disputes caused by unilateral pricing by patent holders or implementers.

In summary, the three rate calculation methods each have their own merits. The top-down approach ensures fairness within industries, while the comparable rates method enhances practical rationality through market data. In judicial practice, these methodologies are increasingly converging. However, due to challenges in evidence acquisition and inherent flaws in the methodology itself, a universally accepted theoretical consensus has yet to emerge[29].

4. Restructuring the rules of application of injunctions in distress

4.1 Reconstruction of governance concept

In addressing SEP disputes, the core concept to grasp is the shared attributes of technology, with this core principle prioritized to promote technological diffusion and fair market competition. First, we can quantify the technical contributions of basic standard patents to clarify their fundamental role in advancing industrial technology, thereby demonstrating the paramount importance of technological commonality. Second, when formulating and implementing regulations, we consistently apply this methodology to ensure SEP licensing rules, dispute resolution mechanisms, and international patent schemes maximize public interest in technology. Finally, it is essential to establish a multi-tiered framework for balancing interests: applying the "necessary restrictions principle" to curb patent abuse through technical standard implementation, while protecting the legitimate rights of innovative enterprises via market access supervision and antitrust review mechanisms, thus improving both technical standard management and private rights protection.

4.2 Restructuring the institutional framework

First, the World Intellectual Property Organization (WIPO) and the World Trade Organization (WTO) should collaborate to develop regulations such as the Model Law on Standard Essential Patent Licensing, incorporating royalty calculation models based on technology contributions and industry cumulative rates. By establishing relevant principles, standardization can be quantified. Simultaneously, the EUs Digital Markets Act SEP "gatekeeper" system could be introduced, which clarifies rights holders compliance obligations and strengthens restrictions on their conduct. Second, efforts should be made to revise TRIPS agreements, requiring member states to establish patent pool disclosure systems, enhance transparency in patent information, create binding cross-border enforcement mechanisms for mediation agreements, and expand dispute resolution channels. Finally, a joint experimental model combining "technical expert groups + legal expert groups" should be adopted. Technical experts would assess patent necessity, while legal experts apply model laws to resolve fee disputes, ensuring

authoritative and efficient adjudication. Through standardization bodies like the International Telecommunication Unions (ITU) FRAND Standards Division, judicial interpretations should be coordinated to clarify legal nature and remedy limitations, establish unified calculation standards, reduce judicial discretion, balance flexibility, and introduce a binding global SEP processing rule system.

4.3 Innovation of implementation mechanism

To establish a collaborative framework that combines prevention and resolution from beginning to end. First, during the WTOs conflict prevention phase, the "Provisions on Transfer of Intellectual Property Rights" were added to clarify that member states must "properly consider" other countries sovereignty when exercising their authority, while specifying the transfer obligations under Article 64 of TRIPS: these could be included in dispute resolution mechanisms and a mandatory "transfer assessment report" system could be established. Before filing claims, members can seek court compliance to reduce disputes at their source. Second, during conflict resolution, a "Joint Expert Panel" could be set up to review legal disputes. The panel would indicate that any TRIPS organization found violating its obligations would be ordered to rectify within a specified period. Members refusing to comply should enjoy rights equivalent to suspending compulsory patent licensing and benefit from deterrence mechanisms to ensure decision enforcement. Finally, during the rule integration phase, efforts are underway to promote the Hague Convention on Judicial Decisions and trade-related intellectual property rights. While facilitating link agreements, it is necessary to establish dual jurisdictional standards for "market relevance" and "technological contribution" allocations, prohibiting abuse of injunction rights that undermine other countries judicial sovereignty. Simultaneously, cross-border cooperation mechanisms should be created to coordinate bilateral contract approval procedures and develop The "International Gift Digital Platform" SEP integrated sample library deployed globally provides expert group test reference for different types of cases provided by WTO to solve international gift problems and realize cooperation on global governance rules of technical standards.

5. Conclusion

The global governance mechanism for SEP disputes in the 5G era fundamentally addresses the institutional balancing act between the public good nature of technical standards and the protection of private rights. Current judicial application of injunctions should not be confined to jurisdictional limitations within specific legal jurisdictions, and judicial authorities must adopt a more prudent approach when issuing such orders. To resolve jurisdictional overlap challenges, it is imperative to achieve multilateral collaborative governance through restructuring the international rule system. From a long-term development perspective, the international community should embrace an open and inclusive governance philosophy, focusing on standardizing SEP licensing rules, professionalizing arbitration mechanisms, and institutionalizing the principle of international comity. This will establish a new paradigm for global technology governance that balances efficiency with fairness. Such institutional design must both safeguard the public interest attributes of technical standardization and fully respect legitimate rights claims of market entities, ultimately forming a systematic solution that harmonizes intellectual property protection with technological diffusion.

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