

Sichuan-Tibet Railway Technology Patent Overseas Layout Risk Warning and Prevention and Resolution

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Abstract

In order to protect the "going abroad" of Sichuan-Tibet railway-related technologies, this paper takes the overseas layout of patents as the focus, studies the risks of overseas patent layout of Sichuan-Tibet railroad construction technologies through general method, data search method and case study method, analyzes the insufficient number of overseas patent layout of Sichuan-Tibet railway-related technologies, the imbalance of layout areas, and faces foreign railroad patent jungles. The current situation of technology patent jungle contains, and the risk factors of high risk of patent infringement of Sichuan-Tibet railroad technology, high possibility of patent malicious lawsuit, and difficulty of integration into international railroad market is derived. Sichuan-Tibet railroad construction enterprises should actively build patent families, coordinate overseas traditional and new market patent layout, actively carry out patent countermeasures and actively respond to lawsuits in the process of going abroad.

Keywords

Sichuan-Tibet Railway; Patent; Overseas Patent Layout Risk; Response Strategy.

1. Introduction

Sichuan-Tibet Railway is known as the "Project of the Century" and its construction is highly valued by the state. On November 8, 2020, Chairman Xi, General Secretary of the CPC Central Committee, gave an important instruction on the construction of the Sichuan-Tibet Railway, emphasizing that the construction of the railroad is a major initiative to implement the Party's strategy for governing Tibet in the new era, which is of great significance to maintain national unity, promote national unity, consolidate the stability of the border, and promote the economic and social development of the western region, especially Sichuan-Tibet. The economic and social development of the two provinces and regions is of great importance. Therefore, the overseas patent layout of Sichuan-Tibet railroad construction technology can prevent and solve the infringement and loss of railroad technology, which is related to the export of Sichuan-Tibet railroad technology and patent protection on the one hand, and also linked to our national reputation and international influence on the other hand, so the importance of reasonable overseas patent layout is self-evident.

2. Importance of Overseas Patent Layout of Sichuan-Tibet Railway Technology

Sichuan-Tibet Railway starts from Chengdu in the east to Lhasa in the west, the whole line from the average altitude of 600m Chengdu plain all the way through Ya'an, Kangding, Litang, Batang and other places directly to the abdomen of the Tibetan Plateau. 1543km of the line along the way needs to cross 16 big rivers, over 21 snow-covered mountains, through the eight different

active fracture zones. Geological conditions are complex and diverse, multi-hazard formation mechanism coupled with each other, the overall construction difficulty is huge. In particular, the Ya'an-Linzhi section of the rapid railroad currently under construction, the whole section of the bridge-tunnel ratio of up to 95.6%, the harsh natural environment will lead to the construction of the Sichuan-Tibet Railway to face a large number of problems, must give rise to many for the Sichuan-tailor-made extreme mechanical equipment and innovative construction methods. Such extreme equipment not only has a high technical content, but also has the potential to become a high-value patent. Therefore, it is necessary to start patent protection and layout for the technology and equipment on the Sichuan-Tibet Railway. However, at present, the patent layout strategy of Chinese railroad enterprises tends to apply in their own countries, and the number of overseas applications for the same family of patents is distinctly different from that of domestic ones, and the distribution of the number of patent layouts in different countries also seems to be very uncoordinated. Based on the geographical characteristics of patents, we should predict the risk of overseas patent layout of Sichuan-Tibet Railway and build a corresponding response system, so as to avoid or reduce the possibility of Sichuan-Tibet Railway encountering similar disputes and conflicts in the future.

3. Characteristic analysis of overseas patent layout of Sichuan-Tibet Railway related technology

"Before the railroad moves, the patent goes first." With the rapid development of global knowledge economy, railroad technology and product "going out" gradually changes to patent "going out". For Sichuan-Tibet Railway to go abroad for international transactions, it is important to carry out overseas patent layout in advance, however, at the present stage, there are more problems in overseas patent layout of Sichuan-Tibet Railway related technology.

3.1. Insufficient number of overseas patent layouts for Sichuan-Tibet Railway-related technologies

Overseas patent layout is the pre-requisite for Sichuan-Tibet Railway related technology patents to go abroad, however, at present, Sichuan-Tibet Railway technology mainly chooses to carry out patent layout in China. The author conducted a manual search and screening in SooPAT world patent database with "Sichuan-Tibet Railway" and "Sichuan-Tibet Railway" as keywords, and found that there are only 7 patents directly related to Sichuan-Tibet Railway at present. The number of patents in the process of application is 6, all of which are concentrated in the category of measurement and railroad. Such technologies and patents bear very difficult engineering in the construction of Sichuan-Tibet Railway and belong to the technical patents with high technical content in the railroad field. However, these 13 technologies have only 1 homologous patent layout in Australia, with a patent layout ratio of 7.69%, which indicates that the number of overseas patent layouts of Sichuan-Tibet Railway technology patents is seriously insufficient, which may lead to the situation that Sichuan-Tibet Railway enterprises encounter technical plagiarism and patent infringement when they conduct technical exchanges abroad.

3.2. Foreign railroad technology patent jungle containment

The Sichuan-Tibet Railway is a fast railroad that goes straight to the Qinghai-Tibet Plateau. In the overall construction process, the contractor will use countless railroad technologies, and it can be said that the overall railroad technology patent is the cornerstone of the construction of the Sichuan-Tibet Railway. However, I searched in the soopat world patent database with the search formula "(railway) IPC:(B61)" and selected the patent subcategory F (suspension device of railroad vehicle)/G (traction device)/H (brake) for data deweighting and noise reduction, and found that compared with other countries, especially the The United States and Europe's railroad patent technology in the world's layout, Chinese enterprises in the international

railroad technology in patent ownership are not outstanding, in the export may fall into the scope of foreign enterprises patent protection and lead to patent infringement problems, more likely to encounter foreign railroad enterprises patent containment. Foreign railroad equipment manufacturing enterprises, such as Japan Kawasaki Heavy Industries, France Alstom, Canada Bombardier, Germany Siemens, etc., for the train control system, locomotive devices and other advanced railroad technology have been in important countries and regions around the world to develop a close railroad layout.

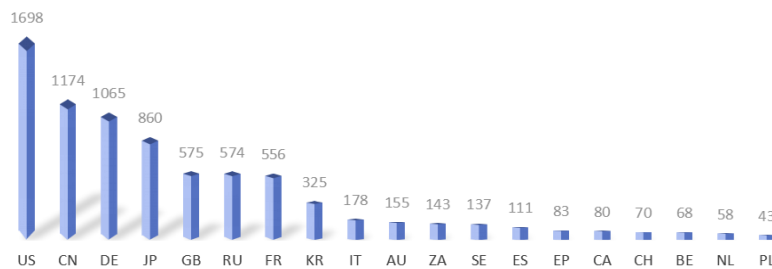


Fig. 1 Number of Railway Technology Patents by Country

3.3. Regional imbalance of overseas patent layout

According to the data of SooPAT world patent database, by locking the international patent classification number "IPC: B61G" to analyze the patents of railroad train traction system, I found that the number of Chinese enterprises in foreign patent layout is very uneven. As of October 2, 2021, Chinese enterprises have laid out 52 railroad traction patents in the United States; only 5 in the United Kingdom, 4 in Germany and 15 in Russia; a total of 2 in 9 countries in Africa; 34 railroad patents in 22 countries in South America; and 19 patents in Australia. From the regional point of view, Chinese enterprises' train traction system patents are mainly concentrated in the United States, followed by Europe, Australia, and the patent layout in African countries is very weak. It can be seen that the layout quantity of Chinese railroad enterprises in various countries and regions in the world is very unbalanced, the number of patent layouts in developed countries such as the United States and Russia is high and mainly core patents, but the number of patent layouts in some developing countries in Africa and South America is very small, the layout of traditional railroad market is a little weak and the patent layout of emerging markets is lacking, the overall overseas patent layout presents an imbalance.

Table 1. Number of Chinese companies' patent layouts in some countries and regions

Country	Quantity
United States	52
Germany	4
United Kingdom	5
Russia	15
Africa (9 countries)	2
South American states (22 countries)	34
Australia	19

4. Sichuan-Tibet Railway Overseas Patent Layout Risk Warning

4.1. High risk of patent infringement

The database of North University of Law shows that the number of patent ownership and infringement dispute cases in the railroad field in 2019 is as many as 2,367, and the overall

trend is rising from 2012 to 2019. At present, the number of patent layouts for Sichuan-Tibet railroad technology is extremely small, with only one overseas patent layout, and the overall railroad technology in China shows the phenomenon of insufficient number of overseas patent layouts. In some countries with stronger patent protection for railroad technology, such as the United States, Britain, Germany, France and other foreign patent applications are more than twice the number of local applications, and there are a considerable number of patent disputes between European enterprises and U.S. enterprises for a long time. 2017, Germany Siemens to the U.S. Westcourts Westinghouse Brake (Siemens vs Wabtec) infringement of different aspects of train safety and control 13 patents, and the court eventually awarded Westinghouse Brake about \$6.7 million in damages to Siemens. Siemens has always focused on overseas patent placement, so when the technology used by Westinghouse Brake fell under the protection of patents held by Siemens, Siemens was able to quickly obtain court support. Similarly, Siemens, as one of the main competitors of Chinese railroad enterprises, in view of the geographical characteristics of patents, if Sichuan-Tibet Railway technology is traded overseas without a patent layout, the relevant enterprises are likely to be defenseless in the face of patent litigation and easily encounter the risk of infringement of others' patents.

4.2. High probability of facing patent malicious prosecution

In today's world where knowledge-based economy is becoming a major element of national competition, the number of patent malpractice lawsuits is increasing, especially in the major markets for China's railroad exports, which often sends bad signals. Take the case of patent dispute between Tibet Zhongchi Company and Germany Xupulin Company about railroad operation noise barrier technology as an example, Xupulin Company mailed the unvalidated civil first instance judgement of Zhongchi's defeat to the bidders of Zhongchi Company during the appeal period of Zhongchi Company, which interfered with Zhongchi Company's bidding project and directly or indirectly caused more than 30 million Yuan economic loss to Zhongchi Company, and Chinese railroad enterprises are facing the risk of patent malicious litigation. The risk of patent malicious lawsuit. Song Qinghui, a famous economist, said in an interview that China's high-speed railway, because of its export products of high quality and low price, would touch the interests of developed countries' high-speed railway enterprises, so it was often accused of patent infringement of China's railway-related technology and encountered litigation from time to time, but in fact these problems were proved to be non-existent in the end. For Sichuan-Tibet Railway, the unreasonable composition of the patent community will lead to the frequent occurrence of malicious lawsuits and stall the process of "going abroad" of Sichuan-Tibet Railway's technology patents.

4.3. Overseas barriers towering, unable to integrate into the railroad market

Overseas railroad projects and China's railroad projects there are technical standards, legal norms and other aspects of non-adapted situation, Sichuan-Tibet Railway related units to build overseas projects there are greater legal risks, facing difficult to break through the barriers. First, foreign technical barriers towering, China's railroad export focus area - the European high-speed railroad market set the EU railroad interoperability (Technical Specification for Interoperability, TSI) certification standards, the entire European railroad design standards and design put forward strict uniformity requirements, trying to block Sichuan-Tibet Railway technology from entering the European railroad market. In addition, there are railroad technology standards such as AAR, GOST and UIC in Britain and the United States respectively, and our railroad enterprises will not be able to carry out overseas patent layout due to such barriers, and it is difficult to integrate into the local railroad market by way of technology export, which is shackled by the patent jungle strategy of foreign railroad enterprises.

In addition, foreign railroad enterprises have gradually integrated intellectual property rights and technical standards in their long-term development, forming a solid intellectual property

barrier and aggravating the situation that technology patents cannot be integrated into the local market. The railroad technology field is one of the key targets. From the "337" investigation case against China's railroad cargo insurance system, China's railroad enterprises were forced to become the respondent, which shows that when exporting to the main markets along the "Belt and Road" and in Europe and America, the overseas patent layout of China's railroad technology is insufficient, and it is likely to fall into the same situation as the main competitors Siemens, Siemens and Siemens. It is likely to be caught in the intellectual property disputes with the main competitors such as Siemens and Bombardier, which will affect the export transactions of Sichuan-Tibet Railway related technologies. In addition to the "337 investigation", the U.S. has also included China in the priority list of "Special 301 Report" for a long time, which is all intellectual property barriers set by the U.S. against China on the pretext of protecting its own intellectual property rights.

5. Sichuan-Tibet Railway Technology Patent Overseas Patent Layout Risk Resolution Mechanism

5.1. Advance layout and construction of Sichuan-Tibet Railway technology patent family

In the process of construction, Sichuan-Tibet Railway may face the risk of infringement in the process of export because of the large number of technologies involved, so it is necessary to reasonably consider the number and structure of patent layout applications for Sichuan-Tibet Railway. Based on the consideration of patent maintenance cost, the core technology and common technology should be distinguished and different strategies should be adopted for overseas patent layout, which can better protect the patent right on the one hand and bring the technology to the market in time on the other hand.

The core technology of Sichuan-Tibet Railway is the carrier of its core patents, and it is necessary to have a sufficient number of core patents to guarantee the smooth development of Sichuan-Tibet Railway to overseas markets, therefore, the layout of core technology patents of Sichuan-Tibet Railway should adopt a broad and comprehensive layout strategy to form a tight technology patent family to provide more comprehensive protection. However, the common technology of railroad construction has high technical maturity in the long-term development process, and the technical advantages are greatly reduced and lack of core competitiveness, so its layout should take a quick and universal layout strategy, and select the patent market that has not been seized for layout, which is conducive to maximizing the transformation of patent benefits.

5.2. Coordinate the patent layout of overseas traditional and new markets

At present, the overseas patent layout of China's railroad technology presents an unbalanced state, the traditional market layout is extensive but the emerging market patent layout has not kept pace with the development of technology as well as commercial trade. Take China's railroad overseas layout primary country - the United States as an example, in the environment of China-US technology friction and trade friction intensified, if the patent is too much concentrated in the United States, the role of Sichuan-Tibet railroad technology in the United States patent layout declined. Therefore, reasonable patent layout should be carried out in advance in regions other than the United States, such as Japan, South Korea, "One Belt and One Road" countries and other key railroad export markets.

In the African region, many countries have complex natural environment and rugged terrain, which is similar to the construction difficulties of the Sichuan-Tibet Railway, and are challenges that should not be estimated for the railroad contractors. However, as the geological environment of Sichuan-Tibet Railway is more extreme and challenging, its extreme equipment

can pass through the East African plateau unimpeded, which is more in line with the construction needs of the African region than the railroad enterprises of other countries, and the Sichuan-Tibet Railway contractors have a competitive advantage unmatched by other enterprises under the control of natural attributes in the African region. In addition, since the two major intellectual property organizations in Africa, ARIPO and OAPI, both accept PCT patent licenses, this greatly facilitates the Sichuan-Tibet Railway contractors to make patent applications in Africa. Moreover, the IP market in Africa is still in a primitive state, with a large untapped market share, and the emerging market appears to have more value potential. Therefore, the overseas patent layout should pay attention to the patent layout of traditional market and strengthen the patent layout of emerging market at the same time, so that the patent layout of two markets can effectively cope with the uneven, uncoordinated and imperfect distribution of overseas patent layout of Sichuan-Tibet Railway, build a complete, coordinated and systematic overseas patent network of Sichuan-Tibet Railway technology and escort Sichuan-Tibet Railway technology out of the country.

5.3. Make good use of patent countermeasures to eliminate the impact of patent jungle barriers

Sichuan-Tibet railroad contractors in the face of foreign patent jungle containment, you can use the "Wei Wei save Zhao" strategy to limit competitors to suppress. On the one hand, in-depth analysis of China's railroad technology overseas patent layout blocker patents, find each other's patent weak links, patent development competition, preemptive layout of new patents, to break the foreign patent jungle constraints, to reach cross-licensing. On the other hand, based on various legal provisions, there will be a certain number of patents in foreign patent families that have lost their patent rights and are no longer protected by law, but the invalid patents are not useless. However, the invalid patents are not useless patents. The Sichuan-Tibet Railway contractors can explore the invalid patents, redevelop the value of the invalid patents and incorporate them into their own patent pool, so as to dismantle the patent families in other countries and eliminate the influence of overseas patent jungle restrictions.

From the current situation of foreign railroad patent layout analysis, multinational companies in key areas have long been running around, the copper wall of patents, Sichuan-Tibet railroad construction enterprises want to jump out of the multinational patent siege defense, should seize each other's omissions for patent countermeasures, to achieve the "four two dial a thousand pounds" victory.

5.4. Active litigation and sound response mechanism for overseas patent disputes

Different from the aforementioned offensive patent layout risk resolution strategy, if the Sichuan-Tibet Railway related technology "going abroad" process encounters others infringement lawsuit, should break the traditional thinking of the limitations, and actively use legal weapons for defensive risk resolution strategy. First, actively respond to the lawsuit, the respondent can use the conventional non-infringement defense, prior art defense, patent invalidation, design avoidance and other means, comprehensive use of jurisdictional objections, application for temporary injunction, the use of "the possibility of the patentee to win" principle and other special response to the laws of intellectual property rights of various countries. The second is active countersuit, the party being sued can study the technical features and layout of the patent claimed by the prosecution to collect evidence, claiming that no infringement of others' patent rights or the existence of abuse of patent rights or monopoly, so as to file a countersuit.

6. Conclusion

We are looking forward to the early completion of the Sichuan-Tibet Railway, which is a 100-year dream coming true, as a great unity channel linking the Chinese and Tibetan people. However, from the current situation, the Sichuan-Tibet Railway has potential intellectual property risks and its overseas patent layout has many kinds of problems, which should be paid attention to and solved by a good prevention mechanism to ensure that the Sichuan-Tibet Railway can go out smoothly in the process of "going out" in the future.

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