

Chinese Patent Activity Analysis about Vibration Reduction Control Technology in High Speed Railway Vehicle Systems^①

Zhang Fan*(zhangfanemail@gmail.com)

Department of Accounting, Emei Campus, Southwest Jiaotong University,
No.1 Jingqu Road, Emei Sichuan 614202, P. R. China

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Introduction

In January 2004, 'Chinese Medium-and-long Term Plan of Railway Network' was passed by State Council, and the year of 2004 was regarded as the exact first year of China's development of HSR. As of June 2011, China has had the world's longest HSR network in service [1] and 1,902 patents/applications filed [2]. This paper concerns the patent activities in the technology field of vibration reduction control in HSR vehicle systems in China to portray China's HSR innovation processes.

Data and research methods

Research base data was taken from the SIPO official Web-based Database and WIPO PCT Database Search. As of Feb.5 2011, after data searching and cleaning, there was a patent portfolio of 193 patents/applications kept. The research methods are omitted in the extended abstract due to space limitations.

Research findings

- Patent application filing trends.

The patent application filing trend could be divided into 3 periods: 1985-1997, 1998-2005, since 2006 (fig. 1).

- Technological Life Cycle

The period of 1985 to 1997 was the emergence period of TLC, and the period of 1998 to 2009 was the development period, Some major R&D units had begun to conduct this area with more technology innovation since 2006.

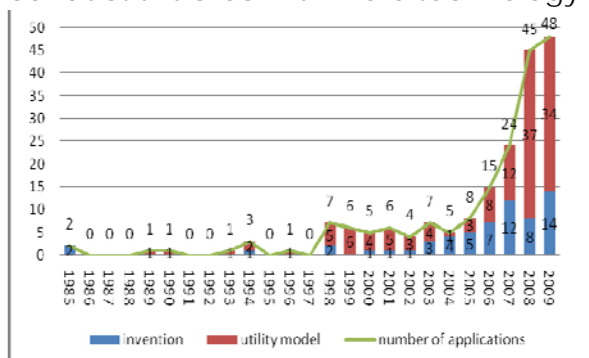


Fig. 1 Patent application filing trends

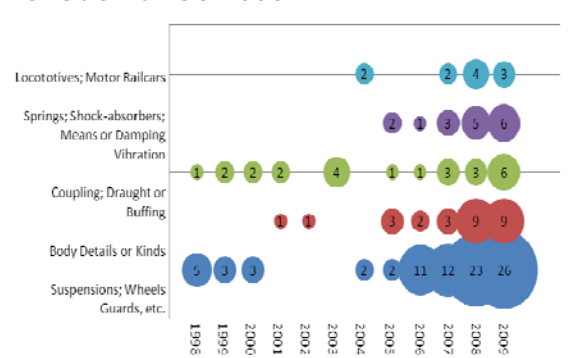


Fig. 2 Progress of R&D hotspots

- Patent filing activity-year

More than 76.70% applicants filed applications in only one year during 1985-2009, showing it was not long since they entered the technology field or their activity and sustainability were kept at a low level after they entered.

- Patent type

The percentage of invention (32.28%) was far lower than that of utility model and also lower than the national average (49.12%) over the same time.

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-Applicants

Among 6 types of applicants^②, corporate applicant conducted the field by filing 67.39% applications, and his advantages in number of both applicants and applications had been being kept increasing since 2004.

Government-Industry was the most important joint applicant, while Industry-Academia-Research played unremarkable role in the area with zero application. All the joint applications were filed after 2004.

-Technology R&D themes

The majority of applications were concentrated in 5 themes (IPC subclasses) and around 44.44% applications focused on the suspensions. During the development period of TLC, technology progresses had concentrated in 5 R&D hotspots (fig. 2).

Correspondence between technical item & function of bogies was showed in a matrix table (omitted here). The technological innovation of bogie focused on 6 technical functions by 9 most important technical items (fig 3, 4).

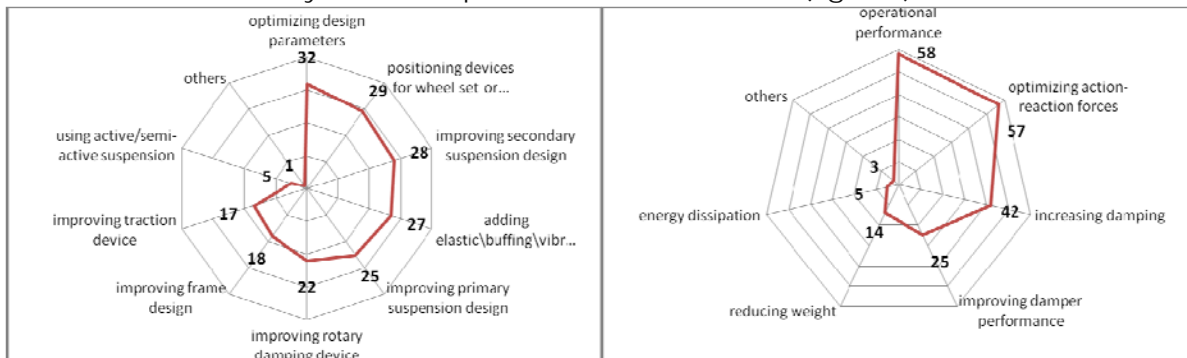


Fig. 3 Distribution of major technical items on bogie Fig. 4 Distribution of major technical functions on bogie

-Priority right claiming/claimed

Only one right of priority based upon an earlier Chinese application was claimed for an international application under PCT, and this international application did not enter any national phase until the deadline.

-Actual terms of patents in force

The average actual term of invention in force was 4.0 years, shorter than the national average, and the average actual term of utility model in force was 3.1 years, longer than the national average by 0.1 year.

▪ Policy Implications

In view of around 67.3% applications filed by Chinese enterprise, policy implications were provided for domestic R&D sector, including strengthening strategic planning, improving the quality of patents, promoting Industry-Academia-Research cooperation, getting breakthrough in blind zone of existing technology and strengthening the international protection of IPR.

▪ References

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^② In accordance Patent law of China, a unit or individual may file a patent application.