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CHINA SCIENCE & TECHNOLOGY NEWSLETTER

Facts and figures : Innovation in China

- Analysis of China's Patent Statistics

Science and Technology Pioneers - Ming Dong & Li Yu

Proportion of scientifically literate Chinese citizens exceeds 10%

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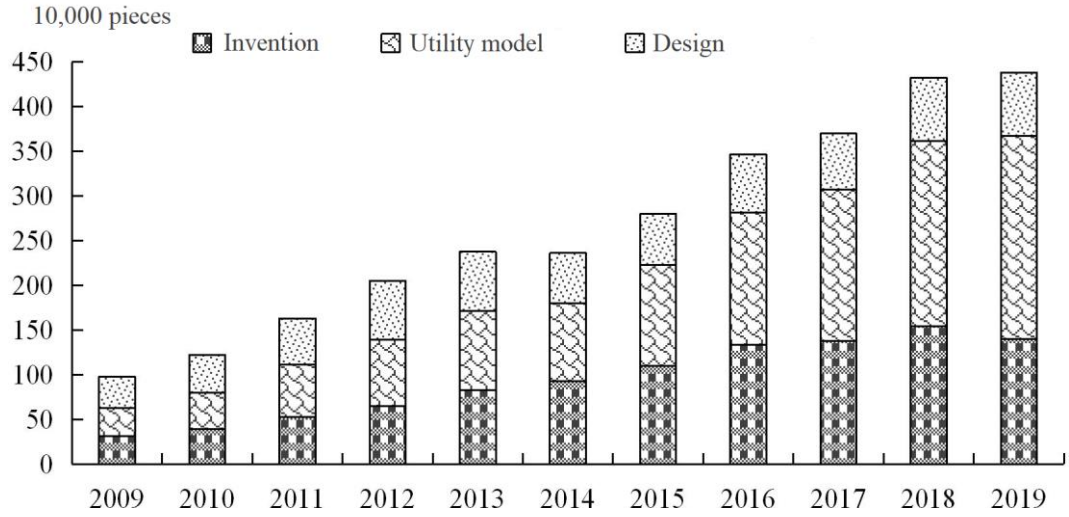
Technology in Numbers - Analysis of China's Patent Statistics

In 2019, China saw a moderate growth of patent applications and grants. Among the three types of patents, the number of invention applications dropped by 9.2% year-on-year, accounting for 32.0% of the total applications. The number of domestic filings for invention patent stood at 1.244 million, down by 10.8% year-on-year. Grants for domestic invention patent were 361,000, up by 4.3% year-on-year. Enterprises accounted for 65.0% and 61.6% respectively of the applications and grants of invention patents. The number of invention patents per 10,000 heads in China has reached 13.3. China was also the top filer of 59,000 PCT international patents. In 2018, China's total triadic patents reached 5,323, ranking the fourth globally.

✧ I. Moderate growth in patent applications and grants



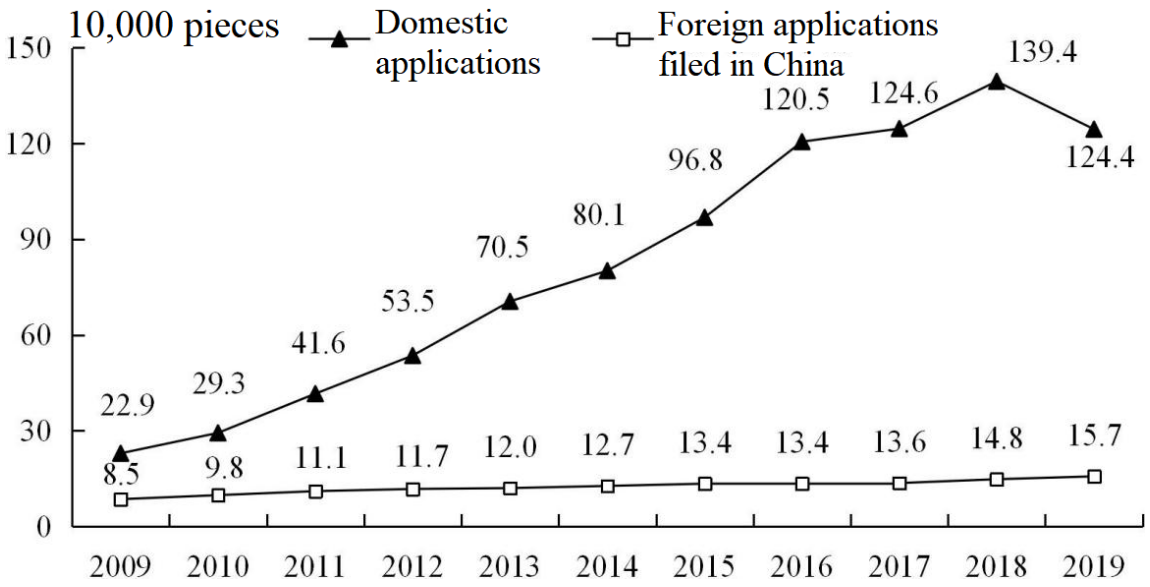
Changes in the total number of three types of patent filings in China (2009-2019)

In 2019, the number of patent filings in China stood at 4.380 million, an increase of 1.3% year-on-year. Among them, the number of invention patent applications was 1.401 million, down by 9.2% year-on-year, accounting for 32% of the total; the number of utility model applications was 2.268 million, up by 9.5% year-on-year; and the number of design patents was 712,000, up by 0.4% over the previous year.

In 2019, the number of patent grants in China was 2.592 million, up by 5.9% year-on-year, notably slower than previous year. Among them, 453,000 invention patents were granted, up by 4.8% from the previous year; 557,000 and 1.582 million utility model patents and design patents were granted, up by 3.8% and 7.0% respectively over the previous year.

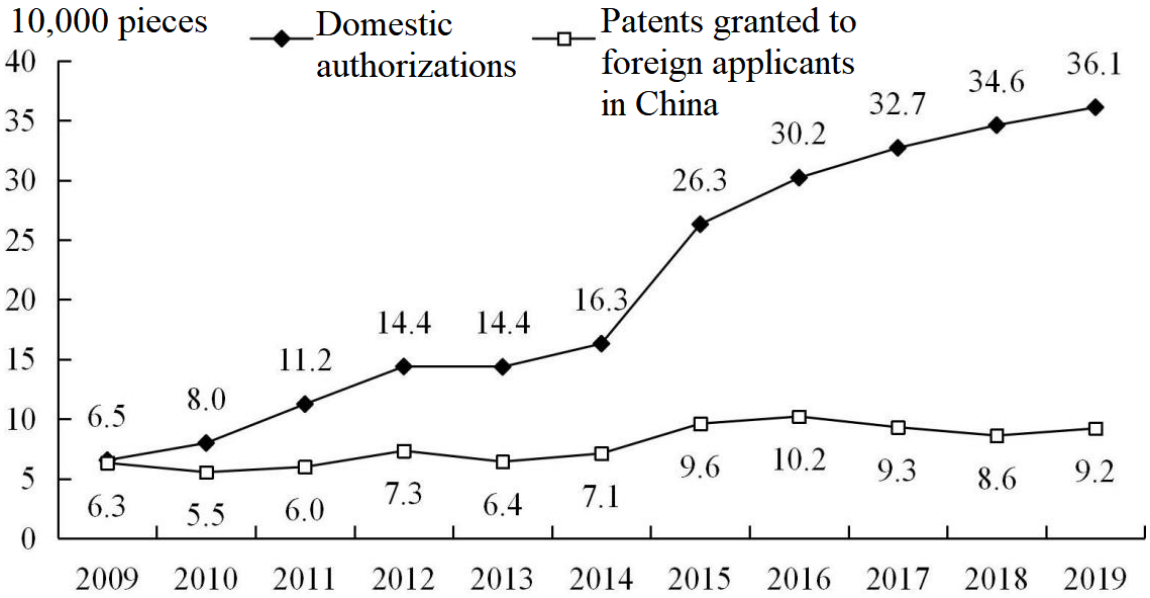
✧ II. Domestic invention patent filings dropping for the first time

In 2019, domestic patent applications saw a year-on-year increase of 1.2%, reaching 4.195 million. Among them, invention filings reached 1.244 million, down by 10.8% from the previous year, declining for the first time after years of positive growth; the applications for utility model patents totaled 2.26 million, up by 9.5% over the previous year; and the applications for design patents reached 692,000, up by 0.4% from the previous year.



Domestic and foreign applications for invention patents (2009-2019)

In 2019, domestic patent grants saw a year-on-year increase of 6.0%, totaling 2.474 million. Among them, 361,000 were invention patents, up by 4.3% over the previous year; 1.574 million were utility model patents, up by 7.0% over the previous year; and 539,000 were design patents, up by 4.2% over the previous year.

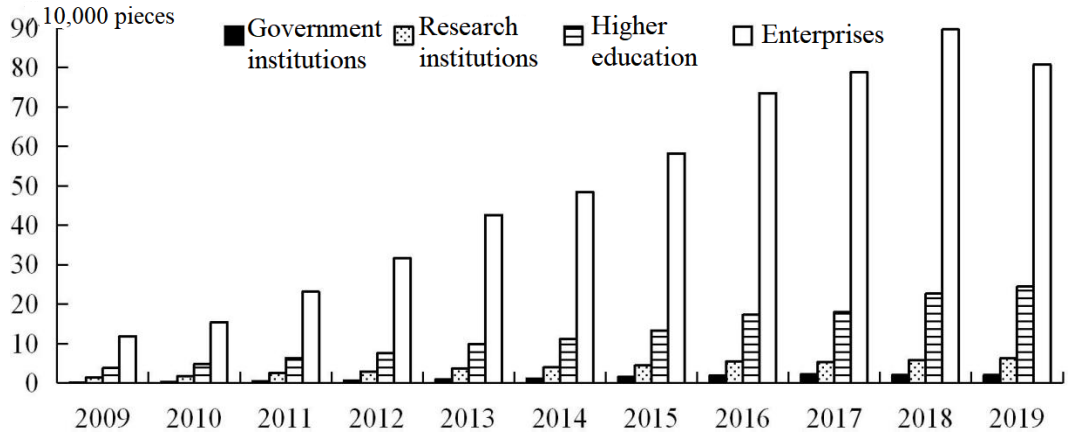


Domestic and foreign invention patent grants (2009-2019)

In 2019, the number of invention patents filed by foreign applicants in China totaled 157,000, an increase of 6% over the previous year. The number of invention patents granted to foreign applicants in China totaled 92,000, an increase of 6.6% over the previous year.

✧ III. Significant decline of invention patents filed by enterprises

Enterprises are main players in the application of service-invention patents, yet the number of filings has notably declined. In 2019, the number of invention patents filed by domestic enterprises was 808,000, down by 9.9% from the previous year, accounting for 65.0% of the total; the number of invention patents granted to domestic enterprises was 222,000, up by 0.1% from the previous year, accounting for 61.6% of total domestic invention patents granted.



Number of domestic applications for service-invention patents by institutions (2009-2019)

✧ IV. Optimizing structure of valid domestic patents

By the end of 2019, valid patents in China totaled 9.722 million. Among them, the number of valid domestic patents and valid foreign patents stood at 8.812 million and 910,000, up by 17.2% and 5.5% respectively year-on-year. Among the valid domestic patents, invention patents totaled 1.926 million, accounting for 21.9%, down by 0.3 percentage points compared with the previous year.

In 2019, the number of invention patents per 10,000 heads in China (excluding Hong Kong, Macao and Taiwan) reached 13.3, meeting the target of the 13th Five-Year Plan ahead of schedule. The top three regions were Beijing (155.8/10,000), Shanghai (53.5/10,000) and Jiangsu (30.2/10,000).

✧ V. Ranking top filer in PCT international patents

According to the World Intellectual Property Organization (WIPO), Chinese inventors filed 59,000 international patents through the Patent Cooperation Treaty (PCT) in 2019, an increase of 10.8% over the previous year. China overtook the US (57,000 pieces) to be the first in PCT applications, followed by Japan with 53,000 PCT applications.

Triadic patent ownership is an important indicator to measure patent quality and competitiveness of a country or region. According to OECD statistics on 41 countries (regions) holding triadic patents, the total number of triadic patents stood at 57,000 in

2018. Among them, the 35 OECD member countries had 50,000 triadic patents, accounting for 87.7% of the total; and the 27 EU countries had 11,000 triadic patents, accounting for 20.7% of the total. Country-wise, Japan and the US respectively held 19,000 and 13,000 patents triadic patents, which together accounted for 54.9% of the total. In 2018, China held 5,323 triadic patents, up by 28.2% over the previous year, accounting for 9.3% of the total, and China's global ranking moved up one spot to the third place in the world.

Science and Technology Pioneers

✧ Ming Dong: Decipher of the "brain code"

After more than a decade of research, the team led by Ming Dong, Director of Tianjin Brain Science Research Center and Dean of the Institute of Medical Engineering and Translational Medicine of Tianjin University, achieved a breakthrough in key technology of brain-computer interface (BCI) in China, standing at the forefront of innovation.

At the third World Intelligence Congress in 2019, Nezha showcased the world's first integrated BCI decoding chip -- the "Brain Talker". With application of advanced machine learning algorithms, it is capable of making fine distinction and fast decoding of extremely weak EEG characteristics. Currently, it only takes 1.7 seconds to output a command, which makes it the first high-speed brain-machine interaction system with 108 characters. It has also set a world record of scalp EEG BCI with the largest set of commands for online control.

✧ Li Yu: Academician of "mushroom" in poverty alleviation

Since 2012, Li Yu, a poverty alleviation star who helped locals out of poverty by teaching them how to grow edible mushroom, has led a team supporting more than 40 counties in entrenched poverty with science and technology.

He has developed more than 300 technologies for cultivation of edible fungus, bred 45 new varieties suitable for application in impoverished areas, and helped more than 800 villages and 35,000 impoverished households out of poverty.

Focusing on the edible fungus industry, Academician Li Yu has made attempts in recent years to extend industrial chain, improve products' added value and enhance market competitiveness. The development of products such as fungus flakes, fungus ice cream, fungus superfine powder and fungus herb tea has further extended the industrial chain and elevated the added value of products.

(Source: Ministry of Science and Technology of China)