The Magic of Patent Information

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Introduction

Traditionally, patent information searches are done, if at all, as a part of the application drafting process before filing patent applications, or while planning and preparing for patent litigation. In the recent past, this traditional micro-level use of patent information has evolved into a much more strategic use of patent information, thanks to the development of customized computerized databases of patent information.

In recent years, economists, social science researchers, policymakers, businessmen and professionals have begun to make increasing meso-level and macro-level use of patent information. This is being done to analyze, for example, patenting activities of a country' technical patterns of internationalization; patenting activities in a sector, technology or company to ascertain or forecast the direction of technical change, or ascertain the relative technological position of a company in a marketplace; etc. As such, the use of patent information has expanded to many different tactical and strategic business, research, and policy making activities at national, institutional or enterprise levels.

What is Patent Information?

Patent information includes not only the content of published patent documents but also bibliographic and other information concerning patents for inventions, inventors' certificates, utility certificates and utility models. It is the largest, well-classified and most up-to-date collection of technical documents on new and innovative technologies.

Patent applications are filed in accordance with the requirements of national or regional patent laws. An applicant may be a public and private company, government agency, researcher in a university or in a research and development institution, or even individual inventors.

So far, around the world some 40 million patents have been published, and that too in all possible technical fields. To these, some one million additional patent documents are added every year.

A patent document contains, in a standardized form, a wealth of information about the state-of-the-art, adjudged in the international context, in technological developments in that area of technology. As a first step**,** it is essential to grasp clearly the basic concepts

[1] The opinions and views expressed in this article are solely of the author, and should not be attributed to the World Intellectual Property Organization (WIPO). Any comments or suggestions pertaining to this article may be sent to soon woo.hong@wipo.int

of the patent system so as to appreciate better the practical usefulness of patent information.

Basics of Patents

A patent provides its owner an exclusive right over a claimed invention, which is granted by the industrial property or patent office of a country or group of countries on the basis of a patent application. It is granted done after following the procedure prescribed in the relevant patent law and regulations. The exclusive right of the owner provides a legal right and possibility to the owner to prevent others from making, using, offering for sale, selling or importing the patented invention without the owner's permission. In return, the owner is required to disclose the claimed invention to the public. Describing the invention in a patent application does this. A patent application consists of a front cover, an abstract and a patent specification, including drawings (if necessary), a description and one or more claim. The claims determine the patentability of the invention as well as define the exact scope of the claimed invention.

The front page of a published patent document generally displays bibliographic information such as the title of the invention, the date of filing, the priority date, the relevant technical field, the name and address of applicant(s) and inventor(s). It also contains an abstract and a representative drawing. Bibliographic information is an essential means of identifying, locating and retrieving patent documents.

The patent specification is the most important part of a patent document, as it enables a person to understand the claimed invention and the technical information contained in it. The specification should disclose the invention clearly and precisely. Preferably, it should be illustrated by examples to explain how to work or carry out the invention in practice so as to enable anyone skilled in the relevant art to do so likewise, without undue experimentation. In most countries, a specification of the invention includes the background of the invention, summary of invention, brief description of drawings (if necessary) and a detailed description of the invention.

The claims define the scope of legal protection. While drafting claims, the applicant will draft them as broadly as possible, whereas in an industrial property or patent office, during a full substantive examination, if done, a patent examiner would generally like to narrow the claims to the actual invention described in the specification. This be combined effort of the applicant and the office concerned makes the scope of protection clear and clarified. In patent litigation, interpreting claims is the first step in determining whether the patent is valid and whether the patent has been infringed.

A patent is granted by a national or regional patent office and is valid for 20 years from the filing date of the application or from the date of an earlier related application. A patent is a territorial right and has no effect beyond the national or common regional boundary of the country or countries concerned.

Merits and Shortcomings of Using Patent Information

In most countries, a patent application is published 18 months after it is filed. So, there is always a time lag between the publication of patent application and the point in time at which the invention was made or completed. Generally, however, patents are granted well before a product based on a patent is introduced in the market. As such, the publication of a patent application, despite the time lag, is invariably the earliest point in time at which the relevant information becomes available to the public as the first published detailed and up-to-date information.

Since most countries require the invention to be disclosed in a manner that is sufficiently clear and complete for it to be carried out by a person skilled in the relevant art, therefore, a patent document has much more detailed information about a technology than any other type of scientific or technical publication. It is also a unique source of information, as it is estimated that, on average, some 70 % of the information disclosed in patents is never published anywhere else.

Patents do not cover every kind of inventive activity in every country. Some inventions that are patentable are either kept as trade secrets or put in the public domain through defensive publication so as to prevent all others from obtaining a patent on that invention. Both are valid business strategies. Patents, however, do cover virtually every field of technology although the subject matter excluded from the purview of patents is variable from one country to another. Therefore, consulting non-patent literature is often obligatory to get a complete picture of the prior art. Even so, patent documents remain a key tool for analyzing trends in the diffusion of key technologies for the purpose of generating specialization profiles of countries or companies of interest.

Analyzing Patent Information

There are two primary ways of analyzing patent information: qualitative and quantitative. The qualitative method shows more closely the content of the individual patent documents. The quantitative method results in statistical processing. These two methods have quite different objectives and different ranges of applications. Patent analysis can be displayed by visual representation using bar graphs, polygonal line graphs, pie charts, radar charts and other charts/graphs, which are called ‘Patent Maps’. Visualization is an especially effective way of representing the results of this type of analysis.

Today, electronic databases, analytical software products and private service providers with their own proprietary value-added patent or technology databases are available for assisting in the analysis of patent information.

Availability of Patent Information

Databases on CD-ROM

Information technology allows accessing patent data in text and picture form on CD-ROM. CD-ROM databases are very convenient for documentary searches. Users need no outside connections, and can work with simply a CD-ROM driver plus a computer.

CD-ROM databases, however, have some drawbacks. One problem is with their updating. As on-line databases can be easily updated on a regular basis, the information on CD-ROM rapidly becomes out of date, at least for certain types of analysis. It is also a problem to easily use CD-ROM databases to compile statistical series; hence, they are not yet suitable for statistical applications.

On-line Databases

Internet-based databases are on-line databases. Anyone who has access to the Internet may be able to browse the full text of published patent documents via free of charge databases or commercial databases. As access to these kinds of databases is not restricted across national borders, so users worldwide can very easily access patent documents from a computer connected to the Internet.

As of now, many national patent offices have launched free-of-charge patent information databases, which are open to the public. For example, the Full-Text and Full-Page Image Database of the United States Patent and Trademark Office (USPTO) is one of the earliest and free online patent information services. Another major on-line free patent database is esp@cenet®, which has some 30 million patent documents. The free services work well for simple searches, based on key words, such as a known patent number, name of the inventor(s) or applicant(s), a key word in the title, etc., but are not a suitable tool for executing more complex investigations and legally motivated searches.

There are a number of private companies that have commercial databases. These include **Derwent, Dialog, STN, Questel Orbit, Micropatent, WIPS**, etc. Commercial services offer enhanced or value added patent information, based on the actual requirement of particular end users. Commercial database hosts offer different types of clearing procedures or fees. Some collect a flat fee in advance that expires after a certain period of time, while others calculate database usage time plus document royalties or have no time cost but slightly higher document royalties.

Reasons for Using Patent Information

Patent information is more than just technological or legal information. When developing a new product, comparative technological information may determine the success or failure of the product and, in turn, the success or failure of the company itself. Some of the practical applications of patent information include:

A Tool for Creative Thinking

Patent information provides a source of technological information that can be used by researchers and inventors to find new solutions to technical problems. A specific methodology developed on the basis of patent information is the TRIZ methodology (Russian acronym for Theory of the Solution of Inventive Problems). Genrich Altshuller developed the TRIZ methodology and his colleagues, starting in 1946, based on the study and analysis of a set of worldwide patent documents. TRIZ began with the hypothesis that there are universal principles of invention that are the basis for creative innovations that advance technology, and that if these principles could be identified and codified, they could be taught to people to create or enhance their inventive capabilities.

The TRIZ research has proceeded in several stages and more than 2 million patent documents have been examined, classified by level of inventiveness, and analyzed to look for principles of innovation.

TRIZ is currently being applied internationally to create and to improve products, services and systems. Large and small companies, including many Fortune 500 companies are using TRIZ on many levels to solve real and practical problems and to develop strategies for the future of technology. Based on one of the conclusions of the theory, that inventiveness and creativity can be learned, universities worldwide have introduced undergraduate courses related to the TRIZ methodology to enhance creativity and inventive thinking abilities of students. Patent information, therefore, provides an extremely useful source of information for learning and developing creative problem solving and innovation strategies.

Input for Licensing Strategy

When considering "licensing in" of technology owned by others, "licensing out" your technology or "cross-licensing" between two patent portfolio owners, you must collect reliable information on the target or key technology in order to take the right decision. If the technology in question is valuable enough, it will generally be protected by a patent because of the intrinsic insecurity and difficulty of keeping it as a trade secret. Therefore, the analysis of patent information provides you with valuable technical and business information regarding target or key technology. Before entering into licensing negotiations, it is most important that you have a very good understanding of the target technology itself, its value, in terms of its strengths and weaknesses, which is aided considerably by a thorough and careful analysis of relevant patent information.

While preparing to 'licensing in' of technology, analyze patent information to consider:

1. whether the technology in question is in the public domain in your target market due to its non-protection, expiration, non-payment of maintenance fee or invalidation of the patent in a court proceeding;
2. whether there is a possibility of someone else bringing an action for infringement against you to make you liable for payment of any damages,

3. whether the technology is overvalued or undervalued by comparing it with other related or alternate technologies, etc.

Similarly, while preparing to 'license out' your technology, analyze patent information to consider:

1. who could be prospective licensees in the marketplace;
2. how valuable is your technology in order to prepare an attractive offer; and
3. whether it is a core technology in your business, which if licensed out might become an obstacle to continue to practice this technology, etc.

'Cross-licensing' is an exchange between two companies to license one or more patents to each other, which gives the companies the **freedom to operate;** that is, without any fear of being accused of violating the patent rights of the other party. Payment(s), if any, in a cross-licensing agreement is/are made by the party, which is perceived to have a patent portfolio of lesser value. Let us say that Company X is negotiating with Company Y. If Company X argues that its portfolio is more valuable than that of Company Y, it may require Company Y to fill the gap in the form of one time or recurring payments. Here, patent analysis plays a role in comparing the patent portfolios of the two companies and in identifying key patents, so that it can help to decide who should pay whom and how much.

Supporting Mergers and Acquisitions (M&A)

If a company wishes to acquire a specific technology along with other complimentary assets and has no idea where to obtain it, then it first needs to identify all the companies with relevant patents and related assets. A patent search help to identify all of the patents related to the area of interest. Once one or more potential target technologies/companies are identified, then the company can undertake additional patent analysis to narrow down its choices to decide which of the companies is the best merger or acquisition target.

Once a company identifies a target company, patent analysis can also address additional issues such as: Is the target's technology as good as it is claimed to be? Is the company priced fairly? Who are the key inventors and will they stay with the merged or acquired company? Let us analyze a case. As part of a broad strategic plan to fill gaps in a company's technology base, a large high-tech company acquired a small specialty business. Soon after completing the acquisition, the acquiring company discovered that R&D capabilities of the acquired company were quite limited, and certainly not consistent with the perception that it had bought a company with strong technological capabilities. Its technological capability was dependent on one key researcher and he did not come along as part of the deal. He was transferred to the parent company before the sale was completed. If patent analysis had been done before proceeding with the acquisition, the company would have been able to find that out who the key researcher is and then could have taken appropriate measures to retain him.

Guiding Management of Research and Development (R&D)

In order to enter into a new business or to develop a new product, a company should be able to seize the overall image of the relevant technology field and accurately forecast the market needs. Patent analysis makes it possible to find out the flow of technology from elementary technologies along with the expansion of those technologies, the trend of technological change, the life cycle of a technology (consisting of growth, development, maturity and decline), problems and solutions in the development of a particular technology, competitors' technologies and solutions to cope with possible problems. Knowing the life cycle of a technology makes it possible to judge the timing of development policy and focus on certain development themes. It can also prevent an infringement from occurring, which would save a huge amount in litigation expenses and compensation for damages.

Patents are often linked to research and development and can be considered as indicators of R & D output. If one company has more patents than another does, then this suggests that the company has a stronger commitment to R&D. Not all patents, however, are equally valuable. A few patents are for radical inventions that change the world; most patents are granted for incremental but non-obvious inventions. A patent, which is more frequently cited than other patents of the same age, is regarded as a patent of greater impact or of higher quality. From links between patents revealed by **patent citation analysis**, it is possible to target the acquisition of strong patents, which results in the enhancement of R&D output and, consequently, much improved or new products.

Human Resources Management

It has been repeatedly shown that a small number of highly prolific inventors drive technological development and a much larger numbers of researchers produce only one or two patents in any laboratory or company. Patent analysis, such as a co-inventor brainmap, can show the key inventors who are vitally important for the future of the company. Such brain maps can identify not only star inventors within a company, but key inventors in other companies, which is a useful analysis for headhunting and in developing an effective M&A strategy.

Conclusion

In a knowledge-driven economy, effective use of patent information is a contributor to the success of any enterprise, large or small, as patent document collections have an unmatched wealth of detailed and practically-oriented business, legal and technical information compared with any other types of business, legal, scientific or technical publications around the world. Moreover, fast paced developments in the use of information and communication technologies, coupled with free-of-charge or commercial patent/technology databases and use of analytical softwares for rapid and detailed analysis of patent information, have opened new vistas for smart businesses in their strategic and tactical use of patent information for honing their business strategy in

domestic and export markets. And all this is of special relevance to small and medium-sized enterprises, which are now capable of reaping the benefits from the use of valuable legal, technical and business information contained in patent documents/databases with its high potential benefits and at a relatively low cost.

Suggestions for Further Reading

Using Patent Information for the Benefit of your SME from the IP for Business section of the SMEs website

Technological Powerhouse or Diluted Competence: Techniques for Assessing Mergers via Patent Analysis

The Use of Patent Analysis in Competitive Intelligence

Assessing the R&D management of firms by patents citation: Evidence from the US patents citation

Patents searching: The web drags patents into 21st century

Patent Information and Sustainable Development

Tackling Management Problems with Patent Data

Basic Intellectual Property Research on the Web