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Enhancing the Process Innovation in the Vietnam's Mechanical Industry through Exploitating Patent's Database

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Abstract: ***The selection of potential inventions from the patent's database to for process innovation plays an important role in the creation of good quality and exportable products. In fact, the capability of process innovation in Vietnam's mechanical industry is still limited althought the Government puts it on priority. This has affected the competitive position of Vietnam's mechanical industry and economic growth. This paper gives current status and proposes solutions to improve the capability of process innovation in the mechanical industry through the exploitation of the patent's database in accordance with the conditions and circumstances of Vietnam.***

Keywords: Innovation, mechanical, patent's database

1. Literature Review

Up to now, the term "patent's database exploitation" has not been formally mentioned in any in the legal documents of Vietnam. In the management, exploitation is often understood as the maximization of advantages and the minimization of disadvantages of exploitators in order to achieve the benefits and objectives for the exploitator. Therefore, the exploitation of the patent's database is understood as searching and using information of the patent and the potential patent in patent's databases in order to create benefits, especially economic benefits to the parties involved voluntarily, target-oriented and compliant with the law.

The process innovation is a type of innovation. Innovation can be defined as the process of commercializing new elements, or incorporating existing elements in industrial organizations, relating to new materials, new processes, new markets, or new organizational structures that brings organizational or social benefit (Schumpeter, 1939). According to the Organisation for Economic Co-operation and Development (OECD, 2005), process innovation is the application a new or significantly improved production or delivery method, this includes significant changes in techniques, equipment and/or software. The process innovation can be conducted to reduce production or distribution costs, improve product quality, or create / supply new products. Enterprises's processes Innovation can be measured by the new production methods, continual improvement and innovation of production processes, the use of high and advancetechnology to create high quality products.

Therefore, an important content of the patent's database exploitation in the Vietnam's mechanical industry is selecting patents relevant with the enterprise's capacity and resources to carry out the process innovation activities to improve product quality and competitive position.

2. Research Methodology

In order to obtain information about the patent's database, current status of the process innovation ativities of Vietnam's mechanical industry, the research team collected secondary data from Vietnamese and foreign researches on inventions, patent's databases, innovation and exploitation of patent's databases to clarify the process innovation in the Vietnam's mechanical industry.

To further clarify secondary data, the research team conducted in-depth interviews with a number of experts, entrepreneurs, and managers in the field of innovation and database exploitation in Vietnam. At the same time, the information obtained is one of the key foundations to give solutions to enhance the capability of process innovation of Vietnam's mechanical industry by the exploitation of the patent's database.

3. Results of Research

3.1 The development status of Vietnam's mechanical industry

Vietnam's mechanical industry has been formed and developed since 1956. This industry has an important position in the supplying of components, accessories, machinery, equipment and materials for production activities, and is the foundation and motivation for the development of many different professions in society, contributing to the successful implementation of Vietnam's industrialization and modernization. Up to now, Vietnam's mechanical industry has been given great attention and put on priority by the Government, that are clearly reflected in the development strategies /plans for the development of the mechanical industry. This is an important legal corridor to develop the mechanical industry.

Vietnam currently has about 53,000 mechanical facilities. According to calculation, the average growth rate of mechanical industry was about 40% per year in the period 1996 to 2006 and about 20% per year in the period 2006 to 2016. In fact, although the outputs of industrial production increased year by year, but the capacity to supply the mechanical industry's domestic demand was low, reached just over 33% (lower than the target set in Decision No. 186/2002 / QD-TTg of the Vietnam's Prime Minister, at 45 to 50%).

The technological level in the Vietnam's mechanical industry is still underdeveloped and the level of automation is low, accounting for a small percentage (about 7%), the synchronism of the technology for producing is not high, most of the technologies have been used for about 30 years (up to 2016). According to the survey of 56 mechanical enterprises (Nguyen Trong Hieu, Nguyen Truong Phi, Pham Ngoc Hieu, Nguyen Huu Xuyen, 2015), 39.3% of enterprises using low technology, 48.2% of enterprises using medium technology and 12.5% using high technology. Moreover, most of the Vietnam's mechanical enterprises have invested in technology innovation, but the level of investment/turnover in the last three years was still low. Therefore, the ability of precise processing and quality assurance of stable products of technological lines are still low.

3.2 Current status of exploitation of patent's database for process innovation in Vietnam's machanical enterpises

Vietnam's mechanical enterprises may search patents, utility solutions to execute the process innovation by the database and technology consulting centers. Here are some useful website addresses that may help Vietnam's mechanical enterprises find information of patent for process innovation:

- http://digipat.noip.gov.vn/: This is a Vietnam's patent search system designed to look up patent information based on the converted data from the results of the digitization project (according to standard ST36 of WIPO and PDF document). System data includes patents from 1-0000001 to 1-0008878, and utility solutions from 2-0000773 to 2-0000821.
- http://www.wipo.int/pctdb/en/: This is the World Intellectual Property Organization's patent search database (WIPO): contains all applications international patent filed at WIPO since 1978, currently has more than 1,745,930 international patent applications.
- http://patft.uspto.gov/: This is the United States Patent and Trademark Office's database (USPTO), which includes patents since1790 and the United States's patent application was announced in 2001, currently, the database has over 7 million patents and over one million patent applications.
- http://www.ipdl.inpit.go.jp/homepg_e.ipdl: This is the Industrial Property Library (IPDL) of the National Center for Training and Industrial Property Information under the Patent Office. Japan (JPO). Database of Japanese inventions and utility solutions, patent applications filed since 1975, patents granted since 1996.
- http://ep.espacenet.com/: This is the European Patent Office's Patent Database, including: EP database with all patent applications filed with the European Patent Office Europe (EPO) since 1978.
- http://iplib.noip.gov.vn/WebUI/WSearchPAT.php: This is a database to find the information on applications for protection of inventions, utility solutions already published; the patents and utility solutions are granted currently in Vietnam.

Vietnam's mechanical businesses may access patent database through intermediary organizations such as the National Office of Intellectual Property, Vietnam's provin departments of science and technology, Vietnam Patent Association, etc and television programs such as the "Technology and Life" program, the "Inventor" program, "Initiative and Solution" program. However, according to the experts and mechanical enterprises, the systems that served for exploitation the patent's database have not been appreciated, the capacity of intermediary organizations is still limited, so do not well supporting for mechanical business to exploit the patent's database served process innovation activities.

Specifically, according to a survey of 225 enterprises of the National Institute of Patent and Technology Exploitation (NIPTEX) in 2014, 69.7% of enterprises have demand for patent exploitation, but most do not know the source patent information or the patent database, 77.8% of businesses do not access and do not know the source of patent information from the patent database. Although Vietnam's mechanical enterprises have a high demand for patent exploitation in order to serve process innovation activities to create products with export potential, they do not know or know but are unclear about the database to exploit, while there are few Vietnamese patents, they have yet to create high economic value products, and finding the information on patent databases is difficult.

Thus, in general Vietnam's manufacturing enterprises have the desire and need to exploit the patent database for process innovation activities. However, finding the information and supporting from intermediary organizations and communication systems has certain limitations, so they have not created a motive force for mechanical enterprise's exploitation of patent databases.

4. Conclusions and Recommendations

In order to serve demand for exploitation of patents, step by step to enhance the process innovation capability of Vietnam's mechanical enterprises by the exploitation of patent database, In the future Vietnam should:

Firstly, complete and compile legal documents on the patent database exploitation in the field of mechanical engineering. These legal documents should clarify the scope of the concept of the patent database exploitation, secret patent, patent exploitation activities, at the same time guidelines for finding patent database information sources, and giving the requirement for patent transfer activities. This is an important legal basis that shows the role of the State in promoting the patent application and patent database exploitation in production and reducing the risks of patent exploitation.

Secondly, support for the formation of patent databases and list of patents that should be given special incentives in the field of mechanics. Patent database should be updated regularly every year. This is a good source to mechanical enterprises find the patent information to serve for process innovation. Consequently, the State should support to form appropriate patent database based on the inheritance and development of patent databases in the world. At the same time, it is necessary to review legal documents related to patent exploitation, intellectual property, and innovation of the process. From there, suport to form the mechanical enterprises' roadmap for exploiting the patent database accordance with the enterprise's resources.

Thirdly, create conditions to support 100% of funding for projects applying patents, especially Vietnamese patents. However, in order to benefit from this support, enterprises must prove the feasibility of the project in terms of technical, legal and economic and social aspects, particularly projects of patent exploitation must be spread and stimulate development domestic industries. For 100% State-funded patent exploitation projects, the State unified management principles with the mechanical enterprise on the management plan, such as the objectives, the progress to be achieved, the method of allocating budget, organizing the implementation, controlling the implementation of the patent exploitation projects.

In addition, in order to support mechanical business to exploit the patent database for process innovation , the Ministry of Industry and Trade, the Ministry of Planning and Investment, the Ministry of Finance, and the Ministry of Science and Technology should coordinate to plan incentive policies to promote investment in manufacturing technology innovation in the mechanical industry as well as support and encourage the consumption of domestic mechanical products. These policies should be synchronous and suitable with the international economic integration process, which is an important basis for the mechanical industry's development strategy until 2025. At the same time, it is necessary to implement and control demand stimulus policies for key mechanical products, this is stipulated in the Prime Minister's Decision No. 10/2009/QD-TTg dated 16/01/2009 on the support mechanism to develop the production of key mechanical products and the list of investment projects on key mechanical products.

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