

Study on Patent Strategy of High & New Technology Enterprises Cluster

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Abstract—Patent strategy has become an important strategic means to elevate independent innovation capability and international competitiveness of high & new technology enterprises cluster. Thus, based on connotation analysis of patent strategy of high & new technology enterprises cluster, the paper designs influencing factors analysis framework for cluster patent strategy, and puts forward cluster patent strategy position, and then builds promoting process of cluster patent strategy around patent development, application, use and protection, so as to provide theory and method support for patent strategy management of high & new technology enterprises cluster.

Keywords—high & new technology enterprises cluster; patent strategy; strategy position; strategy process

I. INTRODUCTION

In the era of knowledge economy, high & new technology enterprises cluster (referred to as the "cluster") has become an important form of industrial organization to improve the international competitiveness of the industry and the implementation of independent innovation strategy in our country. The creating and using of the intellectual property rights is the main indicator of independent innovation, patent strategy is bound to become an important means of engaging in the global competition of high & new technology enterprise cluster. However, the integral of high & new technology enterprises cluster in China lacks of patent awareness, patent strategy and core technology, and meanwhile being incurred patent siege by the developed countries and the Multi-National Corporation at present. This series of "internal disturbance foreign aggression" problem has restricted the development of rapid and sustained of high & new technology enterprises cluster in China.

Thus, How to construct the patent strategy of the cluster has become the outstanding problems faced by many current high & new technology clusters. However, there is few

research involving the patent strategy of the cluster at present, only a few scholars have explored the cluster of intellectual property management: Song Wei, et al (2010) constructed a operation process model of intellectual property rights engaging in the cluster innovation system[1]; Huang Wei, et al (2010) put forward the overall framework of intellectual property management platform of industry cluster[2]; Yang Jiao, et al (2009) put forward to emphasize the protection of intellectual property rights towards high & new technology industry cluster or enterprises owning high efficiency in attracting innovation joining the industry cluster[3]; Tetsuaki, et al (2008) proposed a method of testing cluster patent value based on frequencies of citing reference documents[4]. Therefore, there is the important theory value and practical significance on system and intensive study of the patent strategy of high & new technology enterprises cluster.

II. CONNOTATION AND FACTORS OF THE PATENT STRATEGY OF HIGH & NEW TECHNOLOGY ENTERPRISES CLUSTER

A. Definition of the Patent Strategy of High & New Technology Enterprises Cluster

Patent strategy serve for the need of independent innovation and sustainable development in the high & new technology enterprises cluster, and it is the important guarantee of sustainable competitive advantages of industry cluster. Therefore, the patent strategy of high & new technology enterprises cluster is defined as: long-term and master plan of the development of the cluster patent strategy; based on the independent innovation; according to the needs of internal and external environment, cluster's advantages and overall development; taking overall positioning of the development of patent of cluster; and take the strategy of the development, application, use and protection of patent cluster further.

The patent strategy of high & new technology enterprises cluster also has a certain hierarchy, and it can be divided into the overall strategy and specific strategies. Among them, the overall patent strategy refers to gear to the needs of the overall development of cluster and the independent innovation strategy and strategy position of the development trend of patent of high & new technology enterprises cluster; and the specific patent strategy is a series of sub-strategies around key links of the independent innovation of high & new technology enterprises cluster, and it is a specific and implementation process of the overall patent strategy of the cluster.

B. Features of Patent Strategy of Cluster

Patent strategy of high & new technology enterprises cluster has its particularity: (1) comprehensive, the patent strategy synthetically reflects innovation organization, patent technology, the diversity of the competitive environment and complex association of the high & new technology enterprises cluster; (2) mass, the patent strategy of the cluster is the mass representation of patent activities and interaction of many high & new technology enterprises and related institutions; (3) from property, patent strategy belongs to independent innovation and sustainable development strategy of high & new technology enterprises cluster; (4) embeddings, patent strategy of high & new technology

enterprises cluster reflects characteristics of the regional industry, and it has very strong regional dependence; (5) globalization, internationalization degree of patent strategy of high & new technology enterprises cluster is higher than that of traditional industry cluster.

C. Factors of Patent Strategy of High & New Technology Enterprises Cluster

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Clarifying key influence factors is the premise of scientific formulation of the patent strategy of high & new technology enterprises cluster, we carry on the analysis to factors of patent strategy of new and high & new technology enterprises cluster with analyzing dimensions using GEM model proposed by Tim Padmore and Hervey Gibson (1998) [5] and combining characteristics of patent strategy of the cluster, as shown in table I.

TABLE I. FACTORS OF THE PATENT STRATEGY OF HIGH & NEW TECHNOLOGY ENTERPRISES CLUSTER

Model	Name	Composition factors
Factors I Basics	Resources	Patent technologies reserve of cluster, patent creation and management personnel, scientific research resources, et al.
	Facilities	(1)Hardware facilities: the level of development of R&D services of patent technologies (such as informational indexing mechanism), apply for agent service (such as agencies), industrial service (such as incubation base) and management services (such as industry associations, management consulting agencies),et al; (2) software facilities: policies of innovation incentive of the cluster, innovation cultural, patent technologies market, the situation of laws and regulations of the patent and implementation.
Factors II Enterprises of the cluster	Suppliers and related industries	(1) level of collaboration of product and service innovation between the enterprises within the cluster and local suppliers; (2) inter-organizational innovation degree of relevancy of the cluster, such as cooperative; (3) technical consensus and matching between dominant industries and related industries of cluster
	Structures, strategies and competitions of enterprises cluster	(1) Enterprises in the cluster size, quantity and innovation advantage; (2) the enterprises within the cluster innovation strategy planning and consistency; (3) the patent innovations in the cluster orderly competition and external competitive level.
Factors III Market	Local market	The number of high & new technology enterprises cluster products and local market share, respond to the needs of the local market product innovation cluster efficiency.
	External market	Cluster products of the region and even the global market share, blending into the global value chain and innovation chain disorder.

III. STRATEGIC POSITIONING OF HIGH & NEW TECHNOLOGY ENTERPRISES CLUSTER

Its own strength and influence of the critical factors of the cluster determine its patent strategic positioning, overall, the strategic positioning of patent of high & new technology enterprises cluster can be divided into two categories of offensive and defensive. Offensive patent strategy primarily serves the development needs of expansion of high & new technology enterprises cluster, while the defensive patent strategy is to maintain the competitiveness of high & new technology enterprises cluster or avoid being eroded, applicable conditions is shown in table II.

IV. PROMOTE PROCESS OF PATENT STRATEGY OF HIGH & NEW TECHNOLOGY ENTERPRISES CLUSTER

According to the process of independent innovation of high & new technology enterprises cluster, on the basis of patent strategic positioning, they promote strategy according to the four stages of clustering patent development, patent applications, patent application and patent protection.

A. Patent Development Strategy

Patent development is the starting point of promoting patent strategy of high & new technology enterprises cluster, and they need to layout to match the subject and object of

patent strategy of the cluster according to the need of innovation capability and

TABLE II. HIGH & NEW TECHNOLOGY ENTERPRISES CLUSTER STRATEGIC POSITIONING

Type of position patent strategies	Applicable Conditions
Offensive patent strategies	They are suitable for clusters of owning rich innovational resources and replete hardware & software equipment, enterprises of cluster has a high degree of association of technology and distinguished advantages of innovation, and they possess absolute advantages in the local market and external markets of great potential for development.
Defensive patent strategies	They are suitable for clusters of lacking innovation resources or unsound related implementation, cooperative innovation of enterprises of the cluster is not high or competition is disorder, the local market has external threats or high barriers involved in the external market.

development requirements of cluster, that is the strategic purpose of clustering patent development must be clear and the most effective and feasible of the develop of organization need to be considered, As is shown in table III.

B. Patent Application Strategy

The patent application is a comprehensive layout of patent technology dimension, market and legal dimension, clusters strategic of patent application focus on whether to apply for various types of technology, the application scope, and ownership allocation for strategic decision-making, thereby improving the efficiency of patent application clusters. Combined with high & new technology enterprises cluster strategic positioning and a variety of technical features, its specific application strategic decisions shown in table IV.

TABLE III. PATENT DEVELOPMENT STRATEGY OF HIGH & NEW TECHNOLOGY ENTERPRISES CLUSTER

The key of cluster patent development	Subject of cluster patent development
Development strategy of the key common technology, breakthroughs in bottlenecks of key common technology of the whole development of the cluster, to enhance the whole of level of technology of the cluster.	Because of such technology has a strong externalities, government's participation or leading is the inevitable, universities around the cluster core, research institutions and high-end Industry-University-Research Alliance is Formed by enterprise to conduct joint research often become the main development.
Development Strategy of Core Technology. Master patented technology of cluster core product or service, Establishing the Technology with Special Advantages from cluster involved in wider range of competing	Core business of cluster and the leading R&D alliances becomes the subject of such patent development.
Development strategy of general common technology. To strengthen the competition before technology series development, make up for the weaknesses in the innovation chain of patented technology.	Under the subsidization and encourages of government, the university and foundational scientific research institution are the subject of main innovation.
Development strategy of matching technology. Enhancing clustering innovation, and forming a network of patent to protect key common or core technologies of cluster.	Many small and medium high-tech enterprises within the cluster to become the subject of such patent technology development.

TABLE IV. STRATEGIC DECISIONS OF PATENT APPLICATIONS

Patent technology type	Whether to apply	Scope of application	Distribution of the patent right
The key common technology	Apply for a patent	Apply for patent in this region where may be the presence of competitors	If science & technology program support the patent of development, the government retains patent ownership; If the college or alliances collaborative development, then follow the "who will develop, who will owns" or cooperative agreement.
	Internal public	—	—
General common technology	Application	Usually apply for a patent in China	Follow the "who will develop, who will owns".
	Internal public	—	—
Core Technology	Applications for patents	Maximum scope for competition applied for patents	Follow the "who will developed, who will owns" partnership or cooperation agreement of alliances.
	Technical Secrets	—	—
Matching technology	Application	Usually apply for a patent in China	Follow the "who will developed, who will owns".
	Do not apply	—	—

C. Patent Use Strategy

Only through patent achievement transformation of high & new technology enterprises cluster, they could promote the rapid productization, marketization and industrialization of patented technology, forming products and services with independent intellectual property rights in order to achieve the maximization of utility patents. According to the patent technical characteristics and the level of competition, patent use strategy of high & new technology enterprises cluster can be divided into patent shares, transfer of patent rights, patent cross-licensing, entrepreneurship based on patent technology, building patent pool and standardization of the patent technology and other specific forms.

- Patent shares. In addition to some internal disclosure commonalities technology can be shared within a cluster, the ownership of the government's patent technology can also be shared within the cluster, in addition, government can allow common patented technology of some universities and research institutions be shared within a cluster through subsidy and other motivational Patterns.
- The transfer of patent rights. Transaction cost of patent technology within the cluster is low, many transfers of patent technology can be carried out smoothly, for example, through Industry—Academy—Research cooperation, transferring the patent technology of universities and scientific research institutions to enterprises, besides, there are a lot of non-service patent can also be transferred to enterprises with ability of industrialization.
- Patent Cross Licensing. Complex product of high-tech enterprise cluster is high, and complete products usually will integrate the patent technology belonging to several companies, therefore, the production and sale of cluster products require patent cross-licensing.
- Entrepreneurship Based on Patent. The high & new technology enterprises cluster in china mainly rely

on the development of the high-tech zone, and these clusters usually have some incubators, university Science Park, business center and other facilities, these will provide the possibility for some personnel with patent technology or miniature enterprise innovation and Entrepreneurship, and this is a major feature of patent use of high-tech enterprises clusters.

- Building patent pool. Patent strategy is to form clusters overall competitive advantage through combining patented technology of cluster enterprises, to build patent pools (also called patent Alliance) by core businesses, universities and research institutions [6], to Became important means of clusters who involved in broader competition.
- Standardization of the Patent Technology. Current high-tech industry competition has been upgraded from the standard competitive to product competition, around a series of key technologies of specific areas and core technology patents operational technical standards, it is not only feasible, but necessary for a certain strength of high-tech cluster.

D. Patent Protection Strategy

Patent protection throughout all aspects of innovation, it is a concentrated expression of effective use of the patent system. Getting together to form the technology spillover among cluster enterprises, accelerating the innovation process, it also can cause a lot of enterprises "hitchhike" phenomenon, confusing enthusiasm of enterprise innovation. Therefore, clusters patent protection of the high-tech enterprise has its particularity, not only to comply with international patent law and domestic patent law, but the need to build the optimal patent protection system within cluster, which formed a three-tier system of patent protection, as shown in Figure 1.

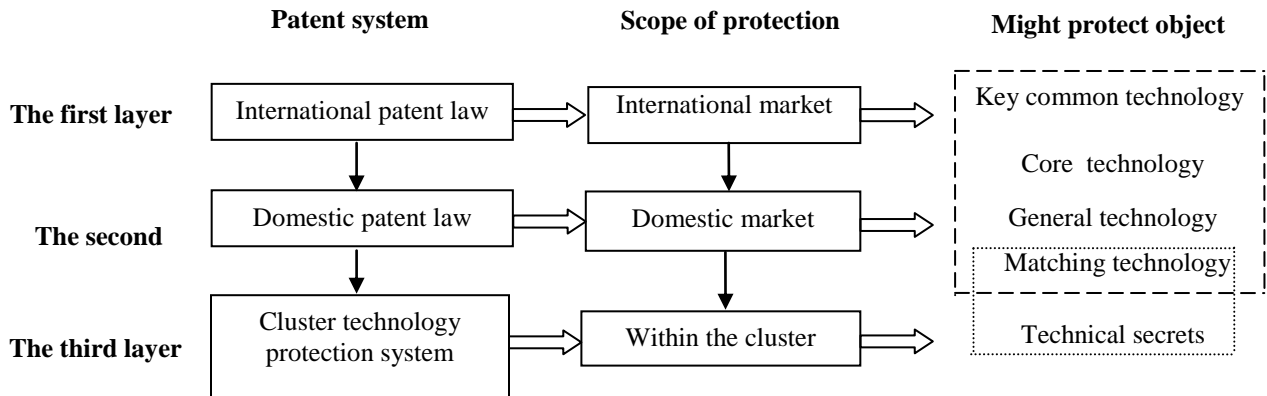


Figure 1. three-level of patent protection of high & new technology enterprises cluster

International and domestic patent laws apply strict legal regulations to protect patents, and it is first and second floor of patent protection about high & new technology enterprises cluster system, with a focus on the protection cluster key common technologies , core technologies and the general common technology , matching technology , supporting clusters participation in international and domestic market competition. Lack of protection and protection too much for technology within the cluster will affect the overall innovation effect of the cluster, therefore, we need to develop appropriate technical protection system within the cluster , focus on the protection of technology secret of cluster enterprise and part of the matching technology, among them ,technical secrets include core technology which is not suitable for application patent, and there is a lot of technology which didn't meet the requirements of national patent or update speed is quite quick. Therefore, through trade associations, cluster management, and core enterprise technology led the development about protection systems of cluster technological enrollment [7], the specific scope of protection may refer to the national patent claims, and reducing height, width and length of the patent protection adequately. Once the violations occurred among cluster enterprise, the cluster internal regulatory agencies and industry associations should crack down, thus create a favorable environment within the cluster patent protection. In short, the international patent law is more inclined to attack the escort for the patent of high-tech enterprise cluster, and the protection system within the cluster is in order to better regulate innovation order of the cluster, preventing vicious competition, improving the patent consciousness and management level, and lays the foundation of cluster defensive strategy.

V. CONCLUSIONS

High & new technology enterprises cluster is important industrial organization which can improve our capability of independent innovation and international competitiveness, what's more, promoting important channel of patent strategy. According to high & new technology enterprises cluster's innovation strength, diversity of competitive potential and difference of key influence factors, its patent strategy are divided into offensive and defensive patent strategies ;On the basis of positioning of patent strategy for cluster, promoting the specific process of patent strategy to followed by patents development strategy , strategy of patent application,

strategy of patent use and strategy of patent protection ,and the four aspects are coordinated , interlocking , correspond to each other , and it is the specific positioning and implementation process for patent strategy of cluster. This research can provide theoretical guidance and decision-making reference for development and implementation of patent strategy of high & new technology enterprises cluster.

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