Science and Innovation. 2014. V. 10. No. 5. P. 47–53

Demyanchuk, G.V.

National University of State Tax Service of Ukraine, Irpin

INDUSTRIAL PROPERTY IN THE COMMERCIALIZATION OF INNOVATIONS

The status of creation of industrial property objects and the reasons constraining their development have been analyzed; their role in the commercialization of innovation has been determined.

Key words: industrial property, patent, invention, utility model, industrial design, protection documents, innovation, and commercialization of innovations.

The R&D results are the intellectual property of inventors. This intellectual property is one of the most important factors of Ukraine's transition to the post-industrial economy based on new technologies. The issues related to the creation, protection, and commercialization of intellectual property have now acquired a special significance and relevance in terms of economy modernization and transition to the path of innovative development. The intellectual property objects are as follows: patents on inventions, utility models, research and pre-production prototypes; copyright; trademark; and knowhow (copyright protection having a commercial value) and others.

The intellectual property can be divided into 4 groups: 1) objects of copyright and related rights; 2) industrial property objects (IPOs); 3) intellectual property designations; 4) non-traditional intellectual property [1].

The purpose of this paper is to analyze the status of research on the creation of IPOs, the reasons constraining their development, and their role in the commercialization of innovations. The number and structure of IPOs are known to be indicators of the status of innovation activities in the country, in general, and in the private business and corporations, in particular.

The number and structure of copyright protection related to IPOs and compliance of R&D products with a certain legal status play the critical role in the commercialization of innovations. The structure of copyright protection includes patents on inventions, utility models, pre-production prototypes, and certificates of trademarks and service marks. The patents play a key role in determining the object of commercialization, inasmuch as they deal with scientific and technical component of innovation. The patent (the world originates from Latin *patens*: laid open, available for public inspection) is a document granted by a sovereign state to certify authorship and exclusive rights for invention [2], a mark for goods and services [3], and an indication of origin of goods [4]. The patent has three main functions:

1) It defines the exclusive rights for invention and is a key tool of competition among the companies and firms (in the 1970–1980s, the patents played the protective role only, while in the 1990s they became a means of competition [5]; in addition, the number of patents is an indicator of the status of innovation activities of individual corporations and the country as a whole);

2) It is a certificate of the intellectual property of inventor, organization, firm or company, i.e. a legal document underlying and governing the relations between the participants of commodity exchange;

3) It is negotiable i.e. subject to technology transfer both within the country and in the foreign markets (volume of trade in patents and licenses is growing worldwide and is estimated at USD hundreds of billions annually).

Table 1 shows the dynamics of issuing the documents of title (copyright protection) by the State Service for Intellectual Property of Ukraine. As one can see, the number of patents issued is small and has tended to decrease in recent years. Since Ukraine got independence, the total number of patents amounted to about 100 thousand, whereas, in the United States, 190 thousand patents were issued only in 2009. Worldwide, about 750 thousand patents are issued annually. In addition to the United States, the leaders in this field are Japan, China, Germany, Great Britain, and South Korea. Ukraine's indices testify to a crisis in the sphere of innovation.

This situation is caused by a poor funding of R&D works and by the lack of incentives to conduct R&D and to apply new technologies in the private business sector. However, it should be noted that till 2012, the number of patents, preproduction prototypes, utility models, and certificates of trademarks increased yearly (Table 1), and since the beginning of 2012 it began to decline indicating the stagnation in R&D project market over the past two years.

The four sectors: *the public* (mostly, the NAS of Ukraine), *the business*, *the private non-profit*, and *the higher educational* ones are known to be engaged in inventive activities in Ukraine. In 2010, the undisputed leader by the number of applications filed and copyright protection documents issued were the Ministry of Education and Science of Ukraine and the National Academy of Sciences of Ukraine. The business sector was an outsider. In 2013, the situation did not changed, but the number of applications for patents decreased.

Thus, in 2010, the higher education sector filed 6232 applications for copyright protection (in-

Table 1

Dynamics of Issue of Copyright Protection Documents

Copyright protection (by year)	Invention patents, pieces	Utility model patents, pieces	Design (prototype) patents, pieces	Certificate of trademark, pieces
1992	230	—	12	15
1994	4650	—	338	3316
1996	4270	24	240	1025
1998	4336	161	725	1945
2000	5772	222	1044	3339
2002	9178	440	1267	6642
2004	9907	1853	1436	9383
2006	3705	8268	2061	13134
2008	3832	9282	2503	15357
2009	4002	8391	1754	15137
2010	3874	9405	1431	16686
2011	4061	10291	1337	16677
2012	3405	9951	1541	15459
2013	3635	10137	2010	14981

Note. According to the data of the State Service for Intellectual Property of Ukraine.
Source: http://sips.gov.ua/i_upload/file/zvit-2013-ua.pdf.

cluding 816 for invention patents) and got 5419 documents of title (including 1051 invention patents); the public sector submitted 2182 applications (including 490 for invention patents) and received 1886 documents (including 663 inventions patents). The business sector showed the lowest result for the same period (from 480 applications submitted only 244 ones were the applications for invention patents) and obtained 443 documents of title, including only 217 invention patents [6, 158].

In 2013, the total number of applications to the National Patent Office decreased by almost 2% as compared with 2012 and by almost 6.6% as compared with 2010 (the applications filed accounted for 8348, including 2965 applications for invention patents) [7].

The comparative data on the number of applications filed and documents of title issued by the State Service for Intellectual Property of Ukraine in 2010 and in 2012 structured by sectors are presented in Table 2. This proportion of applications filed and documents of title issued indicates a quite high effectiveness of higher education institutions in conducting the applied research. A similar situation can be observed in the advanced economies, including the United States. However, extremely low patenting indices of the business sector indicates the lack of interest of Ukrainian industrial corporations and their research units in R&D activities as opposed to the advanced economies. For example, the largest share of patents issued in the United States and Japan belongs to private companies (*IBM, Samsung, Microsoft, Canon, Panasonic*, and *Toshiba*).

These data indicate that the domestic business does not invest in science and new technologies, and continues to use obsolete equipment and outdated technologies. At the best case, the innovative activities of Ukrainian corporations reduce to purchasing new equipment abroad.

The comparative analysis of patents on inventions, utility models, industrial prototypes, and certificates of trademarks and service marks issued in Ukraine (data for 2010) and the average indicators of five advanced economies has showed imbalance in the structure of copyright protection documents in Ukraine (see Table 3).

In the advanced economies, there is almost uniform distribution of the inventions, the total number of industrial prototypes and utility models and the certificates of trademarks and service marks (each category having the share of nearly 30%) testifying to a well-balanced innovative development of different economic sectors.

In Ukraine, in the structure of IPOs, the number of invention patents is more than twice below, and the number of prototype patents is more than trice less than that in the advanced economies with high innovation effectiveness. Obviously, this si-

Table 2

Number Applications for the Issue of Copyright Protection by the State Intellectual Property Service of Ukraine by Sectors

Sector	Applications for issue of copyright protection submitted, pieces				Copyright protection issued, pieces			
	2010	2012	Including invention patents		2010	2012	Including invention patents	
			2010	2012			2010	2012
Government	2182	1896	773	938	1886	1807	663	911
Business	480	355	244	151	443	360	217	157
Higher education	6232	6263	1235	1798	5419	6385	1051	1626
Profitable/non-profit	0	0	0	0	0	0	0	0
Total	8894	8514	2252	2877	7748	8552	1931	2694

Note. According to SSC of Ukraine. www.ukrstat.gov.ua.

tuation is caused by a decrease in the number of professionals and organizations engaged in R&D sector. At the same time, there is a high percentage of utility models, trademarks and services marks. The high share of trade and service marks is explained by the fact that new marks can be registered not only for the new, but also for the "old" goods, as well as for the goods produced on the basis of a license. So, goods bearing different marks (brands) based on the same R&D product can be presented in the market [8].

The term «*utility model*» is known to refer to some technical solutions, namely, to those in the field of mechanics. It can cover a design of device that meets the requirements of patentability. The main distinguishing feature of utility model from other industrial property is that patent on it is issued under the applicant's responsibility, without an expert examination. In Ukraine, a significant increase in the number of utility model patents issued has been reported in recent years; their number is more than twice higher than that in the advanced economies. This implies that the utility model is widely used as an object of civil relations, particularly, as an object of licensing agreements [10, 11]. This fact means that the enterprises of Ukraine preferably use transfer of foreign technologies and equipment. A similar situation is reported for the certificates of trade and service marks.

The R&D works in high-tech industries, i.e. the industries creating products with high added value, are of particular importance for the competitiveness of the national economy. However, the statistical data do not allow the authors to estimate the level of patenting in a particular field, insofar as the State Service for Intellectual Property of Ukraine does not have data structured by economic sectors. However, the analysis of publications has showed that the share of Ukraine in the world high-tech exports is negligible and accounts for approximately 0.03%.

In the industrialized countries, usually, this is just the private business that deals with commercialization of innovation projects, except for those that fall within the responsibility of the state (defense, infrastructure, etc.). Therefore, the balancing of interests of the public and the private sector is of paramount importance. A large gap between the research (basic and applied), development, and commercialization led to an industrial crisis of the former USSR economy. This is evident from a comparison of the innovation activity of the USSR and the USA (the world leader in the commercialization of innovation) for the year of 1989, when the Soviet Union collapsed.

Table 4 showed that despite almost the same

Table 3

Structure of Copyright Protection of Intellectual Property in the Advanced Economies and in Ukraine, %

Type of intellectual property	Advanced economies*	Ukraine**
Inventions	31.0	12.25
Industrial prototypes	18.7	4.79
Utility models	12.6	29.95
Trademarks and service marks	37.7	53.11

Note. * according to [8]; ** according to the SSCU; www.ukrstat.gov.ua.

Table 4

Comparison of Innovation Activity in the USSR and in the United States, in 1989

Country	Patent applications filed		Patents issued		Patents commercialized	
	Quantity	%	Quantity	%	Quantity	%
USSR	151808	100	84577	100	9437	100
USA	161660	106	95539	113	1151178	12138

Note. * according to [9].

number of the applications for patents and the patents issued (an indicator of the economy innovativeness) in both countries, the number of commercialized patents in the US industry was 120 times greater than that in the Soviet Union.

In should be noted that in the Soviet Union, for the implementation of R&D there was State Standard (GOST) «System for the Development and Commercialization of Products» [12] which defined the procedure and the whole list of works necessary for commercialization of new technologies. Since Ukraine got its independence, the Government Standard of Ukraine (DSTU 3974-2000) under the same title [13] has been used. However, the planned economy, the absolute nationalization of all stages of the innovation process, and the lack of incentives made it impossible to use high scientific and technical potential. The gap between R&D and commercialization of innovation has led to the so-called «*European paradox*»: having almost the same volume of R&D works and level of development of legal framework and small business, the US share in the export of certain types of high-tech products exceeds that of European countries 2–10 times [14]. The author of this work explains the fact that the knowledge is accumulated and sold as new technologies mainly by large corporations, with the United States having more corporations (in terms of their number and capacity) than Europe [14]. Without prejudice to the importance of large corporations, it should be noted that a wide network of small, medium, and large private innovative companies has contributed a lot to the US success in commercialization of innovations. This diversity leads to the stability of the whole innovation system of the United States, the main priority of which is the practical use of innovation, that is, the commercialization.

The U.S. global leadership in R&D commercialization is backed by a strong legislative support, including the Bayh-Dole Act (1980); the Stevenson-Wydler Technology Innovation Act (1980); the Federal Technology Transfer Act (1986); the National Competitiveness Technology Transfer Act (1989); the Small Business Innovations Research Act; the Cooperative Research Act (1984); and the Small Business Technology Transfer Act (1992), which give the right to the non-profit organizations (universities, research centers, laboratories) and the small businesses to use the results of R&D works performed at the expense of federal funds. This stimulates high interest of inventors in the patenting and of business in the development of new technologies.

The U.S. legislative framework has established the allocation of rights to intellectual property created at the expense of federal funds; has protected the interests of federal government, inventors, and contractors; and has shared the royalties from the commercialization of inventions.

The above-mentioned laws having been adopted, in the United States, the number of patents increased 10 times. During 2–3 years, 2200 companies were incorporated for R&D commercialization, and more than 300 thousand jobs were created.

Today, these laws have been properly adapted to the local conditions and used in the most advanced countries [15].

Given a critical gap between Ukraine and the leading countries in the field of technology commercialization and the best international practice (particularly, the U.S. one), Verkhovna Rada of Ukraine adopted the Law of Ukraine on the State Regulation of Activities in the Sphere of Technology Transfer as revised, on October 6, 2012 [16]. Pursuant to this Law, the property rights to the technologies developed at the expense of the state budget are transferred to organizations and inventors for further commercialization. The Law also states that the funds received from the transfer of such technologies should belong to the organizations and inventors and be used for the development of innovation. As *Boris Grinyov*, the First Deputy Chairman of the State Agency for Science, Innovation, and IT Development, puts it, for the successful innovation activity in Ukraine, the Agency intends to draft the Laws of Ukraine on Amendments to the Budget Code (with respect to the Foundation for Support of Priority Innovation Projects) and on Amending the Tax

Code of Ukraine (regarding the facilitation of innovation activities) and a set of other initiatives. It remains to be seen how these initiatives influence the commercialization of innovations [17].

It is a well-known fact that the higher is the level of technological development of the state, the stronger is its export capacity and competitiveness. To ensure the reliable protection of intellectual property rights all the advanced economies have created their national patent systems. In Ukraine, this system is represented by the State Service for Intellectual Property of Ukraine whose activities are directed mainly towards issuing the copyright protection documents, developing the tools and rules of examinations, and so on.

Summarizing the views of researchers, inventors, innovators, and experts, one can conclude that the main difficulties in patenting the R&D results in Ukraine are as follows:

- Unfavorable attitude of economic entities to innovation;
- Reorientation of the basic and applied research towards foreign customers;
- Large business corporations do not show much interest in funding and use of domestic R&D preferring to transfer foreign technologies and to purchase foreign equipment;
- The lack of incentives for the private business to invest in the R&D sector;
- Low motivation of inventors;
- The lack of government support of small and medium innovative business;
- Imperfect legislation with regard to the transfer of R&D results to the private business.

These challenges in the patenting correspond with the findings of [18] with respect to declining patent activities in Ukraine and, in the author's opinion, should be addressed promptly. Otherwise, Ukraine is in danger of being a permanent outsider in the innovation development.

REFERENCES

1. Virchenko, V.: Financial and Economic Mechanisms of Intellectual Property Commercialization. *The Banking*, 7, 23—31 (2013) (in Ukrainian).
2. The Law of Ukraine on the Protection of Title to Inventions and Utility Models of 15.12.1993 no.3687-12 (as amended on 05.12.2012). Verkhovna Rada of Ukraine; http://zakon4.rada.gov.ua/laws/show/3687-12 (in Ukrainian).
3. The Law of Ukraine on the Protection of Title to Trade and Service Marks of 15.12.1993 no.3689-12 (as amended on 05.12.2012). Verkhovna Rada of Ukraine; http://zakon4.rada.gov.ua/laws/show/3689-12 (in Ukrainian).
4. The Law of Ukraine on the Protection of Title to Goods Origin Designation of 16.06.1999, no. 752-14 (as amended on 05.12.2012). Verkhovna Rada of Ukraine; http://zakon4.rada.gov.ua/laws/show/752-14 (in Ukrainian).
5. Fedulova, L. and Pashuta, M.: the Development of National Innovation System in Ukraine. *The Economy of Ukraine*, 4, 45—47 (2005) (in Ukrainian).
6. Statistical Book of Research and Innovation Activities in Ukraine in 2010 (2011). Kyiv: Information and Publishing Center of SSSU; http://ukrstat.gov.ua/druk/katalog/nauka_in/nid%20_2010.zip (in Ukrainian).
7. Report on Scientific, Research and Engineering Activities in Ukraine in 2013 http://ukrstat.gov.ua/druk/publicat/kat_u/2014/ dop/04/dop_ny_13.zip (in Ukrainian).
8. Shynhur, M.V. (2003). Organizational and Economical Mechanism for R&D Commercialization. Ph.D. Theses. Kyiv (in Ukrainian).
9. Bazhal, Yu.M. (1996). Economic Theory of Technological Changes. Kyiv: Zapovit (in Ukrainian).
10. Batova, V.: License Agreement on the Use of a Utility Model. *Theory and Practice of Intellectual Property*, 5 (67), 45—50 (2012) (in Ukrainian).
11. Batova, V.: Utility Models in Ukraine: Improvement of Copyright Protection. *Theory and Practice of Intellectual Property*, 3, 3—10 (2012) (in Ukrainian).
12. System for the Development and Commercialization of Products. Producer Durable Goods: GOST 15.001-88. (1989). Moscow: Izdatelstvo Standartov; http://docs.nevacert.ru/files/gost/gost_15.001-1988.pdf (in Russian).
13. System for the Development and Commercialization of Products. Regulations for R&D Works. DSTU 3974-2000. (2001). Kyiv: Derzhstandart Ukrainy; http://science.crimea.edu/norm_doc/statdart/132_DSTU3974.pdf (in Ukrainian).
14. Mykhailovska, O.: The European Paradox of Innovation Development: Lessons for Ukraine. *The Economy of Ukraine*, 9, 80—85 (2006) (in Ukrainian).
15. Mazur, A.A. and Pustovoit, S.V.: Role of the State in the Consolidation of Innovation Potential of Ukrainian Science and Industry. Science and Innovation, 7, 4, 47—51 (2011) (in Russian).
16. The Law of Ukraine on the State Regulation of Activities in the Sphere of Technology Transfer of 14.09.06, no.

143-V (as amended on 05.12.2012). Verkhovna Rada of Ukraine. http://zakon4.rada.gov.ua/laws/show/143-16 (in Ukrainian).
17. Grinyov, B.: The Innovative Ideas Cost Money. *Zerkalo Nedeli*, 15, 13 (2013) (in Russian).
18. Fedulova, L.I. and Khaustov, V.K.: Assessment of Opportunities for Realization of R&D Potential of Ukraine and Russia in the Form of Cluster Cooperation with the Help of Patent Analysis. Relevant Economic Issues, 10, 75–89 (2011) (in Ukrainian).

Г.В. Демьянчук

Национальный университет государственной налоговой службы Украины, Ирпень

ОБЪЕКТЫ ПРОМЫШЛЕННОЙ СОБСТВЕННОСТИ В ПРОЦЕССЕ КОММЕРЦИАЛИЗАЦИИ ИННОВАЦИЙ

Проведен анализ работ по созданию объектов промышленной собственности и причин, по которым задерживается их развитие, а также определена роль этих объектов в процессе коммерциализации инноваций.

Ключевые слова: объект промышленной собственности, патент, изобретение, полезная модель, промышленный образец, охранные документы, инновации, коммерциализация инноваций.

Г.В. Дем'янчук

Національний університет державної податкової служби України, Ірпінь

ОБ'ЄКТИ ПРОМИСЛОВОЇ ВЛАСНОСТІ В ПРОЦЕСІ КОМЕРЦІАЛІЗАЦІЇ ІННОВАЦІЙ

Проведено аналіз стану робіт по створенню об'єктів промислової власності і причин, через які затримується їх розвиток, та визначена роль даних об'єктів в процесі комерціалізації інновацій.

Ключові слова: об'єкт промислової власності, патент, винаходи, корисна модель, промисловий зразок, охоронні документи, інновації, комерціалізація інновацій.

Received 12.05.14