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THE PATENT-LICENSE SYSTEM OF UKRAINE IN THE SECOND HALF OF THE XX CENTURY

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Abstract. The formation of the patent-licensing system of Ukraine during the second half of the XX century is investigated. It is established that the first funds of technical literature, which was necessary for patent work, were created in the departments of the institutes of the Academy of Sciences of the USSR in the first postwar years. For example, the fund of scientific and technical

literature, documentation, patents and inventions began to form in the Institute of Electrical Engineering of the USSR. It was established in 1944. But various special centers for providing information support for the development of the patent and license business were organized a somewhat later. In particular, at the Institute of Electrical Engineering of the Academy of Sciences of the USSR only 20 years later in 1964. Employees were making a preliminary examination of applications for inventions and expanding the funds of scientific and technical documentation, were completing foreign patent documentation from foreign countries.

A network of special Patent Departments was created on the basis of the higher technical institutions. A small group for the systematization of patent information was created at the Kharkiv Polytechnic Institute in 1967. In 1971, the patent office was also established at the Odessa Polytechnic Institute. In 1974, at the Kyiv Polytechnic Institute an organizational and analytical department was created, it contributed to the development of inventive activities of the Institute. The intensification of inventive search occurred in the 1980s and was aimed at improving quality, which contributed to the creation of prospective, competitive world-class developments and their introduction into industry.

During this period, the vast majority of scientists took part in patent and licensing activities, a large number of patents were obtained and scientific and technical cooperation was started on a commercial basis with the conclusion of licensing agreements. A number of devices were patented in the following countries: Spain, Italy, England, Switzerland, Japan, Germany, Hungary, Poland, Bulgaria and others. In the early 1990s, the situation with inventive and patent licensing activities changed. A significant reduction in the number of inventions demonstrated the general state of scientific research in the country.

Keywords: invention, patent, copyright certificate, licensing, technical sciences, research institutions, Ukraine.

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ПАТЕНТНО-ЛІЦЕНЗІЙНА СИСТЕМА УКРАЇНИ У ДРУГІЙ ПОЛОВИНІ XX СТ.

Анотація. Досліджено становлення патентно-ліцензійної системи України впродовж другої половини XX ст. Встановлено, що перші фонди технічної літератури, яка була необхідна для патентної роботи, створювалися у відділах інститутів АН УРСР у перші повоєнні роки. Наприклад, фонд науково-технічної літератури, документації, патентів та винаходів розпочав формуватися в Інституті електротехніки УРСР, його створено 1944 р. Але різні спеціальні осередки для надання інформаційної підтримки для розгортання патентно-ліцензійної справи були організовані декілька пізніше. Зокрема в Інституті електротехніки АН УРСР – лише через 20 років, у 1964 р. Співробітники проводили попередню експертизу заявок на винаходи, розширяли фонди науково-технічної документації, здійснювали комплектацію закордонної патентної документації.

Мережа спеціальних патентних відділів була створена і на базі вищої технічної школи. Невелика група з систематизації патентної інформації була створена в Харківському політехнічному інституті в 1967 р. У 1971 р. патентне бюро було створено також в Одеському політехнічному інституті. У 1974 р. в Київському політехнічному інституті створили організаційно-аналітичний відділ, що сприяло розвитку винахідницької діяльності інституту. Активізація винахідницького пошуку припадала на 1980-ті рр. і була спрямована на підвищення якості, що сприяло створенню перспективних, конкурентоспроможних розробок світового рівня та впровадженню їх у промисловість. На початку 1990-х рр. ситуація з винахідницькою та патентно-ліцензійною діяльністю змінилася. Значне скорочення кількості винаходів демонструвало загальний стан наукових досліджень у країні.

Ключові слова: винахідництво, патент, авторське свідоцтво, ліцензування, технічні науки, науково-дослідні установи, Україна.

Introduction. An important qualitative indicator of the results of research work of research teams is the scale of inventive activity. The amount of patenting of inventions in the country determines its competitiveness in the world market. Inventing that develops on a scientific basis is the result of interaction with production experience. Human engineering from ancient times to the present is unthinkable without invention. The main task of research institutions is the generation of a new ideas, the introduction of innovative developments and technologies. The main factor contributing to the effectiveness of inventive activity is the scientific and technical potential concentrated in the research institution. An integral part of inventive, innovative and patent-licensing activities is its information support. The fund of patents and licenses is a set of patent and technical documentation, regulations and reference books. The presence of resources helps to identify scientific and technical solutions that may become a subject to patent protection or licensing agreements. The invention is the result of human creativity in any field of socially useful activities. The invention is understood as a technical or technological solution that meets the conditions of patentability – novelty, inventive level and industrial applicability. The invention has a long world tradition. The first law on patents was adopted in Venice in 1474, according to the law, the inventor was granted exclusive rights, which contributed to the spread of new devices.

Clarification of various issues of formation and development of patent case in Ukraine can be found in a number of publications [1–7]. In the article by T. G. Kossko and I. I. Khomenko [1] the peculiarities of the formation of the system of patent-licensing activities of institutions of the Academy of Sciences of the USSR are characterized, a comparative analysis of the results of inventive activities of patent divisions of scientific institutions of the Academy of Sciences of the USSR is made, statistical materials on patenting of scientific developments are provided. Comparative analysis of the experience of the patent service forming in the United States of America and Ukraine made by the authors I. I. Khomenko & K. S. Shahbazyan [2]. The considered experience of the National Academy of Sciences of Ukraine on the protection and use of inventions, as well as the patent activity of USA research centers is quite useful. Researchers as V. O. Chehun, O. V. Krasovska & V. Yu. Griga [3] analyzed the problem of organizing the USA patent service. The historiography of the patent case is expanded by the works of G. Atroschuk filled with factual material [4]. Some issues concerning to the activities of the centers of electrical science are outlined in publications [5–6]. However, the authors did not pay attention to the activities of research teams of higher technical educational institutions and research institutions.

The purpose of the article: on the basis of generalization of scientific literature and involvement of archival materials to investigate the formation of the patent business in Ukraine during the second half of the XX century.

Main part. Intensive development of scientific research in the second half of the XX century stimulated an increase in the level of technical creativity and an increase in the number of inventions. Inventive, patent-licensing activities gradually became an integral part of research teams. In Soviet times, the rights of inventors were protected by copyright and patents. And although the inventor was given the opportunity to choose the form of protection of their own rights, it happened on formal grounds. The right to use the invention belonged to the state. During the 1940s and 1950s, with the aim of systematizing patent information and assisting to inventors a network of patent centers was formed

A number of measures were taken during the 1960s to streamline inventive activity and strengthen the information support of scientific research. In particular, in accordance with the resolution of the Council of Ministers of the USSR № 607 of June, 14 1962 «On improving the protection of state interests in the field of inventions and on further improving the organization of invention in the USSR» By the Presidium of the Academy of Sciences of the Ukrainian Soviet Socialist Republic (AS of the USSR) organized a patent service in 29 research institutions.

It should be noted that attempts to organize a system of patent information system were made in the first postwar years. In particular, the fund of scientific and technical literature, documentation, patents and inventions began to form at the Institute of Electrical Engineering

of Academy of Sciences of the USSR early as 1944. In the first years of the fund's existence, the search and selection of scientific documentation was unsystematic. However, the need to create a fund of patent documentation became obvious, and since 1957 more careful work on the selection and obtaining of resources for the patent information service was carried out. First of all, patent information was collected from research and design institutions of the USSR [7, p. 3].

The revival of scientific research, the expansion of scientific topics in the Academy of Sciences of the USSR stimulated an increase in inventive and innovative proposals, required additional information material for the organization of information support of inventive and patent-licensing activities. Patent and licensing activities in technical research institutions and educational institutions have also significantly intensified. In 1964, a special group to provide information support and provide access to patent information was created at the Institute of Electrodynamics (IED) of the Academy of Sciences of the USSR. This group consisted of 11 people who worked on a voluntary basis. These are, in particular, leading scientists of the Institute of Electrodynamics, as well as such specialists as a patent examiner and bibliographer from the department of scientific and technical information of the Institute. Employees of the department carried out patent and licensing work on research topics for all units of the IED of the AS of the USSR; carried out the reception, consideration and implementation of innovation proposals; introduction of inventions into domestic industrial production, as well as the sale of licenses abroad, which contributed to the development of invention and innovation in the Institute [8, p. 2].

To coordinate patent work in the IED of the AS of the USSR, expert groups of scientific departments were created, which together with the authors conducted a preliminary examination of applications for inventions, involving the patent funds of the Institute of Electrodynamics. The creation of the department contributed to the expansion of the fund of scientific and technical documentation. And, importantly, at this time began to carry out the acquisition of foreign patent documentation from countries such as England, the United States, the Federal Republic of Germany, Japan and France. In addition, scientists of the institute were given the opportunity to order the necessary patents and descriptions from other scientific institutions [9, p. 72].

Organizational activity for improving the invention, patent and business license intensified in the 1970s. The legal framework of invention was regulated by the Council of Ministers of the USSR № 584 «On discoveries, inventions and innovations» of August, 21 1973. In addition, it was adopted a number of resolutions on the regulation of innovation activities, inventions and innovation proposals. These measures established the rights of inventors, as well as determined the system of encouragements and rewards, approved a number of state awards for outstanding merits in science and technology and the honorary title of «Honored Inventor of the USSR». All these measures significantly influenced on the development of innovation, stimulated the development of inventive activity, contributed to the increase in the number of inventors [10].

Various aspects of the implementation of the innovation work of the higher technical school have become important. The peculiarity of scientific work conducting in high school is the relationship between the quality of training, research activities of teachers and independent work of students. It became clear that the accumulation of information funds, patent and technical libraries, the development of competent approaches to research work affects not only the criteria for evaluating the results of research activities of teaching staff, but also the training system. In the leading technical universities of Ukraine much attention was paid to invention. A small group on the systematization of patent information was established at the Kharkiv Polytechnic Institute (KhPI) in 1967. During 1965–1969, scientists of the Institute received 251 copyright certificates and 8 patents for inventions. Patent specialist began to work at the Institute in 1971, and after that a decision was made to create a separate structural unit – the Patent Information Department, which influenced on the development of inventive activity of scientists of the Institute. In particular, during 1975–1980, scientists of the institute submitted 1324 orders for copyright certificates [5, p. 229–230].

In 1971, a patent bureau was also established at the Odessa Polytechnic Institute (OPI). In the bureau worked only 3 specialists, one of them with special education. The activities of the patent bureau were aimed at creating a fund of regulatory documentation. The intensification of inventive activity influenced on the reorganization of patent activity at the Institute. During the research work it became obligatory to show the patent level of the scientific topics.

Contracts were signed with the State Committee of Inventions and Discoveries of the USSR and territorial information centers to obtain information, and an automated search system was developed. These measures helped to increase the amount of patent information at the Institute, which influenced the popularization of the patent business and provided significant assistance to researchers. Thus, if in 1970 the Odessa Polytechnic Institute received 46 copyright certificates, in 1975–41 copyright certificates, then in 1977–68 copyright certificates, in 1978–96 copyright certificates, and began work on patenting inventions abroad. In addition 3 patents in the United States, France and Germany were received [11, p. 125].

In 1974 an organizational and analytical division was created in the Kyiv Polytechnic Institute (KPI), it contributed to the development of inventive activities of the Institute. During 1975–1976, the KPI submitted 3472 applications on inventions, it was more than 40 % higher than the previous indicators, when during 1970–1975, 1963 applications were submitted and 841 positive decisions on the issuance of copyright certificates were received.

Innovative and patent work in the early 1970s at the AS of the USSR significantly intensified. In particular, due to the expansion of work, the number of employees of the patent and license group of the IED of the AS o the USSR was increased to 18 people, two of whom worked on a permanent basis. The number and list of works performed by the group's staff also increased. In addition to completing the patent fund, the patent group analyzed research in order to identify the novelty of the proposed inventions; provided consultations and recommendations to inventors on the issues of registration of applications and implementation of developments; compiled reports on the results of industrial implementations of inventions. There was a constant acquisition of patent resources of the IED of the AS of the USSR. The funds of scientific and technical information consisted of 16 000 descriptions of inventions and copyright certificates of the USSR and more than 616 000 abstracts of patent applications of foreign countries for profiling classes G01: measurement; G05: control and regulation; H02: generation, conversion and distribution of electricity; H03: special branches of electrical engineering. In addition, bibliographic collections, normative documents, scientific and technical literature, collections of annotations and theses were used as the resources that formed the funds of foreign countries [9, p. 81–82].

The activity of the patent-licensing group of the IED of the AS of the USSR continued to expand. In 1975, the group consisted of 3 full-time patent specialists, 20 freelancers of scientific departments, an expert council (17 people) and expert groups of the institute's departments. Information scientific, technical and patent support was provided by informants of departments and laboratories, employees of the scientific library. Methodical seminars and consultations were systematically held, and cooperation with various scientific institutions was expanded. Inventions and innovation proposals were discussed at scientific seminars of the departments, passed the examination and sent for consideration to the State Committee for Inventions and Discoveries of the USSR. Involvement of interpreters to the patent-license group made it possible to study carefully the state of foreign markets, as well as the activities of patent organizations of scientific institutions around the world. In 1975, the trademark of IED of the AS of the USSR was registered for a period up to 1995 [12, p. 86–88; 819].

In the late 1970's, the number of scientists who was actively engaged into innovation in IED of the AS of the USSR increased markedly. In 1979, the staff of the institution already included more than 190 inventors and innovators. 179 applications for inventions were submitted to the State Committee for Inventions and Discoveries of the USSR and 122 positive decisions on the copyright certificate were received. The number of implementation into the national economy has significantly increased. In 1979, 87 inventions were introduced,

26 of them in research institutes of the USSR. In 1979, the confirmed economic effect of the implementation of the inventions was 8.1 per 106 ruble.

At this time, the IED of the AS of the USSR got patents on 7 inventions in 14 countries. All inventions were protected by 17 copyright certificates, for which 27 patents have been obtained. One of them – «Method of obtaining spherical granules and a device for their production», in addition to the patent, it also had a license. All patented objects were putted into production and mass-produced. The Institute of Electrodynamics was actively involved into advertising of new developments for further cooperation with foreign partners. In particular, patented inventions were exhibited at international and All-Union industrial exhibitions [13, p. 82–89].

In the 1980s, in the IED of the AS of the USSR the number of patent certificates and licensing agreements for objects patented in other countries increased significantly. Participation in international scientific and technical programs has made it possible to increase the number of patents for inventions abroad, to conclude profitable license agreements. It also contributed to the growth of exports of competitive products based on inventions.

The acquisition of the of the IED's patent fund continued, which was carried out in accordance with the plan of research work of the departments. The basic complete set of the patent fund was based on the documentation of 7 foreign countries and republics of the USSR and covered 127 indices of the International Patent Classification. In 1984, the patent fund numbered 330,000 units only of patents, including 118,000 descriptions of inventions, copyright certificates and patents of the USSR. Some of the patents were marked «secret» and «top secret», which was necessary for defense research. For the convenience of patent search, ensuring access of inventors to information resources created a reference search mechanism, classified funds using thematic, terminological, numbering files [14, p. 89–90].

In 1988, the highest level of inventive activity of scientists of the IED of the AS of the USSR was observed: 231 applications for inventions were made, 170 copyright certificates and patents were obtained, and 79 inventions were used in the national economy.

Thus, if before 1975 the licensors were only 3 academic institutions, in addition, the IED of the AS of the USSR was not included in this number, then as at 1988 the staff of this academic institution was sold 5 licenses. On the license topic «Method of electro erosive polishing of surfaces and a device for its implementation» together with the experimental scientific Institute of metal-cutting machines, license agreements were concluded with the company «Ferroshtaal AG» for a period of 7 years (Germany); with the company «Hiteka» for a period of 8 years (Hungary); with «Mashinexport» for 7 years (Bulgaria).

The licenses were also sold to Italy and Switzerland. The basis of the license was the author's certificate of IED scientists. On the second licensed topic «Methods of obtaining spherical granules from metal melts and a device for its implementation» an international application for filing with foreign patent organizations was prepared. Inquiries from Swiss and Japanese companies were received [14, p. 60–78].

In 1980s in the higher technical institutions, a development of innovative research has intensified, which contributed to the revival of the licensing business and the patenting of inventions abroad. In 1980, totally 230 copyright certificates and 4 patents abroad were obtained at the OPI, but there were no licenses. The development of scientific direction in OPI for the development of mathematical models and software for optimal design of power and measuring transformer devices has contributed to the revival of inventive activity. A new method of improving the accuracy of current measuring transformers was developed and a number of structures were protected by ten copyright certificates and patents of Ukraine [15, p. 34; 16, p. 20].

Active patent and licensing work in the 1980s took place in KhPI. In particular, according to archival data, in 1980 the State Committee for Inventions and Discoveries of the USSR received 1187 applications, 470 copyright certificates were issued and 31 patents were obtained, 147 inventions were introduced and 9 foreign patents were obtained [16, p. 323–324].

The analysis of the materials of the organizational and analytical department of KPI for 1980–1987 shows an increase in the number of patents abroad and the sale of licenses. In

particular, foreign patents have appeared at the Department of Dielectrics and Semiconductors for developed new solid-state electronics devices (France, USA and Germany). And also 5 licenses for inventions in different countries were sold [17, p. 2–30].

All these promoted to the European integration processes of the Ukrainian science into the European scientific space [18, p. 242, 243].

In the early 1990s, the situation with inventive and patent licensing activities changed. A significant reduction in the number of inventions and innovation proposals demonstrated the general state of scientific research in the country. For example, in 1990, employees of the IED of the AS of the USSR submitted 131 applications for inventions to the State Committee for Inventions and Discoveries, which indicated a reduction in the number of inventions almost twice compared to 1988. During this year the institute received 132 copyright certificates, 48 inventions were introduced into the national economy, 2 of them in the institutions of the Academy of Sciences of the USSR.

During 1990, the IED of the AS of the USSR did not receive patent certificates and did not enter into licensing agreements. In 1991, the situation deteriorated significantly: only 95 employees of the Institute took part in the inventive work, 41 applications were submitted to the Committee, 91 decisions on the issuance of copyright certificates were received, and 36 inventions were used in the national economy. This year, the IED also did not receive any patent and did not enter into license agreements [14, p. 71–73].

Before Ukraine declares its independence (1991) the staff of the IED has filed more than 4 500 applications for inventions, received more than 2 700 copyright certificates, 80 patent certificates for devices patented in foreign countries, and registered a trademark. About 200 scientists took part in the inventive activity. During this period, 5 licenses were also sold. The formation of the patent system in the early 1990s took place in conditions of deteriorating economic situation, which affected the state of science as a whole. The number of inventions has significantly decreased; no licensing work has been carried out.

A similar situation was observed at the Institute of Modeling Problems in Energy (IMPE) of the Academy of Sciences of the USSR. The general tendencies of decrease in efficiency of inventive activity are confirmed by the fact that in 1990 only 24 applications for inventions were submitted. Two previous applications got patents in Germany. Also negative was the fact that the legal basis of inventive activity was not supported by the new law, it did not give to the inventor's confidence in the results of their activities. In total for 10 years of patent and innovation activity the inventors of IMPE of the Academy of Sciences of the USSR submitted more than 600 applications for inventions and received more than 300 copyright certificates and patents [19, p. 28].

Conclusions. Systematic work on implement measures that stimulated invention, as well as the emergence of patent specialists contributed to the creation of a network of patent offices in universities of Ukraine, which provided an information support to scientists of higher technical institutions. The expansion of scientific activity, introduction of innovative technologies contributed to the development of invention in the 1980s, which was also supported by a number of regulations, aimed at regulating and stimulating the patent business. Research of results of inventive, innovative and patent-licensing activity of scientific institutions and higher technical educational institutions is important issue. Based on the results of work in these areas, it is necessary to assess the innovation of scientific research and the level of implementation of results into the national economy, as well as confirmation of novelty of technical solutions at the world level.

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