



Inventions in IP Education

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Abstract

The subject matter of this paper are the inventions in intellectual property education. The patent protection of inventions in the field of intellectual property, including digital learning inventions will be identified. The paper analyzes ways of protecting inventions in intellectual property education, providing examples from European and international practice. By obtaining patent protection, patent holders can be monopolists in a particular market and territory, thereby facilitating the generation of profits for them. The role of the technological progress of society, the introduction of new digital teaching methods and the way in which it affects digital competitiveness are highlighted. Examples of inventions that are protected by companies in the area of intellectual property education have been identified. The role and importance of innovation and new technologies in education and the ways in which protecting innovative products as inventions helps society globally. The dynamics of technological development contribute to the imposition and development of technological products in the intellectual property education.

Keywords: *Invention, intellectual property education, digital learning, patent protection, digital competitiveness, innovation*

1. Introduction

This paper will address the topic of inventions in intellectual property (IP) education, including the identification of inventions in digital learning. The inventions are helping enterprises in international aspect to generate large profits by imposing a competitive innovative product on the market. It is through patent protection that many companies are able to gain monopoly advantages globally and to be at the forefront of other competitors in their development environment. Today's world of globalization and high-tech development has contributed to patenting inventions in various innovative fields. Of even greater importance is digitalization, which helps to deliver training globally by introducing online platforms and systems through which to deliver learning in an online environment. The patented inventions in IP education, the introduction of new digital learning methods and the way in which they affect digital competitiveness must inevitably be noted. IP is a factor of company competitiveness. [1]

The essence of the invention as an IP is identified and the ways of obtaining a patent abroad are examined. Examples of companies and inventions that are protected in IP education and digital learning are given, as well as the results of the patent applications and granted patents in this field are examined.

The subject matter of this paper are the inventions in intellectual property education and digital learning.

2. Protection of inventions in IP education

2.1. Invention

The inventions help the people to solve various problems in the science and technology. The introduction of innovative products and methods in each industry has contributed to the patenting of objects with high economic performance. In turn, inventions in digital learning help their patent holders gain digital competitiveness over other companies in the market. In order to be defined as an invention, the intellectual product obtained must necessarily be a technical solution to a problem, and the task can be in any field of public economy. [2] In order to be granted a patent for an invention, it must cumulatively meet the three criteria of patentability - novelty, inventive step, and industrial applicability. The patent protection of the invention is granted by patent. Once issued, its holder gains exclusive rights to the patentable invention, which include the right to use the invention, the right to dispose and prohibiting other persons from using the invention without the consent of the patentee.

In this way, on the one hand, the interest of the business is protected for access to new technological products, for the development of innovative production and on the other hand, the interest of the



patent holder is protected - it holds monopoly rights for a fixed term and for a specific territory. The term of protection of the invention is 20 years from the date of filing of the patent application. A patent has a territorial effect - it operates within the territory of the country to which it was issued.

The discipline of "Patent policy" and in particular inventions are studied at the University of National and World Economy (UNWE), Sofia, Bulgaria by undergraduate students, specialty "IP and Business".

2.2. Patenting abroad

A prerequisite for patenting abroad is the desire of every company to obtain patent protection, except in his or her national territory and in the territories of the countries in which he or she intends to economically realize his / her invention.

2.2.1. National Patent Procedure Abroad

The essence of the national patent procedure abroad lies essentially in the fact that in each country in which we would like to obtain a patent, a separate "national" application should be filed. Patents in individual countries are granted in accordance with their national patent laws. Patents operate independently of one another and the termination of a patent granted in one country is irrelevant to the operation of patents in other countries.

2.2.2. European Patent under the European Patent Convention

It has been established on the basis of the (EPC), signed in Munich on 05.10.1973. A European Patent Organization (EPO) has been established on the basis of the Convention and a European Patent Office (EPO) has been established with headquarters in Munich. The advantage of the European patent lies in the fact that the applicant can obtain protection of his invention in the territory of one or more EPO Member States by filing a single patent application, which is subject to examination and examination by one body - the European Patent Office, subject to rules.

2.2.3. The Patent Cooperation Treaty (PCT)

PCT has been signed on June 19, 1970 at a Diplomatic Conference held in Washington. It is administered by the World Intellectual Property Organization (WIPO). By filing one international patent application under the PCT, applicants can simultaneously seek protection for an invention in a large number of countries. One of the main advantages is the submission of one application, in one language, one publication, examination etc.

Obtaining patent protection has a strong impact on the economic development of patent holders. In the absence of patent protection, they would find it very difficult and almost impossible to succeed in conquering a market and economically realizing their invention. Patent procedures in accordance with PCT and EPC facilitate the acquisition of industrial property rights in a large number of countries.

3. Examples of patented inventions in IP education and digital learning

3.1. System For Supporting Education In Retrieval Of Intellectual Property Right

Patent № JP 4775789 B2. The patent is granted for Japan by Univ Tokai. It refers to a system for supporting education for retrieval of intellectual property right wherein a student voluntarily learns when a teacher gives the student an assignment in retrieval of a patent, and the teacher remotely monitors the student's progress in learning.

3.2. Learning Apparatus In Digital Environment

Patent № US 10445660 B2. The patent is granted for the territory of USA and the patent owners are Ma Zhengfang and Tan Hong. A learning apparatus in a digital environment is advantageous to interaction and communication among users who use a knowledge point structure for learning. [3]

4. Enterprises, patented inventions in ip education and digital learning

Given the large number of foreign companies that have patented inventions in IP education and digital learning at the international level, a comprehensive list of all companies that have protected inventions in this field could not be provided. The applicants, respectively the patent holders are big companies like IBM, Microsoft and individuals who would like to patent innovative technologies in order to



maintain good competitive positions. The students of UNWE often choose to explore the patent policies of big companies when preparing their individual assignments in the specialty of “IP and Business”. The companies listed below are selected mainly because of the number of applications they have filed for inventions and patents issued in IP education and digital learning.

4.1. International Business Machines Corporation (IBM) is an American multinational technology company headquartered in New York. IBM is a major research organization, holding the record for most U.S. patents generated by a business (as of 2020) for 27 consecutive years. Inventions by IBM include different fields as the automated teller machine (ATM), the floppy disk, the hard disk drive, the magnetic stripe card, the relational database and others. [4]

4.2. Microsoft Technology Licensing LLC owns the vast majority of patents formerly owned by Microsoft Corporation. It develops, manufactures, licenses, supports, and sells computer software, consumer electronics, personal computers, and related services. In 2016, it was the world's largest software maker by revenue (currently Alphabet/Google has more revenue). [5]

5. Patent searches at online patent database

Patent searches have a business focus, therefore, during the exercises in the discipline of “IP and business”, we are preparing students to carry out these patent studies. Below we present the methodology for conducting patent search in accessible online databases for patent applications and patents granted in IP education and digital learning. [6]

5.1. Determining the parameters of a patent search

The purpose and subject matter of this patent search is to identify the patent applications and patents granted in IP education and digital learning internationally. The territories covered by the study are China, USA, South Korea, Japan, Australia, Russia, Taiwan, PCT applications and EP applications. The countries surveyed were selected due to the fact that these territories have the most patent applications and patents granted in IP education and digital learning. The patent study covers the period from January 2000 to April 2020, or a total of 20 (twenty) years. The patent search is carried out at the European Patent Office's online database and Lens Online Database.

5.2. Systematization of patent documentation

The systematization of the information was done by countries, by companies, as well as by the number of applications for inventions and patents granted.

5.3. Results of the study and analysis of the information

The study was conducted, first on one subject (IP education) and then on another (digital learning), with a view to expanding the scope of the search.

5.3.1. Statistics on patent applications and patent granted in "IP education" for the period 2000-2020

The patent applications filed during the aforementioned period are 70 and the patents granted are 16.

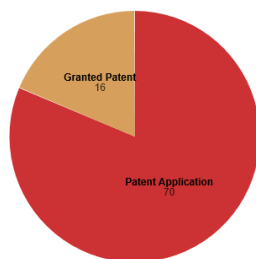


Figure 1 Patent applications and granted patent for the period 2000-2020

During the period under review, patent applications to the territories of China, USA, South Korea, Australia, Japan, Russia, PCT applications filed with WIPO, as well as European applications submitted to the EPO were 70 in total, and only 16 were granted patents.



The largest number of applications for inventions and patents granted in the territory of the United States is in IP education - 48. WIPO ranked second after China, with 13 PCT applications submitted internationally, followed by Australia with 12 results, China with 5, Japan and South Korea with three results each.

Country / Patent Office	Patents applications and granted patents
USA	48
World Intellectual Property Office (WIPO)	13
Australia	12
China	5
Japan	3
South Korea	3
European Patent Office	1
Russia	1

Table 1

Table 2 lists the applicants with the highest number of applications submitted in IP education, namely: IBM – 4 patent applications and granted patent, KALLURKAR SRIKANTH V – 3 results, ELAD JOSEPH B – 3 results, COLBRAN STEPHEN – 3 published documents, JOHNSON APPERSON HUNTER – 3, BLOOMBERG LP – 3.

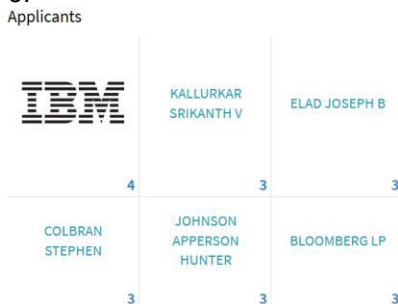


Table 2

5.3.2. Statistics on patent applications and patent granted in “digital learning” for the period 2000-2020

The inventions filed in the aforementioned period are 8572, the patents granted are 3190.

The relationship between the patent applications and patents granted for the period 2000-2020 is shown in Figure 2.

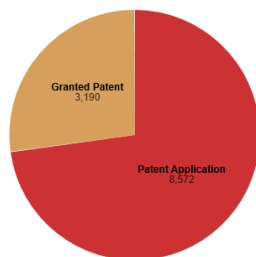


Figure 2

During the period considered, patent applications in China, the USA, South Korea, Australia, Japan, Canada, the United Kingdom, Taiwan, including those filed under the WIPO and EPO, totaled 8572, and patents for the invention granted are 3190. The total number of published patent applications in digital learning is almost three times more than the patents granted in the same field. When analyzing the results of the study on the total number of inventions filed and patents granted in the jurisdictions presented in the table below, we can conclude that the leading country here is undoubtedly the USA with 6111 documents, followed by applications submitted to WIPO - 1827 PCT applications, followed by China in third place with 1779 results and South Korea with 515 documents found. In fifth place is the EPO, which has 442 applications and patents granted, and Australia ranks sixth with 407 results.



Japan is in seventh position with 365 documents; Canada is in 7th place with 72 results, Great Britain with 69 and Taiwan with 55 results.

Country / Patent Office	Patent applications and granted patents
USA	6111
WIPO (World Intellectual Property Organization)	1827
China	1779
South Korea	515
European patent Office	442
Australia	407
Japan	365
Canada	72
United Kingdom	69
Taiwan	55

Table 3

The following table 4 lists the applicants with the highest number of patent applications and patent granted in digital learning, namely: IBM – 273 patent applications and granted patents, Microsoft – 190 results, Adobe – 135 documents, Adobe INC – 128 results, Microsoft Corp – 127, Sony Corp – 107.

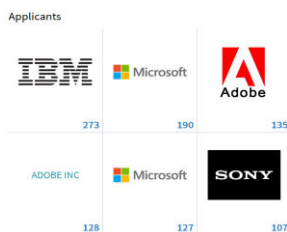


Table 4

5.4. Conclusion of the search

After analyzing the results of the study, we can conclude that patent activity of the companies in the area of IP education is very low for all the period studied. Unlike the IP education search, the digital education survey has radically different results. It is important for each of the students, in addition to conducting the patent search, to be able to correctly draw conclusions and analyze the results obtained.

6. Conclusion

Stimulating innovation and investing in technological development has a direct impact on patent protection. Businesses need to understand the nature and importance of new knowledge, as well investing resources in new developments of the companies. In knowledge based society, the knowledge of IP system as objects, rights and their management is a necessity in the education. [7] Obtaining patent protection for IP education and digital learning should be objective for the companies involved in this activity. They need to be aware of the advantages they have as patent holders – they must gain technological advancement, develop and apply innovation, protect innovative products as IP objects, and manage its IP in a way that enables it to generate profits.

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