

INTELLECTUAL PROPERTY IN THE INNOVATION ACTIVITY OF THE CONSTRUCTION BUSINESS IN BULGARIA FOR 10 YEARS PERIOD

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Abstract: *The aim of this article is to present the author's view and results of research for the intellectual property rights /IPR/ in the innovation activity of the constructive business in Bulgaria for 10 years' period. The author presents definitions for the following terms: IP, IPR and IP research as a general and for the innovations in the constructive business in Bulgaria.*

The focus of this paper is to present results of the IP research in patents, utility models and industrial designs for innovations in the constructive business in Bulgaria. Special attention is paid to the complex analysis of the research results as quantitative indicators: total number of obtained IPR, trends and ration in patents, utility models and industrial designs.

The article is structured as follows:

1. Introduction

2. Research methodological framework

3. Analysis of trends of patent for inventions and registration activity as UM and ID in constructive business in Bulgaria

4. Summary.

The practical issue of this article is presented as good examples from the Bulgarian successful innovators; natural persons, universities and companies created and operated in the constructive business in Bulgaria.

Key words: intellectual property /IP/, IP rights /IPRs/, IP research, innovations, construction business

I. INTRODUCTION

The construction business is one of the sustainable developing sectors of the Bulgarian economy in the last 10 years. In different years with different priority and relative share develop: engineering construction, office buildings, housing construction, construction in municipal projects.

Consider the analysis of the Bulgarian Construction Chamber (CCB) in 2017 were fulfilled for BGN 12.9 billion, which is an increase of almost 12% this year earlier. The rate is mainly due to the increased construction of buildings, which is 56% of the non-existent production in the sector. Here the growth is almost 18% on an annual basis. Develop engineering, which until two years ago formed the major part of the production, falls to 44%. As general there are many factors for the identified development in the constructive business in Bulgaria.

The purpose of this article is to present the author's view, observation in innovation activity and results of research for the intellectual property rights /IPR/ in innovation activity of the constructive business in Bulgaria for 10 years' period.¹

The author presents definitions for the following terms: IP, IPR and IP research

Generally, the term 'Intellectual property'²

includes **objects** – results of human intellectual work and creativity, and **relations – economic and legal** that are established during the process of creation, implementation and realization of those results in the business.¹

As general IP objects are the following: objects of **copyright** and related rights called '**art property**': artworks and performances; objects of **industrial property**: patents /P/ for inventions, utility models /UMs/, industrial designs /IDs/, trademarks /TMs/, geographical indications /GI/, protection against unfair competition, according to the Paris convention, 1883; new objects: creation of new technologies and knowledge, results of intellectual activities in scientific, industrial and cultural fields. In the focus of this article are patents, UMs and IDs for the new solutions in constructive business.

Intellectual property rights: For every object of IP exists an opportunity to obtain rights of intellectual property. This opportunity is based on the legislation in intellectual property /IP/: international conventions, regulations. European regulations and directives, national laws of the countries-members of WIPO. Those rights are called IP rights. IP rights in industrial property included patent. UMs and IDs arises following the specific legal procedure for applying, examination and obtaining a document granted the exclusive IP

rights: right to use and to license for the owner of those rights and to prohibit other persons to exercise those rights.³

IP research also called patent studies cover a range of activities, link to selection, systematize, analyze and deliberately use the information recommended in patent documents, with the help of high-tech development goals, patentability of technical solutions, design of solutions and other objects of IP, patent purity of the technical projects, whatever the time, for what finds the most effective legal protection and the most efficient economic realization of the innovation results. IP research are conducted using a special methodology using specialized sources in the field of intellectual property - paper or digital.

II. RESEARCH METHODOLOGICAL FRAMEWORK

The innovation activity as general is an object of special research and protection for IP rights in digitally based information for patents for inventions, utility models and industrial designs as following:

1. Patent /P/ for product and technological innovation – Patents for inventions

As Bulgarian patent law⁴ envisages: Patents shall be granted for inventions in any field of technology, which are new, involve an inventive step and are susceptible of industrial application. The invention may be protected by the patent. The protection conferred by the patent is limited in time and the term of validity of a patent shall be 20 years from the date of filing of the application (art. 16 of LPUMR). To obtain a patent the inventors should follow a legal procedure for the patenting of their invention, which should meet several criteria to be eligible for patent protection. Hence an invention must be:

a) world novelty - An invention shall be considered to be new if it does not form part of the state of the art. /art. 8 of LPUMR/ The state of the art shall be held to comprise everything made available to the public by means of a written or oral description, by use, or in any other way, anywhere in the world, before the filing date or the priority date, as appropriate, of the application. Novelty is a fundamental requirement of patentability.

b) exhibit a sufficient "inventive step" An invention shall be considered to involve an inventive step if, having regard to the state of the art it is not obvious to a person skilled in the art. /

art. 10 of LPUMR/

c) industrial application: An invention shall be considered susceptible of industrial application if it can be made or used repeatedly in any branch of industry or agriculture. /art. 9 of LPUMR/

2. Utility models /UM/ for new constructive and architectural components and complete decision

– Utility Model

At the lower creative level, the product innovation should be protected as a utility model (UM). In a number of countries inventions are also protectable through registration under the name of "utility model" or "short-term patent."

The requirements for legal protection /art. 73-78 of LPUMR/ are not as strict as those for patents, in particular in respect of the duration of protection, which is shorter, but otherwise the rights under the utility model or short-term patent are similar. The fees are lower. Utility models are intended for products, not methods. In the Bulgarian patent law, the certificate for the utility model shall be granted for utility models which are new, obtain inventive step and are industrially applicable.

Utility model protection shall be available to objects with structural and technical features related to the improvement of the shape or layout of the elements of products, tools, devices, apparatus or their parts, materials, etc., designed for use in production or in everyday life, and that satisfy the requirements mentioned above.

A utility model certificate shall not be granted for the methods and the objects that are non-patentable as inventions. A certificate having a term of 10 years maximum as of the filing date shall provide legal protection for utility models and its duration is 4 years as a start – filing date plus 2 periods of 3 years. At the applicant's request, an application for a patent of invention may be converted into an application for a utility model certificate until a decision is taken on the application.

3. Industrial design /ID/ for an appearance of the constructive and architectural components.⁵

– Industrial Design

The new outlook, esthetical or ornamental decisions for the existing product can be protected as industrial design (ID)⁶. Generally speaking, industrial design is the ornamental or aesthetic aspect of a useful article. Such particular aspect may depend on the shape, pattern or color of the

article. The Bulgarian ID law (Law on the protection of industrial design - LPID) says: 'Industrial design means the appearance of the whole or a part of a product resulting from the specific features of the shape, lines, contours, ornamentation, colors, or combination of such.

Product means any industrial or handicraft article, including parts intended to be assembled into a complex article, sets or compositions of articles, packaging, graphic symbols and typographic typefaces, but excluding computer programs. /art. 9 of LPID/

The right in a design shall be acquired by registration with the Patent Office as from the date of filing an application for registration. Design shall be registered if it is new and has an originality /individual character/.

a) novelty

- A design shall be considered new if, before the filing date or the priority date, as appropriate, of the application no identical design has been made available to the public by means of publication, use, registration or otherwise disclosed anywhere in the world /art. 12 of LPID/. Designs shall be considered to be identical if their specific features differ only in immaterial details that do not influence the overall perception of the design. Novelty is object of assessment by the patent expert.

b) originality /individual character/

- A design shall be considered to have an

individual character if the overall impression it produces on the informed consumer differs from the overall impression produced by a design that has been made available to the public before the filing date or the priority date, as appropriate, of the application /art. 13 of LPID/. Originality is object of assessment by the informed consumer – expert in the specific design area and business. A design must meet both of the criteria to be eligible for a protection. The design must be at once a world novelty and original in nature. An industrial design certificate having a term of 25 years maximum as of the filing date shall provide legal protection started with first period of 10 years and 4 periods of 5 years each.

The patents and UMs protect new creative innovations presented as a new construction as a whole or part, building elements or technology/method of building them. To find and analyze such results protected as IP there is a need to realize a special research of mentioned objects: P. UMs and IDs.

For the multi aspects complex research in P and UMs in constructive business we should follow the IPC in indexes: E – BUILDING and classes and subclasses in it.

For the analysis in IDs the key factor of searching IP information is the following Locarno classification fields:⁷ Class 25 Building materials and building components.

FIXED CONSTRUCTIONS

	BUILDING
E01	CONSTRUCTION OF ROADS, RAILWAYS, OR BRIDGES
E02	HYDRAULIC ENGINEERING; FOUNDATIONS; SOIL-SHIFTING
E03	WATER SUPPLY; SEWERAGE
E04	BUILDING
E05	LOCKS; KEYS; WINDOW OR DOOR FITTINGS; SAFES
E06	DOORS, WINDOWS, SHUTTERS, OR ROLLER BLINDS, IN GENERAL; LADDERS
	EARTH OR ROCK DRILLING; MINING
E21	EARTH OR ROCK DRILLING; MINING
E99	SUBJECT MATTER NOT OTHERWISE PROVIDED FOR IN THIS SECTION [2006.01]

III. ANALYSIS OF TRENDS OF PATENT AND REGISTRATION ACTIVITY AS UM AND ID IN CONSTRUCTIVE BUSINESS IN BULGARIA

1. Research results in innovation activity

Based on the scientific methods and expert skills realized complex IP research for P, UMs and IDs (Borisov, 2003; Markova 2016) for protected innovations in constructive business shows the following conclusions and table summarized table and graphics:

Research results and conclusions:

There are identified patent and registration in UMs and IDs activity as follows:

a) Approximately per year of the 10 years' period the total patent application, UMs and IDs registrations are: 2009 – 70; 2010 – 70; 2011 – 50; 2012 – 160; 2013 – 100; 2014 – 80; 2015 – 70;

2016 – 105; 2017 – 110; 2018 – 60.

b) High level of application and registration activity in area of construction business for 10 years' period. Approximately 6-10 % of all patent applications and UMs annually are in the field of construction business.⁸

c) High level of IDs registration activity in area of construction business for 10 years' period. Approximately 15-23 % of all IDs annually for the years of weak activity /2011, 2015/ approximately 60% of all IDs annually activity for the years 2016 and 2017 in different years in the 10 years' period are in the field of construction business.

d) The business interest for patent protection is about 7 years due to the patent maintenance procedure and rising level of state fees.

For UMs and IDs there are the sustainable trend to maintain the protection about 10 years.

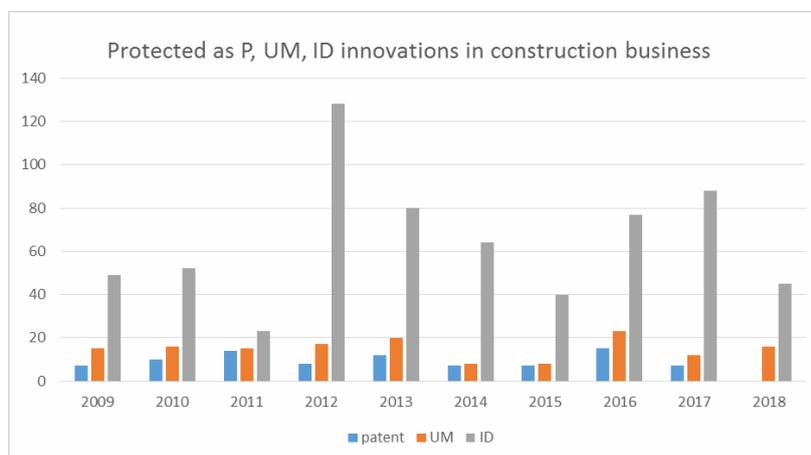
Table 1

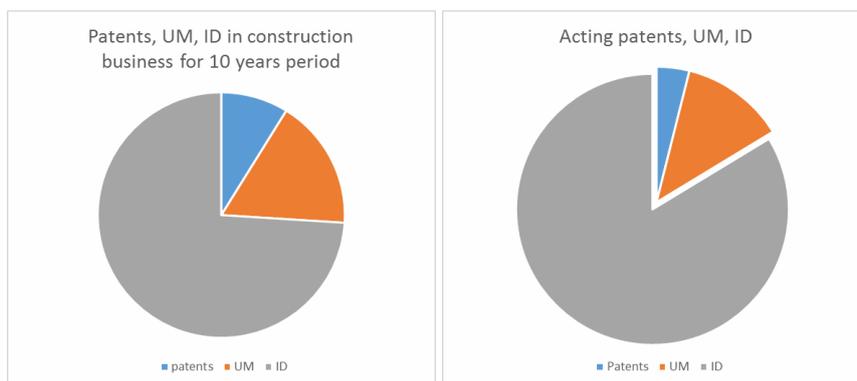
Patent and registration activity in UMs and IDs

Year	Patents/ number incl. acting and applications	Utility models/ number and acting	Industrial designs/ number and acting
2018	0	16/ 16 acting	45/ 45 acting
2017	7/ 7 in expertise	12/ 12 acting	88/ 88 acting
2016	15/ 1 acting and 14 in expertise	12/ 12 acting	77/ 77 acting
2015	7/ 1 acting and 6 in expertise	23/ 19 acting	40/ 40 acting
2014	7/ 1 acting and 6 in expertise	8/ 8 acting	64/ 62 acting
2013	12/ 6 acting	8/ 6 acting	80/ 77 acting
2012	8/ 5 acting	20/ 10 acting	128/ 128 acting
2011	14/ 4 acting	15/ 2 acting	23/ 23 acting
2010	10/ 4 acting	16/ 6 acting	52/ 34 acting
2009	7/ 1 acting	15/ 3 acting	49/ 7 acting
Total:	77/ 27 acting	150/ 86 acting	646/ 581 acting

Note: The data and trends obtained are only directly related to the construction business results. There are not included business-related solutions that are classified, for example, in areas such as electrical equipment, photovoltaic roof structures, furniture, wallpaper and other equipment and furnishings.

Infographics for protected innovations as patents, UMs and IDs





2. Illustration examples of IPR in constructive business

To illustrate IPs – P, UMs and IDs acting in Bulgaria:

A. APPLICATIONS FOR PATENTS

1) ABSTRACT BG 2731 – TECHNICAL UNIVERSITY SOFIA

A sound insulating panel for limiting the propagation and absorption of sound waves consisting of two or more substantially horizontal non-metallic channels disposed one above the other, since the recessed sides of the grooves are directed laterally in the same direction, concave in the grooves (1) is a semi-cylinder shape and the border region between two adjacent channels is shaped as a sharp edge (3). One or more soundproofing panels may form a noise-proofing scotch which also includes vertical bearings (2) and fasteners (5 and 6) for securing the soundproofing panels to the vertical bearings (2). 9 claims, 5 figures

2) ABSTRACT PATENT BG 112237 - SOLID

The invention relates to a door locking system with a simultaneous independent mechanical and electromechanical lock consisting of a microprocessor control controller with a built-in firmware (1) connected to a mechanical lock with a chuck (2) by means of a connecting cable (3) to a mechanical sensor for the condition of the lock (4) and to make a connection with an electromechanical lock (5) by means of an RFID antenna (6) and a button (7) with an indication of the inside control.

B. REGISTERED UTILITY MODELS

1) UM Solar heating system of 'MKM PRODUCT' LTD 2011

Solar heating system is designed for heating of closed premises in residential and industrial buildings, offices, hotels by accumulation and utilization of solar energy. It consists of two main elements - a solar panel (1) and a composite storage wall (11) built up of

thermo-accumulating elements (10). The panel (1) is made of heat-insulating double-folded with aluminum material, the front wall (4) being lowered, made of a transparent material with maximum duration of sunlight. The air ducts (6a and 6b) pass through the wall (8) and connect to the solar panels (1) with a rechargeable wall (11). During the cold months, the conical suction (7) is closed, whereby hot air (14) remains and circulates between the solar panel (1) and the accumulation wall (11). During the warmer months, the conical suction (7) is open and the sun-heated air in the panel enters the atmosphere, leaving cold air between the thermos accumulators (10) to keep the room cool.

2) UM "Facade thermostat" – 2012

The facade thermostat will be used in the construction of buildings with a very high level of energy efficiency and its structure according to the useful model is formed by an external part (1) and an inner part (2). The outer part consists of cladding elements (5) and profiles of galvanized sheet metal (12), all of which are covered in one layer of expanded rigid polyurethane (9). Along with the lining elements, or instead of them, canvas of photovoltaic system or solar collectors (22) can be used. The inner part (2) comprises a supporting structure of steel profiles (10, 11), limiting profiles of galvanized sheet (6), mineral wool sheets (18), expanded layer of rigid polyurethane (9) and fastened with fixing screws or two layers of gypsum fiber boards (13) with a built-in coil of pipes (8) forming part of the internal heat transfer system. The outer half (1) and the inner half (2) are spaced apart at a distance defining the thickness of the wall by placing a layer of mineral wool (4) between them, and the joining of the two halves in one is accomplished by means of a rounded- polyurethane (3)

Owners: Javor Radoslavov Radoshev; Radoslav Jankov Radoshev, Varna

3) Two-sided noise insulating panel and noise

insulating scotch block 2017

The two-sided noise insulating panel and noise insulating scotch block are applicable to noise insulation of roads, railways, high level noise industries and others. The noise insulating panel consists of two groups of two or more substantially horizontal non-metallic semi-cylindrical channels (1) located one above the other, as the one group of channels are located on one side of the panel with directed laterally concave sides and the other group of channels is located on the other side of the panel whose concave sides are laterally directed in the opposite direction to the first group, as the channels (1) of one group are displaced in a vertical direction to the channels (1) of the other group to one radius. The noise insulating scotch block is made up of two-sided noise insulating panels and vertical bearings representing U-shaped or H-shaped (double T-shaped) vertical profiles in whose H-shaped grooves the edges of the noise insulating panels are inserted. 10 claims, 4 figures

Owner: Tehnicheski univesitet Sofia

4) UM Constructive panel, 2018

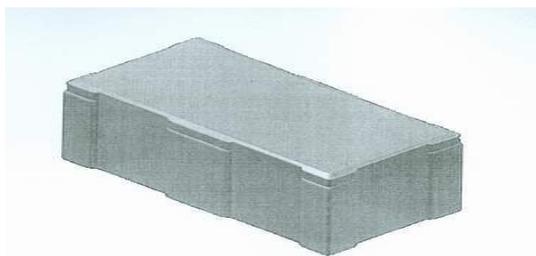
The panel is used in construction for the construction of different types of buildings. Its use achieves high insulation characteristics, increased stability and durability of the constructions, which are of low cost and relatively easy installation, without the need for special technologies and skills. It consists of a wooden frame (5) with longitudinal (8) and transverse (9) beams that form cavities, each cavity being filled with mineral wool (3). The frame (5) is lined with outer (4) and inner (1) panels, and the mineral wool (3) is 3 to 150 mm thick and is encased in foil foamed polyethylene (2). The entire length of the frame (5) on the side of the outer panel (4) accommodates at least one first layer (6) of foil foamed polyethylene

Owner: Konstantin Bojkov, Plovdiv

C. INDUSTRIAL DESIGNS IN THE CONSTRUCTION BUSINESS

Industrial designs: the registered IDs are related to the constructions, including elements, profiles, booths, panels, concrete building blocks, lockers, doors.

Examples:



Concrete block/ 2018



Building thermo-isolated element 1/2017



Building thermo-isolated element 2/2017



Pavilion 1 /Kiosk/2012



Pavilion 2 /Kiosk/2012

IV. SUMMARY

1. We identified that the Bulgarian business participants have a steady interest to protect their innovations in the construction industry using IPR for the period of last 10 years with a various numbers of patent applications and registrations in UMs and IDs during the 10 years' period.

2. We identified high level of application and registration activity in UMs and IDs area of constructive business for 10 years' period. Approximately 6- 10 % of all patent applications and UMs annually are in the field of construction business.⁹ It is approximately 15-23 % of all IDs annually for the years of weak activity /2011, 2015/, approximately 60% of all IDs annually activity for the years 2016 and 2017 in the different years in the 10 years' period are in the field of constructive business.

3. There are clear economic reasons for construction business to obtain, maintain and sustain their IP rights: to win a better economic results: turnover, profit and price of monopoly state; to sustain a leader position on the market for next years and to achieve additional economic benefits: license payments, business agreements, etc.

NOTES

¹ www.bcci.bg, www.capital.bg

² The already mentioned in this study regulations in IP incl. Convention for the establishment of WIPO, 1967, are accessible on the site of WIPO World intellectual property organization - www.wipo.int and on the site of EPO /European patent office: www.epo.org

³ For more information: www.bpo.bg, www.wipo.int, www.epo.org. There are many international and regional regulations for protection of patents, industrial designs and trademarks. Most important of them are the following Patent Cooperation treaty – PCT (1970), European Patent Convention - EPC (1977), Agreement of the trade related aspects of IP rights – TRIPS (1994), Madrid system for trademarks - Madrid agreement (1891) and Protocol (1989), Hague agreement for industrial design (1925), etc.

⁴ Law on patents and utility models registration /LPUMR/

⁵ www.bpo.org.; www.epo.org/espacenet, www.bpo.bg: Patent law and registration of UM, SG, 1993, N 27; Law for industrial design, SG, 1999, N 81.

⁶ For more information: Markova, M. (2010) *Design management*, PC "Stopanstvo", Sofia; Markova, M. (2008) 'Protection of ID in country and abroad', *OHIM and BPO edition*, Sofia

⁷ For International patent classification /IPS/ and for ID classification – Locarno classification you may visit www.wipo.int/classification/en. In ID there are many related to the construction business classes that are skipped in this article to not avoid a focus.

⁸ P and UMs approximately per year: 2009-2012 – 460; 2013 – 650; 2014 – 450; 2015 – 550; 2016 – 700; 2017 – 500;

IDs – approximately per period: 2011-2015 – 250; 2016-2017 – 150.

All data and facts regarding this matter is accessible on the official web site of BPO.

⁹ Patents, incl. applications, and UMs as a total number approximately per year: 2012 – 460; 2013 – 650; 2014 – 450; 2015 – 550; 2016 – 700; 2017 – 500;

IDs – approximately per period: 2011-2015 – 250; 2016-2017 – 150.

All data and facts regarding this matter is accessible on the official web site of BPO.

REFERENCES

Borisov, B. (2003) *Methods for patent research*. Sofiya: Izdatelstvo "Stopantsvo"

Markova, M. (2013) "Management of company innovations as IP", *Economical Alternatives Journal*, Vol. 1, Sofiya: Izdatelstvo "Stopantsvo"

Markova, M. (2016) *IP research for business education*. Pixel, Italy.

Law on patents and UM registration, State gazette N 27, 1993

Law on industrial design, State gazette N 81, 1999

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