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Patenting of Software Embarked Under the Optics of Brazilian Legislation

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ABSTRACT
Embedded Electronics Systems are types of systems that are present in the day to day in the most diverse equipment, developed to solve technical problems of repetitive form. The purpose of this case study is to present questions about the possibility of registration and patentability of an embedded software, developed for the automation system of a residence. The methodological course is characterized as a qualitative approach, a descriptive character, case study method, for which a fictitious case was used, documentary analysis was also used. For this purpose was analyzed Laws 9.279/98 on Industrial Property, 9.610/98 on Copyright, 9.609/98 on Software Registration and the Resolution Nº 158, dated 11/28/16. After the documents analyzed, it can be concluded that the computer program in embedded system format can follow different paths of protection, such as patent process (patent law) and registration as a computer program (direct author). This case can be used to raise a discourse to a better understanding about the patents of processes involving computer program.
Keywords - Patent process; Embedded system; Record.

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I. INTRODUCTION

The process of intellectual protection is a preponderant factor for the decision making regarding its registration. According to the World Intellectual Property Organization (WIPO), Intellectual Property corresponds to the protection of rights in literary, artistic and scientific works, as well as on scientific discoveries, designs, trademarks and industrial models, geographical indications, computer programs (Sherwood, 1992; Barbosa, 2003).

Concern about patent acquisition has been growing in recent years (Wright, 2008) to the extent that Intellectual Property is extended a process. In this sense, protecting an invention through the acquisition of patents, while being a valuable action, can be a daunting challenge (Bressler and Bressler, 2014), because there are different ways of protecting an intellectual creation (Rodrigues; Lage and Vasconcellos, 2011).

Rai, Schultz and Funkhouser (2014) attributed the difficulty in the diffusion of certain technologies to the complexity existing in processes of protection of intellectual property, besides the understanding of the courts in several countries (Pathak, 2015). One of the problems in the patent flow is the doubt as to how best to go to the registration application (Pereira, 2011). As for example, the cases of embedded systems and computer programs.

With the development of information and communication technologies, embedded systems have become part of people's lives in the most varied situations, at home, at work, in educational institutions, in services (Cunha, 2007). The development of platforms for these systems has also been growing in a directly proportional way. Embedded systems, for example, may be present in a smartphone or a microwave oven, designed to perform a specific function, where the efforts of the process are repetitive. (Barros and Cavalcante, 2003).

Recent research carried out by Strategy& and consulting PwC 13ª Globo Innovation, reveals

that global research and development 3,2% in 2017 reaching a total of $ 701.6 billion, the software and internet industry was the follow-up that most contributed to the investment in innovation with growth of 16.1% along with Research and Development (PWC, 2017), confirming the importance that this sector has for the technological development of a country.

The growth of the software industry raises a discussion about its protection and registration of systems (Saur, 2004). In Brazil, these issues become even more punctual because of changes in legislation, control, and the various types of records regarding invention, which allows of so many interpretations for authors and users.

According to item V of article 10 of Law 9.279 of May 14, 1996, Industrial Property, "the computer program itself", cannot be patented, because it is not evaluated as an invention and no model used (Brasil, 1996), being its framework as in Copyright Law 9.610, of 19 February of 1998. In analyzing the two laws, there is a double possibility of examining products that have embedded systems (Brasil, 1998).

Starting from the idea of dissociability between product and process, a system embedded in a house, in addition to the author's records of the architectural design and software, of the industrial design patent, could also be considered an process patent? The objective of this paper is to present a case study with questions about registration of the possibility of the patentability of embedded software, developed for the automation of the house.

A model project of a house was developed by three professionals, an architect, a programmer and a builder. This project was prototyped on average wireframe better understanding of the case. The architect designed the house in a modular way, facilitating its assembly quickly and efficiently. The house has sustainable concepts, built from 2 (two) Containers. In this model perspective, the house can be built on an industrial scale and its main architectural differential is the roof that captures photovoltaic energy, a temperature sensor and a humidity sensor. The programmer has developed a computer system, which controls all the actions of the house through Embedded Software installed in the house, also responsible for the execution of the developed project, as well as all the construction and assembly of the pieces. The introduction of the paper should explain the nature of the problem, previous work, purpose, and the contribution of the paper. The contents of each section may be provided to understand easily about the paper.

II. METHODOLOGY

It is a case study (Yin, 2005 and Miguel, 2007), for seeking broad and detailed knowledge, with a qualitative approach (Silva and Menezes, 2005) for dealing with subjective and particular traits. It has a descriptive character (Godoy, 1995) because it analyzes the data present in the Laws and Resolution that seeks to protect the rights of inventors.

In the first stage the issues related to the registration of computer programs are presented, according to Law 9.279/96, of Industrial Property; 9.610/98 Copyrights and 9.609/98, registry of the software, in addition to Resolution 158, dated 11/28/16 (INPI, 2016), corresponding to the Guidelines for Examination of Patent Applications, involving inventions elaborated by computer programs.

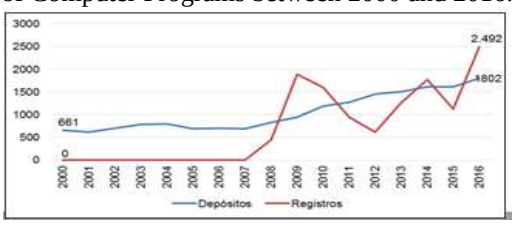
III. RESULTS AND DISCUSSION

Studies show that concern over the protection of inventions has been growing year after year due to the advancement of each country's innovative capacity (Burhan and Jain, 2015). In 2014, for example, China overtook the United States and Japan and already has more patent applications than the two countries added. Despite this growth, China has experienced substantial growth in trademark registration. (18,2%), but a decrease in the number of industrial project patents (14,4%).

Brazil has had a latent growth in the last 15 years. According to information from INPI (2017), the growth rate between 2002 and 2011 was 6.1%. This represents an increase in patent applications by 1.6 percentage points, above the world rate (4,5%). In 2014, the country ranked the second country with the highest number of patent applications with more than 7,400 applications, only behind the United States with more than 9,600 applications (ERWP, 2014).

In the context of evolution in the protection regime, the demand for registry of computer programs in Brazil is increasing. Between 2000 and 2016, for example, it was requested to register more than 17,800 programs, with a number of more than 12 thousand registered computer programs. Thus, more than 68% of applications for registration were granted (INPI, 2017). Figure 1 below shows the evolution in the number of applications and registrations of computer programs between 2000 and 2016 in Brazil:

Figure 1. Comparison between deposits and records of Computer Programs between 2000 and 2016.



Note: Deposits, Records

Law 9.609/98 covers the protection of Intellectual Property of computer program, presents in its first article a concept of computer programs as follows:

[...]expressão de um conjunto organizado de instruções em linguagem natural ou codificada, contida em suporte físico de qualquer natureza, de emprego necessário em máquinas automáticas de tratamento da informação, dispositivos, instrumentos ou equipamentos periféricos, baseados em técnica digital ou análoga, para fazê-los funcionar de modo e para fins determinados (Brasil, 1998).

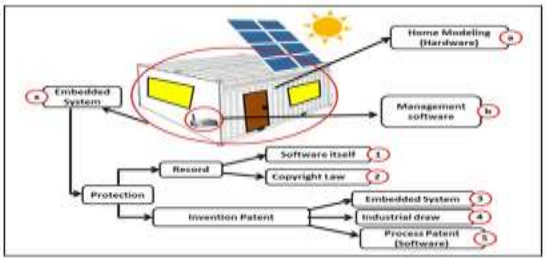
Based on the information presented, it can be seen that the languages coded or not included in the programs inserted in products, like the one proposed by this study, can be registered as a computer program because it is an "expression of an organized set of instructions in natural or coded language, contained in physical support of any nature, "as indicated in the paragraph of said Law.

One of the aspects that can be highlighted in the search for software registration as a computer program is the deadline. According to the INPI (2017), the average time of registration after the deposit is ninety days. This point is a preponderant factor to use this type of record.

Resolution 158/16 published by INPI presents in its aims the best practices and procedures in the processing of patent applications, taking into account for this the principle of efficiency, thus considering social interest and the technological and economic development of the Country. Its main objective is to establish the guidelines of analysis adopted by the INPI to assist the technical examination of patent applications involving inventions implemented by computer program.

For resolution, patent applications which refers to inventions implemented by computer program may be considered as process, thus may be characterized as patent of invention. The invention must meet the requirements of novelty, inventive step and industrial application and, in this case, in accordance with art. 9, a process patent can not be considered as a utility model. For this it needs to fit the legal requirements of Law 9.279/96, where it defines the criteria of patentability. Figure 2 presents an illustrative schematic on the case under study.

Figure 2. Schematic case study.



Legend
a) Modular house or hardware;
b) Home Role Management Software;
x) a + b embedded system (microprocessor system usually with specific requirements).

Possibilities of protection
1 e 2 - Registration by laws n. 9.609/98 of the Copyright Law, Law 9.610/98 of registration of the software;
3, 4 e 5 - Protection of the Patent of the process according to Law 9.279/96, of Industrial Property and Resolution 158, of 11/28/16.

The computer program itself cannot be considered patentable because it is merely a mere expression of a technical solution, if applicable, in the Copyright Law. It is worth noting that during the evaluation process, if the computer program is considered to solve a "technical problem" and achieves a "technical effect", it is considered as a patented invention. under what conditions the computer program solves technical problems and has technical effect?

Criteria for technical effect for computer program

- Optimization (…runtimes, hardware resources, memory usage, access to a database);
- Improved user interface (That goes beyond aesthetics);
- File management, data commutation, etc (Space and file management).

Another important point of the resolution is in section 3, which deals with the classes of processes of inventions implemented by computer program, that is, in addition to being in accordance with the Industrial Property Law (9.279/96), and in the administrative acts technical effect, they may be characterized by:

- Process that uses physical quantities to generate a physical product or effect. (processes linked to transformation and control to generate another product);
- Process that uses physical quantities to generate a virtual product. (Data processing for generation of a virtual product, such as video, music, image);
- Process that uses abstract quantities to generate a virtual product. (processes linked to virtual data manipulation).

The software developed to operate the functions of the house as an embedded system can be considered as an invention because it meets the requirements of the technical effects in Table 1, so it is possible to apply industrial patents.

IV. CONCLUSION

The dissociability between products and processes is a subject that has been raised during the

last few years when it refers to its protection, therefore, the registration or patent of invention implemented by computer program becomes an instigating issue within the field of Intellectual Property. In the normal flow of registration a product that has embedded software can be patented. The study of this case demonstrated that the development of software for residential automation can follow more than one way for its protection.

Based on the collection of information and the content analysis of Law 9.279/96, Industrial Property Law, 9.609/98 Copyright Law, 9.610/98 registration of the software and Resolution 158/16, it was possible legal certainty that it is possible to apply for patent. The inventor with the objective of commercialization of the program itself can seek its registration (copyright), having as main advantage the ease in the end of the concession process, on the other hand, it is also possible to patent the process, ensuring greater security of its creation.

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