
Gymnastics, Innovation and Technological Development: An intellectual property perspective

Ginástica, Inovação e Desenvolvimento Tecnológico: Uma perspectiva da propriedade intelectual

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ABSTRACT

Intellectual property can be conceptualized as the branch of private law that regulates legal relations directed at intellectual production, particularly the interests of authors, inventors and/or those created in their productions, both in material and moral aspects. The concern of this study is to know whether gymnastics stimulates the production of technology and technological development, to investigate whether this sport goes beyond sporting elements, and to present a new perspective on gymnastics and its social contributions. Following the principles of documentary research, the technique of document analysis was applied to systematize and construct the principles of the present study. Initially, it was necessary to carry out a bibliographical survey to provide theoretical depth on the topic: Intellectual property and gymnastics. Having some results that gymnastics has elements for technological development, being an area of production and technological innovation, in addition to stimulating and attracting the attention of researchers, inventors and technology creators.

Keywords: Gymnastics; Innovation; Intellectual property; Patents.

RESUMO

A propriedade intelectual pode ser conceituada como o ramo do direito privado que regulamenta as relações jurídicas direcionadas sobre a produção intelectual, particularmente sobre os interesses de autores, inventores e/ou criados sobre suas produções, tanto nos aspectos materiais como morais. É inquietação desse estudo, saber se a ginástica estimula a produção de tecnologia e desenvolvimento tecnológico, investigar se essa modalidade esportiva vai além dos elementos desportivos, e apresentar uma nova perspectiva sobre a ginástica e suas contribuições sociais. Seguindo os princípios da pesquisa documental foi aplicado a técnica de análise documental para a sistematização e construção dos princípios do presente estudo. Inicialmente se fez necessário realizar um levantamento bibliográfico para o aprofundamento teórico sobre o tema: Propriedade intelectual e ginástica. Tendo com alguns resultados que a ginástica possui elementos para o desenvolvimento tecnológico, sendo área de produção e inovação tecnológica, além de estimular e atrair a atenção de pesquisadores, inventores e criadores de tecnologia.

Palavras-chaves: Ginástica; Inovação; Propriedade Intelectual; Patentes.

INTRODUCTION

Gymnastics is historically the body element produced and used for different purposes in its functionality. Since its beginning in the Middle Ages, in Greece and Rome, gymnastics had utilitarian contours for the development of beauty, physique and spectacle. Initially, contributing to the sculpting of bodies at the time, gymnastics occupied a prominent scene, being evidenced only by the proletariat, self-clergy of the time, with its practice carried out only with calisthenic exercises. Gymnikos, the name for the technical standards of the period, and gymnós, which would be the way of performing the exercises (Lopes, Carbinatto, 2020). During this period, gymnastics was performed without the presence of technology and its purpose was to improve the body.

Over time, gymnastics continues to be a mechanism to meet the needs of societies, but acquiring political characteristics and a hygienist, socialist and eugenicist character, like German gymnastics which sought disciplinary, patriotic, mechanistic, militaristic training and aimed at training for the defense of the homeland (DE Lima, Pinto, 2020). Another gymnastic method was the Swedish one with a strong current towards pedagogy, the emergence of the scientific universe and the biological, anatomical and morphological foundations of the exercise, also aiming at the eugenics of races, creating strong men and women for the systematization of strong children in favor of the defense of the homeland. Another method was the French model, disseminated with the mission of strengthening the physical, mental and moral, with the logic of forming a society focused on the development of the nation, with the aim of strengthening the race (Murbach et al. 2022). It is worth highlighting that all the methods mentioned had similar characteristics in their practices, they were models used to remedy the ills of the time and always with the idea of indoctrinating the population for work, homeland and/or land protection.

Following the logic of the evolutionary process of gymnastics, it is time to mention the English method, which, deviating from the standard, led the gymnastic method to systematize the sport, to value overcoming limits, where gymnastics was used to improve performance, to improvement of technical gestures and improvement of athletic indices and records. The development of gymnastics based on the psychological, physical and moral aspects is encouraged. Therefore, gymnastics is seen as a spectacle and aimed at attracting the attention of the masses (Medeiros, 2015). Having illustrated a little of the epistemological process of gymnastics, it is necessary to address how it enhances the production of technology in its practice.

Gymnastics can be practiced in contemporary times with numerous purposes and perspectives, whether for prophylactic, therapeutic or sporting purposes, it is a cultural element present in almost all sectors of society, at work such as workplace gymnastics, on the streets such as gymnastics for everyone, in sporting events such as rhythmic, artistic, floor gymnastics, among others (Pereira, 2023). The fact is that gymnastics in all its proportionality is an object of study by scientists, inventors, and contributes to the development of technologies and innovation. Because technology is almost always used in practice, just reflect on the equipment used in artistic gymnastics, for example.

To this end, the aim of this study is to investigate and build information on the contribution of gymnastics to the development of technologies, how this sporting modality encourages production and innovation in Brazil, as well as understanding gymnastics stimulates the production of technology, using the bank as a parameter. data from the World Intellectual Property Organization (WIPO), through patent registrations.

Scientific Problem

Intellectual property studies the protection mechanisms and records of innovations, inventions and the technological development of society, through its protection mechanisms it is possible that inventors, creators, scientists, among others, can have the necessary guarantees for the use of their creations and inventions (Vicente, 2020). Within the interfaces of intellectual property, registration through patents makes it possible to map the level of technology production in a given country. Therefore, the concern of this study is to know whether gymnastics stimulates the production of technology and technological development, to investigate whether this sport goes beyond sporting elements, and to present a new perspective on gymnastics and its social contributions.

Main goal

Map through the national intellectual property system the production of technology stimulated by the practice of body gymnastics.

Specific objectives

Check and analyze which patents are registered and related to gymnastics.

Identify patents used for gymnastics involvement.

Describe and present how gymnastics is a source of production and technological innovation.

Methodology

Following the principles of documentary research, the document analysis technique was applied to systematize and construct the principles of the present study, as the source of information was collected at the INPI National Institute of Intellectual Property, through patents, which are documents and records. (Junior, 2021). Initially, it was necessary to carry out a bibliographical survey to provide theoretical depth on the topic: Intellectual property and gymnastics. Then, it was necessary to follow the following methodological procedure. Accessing the page of the National Institute of Intellectual Property Ministry of Economy < <https://www.gov.br/inpi/pt-br>>, clicking on the patent tab, then accessing the advanced search tab on the page < <https://busca.inpi.gov.br/pePI/jsp/patentes/PatenteSearchAvancado.jsp>> and inserting the descriptor 'gymnastics', three hundred and eight processes were found. For the analysis, the following route was carried out: First, individually identifying the country that requested registration, then categorization of Brazilian states and registrations, followed by a temporal search of requests and registrations and finally the CIP. Subsequently, it was necessary to categorize the information following the following process: year of registration, IPC or international patent classification. Finally, the data was organized into graphs.

Intellectual property and patents

Intellectual property can be conceptualized as the branch of private law that regulates legal relations directed at intellectual production, particularly the interests of authors, inventors and/or those created in their productions, both in material and moral aspects (Buainain, Souza, 2019). In Brazil, intellectual property follows the principles that apply in other legislation in other countries, this was structured through pacts developed over the years, at conventions and events.

Intellectual property is subdivided into two aspects and in Brazil it can be directed to copyright or industrial rights. Here the direction will be highlighted in copyright, as the objective

is to identify production and technological innovation through patents. In the context of copyright, technologies developed with the purpose of solving society's problems originating from the intellect come into play. Creations in the industrial model can be thought of in four categories: inventions, utility models, brands and industrial designs (CERQUEIRA, 2019). From this perspective, the aim is to find patents correlated to one of these categories, the theme as the axis of production elements for gymnastics.

In Brazil, the law that regulates industrial rights is law nº 9,279, of May 14, 1996, which states that inventions that meet the following requirements are patentable: novelty, inventive activity and industrial application. In such a way that its applications enable technological improvement and development for society (De Ribeiro, 2020). In this way, at the moment a patent is registered and its design is acquired, it is possible to affirm that there is a potential for significant improvements in the invention in relation to its developed context.

After the invention is created, the author needs to receive due credit for his productions, for this there is the possibility of registering his invention with the INPI seeking protection through industrial rights, thus receiving protection. This is called a patent, as it is conceptualized as legal protection over the invention. Being patented means that the invention is granted and accredited (Keder, 2021).

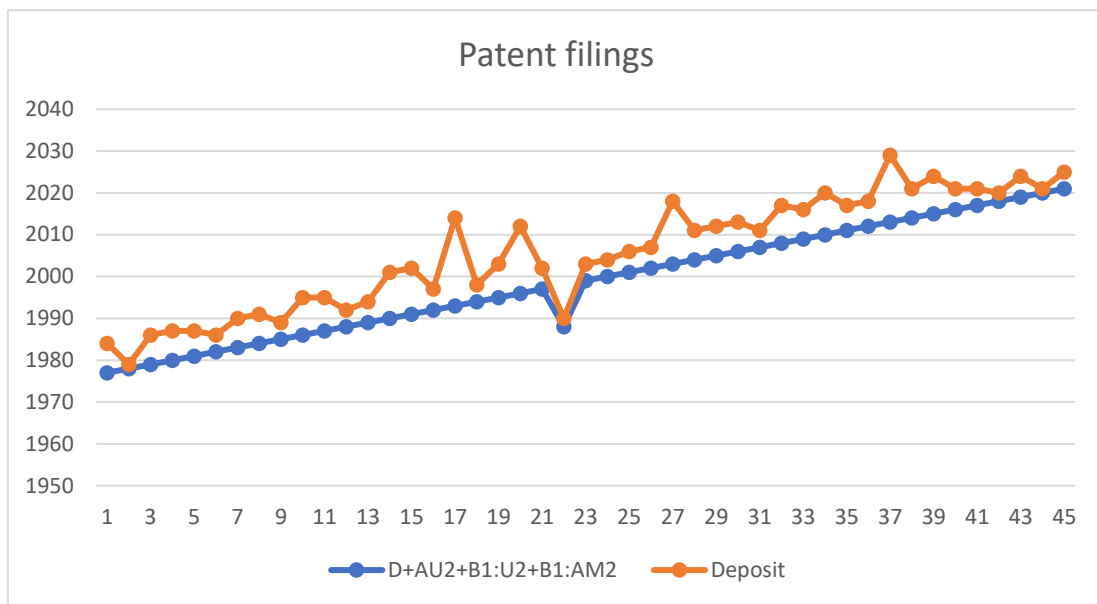
By receiving the patent, it is possible for its holder to be able to guarantee, during the period of its validity, the protected territory, profit from the exploitation of his invention, commercialize his goods, and have his credits for production guaranteed and secured (Keder, 2021). Therefore, it can be said that industrial production makes it possible for the inventor to have his rights guaranteed, and thus production and innovation to be stimulated.

Therefore, industrial rights, through the patent process, play a significant legal role, which ends up culminating in impacts for the scientific, inventive and social community, when the production of technologies is stimulated, and guarantees the rights of their inventors, making it possible leverage the region's technological development. Therefore, this mechanism becomes significant for identifying the triggers of innovation and technological development.

Results and discussions

Figure 1 shows an evolution in the registration and filing of patents, it is evident that between 1970 and 2022 the National Institute of Intellectual Property registered and granted 308 patents in the area of intellectual protection aimed at gymnastics. These data elucidate gymnastics as a mechanism that awakens and stimulates the production of technologies and innovations. The data corroborates another aspect, showing how Brazil produces little when compared to the international market, directly impacting the economy, this being a response to the low incentive from public authorities for the development of science in Pai (Campos and Dening, 2011).

Figura 1 – Patent production-gymnastics



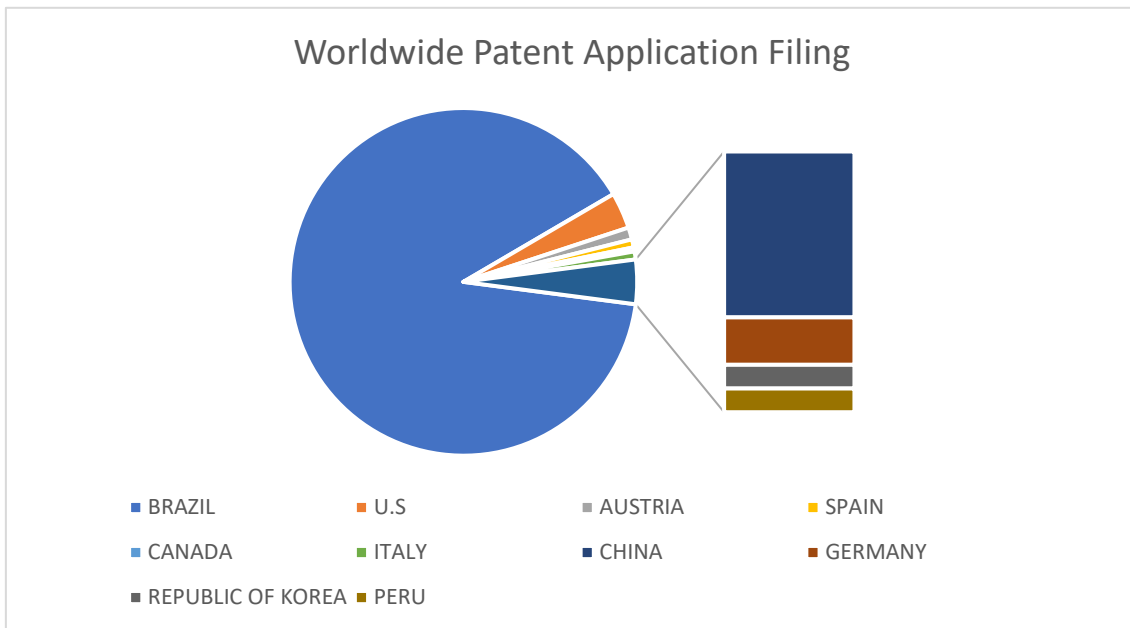
Fonte: Ramos, et al (2023)

The data in figure 1 also shows that after 1990 there was an increase in the registration and design of patents, illustrating that the production of innovations for the context of gymnastics has maintained a pattern since its beginning in 1977, in which until the year 2021 it occurred at least 1 registration per year. This element points to the interest in the production of technologies for the practice of gymnastics. This information reverberates in the Innovation Ecosystem studies in the area of Physical Education and Sport: challenges and perspectives by Claudino, which presents an imminent interest of inventors in the sporting scenario (Claudino, 2023).

Next, it is time to discuss the information in Figure 2, which presents a mapping of the request for registration and conception of patents across the world. It is worth noting that the research was carried out in the national patent database, making it clear that there is a large discrepancy between Brazil and other countries. However, it is still possible to emphasize that through the research it was possible to verify the interest of countries from the West, East and Asia in the Brazilian market, also linked to the field of innovation and gymnastics.

It is from this perspective that the growth strategy study of new sales verticals in e-commerce discusses the need to take advantage of this interest and encourage relationships, aiming at the growth of inter-relationships, providing greater impacts for the economy, giving even more prominence for production and innovation (Massari, 2020).

Figure 2 Distribution of patent designs in the world

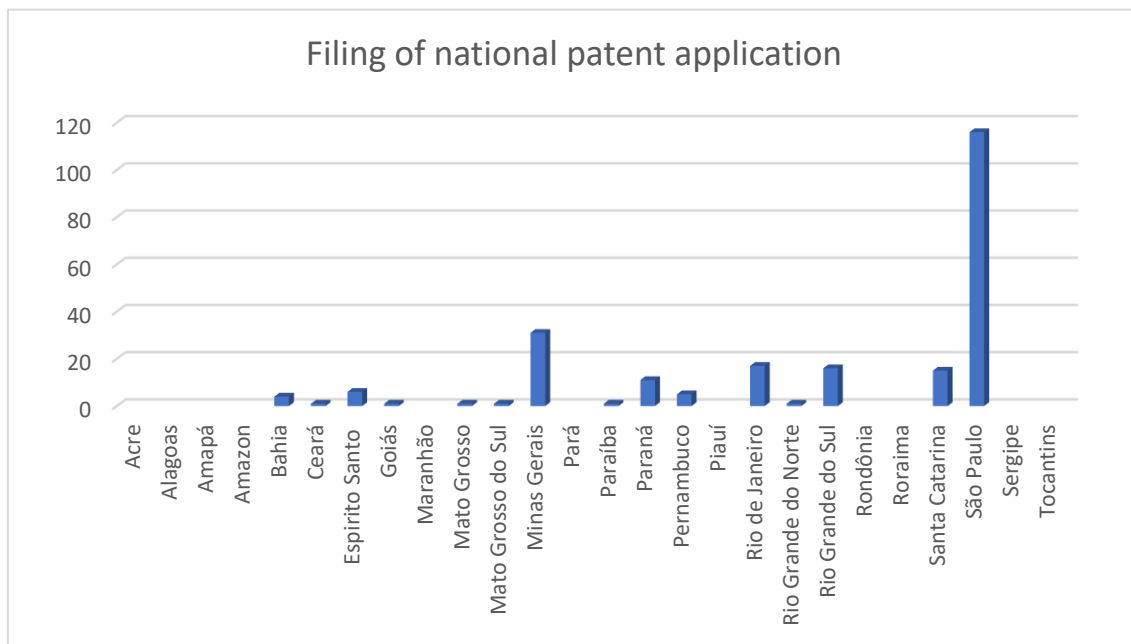


Fonte: Ramos, et al (2023)

Figure 2 presents the distribution table of patent registration requests, in which it is possible to see that the United States and China have a greater number of patent designs, when compared to other countries. Brazil is the country with the largest number of records, a fact conditioned by the study being carried out in the national database. The fact is that there is interest from other economic powers such as the United States, Spain, Germany and China with a view to producing innovations in the field of gymnastics, emphasizing the relevance of this body practice, confirming that gymnastics is a source of production of innovation and technological production.

Figure 3 highlights the distribution of patents in Brazilian territory, here it is possible to highlight the reach of technologies aimed at gymnastics in the national territory, where, among the 26 states in the country, there is registration in 16, showing the dissemination of technological production in the country.

Figure 3 - Distribution of patent designs in Brazil



Fonte: Ramos, et al (2023)

In figure 3 it is possible to notice that the state of São Paulo is the largest producer, followed by Minas Gerais, and with a small margin for states such as Rio de Janeiro, Santa Catarina, Rio Grande do Sul and Paraná. Such information can be referenced from two perspectives, on the one hand the need to expand stimulus policies for the production of technologies, on the other to give greater incentive to the state of São Paulo, to continue its production and technological contributions. Noting the production of technologies in Brazil aimed at gymnastics is a remarkable fact, as it presents a new perspective for gymnastics, further expanding its relevance to society.

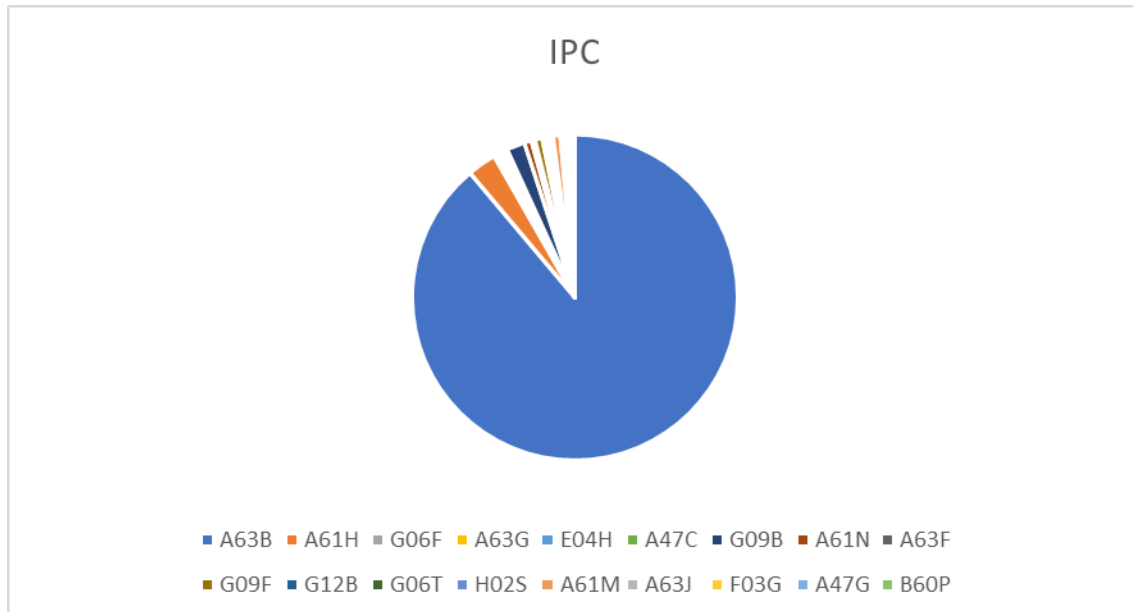
In general, sport is highly attractive, there is great interest in the scientific world in the production of technologies aimed at improving performance, or even in the production of devices and mechanisms that help in the operationalization of sports (De Mesquita Siqueira, 2020). In this way, it is clear that gymnastics follows this dynamism towards sport, being a reference in the segment.

Figure 4 presents the international patent classification (IPC), the IPC is used as a catalog that allows specifying the technical content of the patent, thus allowing greater ease in searching for information about the patented product, also serving as a database in the statistical construction of intellectual property (Tatum, 2018).

In figure 4, a higher incidence of records is noticeable in section A, correlated to human needs, with records in section B processing operations, in G directed to physics, F mechanical engineering, lighting, heating, weapons and explosion, and in H electricity. The distribution of

patents in terms of their classification shows the ramifications of production and technological innovation for gymnastics.

Figure 4 International Patent Classification (CIP)



Fonte: Ramos, et al (2023)

Based on the information in figure 4, it is possible to see that section A of human needs has a greater amount of records, significantly it is clear that in the gymnastics axis, the production of technologies is directed with greater emphasis on human needs, providing support to that field.

The section corresponds to inventions originating from the intellect, where it is possible to deposit creations designed for human needs. This classification allows users to identify the technologies they are looking for with greater efficiency (Silva, 2018).

However, the study found the presence of innovations in the area of gymnastics, making it possible to achieve the perspectives of the central problem, establishing gymnastics as a mechanism that stimulates the production of technological innovations, attracting and encouraging technological development in the country, thus bringing gymnastics to a new perspective, correlated to intellectual property.

Conclusions

Gymnastics is a bodily practice, its presence in the history of humanity is intrinsically linked to political interests, indoctrinators with intentions of preparing the body in various aspects such as war, health, eugenics, health and sport. From this study it was possible to identify gymnastics as a field of study in intellectual property, with technological production in the area of gymnastics being highlighted.

After research at the INPI National Institute of Intellectual Property, 308 patent registrations related to gymnastics were identified, showing that gymnastics is a field of production and technological innovation, it was also found that CIP A is the field with the highest incidence of registration. Another fact found was the presence of countries in Europe, Asia and America requesting patent designs in the Brazilian patent database. In addition to identifying that the state of São Paulo is the largest producer of innovations in the area of gymnastics.

Finally, this study sought to present gymnastics in a new scenario, seeking information on intellectual property to stimulate research on gymnastics from the perspective of innovations and technologies. To this end, it is necessary that new research and studies can expand and deepen the subject. Because here, it is an embryonic study and new research is necessary. This study is of interest to students, teachers, inventors and creators from the most diverse areas, as it is an interdisciplinary area, with an emphasis on Physical Education students.

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