

Intellectual Property In The World Of Football: A Patentometric Analysis

Thayslane De Melo Costa
Tiago Paulino Santos
Tiago de Melo Ramos
Robelius De Bortoli

Abstract

Intellectual property and football have an intrinsic and multifaceted relationship, enabling the protection and commercial exploitation of football-related events. This connection through processes such as patents, trademarks, and image rights allows for the growth, evolution, and guarantee of rights for all involved in football. It is through Intellectual Property that the possibility of protecting inventions, creations, and modernizations of the sport arises. Football, in its emotional, passionate, and intercontinental context, creates a favorable environment for investors and entrepreneurs to develop a promising and advantageous economic market. Therefore, there is the consolidation of the union between Football and Intellectual Property. This study employs a qualitative and quantitative methodology, using a methodological approach of patentometric analysis in the WIPO database in the Patentscope section. The sample is structured by patents related to the descriptor football. While it was identified that the United States of America is the country with the highest number of deposits, countries like Japan and China have an effective participation in the production of technological innovation in football. It was also observed that over the last ten years there has been a linear frequency of patents in the area of innovation and football, and that the subsection of sports materials has the highest number of patent registrations.

Keywords: soccer; Intellectual Property; innovation; technological development.

Date of Submission: 04-12-2025

Date of Acceptance: 14-12-2025

I. Initial Scenario

Football, a global passion that manages to mobilize and engage crowds across different contexts and economic classes, is not just a game; it's not limited to ninety minutes plus stoppage time. Its reach encompasses a rich ecosystem of varied economic value, rich in culture, diverse, and intrinsically linked to Intellectual Property (IP). Behind the grand spectacles performed by players and various actors involved, there is a large system working to disseminate, sensitize, and attract the attention of the population. Its exhibition creates an attractive economic environment that attracts various investors and boosts the sports segment market (Neto & Silva, 2023).

Within the sports landscape, it is possible to identify the presence of Intellectual Property in all sectors, from a club's distinctive logo such as its crest to the production of uniforms, television systems, trademark copyrights, image rights of players exploited through gloves, even choreographed celebrations become elements of IP. This permeates each of these billion-dollar elements, being an essential strategic asset for leagues, clubs, players, agents, and football itself (Rodrigues, 2021). A abrangência da PI no futebol se propaga em inúmeras frentes.

Trademarks, patents, and copyrights are more tangible and palpable examples. Club logos, technologies, player images, and catchphrases associated with clubs and athletes are valuable assets, registered, protected, and with the potential to positively impact the clubs' economy. Other widely exploited assets are personality rights, which are fundamental for managing athletes' careers, enabling them to promote their own brands and generate advantageous agreements, thus leveraging their fame and media reach (Santos, 2023).

Furthermore, intellectual property plays a fundamental role in the process of broadcasting matches and championships. Since matches are intellectual works and their exhibition is the right of the broadcasting rights holders, this creates another lucrative and advantageous space for investors. In the current scenario, this context is so exploited that today one can watch a football match on numerous platforms—internet, television, and streaming—making it possible to follow competitions and leagues from any country.

The relationship between football and Intellectual Property appears to be structural, where IP provides opportunities and creates a fundamental context for the development of the sport. The sport, in turn, utilizes IP principles to leverage its full potential, resulting in a perfect environment for the economic sector. Therefore, this study seeks to understand how Intellectual Property is developed in an international context. The guiding question is: what technologies are being developed and protected within the WIPO?

General Objective: To identify technological innovations and productions through patents in the football landscape.

Specific Objectives: To map the production of patents filed within the international WIPO context.

To identify how football relates to Intellectual Property.

To discuss how Intellectual Property impacts and contributes to the development of football.

II. Methodology

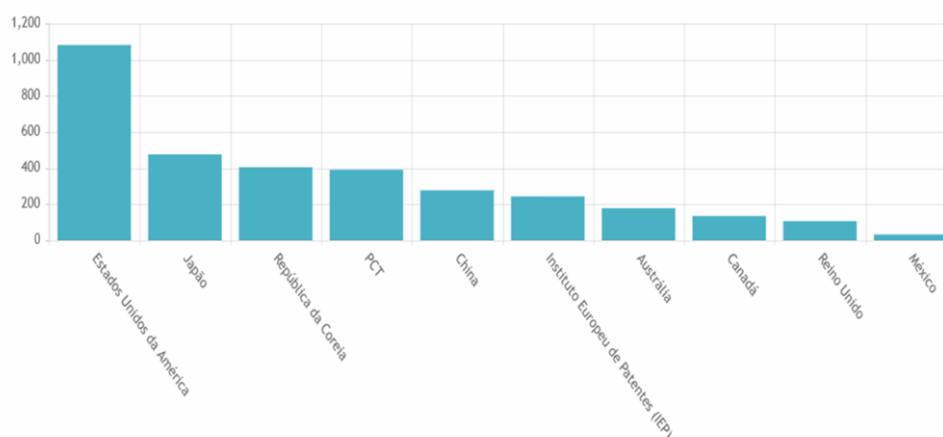
Patentometrics can be conceptualized as research dedicated to the qualitative and quantitative analysis of data, mainly used for the analysis of data contained in patents. Specifically, it allows for the "mining" and interpretation of patents produced and deposited in a given database.

In this study, the following methodological path was followed: initially accessing the website <WIPO - World Intellectual Property Organization>, then accessing the patentscope tab, clicking on the access patentscope section, and typing the descriptor "soccer" in the search terms field. 3,516 patent applications were found, which constitutes the research sample. For systematization and construction of the figures, the data obtained and accessed in the analysis, table, and filters fields of patentscope were used. After the search was performed, the data were categorized and discussed.

III. Results And Discussion

Graph 1 is structured by the countries filing patents related to the production and technological innovation of football. It allows us to identify which countries produce technologies for football, as well as to identify a discrepancy in production when comparing the United States of America to other countries. The presence of countries such as Japan, the Republic of Korea, China, the European Patent Office, Australia, Canada, the United Kingdom, Mexico, and the PCT (an international treaty with more than 155 contracting states for the protection of inventions through patent filings) is also noted.

Figure 1: Patent Filing by Countries



Source: Patentscope database

The application for patent protection of an invention is an indicator of a country's technological development, and may correspond to the value that the country places on the growth and evolution of the production and innovation axis. Graph 1 shows that the United States of America has a significant advantage over its competitors, representing more than a thousand patent applications related to football. It is also possible to analyze the interest in innovating in football, where, according to Neto & Silva (2023), one of the main interests is to gain a competitive advantage; clubs, national teams, athletes, entrepreneurs, and investors invest exorbitant amounts in technological development and production, whether for performance or financial gains. This sparks the interest of developers, inventors, and scientists.

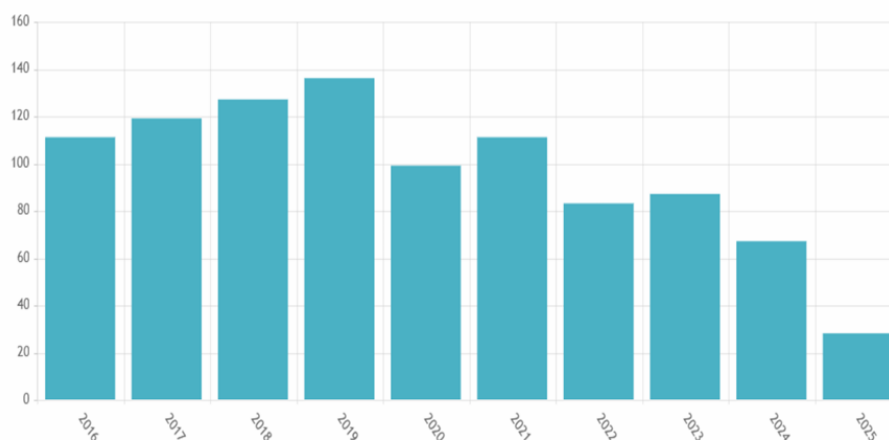
According to Oliveira (2022), another attractive aspect is the communication and television sector, in which the scientific community and inventors, through digital technologies, seek to provide viewers with greater accessibility and sophisticated means to consume and watch football matches. There is also the production of applications that allow following club news, digital platforms that enable greater proximity and establish greater engagement between fans/consumers and football.

In turn, Felipe & Souza (2024) highlight points such as the development and use of applications for monitoring the impacts of sports practices, the use of sensor technologies that seek to monitor the performance of athletes, sports equipment, sportswear with technological functionalities, are the branch of innovations directed at the performance of athletes. Such technologies are drivers of the multi-million dollar market provided by football, and therefore, they attract the attention and commitment of countries such as the USA, China and Japan, ratifying the impact of football on the world economy.

Miranda et al. (2024), in their study entitled "Patents on technologies applied to sports," identified a growing evolution and rise in the development of technologies directed at sports in general. According to the author, countries such as the United States, China, and Japan have been the cradle of technological development, coinciding with the data identified and presented in Figure 1. Another piece of data that showed similarity to the research presented here is the absence of Brazil in the technological innovation process, information that can be explored in more depth in another study.

Figure 2 addresses the scale of production and patent application requests over a ten-year period. It shows a linearity between 2016 and 2021 with a slight drop until 2024 and a greater discrepancy in 2025, perhaps due to the period in which the research was conducted, with more than five months remaining for analysis. It is also evident that in 2019 there was a higher incidence of deposits, followed by 2018 and 2017. The highest number of deposits corresponds to almost 140 requests and the lowest to about 40 requests.

Figure 2: Technological development and evolution of patent filings on an annual scale.



Source: Patentscope database

The increasing modernization and competitiveness of the sports scene, specifically football, has boosted the economic and technological market, arousing greater interest and innovation in the scientific and inventive community. Sport, in its essence, presents the potential for social, economic, and cultural development; these elements have mobilized the scientific community in technological development and sports intelligence, focused on the modernization, expansion, and reach of sport. And in line with Intellectual Property, it establishes a significant and attractive economic market. From this perspective, it directly impacts the interest in and increase of technologies for sport (Miranda et al., 2025).

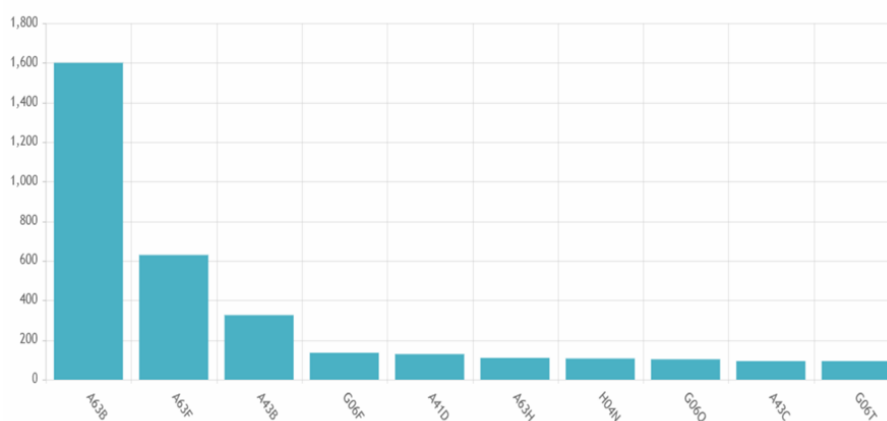
In turn, Luiz Ramidoff et al., (2024) argue that beyond emotions, competitiveness, and entertainment, the sports universe has become a multi-billion dollar business, permeated by the environment of Intellectual Property, where trademarks, patents, and copyrights have gained notoriety and space. According to the author, the relationship between IP and sport has become closer in recent years, conditioned and motivated by the exuberant and attractive economic market. Because football is no longer just entertainment; it has become one of the biggest economic systems in the world.

According to Alves (2023), football has gained great prominence on the world stage, and technologies have played a fundamental role in this. The most practiced sport in the world has an intercontinental reach, and thanks to technology, its captivating power reaches the most varied economic classes, and its development is only expected to evolve. Today, it is possible to mention technologies such as: goal-line technology, video

assistant referee (VAR) system, data analysis applications, virtual training and simulation, statistical programs, video and video analysis, streams, platforms, closed channels, among others. Over the years, the increase in technological production for football has gained prominence, as evidenced in Figure 2.

Figure 3 shows the International Patent Classification (IPC) code, where it can be seen that the identified patents are in sections A63B, A63F, A43B, G06F, A41D, A63H, H04N, G06Q, A43C, and G06T. Sections A63B stand out with the highest incidence of deposits, followed by sections A63F and A43B. The remaining sections show a low incidence.

Figure 3: International Patent Classification (IPC)



Source: Patentscope database, 2025.

Through Figure 3, it is possible to identify that there was greater production of technologies focused on section A63F, which is related to human needs. Following the same metric, we have sections A63F, A43B, A63H, and A43C. Sections G06F, G06Q, and G06T correspond to technologies related to physics, and section H04N to elements of electricity. Based on this, it is possible to analyze for which segment the patents are produced, thus mapping the area of interest of inventors and the scientific community. The present data seem to resemble those found in the study by Miranda et al. (2023), where it was identified that the greatest concentration of deposits was also in section A63B, human needs, and the subclass of sporting goods.

The fact is that the relationship between football and Intellectual Property is inseparable and increasingly planned. Far removed from its origins as a leisure and entertainment sport, football has stabilized and consolidated itself as a global, multi-million dollar industry, where the presence of IP through its segments such as patents, trademarks, copyrights, and others is vital for the growth and sustainability of football. Football attracts and mobilizes hundreds, even millions, of spectators, and IP enables the protection and guarantee of rights for those who create, invent, and produce the technological evolution of the sport..

IV. Conclusions

Football is a global phenomenon, the most practiced sport, deeply rooted in various cultures, and has undergone numerous transformations over the years, mainly due to its symbiosis with the technological universe. This, in turn, influences modern football through technologies related to sports equipment, athlete performance, refereeing, technical and statistical analysis, fan experience, broadcasting, and communication. The relationship between football and technology is a continuous process that together ensures the propagation and maintenance of football.

It was also found that the country with the highest number of patent applications is the United States of America, followed by Japan, China, the Republic of Korea, and PCT.

Regarding innovation and patent production, it was identified that over the last ten years there has been a linearity in patents, with a slight increase in 2019. As for the patent code and sections, it was found that the human needs section and the sports equipment subsection account for the largest number of patent applications.

Overall, this study is part of a master's thesis, which seeks to discuss Intellectual Property in the context of football, in all its segments. It is of interest to professionals in the field of Intellectual Property, as well as professionals in the sports and economic sectors, although further exploration is needed to better understand the relationship between football and Intellectual Property.

References

- [1]. Alves, M. G. D. (2023). TECHNOLOGY ON THE FOUR LINES: ADVANCES IN THE FOOTBALL WORLD. FOCO MAGAZINE, 16(12), E3821-E3821. Available At <TECHNOLOGY ON THE FOUR LINES: ADVANCES IN THE FOOTBALL WORLD | FOCO MAGAZINE> Accessed July 2025.
- [2]. Dos Santos Neto, J., & Silva, A. A. (2023). Study Of The Impact Of The Adoption Of Digital Technologies In Football. RECIMA21-Multidisciplinary Scientific Journal-ISSN 2675-6218, 4(3), E432923-E432923. Available At <STUDY OF THE IMPACT OF THE ADOPTION OF DIGITAL TECHNOLOGIES IN FOOTBALL | RECIMA21 - Multidisciplinary Scientific Journal - ISSN 2675-6218> Accessed On July 20, 2025.
- [3]. Felipe, L., & De Sousa, R. R. (2024). TECHNOLOGICAL INNOVATIONS IN SPORT: IMPACTS ON DATA ANALYSIS, PERFORMANCE, LEGAL AND ECONOMIC ISSUES. RECIMA21-Multidisciplinary Scientific Journal-ISSN 2675-6218, 5(10), E5105838-E5105838. Available At <TECHNOLOGICAL INNOVATIONS IN SPORT: IMPACTS ON DATA ANALYSIS, PERFORMANCE, LEGAL AND ECONOMIC ISSUES | RECIMA21 - Multidisciplinary Scientific Journal - ISSN 2675-6218> Accessed On July 22, 2025.
- [4]. IPT – INSTITUTE OF TECHNOLOGICAL RESEARCH OF THE STATE OF SÃO PAULO. The Insertion Of Digital Technologies In Sport: An Integrated Management Manual. São Paulo: IPT/CEMPRE. 2005.
- [5]. LUIZ RAMIDOFF, M. Á. R. I. O., RAMIDOFF, B., MUNHOZ, G., & DE MIRANDA, V. I. T. O. R. I. N. O. (2024). INTELLECTUAL PROPERTY IN SPORT: PROTECTION OF SPORTS TRADEMARKS AND PATENTS. Revista Jurídica (0103-3506), 4(80). Available At <INTELLECTUAL PROPERTY IN SPORT: PROTECTION OF SPORTS TRADEMARKS AND PATENTS | RAMIDOFF | Revista Jurídica> Accessed On July 26, 2025.
- [6]. MIRANDA, Karolina Ribeiro Paes Oliveira Benevides; MIRANDA, Luciano Benevides; SAMPAIO, Romilson Lopes; TELES, Eduardo Oliveira. SPORTS INTELLIGENCE AND FINANCING IN BAHIA: AN INTEGRATED OVERVIEW OF TECHNOLOGY, MANAGEMENT AND INTELLECTUAL PROPERTY. ARACÊ, [S. L.], V. 7, N. 7, P. 36144–36169, 2025. DOI: 10.56238/Arev7n7-058. Available At: <https://Periodicos.Newsciencepubl.Com/Arace/Article/View/6379>. Accessed On: July 29, 2025.
- [7]. Miranda, K. R. P. O. B., Sampaio, R. L., Teles, E. O., & Ribeiro, N. M. (2024). Patents On Technologies Applied To Sport. Cadernos De Prospecção, 17(2), 539–553. <https://doi.org/10.9771/Cp.V17i2.56530>. Available At <Patents On Technologies Applied To Sport | Cadernos De Prospecção> Accessed July 24, 2025.
- [8]. Oliveira, J. M. D. (2022). Sports Marketing: Analysis Of Brand Licensing Of Brazilian Professional Football Clubs. Available At <Sports Marketing: Analysis Of Brand Licensing Of Brazilian Professional Football Clubs> Accessed July 22, 2025.
- [9]. Rodrigues, I. C. G. (2021). Football Clubs And Industrial Property: An Analysis Of Trademark Protection And General Sports Law. Undergraduate Thesis (Bachelor Of Laws) - National Faculty Of Law, Federal University Of Rio De Janeiro, Rio De Janeiro. Available At <Intellectual Property In Sport: An Analysis Of The Institutes Applied To Football> Accessed July 20, 2025.
- [10]. Santos, L. B. D. S. (2023). An Analysis Of Commercial Rights In Brazilian Football. Undergraduate Thesis (Bachelor Of Laws) - National Faculty Of Law, Federal University Of Rio De Janeiro, Rio De Janeiro. Disponível Em < Pantheon: Uma Análise Dos Direitos Comerciais No Futebol Brasileiro> Acesso Em 20 Jul. 2025