Patent

A patent is a legal protection granted by a government to the inventor of a novel, non-obvious, and useful invention or innovation. Patents give inventors exclusive rights to their inventions for a specific period, usually 20 years from the date of filing. During this period, the patent holder has the right to prevent others from making, using, selling, or importing the patented invention without their permission.

Key features

Invention Protection: Patents are primarily used to protect new and innovative products, processes, machines, compositions of matter, and certain types of plant varieties. They can cover a wide range of innovations, from new pharmaceutical drugs to advanced technology devices.

Exclusivity: A patent grants the inventor or patent holder exclusive rights to the invention for a set duration. This exclusivity allows them to control how the invention is used, either by producing and selling the invention themselves or by licensing others to do so.

Monopoly Rights: While patents provide inventors with a temporary monopoly over their invention, this monopoly is a trade-off for disclosing the details of the invention to the public. This disclosure is essential for the advancement of knowledge and for others to build upon the invention once the patent expires.

Limited Duration: Patents have a limited term, typically 20 years from the filing date (or, in some cases, from the date of grant). After the patent expires, the invention enters the public domain, and others are free to use, make, or sell it without restriction.

Exclusive Rights: Patents grant exclusive rights within the jurisdiction of the granting country. Inventors must file patent applications in individual countries or regions where they wish to secure protection. International treaties, such as the Patent Cooperation Treaty (PCT) or the European Patent Convention (EPC), provide mechanisms to streamline the international patent application process.

Patent Office: Patents are granted by government agencies known as patent offices. The patent office examines patent applications to ensure that they meet the legal requirements for patent protection.

Types of Patents: There are different types of patents, including utility patents (covering new and useful inventions), design patents (covering the unique, ornamental design of an article), and plant patents (covering new plant varieties created through asexual reproduction).

Public Disclosure: As part of the patent application process, inventors must provide a detailed and comprehensive disclosure of their invention. This information becomes part of the public record and is published in patent databases.

Patent Infringement: If someone else uses, makes, or sells an invention covered by a valid patent without authorization, they may be liable for patent infringement. The patent holder can take legal action against infringers to protect their rights.

Patents play a crucial role in incentivizing innovation by providing inventors with a period of exclusivity during which they can commercialize their inventions and recoup their research and

development costs. Once the patent expires, the technology or invention becomes part of the public domain, contributing to further innovation and the advancement of science and technology.

Multiple databases were queried using The Lens to identify the top 100 scoliosis surgery patents, which were selected based on forward patent citations. These patents were then categorized into 8 groups based on technological descriptors and assessed based on various factors including earliest priority date, year issued, and expiration status.

The top 100 most-cited patents included technology underlying anterolateral tethering and distraction systems (n = 11), posterior tethering and distraction systems (n = 23), posterior segmental bone anchor and rod engagement systems (n = 29), interbody devices (n = 10), biological and electrophysiological agents for scoliosis treatment and/or improved arthrodesis (n = 8), intraoperative arthroplasty devices (n = 5), orthotic devices (n = 12), and implantable devices for non-invasive, postoperative alterations of skeletal alignment (n = 2). Seventy-five patents were expired, 21 are still active, and 4 were listed as inactive. The late 1970s and early 2000s saw increased numbers of patent filings. Demonstrated trends showed no meaningful correlation between patent rank and earliest priority date (linear trendline y = 0.2648x - 477.27; R2 = 0.0114), while a very strong correlation was found between patent rank and citations per year (power trendline y = 118.82x–0.83; R2 = 0.8983).

Patent bibliometric analyses in the field of spinal deformity surgery provide a means to assess past advancements, better understand what it takes to make a difference in the field, and to potentially facilitate the development of innovative technologies in the future. The method described is a reliable and reproducible technique for evaluating technological literature in our field [1)]

1)
Hani U, Chen JW, Holland C, McGirt MJ, Kim PK, Chewning S, Bohl MA. Patent bibliometrics in spinal deformity: the first bibliometric analysis of spinal deformity's technological literature. Spine Deform. 2023 Oct 16. doi: 10.1007/s43390-023-00767-x. Epub ahead of print. PMID: 37845600.