

Patents and Copyright for Scientists

INTELLECTUAL PROPERTY COVERS PATENTS, COPYRIGHT, TRADE MARKS, INDUSTRIAL DESIGNS AND RIGHTS IN CONFIDENTIAL INFORMATION

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Intellectual property is an intangible asset, but it confers legal property rights similar to those of tangible assets (land, equipment, etc.). Thus, patents and copyright can be bought and sold, or leased (licensed) for money. A working scientist will frequently come across patents in the background research. In some areas of technology patents are by far the main type of technical publication, so it is important to understand these documents and their context, and not be unduly inhibited by their forbidding appearance.

This article will give advice to practising scientists regarding patenting.

The Purpose of Patents

A patent is a bargain between the State and an inventor. In return for the inventor describing the invention to the public – for the advancement of science and technology – the State rewards the inventor with a limited monopoly that will prevent unauthorised commercial use of the invention.

The publication of a patent is intended to increase human knowledge, and the inventor has to describe to the skilled reader how to make the invention work. The inventor is granted a monopoly period, usually of 20 years, during which time the inventor can exploit the invention for financial reward. In most countries the monopoly will be for 20 years, but because of the delays in getting approval, for instance in medicine and agrochemicals, the time may be extended by up to 5 more years. Renewal fees must of course be paid for the patent to remain in force.

In almost all countries, priority in patenting is granted to the first person to file the Application; (the first official description of the invention, and notice that a patent is being sought). However, in the U.S.A. priority is awarded to the first to invent.

This is a subtle difference that requires scientists in the U.S.A. to be good record keepers.

The documents that people call “patents” are usually the published Applications. Patenting organisations publish Applications (the description of the patents) 18 months after the first application date (an important date also called the filing date or the priority date), so that researchers have early warning of what is being sought for patenting. When the patent is eventually granted it may have been amended by the patentees. Only then can the legal effect of the patent be determined.

Novelty and Inventiveness

The invention to be patented has to meet standards of novelty and inventiveness, that is, it should not be already in the public domain nor be an obvious variant of something that is known.

A patent (also called a specification) has two basic parts:

- a description of the invention, possibly with drawings or graphs, and
- the claims.

While working examples of the invention are desirable, they are not generally required.

The patenting process requires the Application to be lodged in a government patent office along with forms that name the owner of the patent and usually identify the inventor(s), and the patenting fee. The patent office will usually, but not always, carry out a search through prior documents in order to establish that there is novelty and also an inventive step in the patent.

Countries of Enforcement

A patent only has effect in the country granting it. Thus, in order to protect an invention, it may be necessary to apply for a patent in a number of

Advice for Inventors on Applying for Patents

- It is not recommended that an inventor writes his own patents. This is because it is too easy to make the mistake of limiting the scope of the patent or include other fundamental errors.
- An employer will normally have an in-house patent attorney or will use an outside patent attorney.
- An individual should find a patent attorney, and websites or the government Patent Office can provide a list (lawyers do not generally have the technical background to adequately represent a client in patent drafting). A patent attorney needs to understand the invention, and will ask many questions.
- The first Application is usually made in the inventor's country of residence (for convenience). Overseas Applications, especially where translations are necessary, can be quite expensive, and an individual may be unable to fund this level of patenting.

countries. This is conventionally done within 12 months of the initial filing date (the priority date). Certain patent systems, such as PCT (Patent Cooperation Treaty) or European Applications, can cover a number of countries.

Some patents can lead to confusion. For example, Japanese inventors apply for huge numbers of patents, but only about a quarter result in actual granted patents. Frequently, a scientist or businessman may be inhibited by the existence of such a "patent", but closer inspection could show that the patent is only a Japanese Application, without legal status in countries outside Japan.

The Patent Claims

The claims of a patent govern the legal effect of the patent, that is, the areas of technology that are to be monopolised. The accurate interpretation of patent claims is a skilled art, and an area in which patents professionals need to be consulted. However, a patent only protects against commercial activities, such as offering for sale, making, selling, etc., so this may not be necessary. Undertaking experimental work within the scope of the patent to prove, disprove or develop the patented invention is not prevented. Many scientists wrongly concentrate on the examples or specific description, just as they would carefully read the experimental sections of scientific papers.

Generally it can be said that a feature is not protected unless that feature is claimed or covered by general language in the claims. Of course, an earli-

er patent may protect that feature. It may be an "infringement" of a patent to knowingly provide another person with the means to infringe a patent. This is not direct infringement but "contributory infringement".

Monopoly Aspects of a Patent

The monopoly granted by a patent is just one of many possible reasons for applying for a patent. The patent owner may in fact be interested in allowing others to operate within the patent, for example by having them pay a licence fee or royalty. A patent may also be used as a bargaining tool in negotiations, or it can act as a short-term barrier to allow the patent owner to establish a commercial lead. Sales personnel often wish to have a patent to show to customers, to establish that a particular product is novel. But above all the main reason for patenting for many companies is to establish "freedom to operate" and to make sure that a competitor cannot patent a particular development, and use it to prevent the company from commercialising an invention it was first to devise.

Challenging Patents

If a patent is considered likely to prevent a company from proceeding with commercialising a new product or process, there are actions that can be taken. First, the new product or process should be carefully compared to the patent claims to establish if the process or product is the same as all the aspects of the claims. Care needs to be taken here,

as courts may decide that a difference is insignificant.

The legal status of the patent should be checked: that is: whether it exists in the relevant country, that all the renewal fees have been paid, and that the patent is not more than 20 years old. A discussion between the scientist or engineer and a patent attorney may identify a way around the patent claim(s). Finally, if all of the above are unsuccessful, a study of the validity of the patent will be required. Often, serious questions over the enforceability of the patent may arise from finding a prior document, or a prior commercial use that was not found during the patent examination process. This can be a time-consuming and expensive procedure, and may not always lead to a reliable conclusion.

Patent Owner

It should be mentioned that the first owner of an invention is the inventor(s) unless the ownership is transferred by a contract, or the invention arose out of an employee's duties. Most employed inventors will find that their contract of employment claims inventions as the property of the employer.

Patents Illustrate Technology Change

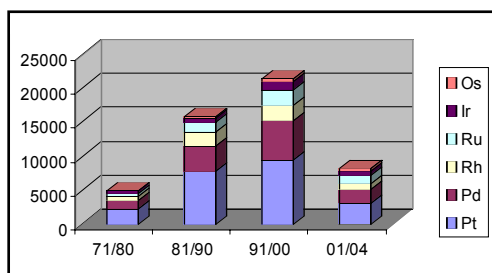
As an example of the development of patenting, the field of the platinum group metals (pgms) has been analysed, see the block chart. This shows

Important Patents in the Platinum Group Metals Field

The following are the author's personal selection of important pgms patents that have had a considerable effect on technology (1).

Early Catalysis

In the early part of the 19th century, the first catalytic processes (although that term had only been coined by Berzelius in 1836) were being developed by Kuhlmann in France, represented by the platinum catalysed nitric acid and sulfuric acid processes in *French Patents* 11331 (Application filed 1838) and 11332, respectively. These concepts took some time to develop, until Ostwald (*British*



The number of Applications naming the six platinum group metals that were granted in the three decades before the millennium and for the current decade

the number of individual published Applications listing one of the six pgms in each recent decade. If two or more metals are listed, there are two or more counts, but duplications of the same invention have been eliminated. The current decade shows lower numbers since it is only part way through. As can be seen, each decade has resulted in more patents for each metal, with patents for platinum and palladium dominating.

Thus, patents play an important part in commercial activities, protecting intellectual property and establishing legal rights. The information they contain and their effects are hugely important.

Glossary

PCT (Patent Cooperation Treaty) can cover almost every country in the World (designated by the Applicant).

European Applications/European Patents cover 30 "European" countries, including Turkey.

Patents 698 and 8300; 1902) and Kaiser (*German Patent* 271,517; 1909) established the bases of the huge ammonia oxidation industry using platinum gauze catalysts. The similar industrial process for making hydrogen cyanide was developed in the 1930s by Andrussov (*German Patent* 549,055; 1932).

Plating/Electroplating

Plating of precious metals was of great interest in the first half of the 19th century, but effective methods of plating pgms were only slowly developed (in contrast to electroplating silver or gold).

Two key patents from that time are H. B. Leeson's *British Patent* 9374; 1842 and G. Howell's *British Patent* 11,065; 1846.

Refining

During the 1920s, with the discovery of the platinum-rich Merensky reef in South Africa, there was considerable research into refining methods Alan R. Powell and Ernest C. Deering, who both worked for Johnson Matthey, developed the matte process for smelting. This was patented as *British Patent* 316,063; 1929.

Homogeneous and Heterogeneous Catalysis

In 1976 Geoffrey Wilkinson was awarded a patent (*U.S. Patent* 3,933,919) for the development of a rhodium-based homogeneous catalyst. This was a truly major step in chemical process technology.

In heterogeneous catalysis, exhaust gas purification is a huge consumer of pgms. Once the increasingly detrimental effects of car exhaust gases on the environment was recognised as an

issue, patenting activity increased. For example, see Johnson Matthey's 1975 patent *British Patent* 1,417,544. Johnson Matthey has also brought patented technology to the removal of soot from diesel exhausts (*European Patent* 341,832; 1989).

Biological Uses

Finally, I mention the discovery of the biological activity of platinum complexes. This led to a new and effective way of treating cancers. The known compound cisplatin was patented in *U.S. Patent* 4,177,263; 1979, and the second generation compound carboplatin was patented in a number of countries (e.g. *British Patent* 1,380,228; 1975). Incidentally, the cisplatin patent was applied for before that for carboplatin, but granted afterwards. This was because of the difficulty in persuading the U.S. Patent Office that a platinum compound could be an active anticancer agent.

Reference

- 1 Donald McDonald and Leslie B. Hunt, "A History of Platinum and its Allied Metals", Johnson Matthey, London, 1982

Other Intellectual Property

Another area of intellectual property that scientists come across in day-to-day work is copyright. Copyright automatically applies to original literary or artistic work (regardless of merit) upon creation. Copyright is owned by the creator(s) unless the creator is an employee, in which case copyright is owned by the employer. Scientific authors will be asked to transfer or assign copyright to a publisher, to permit the publisher to print and publish a paper, otherwise this would technically be copyright infringement. The better copyright transfers permit the author some rights to re-use the material in the paper.

Two important issues concerning copyright need to be mentioned. Recent changes in European copyright law allow copying of articles or parts of books only for research that is purely academic. A copyright fee is generally due for copying for commercial research, even when the researcher or employer already owns a copy.

The other issue concerns electronic copies.

Scanning copies is regarded in the same light as photocopying.

The Internet is another minefield for users. Because an article or image is available on the Internet does not mean that it can be freely copied, forwarded, stored in a database or used in another publication. The website concerned almost certainly will have a "small print" section with a copyright notice and conditions. As with patents, the complexities of copyright law warrant the use of a specialist where there is any case of doubt.

The Author

Ian Wishart has the position of Corporate Patents & Licensing Director of Johnson Matthey PLC, where he has worked since 1987. After gaining a degree in Chemical Engineering from Edinburgh University, he trained in intellectual property, qualifying as a U.K. Patent Attorney in 1973. He has worked for Sandoz in Switzerland, and for the U.K.'s National Coal Board, where he became involved in licensing and other IP agreement work.

