Intellectual Property for Food Science and Technology

This second of a series of articles on intellectual property, its management and exploitation by Michael Moore, focuses on patents and their importance to individuals and corporations in the food science and technology sector

Part 2: Patents

As discussed in the first article in this series (see *FS&T* vol. 22, issue 3, p.41-43), patents are one form of intellectual property (IP) right. Other IP rights include trade marks, (registered) designs, copyright, goodwill, know-how and trade secrets. To maximise the commercial value of a company's intellectual assets, a well-balanced IP strategy should take into account all relevant IP rights.

A patent is a legal document granted for the protection of inventions that have technical character. It provides its owner with a "monopoly" right in the claimed invention for the life of the patent - up to 20 years. This monopoly is, in fact, an exclusionary (negative) right, which allows its owner to prevent any unauthorised party from performing an act (e.g. making, using, selling, offering for sale, importing, keeping) that infringes the patent; it does not, however, give its owner the right to commercially exploit the invention. This common misconception can have devastating consequences, putting the patent owner at risk of (inadvertently) infringing an earlier patent right. By way of explanation, imagine that Person A has made a new preservative agent, and is granted a patent (Patent 1), directed to the new agent and to its use as a preservative. Now imagine that Person B discovers that the same chemical agent, when used in a particular dairy product, provides an improved texture. Person B's invention may provide technical benefits that warrant the grant of a second patent (Patent 2) to Person B. In these circumstances, if Person B were to commercially exploit the invention claimed in Patent 2 it would inevitably result in the use of the preservative agent claimed in Patent 1 and, *without the permission of Person A*, this could infringe Patent 1. It is worth noting here that a lack of knowledge of an existing patent right is not a defence against infringement. Therefore, it is essential for a business to be aware not just of their own technical innovations and IP rights, but also of their competitors.

Legal requirements

The patent system is a complex legal maze, but the process can be simplified by using a professional patent attorney. For the purposes of obtaining a patent in the UK, it is not compulsory (although it is advisable) to be represented by a qualified Chartered Patent Attorney (or "CPA"). To obtain patents outside of the UK, however, professional representation is usually a prerequisite.

Whether or not you seek the help of a patent attorney, the first step is to identify a potentially patentable "invention". As discussed in the first article in this series, a patentable invention must have **technical character** and it must be **novel** (new), **inventive** (not obvious) and **industrially applicable** (e.g. usable in industry). If you are involved in R & D then the requirements for technical character and industrial applicability are almost certainly met. The assessment of novelty and inventive step is based on the "state-of-the-art" at the date on which the patent application was filed. In the majority of countries, the state-of-the-art is taken to mean anything that has been made available to the public, anywhere in the world, by any means (e.g. orally, visually, by use or demonstration, or in any other way), before the relevant date. As an exception, the US patent system grants a 12-month "grace period" to inventors who have disclosed their invention (e.g. at a scientific conference) within one year of filing a patent application to that invention. Therefore, you should consult a patent attorney for advice on how best to safeguard an invention in a commercial environment where disclosure may be necessary to obtain contracts or funding. While the test for novelty is a question of fact, the test for inventive step is more subjective. To be considered inventive, the difference(s) between the claimed invention and the state-of-the-art must not be obvious to an averagely skilled technician in the appropriate technical field.

The patent process

Having established that an invention is worth patenting, the next step is to write and file a *local patent application*. Given the legal complexities of the patent process, it is advisable to have your patent application drafted by a patent attorney who specialises in the technical field concerned. This is especially important when it comes to preparing the claims of your application, which will ultimately determine the scope of protection of any patent that may be granted. The time and cost of preparing a patent application can be somewhat reduced by providing your attorney with a detailed description and figures of your invention.

One of the important legal requirements for a patent is that the invention and how it can be carried out is *fully described* in the application. Furthermore, a patent application is published shortly after 18 months from its filing date (unless the application is withdrawn/terminated before this time). Therefore, if you are concerned about disclosing your invention to third parties, you should carefully consider whether a patent is the appropriate form of IP to protect your interests. In some cases, it may be better to keep your knowledge to yourself as a trade secret, for example. On the plus side, the filing and subsequent publication of an application prevents anyone else from patenting exactly the same invention at a later date.

Once all parties are happy that the invention has been properly described and claimed, the patent application is filed at a local patent office (e.g. the UK Intellectual Property Office, UKIPO), and the patent lifecycle begins (Fig. 1). The date of first filing is known as the "priority" date of the invention.

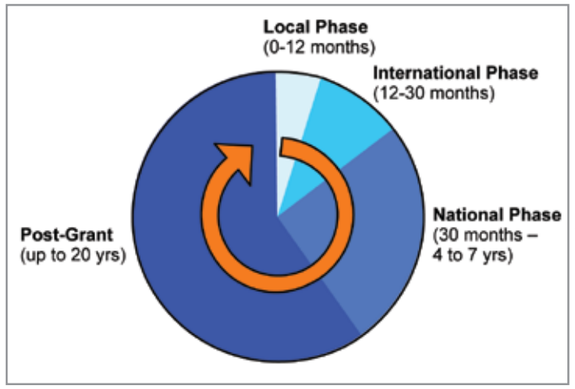

Figure 1. Patent life cycle (20 yrs).

During the 12 months following the first filing (also known as the "priority year"), it is possible to amend the original patent application and, therefore, any developments made to the invention during this time may be included in the application. However, if in this first year it becomes clear that the invention is not commercially useful, the application can be abandoned without further expense. On this point, before embarking on this process it is worth having some regard to: (i) the costs involved in obtaining a patent in your key markets; and (ii) a strategy for exploiting any patents obtained. Patents are territorial rights and, therefore, further national or regional (e.g. Europe) applications must be filed in any country in which patent protection is desired. Table 1 gives approximate costs for obtaining the grant of a patent in popular territories. Costs should be balanced against the likely commercial benefits that will be gained from protecting the invention in particular countries for a period of up to 20 years. For some inventions, the benefits may easily outweigh the likely expenditure.

At the end of the priority year, to defer the costs of filing several national/regional applications, a convenient strategy is to file an *international patent application* (via the Patent Co-operation Treaty, PCT). The PCT is a depository system: it provides an 18-month window in which to decide upon and file new national and regional applications in any of the 130-plus member countries of the PCT, but a PCT application itself is never granted. Essentially, the PCT route provides a further period in which to assess whether there is a commercial benefit in proceeding with the application.

		Patent costs (£1000s)				
		UK	International	Europe	USA	Japan
Patent drafting[a]	1 to 8	-	-	-	-	-
Filing		Up to 1	2.5 to 3.5	3.5 to 5	2 to 3.5	3 to 6[b]
Examination		1 to 6	(0 to 2.5[c])	1 to 8	2 to 8	2 to 8

[a]Drafting cost is dependent on the complexity of the invention and the quality of the instructions given to the attorney. This is usually a one-off cost because the same application can be used around the world.
[b]Includes cost of translating application into Japanese.
[c]Examination in the international phase provides an early indication of the likely patentability of the claimed invention, but since an international application never becomes a granted patent, examination is optional.

Table 1. Approximate costs for obtaining the grant of a patent in popular territories.

After 30 months (or in some cases 31 months) from the priority date, the international phase ends and *national* and/or *regional patent applications* must be filed in territories of interest to the Applicant. The filing of these national and regional applications marks the start of the patent examination period, in which the patentability of the claimed invention is assessed by the respective national or regional patent offices. Typically, each patent office carries out its own literature search to identify the state-of-the-art. It then assesses whether the claims of the patent application are novel and inventive, and issues an Examination Report outlining any objections to patentability. The Applicant then has an opportunity to respond to objections that have been raised – usually through an appointed patent attorney – making any amendments that may be necessary to the claims, in order to overcome those objections. The examination process may continue through further rounds of examination and response, until the patent is finally granted or refused.

In Europe and other regions that encompass several countries, if a granted patent is to take effect in the individual countries, it may be necessary to file a translation of the patent and its claims into the local language. The European Patent Convention (EPC) covers over 30 countries in Europe and, therefore, translations can be a significant expense. While the requirements for full translations have been reduced in recent times (e.g. in the UK, France and Germany), countries such as Spain and Italy still require full translations of any allowed patent if the patent is to take effect in that country. Figure 2 gives a basic timeline of the costs likely to be incurred in relation to filing, examination and grant of a European patent.

After grant, a patent can be enforced and exploited. Exploitation can involve assigning or licensing the patent in one or more countries, or enjoying the exclusive rights to the patented invention to corner a particular market and generate enhanced revenue streams. To maintain the patent "in force" for the maximum term of 20 years, renewal fees must be paid, typically on an annual basis.

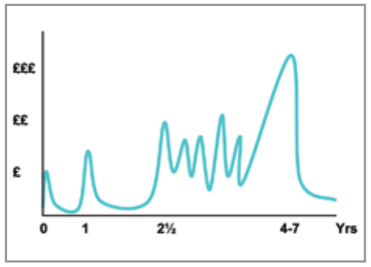

Figure 2. Timeline of patent costs in Europe.

Patents in Food Science and Technology

Patenting opportunities in the food science and technology field are varied and extensive. In the first eight months of 2008, almost 500 European patents and approximately 600 US patents were granted with the word "food" in the claims. Common themes include: agents for flavouring, sweetening and colouring; methods and devices for detecting microbial contamination, or for protecting against contamination; functional foods (such as antioxidants and probiotics); nutraceutical/botanical compositions for protecting against or alleviating illnesses; food packaging and apparatus for making food packaging; and production line processes.

To give some examples of flavourings and colourings, Nestlé patent (EP1469748B1) describes a coating for obtaining a roasted appearance after cooking. The coating includes a colourant selected from one or more of caramelised sugar, powdered blood, congealed blood and a mineral oxide. In a similar vein, EP0971599B1 provides flavouring agents as precursors that react on heating to generate cooked flavours. Interestingly, EP1629726B1 claims a three-step method of colouring eggs (e.g. Easter eggs), involving: (i) placing in a container a mixture, comprising at least one colour transfer component, selected from a group comprising rice, lentils, peas, noodles, corn, maize, hazelnuts, walnuts, almonds or mixtures thereof, and at least one colouring agent; (ii) placing at least one egg in the container; and (iii) removing the coloured egg from the container. Furthermore, EP1263299B1 claims a perfuming or flavouring ingredient that is useful as a booster for mandarin or tangerine type flavours.

On the microbial theme, EP1173064B1 entitled *"Food products with biocontrol preservation"* claims a method of preserving a food product by including dried microorganisms as a biocontrol agent. The particular dried cultures resist inactivation during pasteurisation of the food product, are non-toxic and inhibit growth of pathogenic microorganisms. EP1427436B1 relates to the use of milk apoproteins to prevent or treat microbial or viral infection in animals. The active agent(s) may be delivered using medical foods or drinks.

In relation to nutraceuticals and functional foods, we all know that an apple a day keeps the doctor away, but bananas can be beneficial too. EP1596810B1 claims "a composition for use in the prevention or treatment of Inflammatory Bowel Disease comprising a therapeutically effective amount of a soluble fibre derivable from fruit of the *Musa spp*." (e. g. from bananas or plantains). EP1682162B1 describes the use of the prickly pear for the preparation of a medicament for treating depressions.

Meanwhile, European patent EP1567177B1 provides pharmaceutical compositions comprising components from *Mucuna pruriens* seeds (a type of legume) for preventing, alleviating or treating neurological diseases. In another example, EP1177729B1 relates to pharmaceutical and food compositions containing "wood alcohols" or "wood sterols" that are useful for lowering serum cholesterol. Interestingly, EP1833495B1 claims a whey protein fraction comprising lactoferrin for preparing an oral composition for the treatment of acne.

With so much emphasis these days on functional foods, fast-foods could easily be ignored. However, patents are available in this field too, as demonstrated by EP1776295B1, which claims a particular construction of a pizza box; and EP1378459B1, which claims a sandwich packaging.

Finally, production line systems may also provide inventions worthy of patent protection. For example, EP1532866B1 relates to a method for producing frozen ready-to-eat meals based on pasta or cereal grains, and EP1475001B1 describes a method for producing multiple portions of a precooked dish.

Summary

In fast moving and competitive fields, such as food science, patents are vitally important in enabling an enterprise to protect and exploit its investment in R & D. A key point of patent law is that, once granted, a patent can provide its owner with up to 20 years of exclusivity for the commercial exploitation of an invention. Another important aspect is that patents may be granted in diverse technical disciplines. Therefore, through intelligent exploitation, a patent can safeguard the commercial success of a business for up to two decades.

Further information

The UK Intellectual Property Office: *www.ukipo.gov.uk*.
The Chartered Institute of Patent Attorneys: *www.cipa.org.uk*.

The views expressed herein are those of the author and not of Keltie and do not constitute legal advice.

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