

Plant Biology and Patents *

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Abstract

In industry, it is usual to try to get money from the research to develop not only the research itself, but also the company. This is particularly true for industrial use of plant microorganisms which requires high costs for research. Such a valorization is only possible when the results of research are adequately protected.

There are two essential ways to protect results of research: (a) the secret, (b) the patent.

Keywords: patents, plant microorganisms, protection of invention

1. The Secret and the Know-How

All information which is not patented and is kept secret is called know-how. The secret seems to be very simple and costs nothing to protect compared with the patent. But, in fact, this is a very superficial view of the problem.

In some cases, secrecy is not possible. For example:

- if the product must be put on the market (e.g. microorganisms or probes of DNA).
- if the invention must be cultivated in an open field (e.g. plants transformed by a viral vector for preparation of particular proteins).

If secrecy is possible, then you have to develop a very specific strategy which is very expensive:

- particular security devices around the area wherein the invention is used,

* Invited lecture * Reviewed

- particular written agreement with all the people of the company who are in relationship with the invention, for the present and for the future,
 - confidential agreement with outside persons.
- In addition, the use of secrecy will give rise to many difficulties during:
- relations with an official organization (for example, obtaining administrative authorization),
 - relations with a third party for negotiation of a know-how agreement,
 - relations with the people in your research center who are not authorized for scientific publication.

So, in fact, the secret is expensive and complicated. This is the reason why most companies use the patent system, *when it is possible*, and only use secrecy when it is absolutely necessary.

2. The Patent System

A patent is a title granted by a Government and which gives you a monopoly of 20 years (in general) on your invention. This title is granted if the invention is patentable and only in a specific country.

Patentability

The following applies to most European countries and especially to the European Patent Convention (EPC).

To be patentable, an invention must be:

- susceptible of industrial application,
- new,
- involve an inventive step.

In addition:

- the invention must not be excluded from patentability,
- and must be disclosed in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art.

Not to be excluded from patentability

The following shall not be regarded as inventions:

- discoveries, scientific theories and mathematical methods,
- methods for treatment of the human or animal body by surgery or therapy and diagnostic methods practised in the human and animal body.

There are other types of inventions which are not patentable but they are not related to the present field of biology.

The essential part of the exception is mentioned in article 53b of the European Patent Convention: "European patents shall not be granted in respect of:

"
 "b) plants or animal varieties or essentially biological
 "processes for the production of plants or animals,
 "this provision does not apply to microbiological
 "processes or the products thereof.

So, we shall examine the 3 main points of this article:

- the plants,
- the processes,
- the microorganisms.

The Plants

Plant varieties have been excluded from patentability by EPC. This restriction has been introduced in EPC and may be found in other European laws, because there exists a special type of protection for plant varieties under an international convention named the UPOV Convention (Union pour la Protection des Obtentions Végétales).

According to this Convention, cumulative protection (patent and plant variety protection) for one plant variety is forbidden.

Since, the EPC covers various countries in Europe wherein the plant variety protections are different, the final solution has been to deny patentability for plant varieties.

In some national laws, the provision is different. For example, in France, it is possible to file a patent application for a plant variety if it cannot be protected by a "Certificat d'obtention végétale", for example, it was possible to file a patent for a *Dieffenbachia* which was not mentioned in "Certificats d'obtention végétale".

The situation is very complicated and, in any case, if you want to protect a new plant it is necessary to check the problem on a case by case basis because of these different types of protection.

The processes

Particular processes are unpatentable in our field, they are: "essentially biological processes for the production of plants".

This is not clear, but an explanation is given in the "rules" of EPC.

The question whether a process is "essentially biological" is one of degree depending on the extent to which there is a technical intervention by man in the process. If such intervention plays a significant part in determining or controlling the result it is desired to achieve, the process would not be excluded.

The examples given are:

a method of crossing inter-breeding or selectively breeding, such as, horses for example, would be essentially biological and so unpatentable.

But, a method for pruning a tree would not be essentially biological, a method for treating a plant by application of a growth stimulating substance or radiation would not be essentially biological.

The treatment of soil by technical means to suppress or promote the growth of plants is also not excluded from patentability.

So, in our case, it seems that what we may call the "classical breeding technic" or its derivatives cannot be patented, but all other technics may be patented but need, in some cases, to have an adequate presentation in the patent.

For example, transformation of plants with vectors which may be virus, plasmid or various DNA, but also somatic fusion of protoplasts, seem to be patentable.

Microorganisms

All the processes in our field involve a microorganism (with a very broad definition), so one of the key questions is:

- Is such a microorganism patentable per se?

The response is YES.

But, the reason is a little bit confusing. It is said that the exclusion of some types of biological processes does not apply to a microbiological process or the product thereof and because microorganisms are often the "product of a microbiological process", they are patentable per se.

Although, the microorganisms are patentable per se, in some cases the patentability will be questionable, especially if the microorganism is obtained by a screening technique from a natural source. This case is complicated and cannot be examined in detail here.

The microorganisms cover also plasmids and viruses (rules C IV3.5). Other DNA materials are not excluded from patentability.

Novelty

An invention is novel if it does not form part of the state of the art. State of the art comprises everything made available to the public before the date of filing of the patent application. It includes all types of disclosure:

- oral or written disclosure,
- made by anybody including the inventors,
- anywhere in the world.

This is the reason why you must file the patent application before filing a scientific publication. When you are at a symposium or a colloquium, you must be very careful, especially during the discussion. If you give oral information on your invention, then it will no longer be possible, in some cases, to file a valid patent application.

Inventive activity

An invention shall be considered as involving an inventive activity if, having regard to the state of the art, it is not obvious to a person skilled in the art.

It is very difficult to develop this point because there are many possible situations. For example, preparation of a mutated microorganism which enhances the yield of the desired product by only 2 or 5% would probably be considered without inventive activity.

Industrial application

An invention shall be considered as susceptible of industrial application if it can be made or used in any kind of industry, including agriculture.

Sufficient disclosure

The invention must be sufficiently disclosed to be reproduced by a man skilled in the art.

The essential problem is the problem of the microorganisms, because if the invention involves the use of a microorganism which is not available to the public, the specification will be considered as sufficiently disclosed only if the microorganism has been deposited in a culture collection.

In EPC, there is a particular rule which deals with this deposit.

The main characteristics of this deposit are the following:

- culture collection must be a recognized one (for example, International Depository Authorities under article 7 of the Budapest Treaty),
- the deposit must be done before the filing of the application,

- the deposit is not freely available and there are some limitations to protect the right of the applicant.

3. What Can be Done With a Patent?

- The patent may be sold, this is an assignment.
- The patent may be licensed, the licensee will use the invention and will pay royalties.
- If a third party uses the invention without your authorization, you may introduce an infringement lawsuit.

The lawsuit differs according to countries, but, in any case, if you win then the infringer will have to stop and pay you a prejudice (which in some cases is very high).

You must also keep in mind that the information which is not patentable or patented may also be negotiated; this is a know-how agreement.

In most cases, a license agreement on a patent also incorporates some know-how.

4. Conclusions

Due to the importance of research in plant biology, there is a need for appropriate protection of invention in this field and this is the object of numerous French, European and international meetings to amend the laws if necessary to allow the best possible protection for such type inventions, especially protection of the plant per se.