Indian J. Genet., 79(1) Suppl. 375-378 (2019)
DOI: 10.31742/IJGPB.79S.1.30

Writing successful patents and overcoming patent barriers

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(Received: January 2019; Revised: March 2019; Accepted: April 2019)

Abstract

Inventions related to pre-harvest and post-harvest technologies have revolutionized agriculture. There is a significant growth of intellectual property rights (IPR) in agriculture across the globe. The predominant forms of IP relevant to agriculture sector are patents and designs. Patents are given to inventions that qualify patent eligibility, patentability criteria and disclosure norms. In the area of agriculture, patents provide a great opportunity for improving agricultural processes and products. Understanding the requirements of an invention under the Indian Patents Act, 1970 is necessary to know what can be patentable in India. The criteria of novelty, non-obviousness and industrial application and disclosure norms are applicable to all inventions irrespective of the technology areas. Examination guidelines for each technology area indicate to the elaborateness of the practice in relation to patents. While preparing patent specifications for agriculture inventions, it is important to ensure that the subject matter claimed should not be a method of agriculture (under Section 3h) or plants or plant parts (under Section 3j of the Act). Identification of relevant prior art and its anticipatory value is very important for the assessment of novelty of inventions. Agriculture inventions which can lower the cost, be obtained by reduced number of steps and are environment friendly can be considered under 'economic significance' by the Indian patent office (under the purview of Section 2(1) ja). Adhering to the disclosure norms (as mandated under Section 10 of the Act) are also important. Inventors/applicants need to also consider the deposit requirements. The present work examines the relevance of IPR and expansion of the patentability criteria, disclosure norms and additional requirements in relation to agriculture. It will highlight the need for patent search as an integral requirement for research, the process of preparation of invention disclosures to enhance the innovative ability of academic institutions as well as researchers.

Key words: Patents, agriculture, IPR, invention

Introduction

The notion of IP rights has changed due to rapid advances in technology and communication systems. We are now not only in a cross-discipline context but also fast moving into transdisciplinary understanding. The merging of disciplines and development of new disciplines has posed challenges in protecting products and processes. Agriculture inventions were one of the first patents filed post industrial revolution. The increase in use of agriculture machinery and tools became significant for the various stages of crop growth and production. Plant breeding and selection has led to improvement of crops and development of new hybrids. The development of new crop varieties has been driving the long term productivity as well as sustainability in agriculture.

The growth of agri-biotech industry is largely due to the growth in agri-machinery and development of the commercial seed sector. Agricultural innovations predominantly are in the area of trait improvement and development of value added products (Dewan 2011; Padmavati and Sengupta 2011). As such crop innovation involves long years of research and development. From the traditional plant breeding to genetic engineering and now synthetic biology, there has been a paradigm shift in agricultural innovations in the past few decades (Fig. 1).

Intellectual property protection has become an important aspect of marketing new processes and products. Rapid advances in technology have also enabled easy modes of replicating processes and products. It has become imperative for academic institutions to obtain intellectual property rights that help in technology transfers.

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Published by the Indian Society of Genetics & Plant Breeding, A-Block, F2, First Floor, NASC Complex, IARI P.O., Pusa Campus, New Delhi 110 012; Online management by www.isgpb.org; indianjournals.com

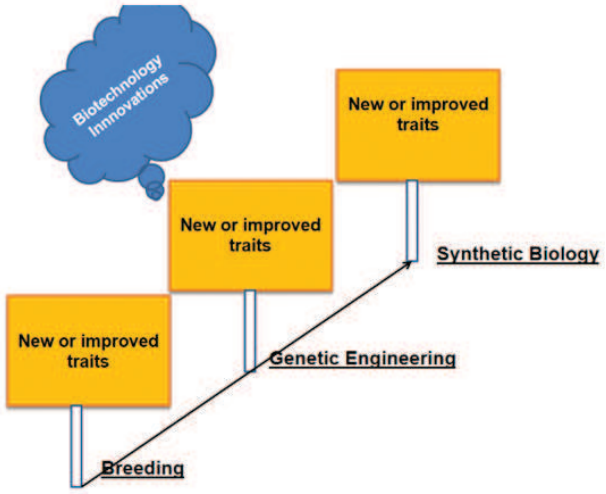

Fig. 1. The growth of plant breeding and biotechnology

The development of Ogura technology for oilseed rape by the French National Institute for Agricultural Research (INRA) is an important case to understand how IP can enable innovation. Its hybrid seed technology was licensed to several seed producers in a non-exclusive mode. INRA received 5% royalty till 2011 and then 1% upto 2016 respectively which helped INRA reap Singh and Padmavati 2011 back the benefits of the developed technology (Jewell C 2015).

The protection of IP rights in agriculture sector has incessantly been a concern as patent rights are monopolistic in nature. Nevertheless, the importance of IP rights in agriculture cannot be underscored (Singh and Padmavati 2011) Patents are the form of intellectual property rights which are given to inventions. In order to be patentable an invention needs to satisfy certain requirements as per the relevant patent law of a country. Inventions must have clear eligible subject matter. The patentability criteria include novelty, non-obviousness and utility. Further, inventions need to be disclosed in written document form (called specification) as per disclosure norms. The right associated with the grant of a patent is a negative right, an exclusionary right. Any unauthorized use will amount to an infringement of a patent right. The TRIPS Agreement (Trade Related Intellectual Property Rights) has made IP a global obligation and member countries need to be compliant with the minimum standards of this Agreement. Agriculture, traditional knowledge and public health were a prime concern for several countries including India at the negotiations on the TRIPS agreement. The option for protection of plant varieties as either patents or by *sui generis* legislation was given to the members of the TRIPS agreement. India chose to enact the Protection of Plant Varieties and Farmers Rights (PPV&FR) Act 2001. By enacting the Biological Diversity Act 2002, which is a complementary legislation, India showed its commitment to protection of bio-resources and agriculture. Indian Patents Act 1970 was amended thrice to bring in the compliance with respect to the TRIPS agreement.

Agriculture related inventions and patentability criteria

With respect to agriculture inventions an important challenge deciding how to obtain a patent on inventions derived from plant material and modification of genes. Eligible subject matter issues may arise in relation to Sec 3 of the Indian Patents Act 1970 (that describes ineligible inventions). Section 3 (b) of the Indian Patents Act 1970 may bar the patenting in view of effects on plant life or on the environment. Methods of agriculture and horticulture are ineligible for patent protection in India. From a policy perspective this reflects a public policy measure wherein cultivation and growing practices including improvement of plant varieties that are the routine and extended part of agriculture are not subject to monopoly and should be available for all at large (as provided under Section 3h of the Act). Further, whole plants, parts of plants, including seeds are ineligible for patent protection in India (under Section 3j of the Act). While patent protection is not available, new and improved plant varieties can be protected under another IP legislation, the Protection of Plant Varieties and Farmers Rights (PPV&FR) Act 2001.

According to Section 2 (1) (j) an 'invention' means a new product or process involving an inventive step and that is capable of industrial application. In the preceding section eligibility of an invention for patent protection has been discussed. Patentability criteria involve requirements of an invention to fulfil novelty, non-obviousness and utility. Every invention solves an existing problem in the prior art. Hence, the relationship with prior art is an important determination. When the prior art and an invention are identical, then there is no novelty in the invention. Even when the invention is novel, it is possible that it can be easily envisaged. A combination of prior arts may help in arriving at the invention. Then the invention is no longer non-obvious (Fig. 2).

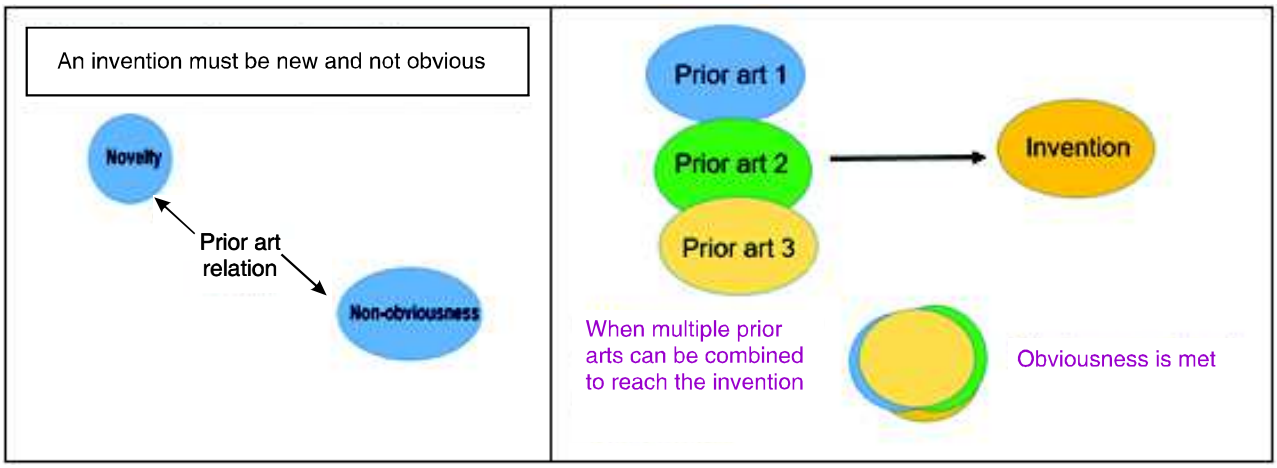

Fig. 2. Prior art relation for novelty and non-obviousness

In addition to meeting the novelty and non-obviousness criteria every invention must demonstrate general utility. A patent specification is a techno-legal document. It consists of two distinct parts; the description of the invention and the claims. Claims define the boundary of the invention sought to be protected. Claims have to be read in light of the specification, i.e., the written description. Section 10 of the Act describes the specification requirements, which is crucial to provide support to the patent claims. Claims must be clear, concise and sufficiently described and they are read in light of the written specification support. The requirements for patent protection are shown in Box 1.

Requirements for patent protection:

a) Invention must be novel and meet eligibility requirements
b) Invention must be non-obvious to a person with knowledge in the field related to invention
c) Invention must have utility
d) Invention must be adequately described to the public to demonstrate 'possession' of the invention at the time of filing
e) Invention must enable a person with knowledge in the field related to the invention to make/ carry out the invention without 'undue experimentation'
f) Invention must be described in clear, unambiguous and definite terms
g) Invention must set forth the best mode of making or using the invention, contemplated by the inventor at the time of filing of the patent application.

A good way to tackle the issue of broad claims in this area is through a strong enablement clause or disclosure standard. Disclosure norms in this area also involve the need to mention the origin of the plant material and its living conditions.

Seeking no objection under the Biological Diversity Act 2002

For agricultural biotech inventions there are additional steps of compliance required in case inventions are derived from plant bio-resources. In certain cases a no objection certificate may be required from the National Biodiversity Authority (NBA). Unless this is obtained an examiner who is involved in examination of a patent application will not put forward an order of a grant of a patent to the patent office. Section 6 of the Biological Diversity Act 2002 mandates that no person shall apply for IP in India unless an approval is sought from the NBA. The NBA has an important role to regulate the use of biodiversity in India. Applicants seeking no objection will need to sign a benefit sharing agreement. Subject to commercialisation the applicant will need to pay the royalty as stipulated in the ABS guidelines 2014.

The way to overcome patent barriers in this area is to identify the most feasible protection of agriculture inventions. Due to the need to foster agriculture many times breeders prefer to keep trade secrets and have effective licensing mechanisms. Open innovation like platforms are beginning to be available in this area. Syngenta's Traitability platforms provide an international licensing platform for improved access to patentable vegetable traits. This facilitates the

exchange of know-how and material for the benefit of farmers. The Patents Act has many effective safeguards which could be invoked in order to gain access to agricultural biotechnology for public good purpose. A compulsory license mechanism, Governmental use, research exemptions are available under the Act. Similarly, in the PPV&FR Act gives an emphasis on farmer rights. The interpretation of the relevant provisions indicate that farmer as a breeder can invoke emergency legislation to gain access to seed. The use of a patented technology by a farmer for livelihood purposes will not be construed as infringement. The recent case of PepsiCo filing against the Gujrat farmers for violation of its intellectual property in relation to certain potato varieties has opened up several considerations.

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Syngenta's Traitability platform -https://www.traitability.com.