

**NANOTECHNOLOGY ADVANCES AND IPR****Dr. Neeraj Kant Sharma***Editor-in-Chief, Journal of Advanced Scientific Research***ABSTRACT**

Advancement in the various fields of technologies like nanotechnology, biotechnology, databases, genetic resources, computer software etc. increases the trend of their commercial exploitation. This has triggered the efforts of industries, organizations, or individuals to fit in subject matters into the IPR (Intellectual Property Rights) regime, more particularly in the patent system.

The utilization of newer nanotechnologies for the development of useful products requires large economic investments. Even after development of these products, they may need to undergo screening and trials in order to be declared safe and effective utilization. Many such products get rejected even at the last stages of trials and all the investments made in such product development are wasted. Hence when any such product passes all regulatory tests and obtains market authorization, the organization, in order to recoup all the investments made in product development, are keen to obtain strong legal protection (like patents) against anyone trying to free ride on the developed product by copying it. Once a product hits the market, the reverse engineering or copying the chemical formula is quite simple and inexpensive matter. This necessitates the demand of intellectual property protection; but it may not be easy to protect them by just restricting in the conventional framework of copyright, patent and trademarks. There are also some efforts to develop new legal frameworks to meet demands of these new technologies. This note highlights various implications of IPR on novel nanotechnological development.

Practically everything we use in our daily life is the product of human ingenuity, knowledge and skill and represents some kind of intellectual property (IP) that has to be respected before the item could be lawfully produced for use by the public. The IP is a significant factor in gaining competitive advantage over rivals in the trade and industry as the entire idea of IP is to protect the owner against its unlawful use by any person or party offering same or similar products or services.

IPRs, as their exercise has evolved in practice, can secure for the owner a broad range of advantages depending on the national law. IPRs are exclusive rights that grant legal monopoly powers to the owner to ensure just reward for creative activity and best techno-economic returns for the state and the society.

PATENT

Patent is a statutory monopoly (exclusive) right granted to its owner to make use or sell the invention (whether product or process) for a limited period after which the invention passes on to the public domain. During this period no one must commercially utilize the patented invention, except by a license or due authorisation from the owner of the patent. The prohibition is applicable even to a person who may have independently created the same invention. The inventor is required to make a public disclosure of the invention to full working details

in the application, in lieu of the grant of monopoly right for the term of the patent, generally 20 years.

ROLE OF PATENTS IN ADVANCEMENT OF NANOTECHNOLOGY

Over the last three decades the technology has advanced with overwhelming rapidity and several new fields of technological endeavour have emerged; computers, electronics, digital technology, biotechnology, genomics, high performance materials, robotics, nanotechnology etc. Nanotechnology, the technology at the nanometer scale, resulted in the development of nano-objects (e.g. nanotubes, nanofibers, nanoparticles, quantum dots etc.) that can potentially be applied as nanomedicines to tackle immunological problems, in targeted drug delivery and for increased accuracy and sensitivity in analyzing laboratory samples. The role of patents in development of these technologies can be explained under following headings:

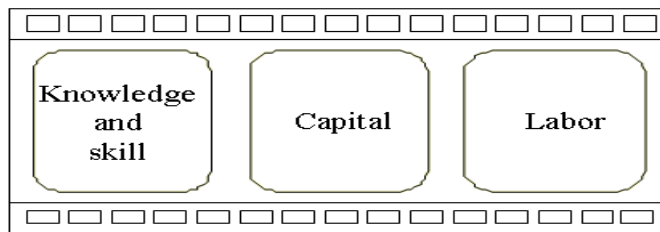
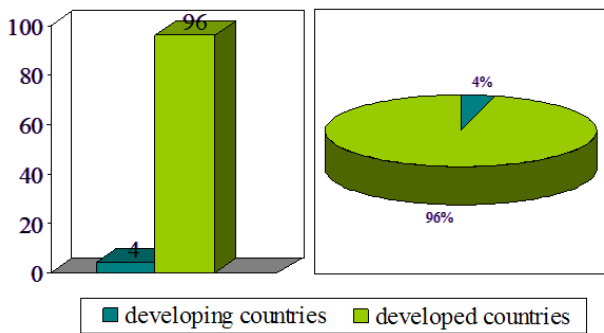
PATENT AND TECHNOLOGY DEVELOPMENT

There is a great asymmetry in R&D efforts between the developed and the developing countries. Presently developed countries account for 96% of the global expenditure on R&D. As the vital lap from invention to innovation requires much larger funds than were required for the R&D for the invention, the research

institution needs involvement of a commercial partner who is usually to be a private party.

For effective technology transfer from lab-to-industry it is necessary that the research institutes and universities must have a motivation to do so and the entrepreneur must have a minimal assurance that there is a reasonable chance that the technology, though as yet commercially unproven, will be successful in commercial production. Both these objectives are met by encouraging research institutions to seek patents for their invention and permit them to license the patents to private parties.

Global expenditure on R&D



PATENT AS AN INSTRUMENT OF RIGHTS AND PRIVILEGES

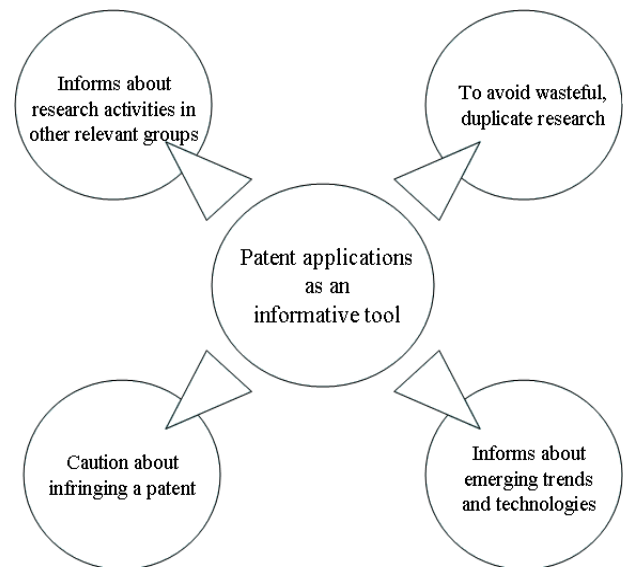
Grant of a patent for an invention provides following privileges to the inventor:

- The inventor is effectively shielded from the heat of market competition if he wants to commercially exploit his invention, for the term of the patent.
- The inventor gets time and opportunity to recover his cost in terms of money, time knowledge and skill invested to come up with the invention.
- The inventor gets time and opportunity to make neat profit through license fees and royalties.

PATENT APPLICATIONS AS GOLD MINE OF INFORMATION

Patent applications contain a wealth of information which serves many purposes:

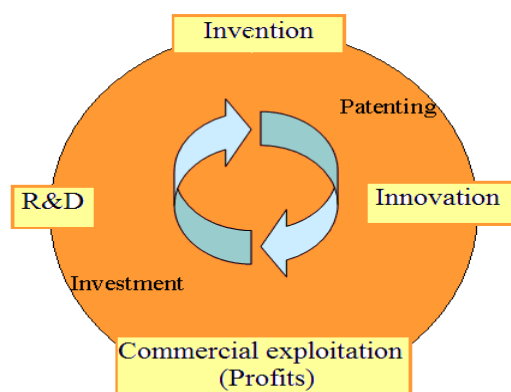
- It prevents one from wasteful, duplicative research.
- It informs one of the technology available for licensing and also of technologies that are freely available in the public domain, either because their patents have expired, or they were never patented in the country.
- It is a good source of information on the research activities of a company for its competitors. Technical information of new processes and products is published in patent specification much before they appear on the market.
- It is a sure indicator of the emerging trends in technology and emerging new players in a field.
- It can save one from infringing patents and incurring heavy legal costs and penalties.



ECONOMIC CONSIDERATION

Investment in R&D is quite an expensive undertaking. IP protection plays a catalytic role in stimulating R&D by assuring the investors of reaping a major portion of resulting benefits.

- Protection of IP has the potential to contribute positively to a country’s efforts to attract foreign directed investment (FDI), increase foreign trade, and provide necessary conditions for transfer of technology.
- A steady and steeply rising increase in FDI in India has been evident ever since patent and trademark reform was introduced in the early 1990s.



**Patent- sustains the virtuous cycle
from R&D to economic growth**

ENFORCEMENT OF IPRs

Infringement of IP results in large losses to the owner of the IP and adversely impacts national economy by discouraging FDI and technology inflow and discouraging creative activity. Thus global trade suffers. The agreement on the trade related aspects of the IPRs (TRIPS agreement) of the world trade organization (WTO) lays down the minimum standards concerning the availability, scope and use of IPRs and makes it obligatory for members to incorporate in their national laws mutually agreed enforcement procedures as given in the agreement. International agreements have been constantly trying to effectively counter the production of counterfeit goods – right from Paris convention (1883) and Berne convention (1886) to the TRIPS agreement. Several international organizations such as World Customs Organization (WCO) and INTERPOL have joined in the fight for the enforcement of IPRs. Remedies available under national laws to avoid infringement of IPRs fall under three categories:

Civil procedure

The holder of IPR (including an assignee or a licensee) may file a suit of civil action against a person who infringes his right.

Criminal procedure

Here generally the state moves a court for criminal action against the infringer. The penalties for infringement in a criminal case are tougher than in civil proceedings.

Administrative procedure

Apart from court, administrative agencies can and do take effective steps (such as seizure of infringing goods) in case of violation of IPRs

FUTURE

New technologies also brought with them new questions, new dilemmas and the IP system had to respond with needed dynamism and flexibility. Hence, not all the advancements could be accommodated within the old concepts and framework of IP. This necessitates some efforts to develop new legal frameworks to meet demands of these new technologies. New technology measures based on optical technology (holograms) and electronic technology (magnetic strips) to track and prevent infringement, by making counterfeiting and copying difficult, have also been emerging.

CONCLUSION

Nanotechnology based inventions in the field of health care are the product of human ingenuity, knowledge and skill and represents some kind of IP. Commercial exploitation of these inventions in the form of useful products requires large economic investments. IPRs provide a strong legal protection (like patents) against anyone trying to free ride on the developed product by copying it. This motivates the inventors and entrepreneurs by providing assurance of reaping a major portion of resulting profit. In this way, IPRs have been proved to be very critical in technology development, in economic growth of a country and in promoting global trade.