Developing Intellectual Property Laws by Hindsight*

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Hindsight is a process by which historical events are objectively perceived, qualified and reconstructed in terms of cause and effect for effecting a desirable future. Development of intellectual property rights (IPR) especially, patent laws, design rights, copyrights and trademarks, worldwide, have followed the dialectical principle of hindsight by creative interpretation of the laws of political-economy of nation states, judicious interventions of common law and convention principles, laws of IPR, creative interpretations of statutes and case laws by the judiciary and enlightened enactment of statutes by the national legislature. India’s development also closely followed this methodology of hindsight and its relevance, in the changed context of Trade-Related Intellectual Property Rights (TRIPS) of World Trade Organization (WTO) and international demands, is much more evinced. It demands for enactment of a bundle of IPR and related laws in order to raise India’s standard as that of international one. An attempt is made in this paper to study and analyse the development of IPR laws in India by hindsight and suggest enactment of a bundle of new legislations.

Intellectual Property

Property rights is the basis of development of human civilization. Variations of terms of property rights have emerged since the man socialized his living separating from the animal kingdom. Such property rights range from individual private rights, and community rights to the state’s public rights. The properties are both movable and immovable and tangible as well as intangible. The Constitution of India accords its recognition for protection of property rights of private persons subject to certain reasonable restrictions in the public interest similar to the position in many other countries.

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Intelectual property right (IPR) is one such intangible property right. Intellectual property is the creation of the creative labour of inventive people who do deserve suitable property right protection.

Patents, design rights, copyrights and trademarks are the important forms of IPR. Among these, patents are the most important one to the inventors and innovators in the domain of science and technology. It is also one of the most controversial form of property rights whose delimiting factors of inventions are hotly debated worldwide and differed often on precisions. Therefore a focus is made in this paper, to appraise the patent laws in its right perspective.

Patent right is the monopoly right, granted by the State, as per the provisions of the law, for working out on invention commercially and vending the resultant products. This monopoly right is conferred by the State for a limited period to work ones own invention by excluding others from using without his consent.

The word 'patent' is the opposite of the word 'latent'. While 'latent' is hidden by secret or confidential way of working an invention, 'patent' is open by disclosure of specifications and claims in the official patent gazette. And for this disclosure of a novel and useful invention to the public, under the seal of the Government, the inventor is granted a monopoly right for commercial working and vending either by himself or by a licensee.

This is based on the public policy principle of striking balance between the interests of private inventors and the public users. The main object of granting patent right is to promote public interests through progress of science and technology and industry while at the same time protecting the interests of the inventors for a limited period as expressed in the Patent and Design (Amendment) Bill, 1991 of England.

Patent, though blocking in nature is presumed to stimulate technical progress by encouraging investment in R&D, to make inventions and disclose the same to the public, and adventure for its commercial exploitation most profitably, all free from competitive environment, till the expiry of exclusive period. Thus, it is the dialectical relationship of blocking competition to create an upsurge of competition by next generation inventions by many competing inventors paving way for cooperation by cross licensing.

Thus, the object of the patent law is to encourage intellectual labour by competitive spirits to do scientific research and develop new techniques, methods, processes, and products and promote industrial and economic progress of the society.

The price of granting exclusive rights, according to Justice Sarkaria, is the disclosure of the invention, at the patent office, which is then passed on to the public domain, after the expiry of the monopoly period.

**Intellectual Property Rights to Promote Industrial Development**

The origin of patent system in England was closely interconnected with its industrial development. It was to promote textile industries, in 13-14th century, that the crown had granted exclusive rights to various foreign traders. In turn the crown expected the inventors to put their inventions into commercial practice in the country and help spread of knowledge among the people. Thus, any one, who brought the industry to the commonwealth, was given the exclusive rights, irrespective of the fact that he was true and first inventor or not or the manufacture was
a new one or not. Even the patentee was not bound to disclose the invention. Only condition was that he should establish a new industry or trade in England and transfer the related skill to any one willing to learn as explained by the judiciary in the following cases\(^5,6\).

A statute was introduced in 1399 by Henry IV which demanded disclosure of inventions in the form of discipline for the grant of patents, though it was not insisted upon. Thus, the inventor held the invention undisclosed. This was resented and criticised widely leading the parliament to pass a piece of legislation called "Statute of Monopolies, 1624" laying the foundation for modern patent system worldwide.

Section 6 of the Act insists that in order to obtain the patent privilege, the invention must be a 'new manner of manufacture' and the patentee must be the 'true and first inventor'. An element of novelty was thus introduced. The period of exclusive right was limited to 14 years. The statutory provision in patenting was the codification of the common law practice prevalent in the 17th century England. Though the Act did mention about novelty, it did not define it. It was limited to the practice of art or prior use within the memory of man. Though the Act insisted conferring patent rights on the 'true and first inventor', the term was left undefined. And whoever brought the invention to the patent office first was granted the monopoly right, motive being the promotion of industrial development.

As the patent system got popularized, in the 17th Century, the demand for written disclosure of specifications of inventions came from both inventors and the patent officers for their own good and clarity. Lord Mansfield, in categorical terms, had expressed that the consideration for the grant of patent monopoly was the disclosure of the invention for the benefit of the public. In the case of "Liardet vs Johnson", the learned judge emphasized the need for the disclosure of detailed written specifications of the inventions in the patent applications.

For a long period of time the "devisor" of the invention and its 'introducer' in the manufacture were considered as 'true and first inventor' though with a dissent\(^7\).

The principle of limiting the meaning of the 'true and first inventor' to the actual devisor was laid down by Tindal, C J in "Cornish vs Koono" (1778) which was later on followed in many cases in England. And then, the 'true and first inventor' was limited to the actual devisor of the invention or his assignee(s). Such a creative interpretation of the term by the judiciary formed the basis for the grant of patent by protecting the ingenuity of intellectual labour of the inventor.

Section 5(2) of the codified patent law, 1883, of England gave the statutory recognition to the rights of 'true and first inventor' and his assignee(s). This was followed by Section 1 of Patent and Design Act, 1907 and Sections 1 and 2(3) of Patent Act, 1949 which insisted a declaration by the applicant as 'true and first inventor' or his assignee(s) as mandatory. Though not defined expressly it was followed implicitly by judicial interpretations till 1977. And Section 7(3) of the Patent Act, 1977 of England expressly stated that the 'inventor' means the actual devisor of the invention. Now, it is statutorily accepted that patent is available only to the actual devisor of the invention or his assignee(s). The same position holds good in India also as seen from Section 3 of Patent and Design Act, 1911 and Section 2(y) of Indian Patents Act, 1970 which excludes the 'first importer' or 'first communicatee' from the definition of
'true and first inventor'. This principle upholds the public policy and negates the theory of vending the products alone as equivalent to working out the inventions in the country; though it may be exception in certain cases on the grounds of economy of scale of operation.

Now, it is statutorily declared in UK and India that patent rights are granted only to the true and first inventor(s) [the actual devisor(s)] or his or their assignee(s). It is also mandatory that the invention must be disclosed with full specifications in the patent application so that the public is able to work it after the term expires. And what is not disclosed in the claim is considered as not disclosed in the patent application and hence no patent protection granted. Thus, the patent system in UK has developed as a response to the needs of industry and manufacture.

In contrast, the patent system in India has evolved through legislations closely resembling that of England but often differing in quality in content and context which are of national interest. The first patent Act was enacted in 1856 followed by an amendment in 1859. In 1872 the Patent and Design Protection Act was passed followed by its consolidation in 1883 in line with the English Protection of Invention Act, 1883. Indian Patent and Design Act, 1911 was passed on the lines of English Act, 1907. For the first time, the administration was brought under the control of "Controller of Patents" (COP) and an Office of Controller of Patents was established in the country.

Developing Patent Laws in India

Justice Tek Chand Committee Report, 1948-50 has proved that the Patent Act, 1911 in India had favoured the British and the foreigners only and not the Indian industries and inventors. It failed in its main object of stimulating inventions by Indians and then encouragement to develop them further and their commercial exploitation by industries including domestic working of foreign inventions in India and derive the resultant public good. Thus it did not encourage the national interest of technological assimilation and diffusion. Rather it encouraged the antithesis of technological dependence in many sectors of national economy.

This report was followed by Justice Rajagopala Ayyangar Report, 1959 which came to the similar conclusions and recommended legislation of new patent law with substantial modifications to balance private interests of the inventors with that of public interests. The Bill was extensively debated by the public as well as joint select committees of both the houses of Parliament. It also invited views and comments from commerce and industries worldwide and made extensive comparative analysis. And finally Indian Patents Act, 1970 was enacted which has been considered as a 'Model Act' for many developing countries.

The Parliament took enough care to protect the public interests as seen in the provisions of the Act: patentable inventions (Sections 3, 4 and 5); the test of invention (Section 2(1)); the term of patent (Section 53); the provisions for working of patents in the country (Section 82-98); and the Government control over the patents (Sections 99-103). Section 3 of the Act stipulates which are not considered as inventions for patentability purposes: some by virtue of natural logic of scientific discoveries and some others by virtue of public interest and many more by balancing both public and private interests.

The term 'invention' is defined in the Section 2(1)(j) of the Act to mean any new and
useful (i) art, process, method or manner of manufacture; (ii) machine, apparatus or other article, and (iii) substance produced by manufacture and includes any new and useful improvement of any of them and alleged inventions. Thus the law in India recognizes both process and product patents but subject to certain exceptions which are both inclusives and exclusives.

Public Policy and Exceptions

The legislature, in the public interest, has expressly excluded certain inventions from the purview of patentability. Under Section 3 of the Act, the following are not considered as inventions: (i) frivolous and contrary to the laws of nature; (ii) intended to be used contrary to the law or public morality or injurious to the public health; (iii) mere discovery of a scientific principle or formulation of an abstract theory; (iv) the mere discovery of any new property or new use for a known substance or mere new use of known process, or machine or apparatus, unless such known process results in a new product or employs at least one new reactant; (v) a substance obtained by a mere admixture resulting only in the aggregation of the properties of the components thereof a process for producing such a substance; (vi) mere arrangement or rearrangement or duplication of known devices each working independently in a known way; (vii) a method or process of testing, during the process of manufacture, for rendering the machine, apparatus or other equipment, more efficient or for the improvement or restoration of the existing machine, apparatus or other equipment or for the improvement or control of manufacture; (viii) a method of agriculture or horticulture; and (ix) any process for the medicinal, surgical, curative, prophylactic or other treatment of human beings or any process for a similar treatment of animals or plants to render them free of diseases or to increase their economic value or that of other products. This is also the position of patent laws world wide.

Likewise, inventions relating to atomic energy, falling under Section 20(1) of Atomic Energy Act, 1962, are also excluded from patentability (Section 4). In the case of invention concerning food (Section 2(1)(g); medicine or drug (Section 2(1)(g) and chemical products (including alloys, optical glass, semiconductors and intermetallic compounds), patent rights are not granted to the substances themselves. But patents are granted only to the methods or processes used for manufacture of such products (Section 5(a) & (b) of the Act). Under Section 5(a), substances intended for use or capable of being used, as food or as medicine or drug; or under Section 5(b), relating to substances prepared or produced by chemical processes (reactions), only process patents are granted and not the product patents.

Besides public policy, this is also the natural logic that if there are 'n' number of chemists, they will have 'n' number of methods, techniques, processes or ways to prepare or produce the same chemical substance or product. And it is illogical, and against the public policy to prevent their initiatives to search for alternate routes, methods or techniques by product patent grant. And it is in this context that chemical product patents are called the blocking patents that retard productivity by inhibiting competition. However, there is a need for new laws to protect the economic interests in the S&T efforts in the discovery of new chemical molecules, compounds and substances as there is an element of human intervention, labour, skill capital and intellectual ingenuity. The law that protects products submerged in processes
could be the appropriate ones for discovery intensive inventions.

The living and naturally occurring things like viruses, cultures, microorganisms and biological processing for their creation or reproduction are not patentable as they do not fall under the category of inventions (Sections 2(1) (j); and Section 3(1)-h) as above. It is difficult for disclosure of complete specifications of living things (Section 10). However, inventions relating to the processes, for production of substances, like enzymes, yeasts, antibiotics, alcohols, by bioconversion, using microorganisms can be patented in which case the disclosure of microorganism is identified with a microorganism bank deposit accession number. This is the position of law with respect to microorganism protection world wide including India. However lately US has accorded patent protection to microorganisms and genetically manipulated life products _per se_. And the law is still evolving in the US. Speaking literally, US laws could be more open ended as the society is more dynamic and hence self regulating. But such an open ended law in a developing country like India will be prone to more chaos and hence an in built mechanism within the Act to protect public interest.

**Indian Patent Act: Its Impact**

The provisions in the Indian Patents Act, as cited above, strike a balance between public and private interests. The positive results in the areas of domestic research and development (R&D), agriculture, horticulture, animal husbandry, fertilizers and agrochemicals, atomic energy, pharmaceuticals and health care and industrial chemicals, machine building, space and defence technology, remote sensing, mineral prospecting, are the standing examples, where India has attained a near self-sufficiency after the enactment of Indian Patents Act, 1970.

**India in the International Scene**

In the changed context of TRIPS of Dunkel Draft Text (DDT) of the General Agreement on Tariffs and Trade (GATT) or the renamed WTO and Paris Convention (PC) and trade sanctions of the US, under their super and special 301 laws, demands have been put on the developing countries, including India, to structurally alter the basic features of their patent laws.

India is a signatory to the international treaty of DDT. It needs to be respected by virtue of Article 51 by incorporating this international treaty into the national trade laws by enacting new laws and/or amending the existing ones as per Article 253 of the constitution. But in the context of the directive principles of State Policy and the Fundamental Rights under Articles 14-19 of the constitution, the GATT agreement, itself, is believed to require a serious examination for constitutional validity. Hence the difficulties in structural amendment to Indian Patents Act 1970. Therefore it is desirable to enact a bundle of new intellectual property laws to overcome this hurdle.

The DDT demands patent protection to any invention (discovery), whether product or process, living or nonliving, plant or animal, in all fields of science and technology, as long as there is an element of human intervention, novelty of invention (discovery), economic use and value addition and not contrary to the law and public morality (Article 27 of TRIPS). This is the position of law in the US and also in the provisions of Paris Convention. TRIPS demand for exclusive ownership by the patentee, in absolute terms, and accord recognition to importa-
tion of the product as equivalent to domestic working of the patented process (Article 8); is one which is something similar to that of Article 5A(1) of Paris Convention. It is the dicotomy of the property rights of free market economies. That is, freedom is accorded in generalities while restrictions are imposed in particularities.

Article 10 of the Paris Convention curtails any form of competition on the ground of unfair trade practices. It insists on the extension of patent term to 20 years, uniformly to all inventions, irrespective of the nature of inventions and their economic life time (Article 33). Though this term should be proportionate to the economic value of the invention, it is one area where the demand can be reconciled in favour of 20 years for both process and product patents from the date of filing running concurrently.

Further, in case of process patents, for which product patents also exist for the purposes of civil infringement of the rights of the owner of the product patent, as in Article 28(1)(b) of TRIPS, it demands reversal of burden of proof by the defendants themselves (Article 34). Whereas according to the Indian Evidence Act, 1872, the burden of proof for infringement is on the person who alleges infringement. The demand for reversal of burden of proof could be agreed on practical grounds that only the alleged has access to it, but it should be subject to a correction that the examination committee consists of independent judges similar to that of International Atomic Energy Safety Committee.

It insists on scrapping of the provisions of "compulsory licensing" and "automatic licensing of rights" (Article 28-32). However, this demand, if conceded will weaken the public interest of the nation. And by retention there is no disability induced to any one.

Further, it concludes that a signatory to the TRIPS, Part II, III and IV of DDT of GATT/WTO, automatically binds to the provisions in Articles 12 and 19 of the Paris Convention (Article 2) the process of which is patently unfair. However, India can join the Paris Convention, to avail certain fringe benefits, provided no precondition is set for its admission.

The fringe benefits of Paris Convention are seen in two aspects: Principle of nationality treatment (Article 2) and priority of filing of patent applications (Article 4). Though India is not a member of Paris Convention, it is not practising any discrimination. The Patents Act, 1970, Sections 133-139, provides for international agreements for the status of convention country for nationality treatment on reciprocal basis and the associated fringe benefit of priority of filing. And in practice India has given more, preferential treatment to foreign inventors, than mere nationality treatment.

Article 28 of the Paris Convention insists the aggrieved party to go to the International Court of Justice for dispute resolution if the same is not settled by negotiation within the convention, the approach of which though costly affair to the developing countries can be accepted as ultimate resort. And revision of substantive articles of Paris Convention requires unanimity among all members which is an impossibility in practice. These are the costs and benefits of membership of Paris Convention.

As a signatory to the TRIPS of DDT, India, now, is under an obligation to alter the basic features of its Patents Act, 1970, by 2005 AD on the presumption that its provisions are at variance with the TRIPS provisions.

Article 65(4) of TRIPS provides a transition period of one year grace period to all states
of GATT/WTO, four more years to developing countries and former socialist countries and another five years to developing countries which at present do not permit product patents in all fields of S&T as per Article 27. Thus a total 10 years, commencing from 1 January 1995, is given as transit period. Altering the law in favour of product patents, for all inventions, without exceptions, India is required to provide Exclusive Market Rights (EMR) for such products for a period of 5 years, for which product patent applications have been deposited with the Controller of Patents (Article 70 of TRIPS). The patent amendment Bill provides such provisions provided there has been a patent application filed and granted in the parent country on or after 1 January 1995.

Since Indian Patents Act 1970 provides product patents, subject to certain exceptions, it is really doubtful whether it is at variance with the TRIPS provisions. The only difference is in the scope and extent of patentability, subject to certain logics of inventions and public policy.

TRIPS Provisions: Demand for Structural Changes

If TRIPS demands are accepted, the following important sections, defending the public interests, would have to be deleted from the Indian Patents Act, 1970.

1. Section 83: To encourage inventions and secure their commercial working in the country itself thus helping S&T assimilation and diffusion.

2. Section 47: Government's rights to work the patent or import the product, specially drugs and medicines, for its own use or distribution and ensure the availability to the public at fair prices.

3. Section 86: Endorsement of "Licences of Rights" in the interests of public after 3 years from the date of sealing, and enable the public to work in the country, obtained for a reasonable price and ensure availability of the products to the public at fair prices.

4. Section 87: Endorsement of "Automatic Licences" of Rights, for process patents, especially in drugs and medicines after a period of 3 years from the date of grant, to enable the public to work it, obtained at reasonable price, and ensure availability of products at fair prices.

5. Section 84: Provisions of "Compulsory Licences" after the lapse of 3 years from the date of sealing, if the same is not worked in the country or if worked, the public demand is not adequately met at reasonable prices.

6. Section 89: Revocation of patents in respect of "compulsory licensing" or endorsement of "Licences of Rights" on an application by the Government or any person, after the lapse of 2 years from the date of sealing, on the ground of nonworking or nonfulfilment of public demand at reasonable prices.

7. Section 53: Term of patent is 5 years from the date of grant or 7 years from the date of filing in case of inventions claiming methods or processes of manufacture of chemical substances, food, drug or medicines and 14 years in respect of other inventions. However, this section may be amended extending the term to 20 years from the date of filing or proportionate to the economic life of the invention from the date of grant and sealing. It should be noted that licensing and commercialization of the patent need not wait till
the grant. It can even precede it under a secrecy clause in the licensing Agreement.

Wide Perceptions and Fear Psychosis

It is widely perceived that, Indian industry, economy and public, will be adversely affected if the TRIPS provisions are literally accepted and the basic features of Indian Patents Act, 1970, are structurally altered. Such perceptions are: (i) stifle the nation's constitutional sovereign rights to develop its own laws; (ii) allow intellectual piracy of indigenous knowledge resources especially in biodiversity, agriculture, computer software, drug and pharmaceuticals and chemical industries; (iv) increase the cost of production, especially in agriculture, food, drugs and medicines and chemicals; (v) lead to decline in indigenous R&D, plant breeding and self-innovation by local communities; (vi) lead to further loss of genetic diversity and undermine food security; and (vii) undermine health security of the people. However these are the fear psychosis out of extreme perceptions whose occurrence are remote but not impossible if the conditions that prevailed during East India Company days resurface once again.

Patent Rights: Only for the Disclosed Specifications

Disclosure of detailed specifications, in the patent application, provisional or complete, is made mandatory in the Indian Patents Act, 1970 [Section 7(4)]. This is the position of law in many other countries. In case of filing provisional specification, the applicant will have to file the complete specifications within 12 months from the date of provisional filing [Section 9(1)] so as to get the date of priority. The specifications should contain elaborate descriptions of the invention for which the patent protection is sought (Section 10).

But disclosure of complete specifications is difficult in cases of biotechnological inventions (discoveries) particularly, living products such as microorganisms. Hence there is a need for an alternate law to protect the economic interests in the R&D efforts, in such biotechnological inventions (discoveries). Further there is an urgent need for a law to regulate microorganism despository systems and institutions of international standards to implement the laws.

Development of Patent Laws by Hindsight

Till the passing of the statute of monopolies, 1624, there was no specific criterion to determine the subject matter that deserved grant of patent monopolies. It was left to the discretion of the king. For the first time Section 6 of the statute of Monopolies, in England, insisted that the patent monopoly to be granted for the working of the invention or any manner of new manufacture. This criteria of the subject matter for the grant of patent monopoly continues till today in England. In India also, the criteria of domestic working for grant of monopoly rights is incorporated in Section 84 of the Patents Act 1970.

In the early days, only new or substantially new unit was considered as manufacture. But by the passage of time, even improvements upon the existing units have been considered as manufacture as long as there is an element of human intervention, art and skill, employing at least one new and inventive step.

The test applied in the olden days for the term "manufacture" was "Vendible product
test", as laid down by Morton J in case of GEC Applications. According to this test, if the product is the resultant of a method or a process, and also a vendible (marketable) one, then such a method or process is treated as a manner of manufacture.

In India, the term "invention" was defined in the Section 4(1) of Inventions & Designs Act, 1888, to mean any manner of new manufacture which included an improvement as quoted in a case of Elgin Mills Co vs Muir Mills Co, 1895. The definition of invention was the same as seen in the English Act, 1888 also.

The term "manufacture" was defined in the Indian "Inventions and Designs Act, 1888", as any art, process or manner of producing, preparing and making an article or substance and also any article or substance prepared or produced by such manufacture. According to Justice Alkman of Allahabad High Court, in Elgin Mills Co vs Muir Mills Co (1895) case, to justify the grant of monopoly patent rights, one should display at least one faculty of inventiveness. The cheapness, adaptability and other economic advantages are not enough to satisfy the test of invention and manufacture. Even Section 2(8) of Indian Patent & Design Act, 1911, though codified one, did not make any substantial change with respect to the definition of the term "manufacture".

The term "manufacture" was once again subjected to judicial interpretations in a case by Justice BJ Wadia of Bombay High Court. Accordingly, "manufacture" comprehends not only the production of an article but also the means or method of producing it or using it or applying it, including an improvement effected to the old process or method or article or product or use of it. The word "cut" is treated as something equivalent to 'manufacture'. The subject matter of patent must be a new manufacture or art, i.e. man-made and not a natural phenomenon, without which there is no invention. If the result of combination is either a new article or a better or a cheaper article, than before, then the combination is a subject matter for patent. More collection of two or more known things, without exercise of some inventive ingenuity by human intervention, skill, efforts and investment in combining them to produce something new or novel, or something more than the known thing, is not a subject matter of patent.

This principle of inventiveness of manufacture to constitute the novelty of inventions entitled for monopoly patent rights, as observed by Justice Alkman of Allahabad High Court in Elgin Mills Co case and Justice Wadia of Bombay High Court in "Lallubhai Case" and followed in many other cases, was upheld by the Supreme Court, in another case by Justice R S Sarkaria. The test to find out whether the 'manner of manufacture' is the patentable invention of art is to know whether an 'inventive step' or inventive faculty is present or not. The use of independent thought process, inventive ingenuity and intellectual skill of the inventor should be there to satisfy the test. And the Indian Patents Act, 1970 incorporates this definition: novelty of inventiveness of the manufacture in an extensive and inclusive manner.

The element of "novelty" was introduced for the first time in Section 6 of the statute of the monopolies 1624 of England which states that patents must be granted to any manner of 'new manufacture'. The test of novelty was judged from the fact whether the invention was in practice or used by any one during the memory of an English man. The examination of prior use was also limited to this
realm. The focus was on the establishment of a new industry and not the new invention. Lord Mansfield in a case\textsuperscript{18} gave meaningful interpretation of the word 'novelty'. According to him, the issue of want of novelty must be supported either by the proof of continuous and successful prior use of the invention or that the substance of the invention was a common knowledge in the trade. But this meaning was used to be avoided in the contracts between the Crown and the patentees when the patent monopoly was granted.

The test applied, nowadays, to determine the novelty is to search for the prior publication or prior use of the invention. The courts in England have interpreted the term "prior publication" to mean that the publication of the invention is open to the public for inspection\textsuperscript{19}. However, actual knowledge of publication is not considered essential to constitute the prior publication. The term "prior use" is interpreted to mean public use. Secret way of selling the product is also held as 'prior use'\textsuperscript{20}.

In India also a similar position is held with regard to 'novelty' of subject matter as precondition for the grant of patent and 'prior publication' or 'prior use' as test of novelty. If the public vending of an article for a profit, produced by a process, kept itself secret, is held as 'prior use' and 'prior publication'\textsuperscript{21}.

Justice Beanmount has reasoned out, that if secret use of a process to produce, sold in public, for a profit, is not traceable by examination, by reverse engineering and re-engineering, then it is not obvious one and hence the product available in the market is maintainable as one made of secret process. Then such "secret use" is not held to be as "public use"\textsuperscript{22}. This principle was also concurred by Justice Rangnekar and in many other cases\textsuperscript{23}. Accordingly the process of learning by reverse engineering and re-engineering is the bench mark to judge whether a given invention is novel or obvious or not and finally maintainable or otherwise.

Prior publication of requisite knowledge leads to loss of 'novelty' of invention, even if the concerned persons in the trade do not have actual knowledge of the invention. Availability of the publication, even in a public library or patent office, for "public reference" is enough to constitute the prior publication\textsuperscript{23, 24}.

Thus, in India also, prior publication and prior use is enough to negate the novelty of the invention whether it is actually known to the public or not.

Utility of the invention, though not particularly mentioned in the statute, was considered as one of the criterion for the grant of patent monopoly, since the beginning, either by establishing an industrial unit or meeting any other practical or economic utility. Commercial success of an invention is not considered as an essential requirement of granting patent monopoly\textsuperscript{25}.

Though Indian Patent & Design Act, 1911 [Section 26(f)] had expressly stated the need for utility, it was not included in the definition of invention. But Section 2(1)(j) of Indian Patents Act, 1970, has expressly stated in the definition of 'invention' that it must be new and useful one. But the degree of usefulness and the field of application are not defined in the Indian Act. Section 1(1)(c) of UK Patent Act, 1977 stipulates that the invention must be capable of some industrial application. Newer developments and industrial demands may necessitate India to define the degree of use and the fields of applications as prerequisites for grant of monopoly patent rights.
Patent Laws: Expanding Horizons

US Supreme Court, in recent times, has widened the scope of patentability to certain inventions and discoveries, in computer software and programs and living things like microorganisms, under the logic that such things are permitted under constitutional provisions, as long as they are the results of human interventions and possessing some utility and exhibiting some value additions.

The early patent applications for computer programs and related inventions were rejected on the ground of "doctrine of mental steps" and hence prohibited by statutory provisions. For example, 'algorithm' though contained some novel features, patentability was denied on the ground that it was only a mathematical calculation and hence not patentable under the statute.

An 'algorithm' is a simplified, step by step, mathematical model, programmed to a computer machine, to solve a complex problem, to the minutest precisions. When it is a generalized one, without being integrated with any manufacturing process, without directed to solve any specific problem, in any specific field of manufacture, then it is considered as a mathematical equation, something similar to the natural laws, and hence not patentable. But when the "algorithm" is oriented and directed, as a part of a manufacturing process, to solve a set of specific problems in specific fields of manufacturing, in a predetermined manner, then it is considered as a patentable invention. This principle had been evolved first by the US Supreme Court in "Gottschalk vs Benson" (1972) and denied patent rights, by upholding the decision of Patent & Trademark Office (PTO) and reversing the decision of the Court of Customs and Patents Appeals (CCPA), for Benson's method of converting numerical information from binary-coded decimal numbers into binary numbers, which could be used to program a computer, as the claimed programming algorithm, was held to be not a "process" as defined by the Patent Act, and that an algorithm or a mathematical formula, was analogous to the laws of nature and hence not patentable.

This principle was once again examined in another case where the applicant had sought patent protection for a method of updating alarm limits used in a catalytic conversion process. Though the algorithm was claimed to be novel, the court rejected the claim as it was only a mental exercise and did not fall within the statutory definition.

The CCPA in another case, has evolved a two pronged test to determine whether computer-related programs are patentable or not. The patent claim is first examined to determine whether a reference is made to the algorithm, directly or indirectly, as a procedure to solve a given set of mathematical problem. If it is so, then it is examined further to determine, in its totality, whether the claim wholly pre-empted the use of that algorithm. If so the claim is considered as unpatentable subject matter.

In England, the present Patent Act excludes computer program from patentability [Section 1(2)(c) of Patents Act, 1977 (UK)]. Indian Patents Act is silent in this aspect. But computer programs are now protected as literary works under Section 13 of the Copyright Act 1957 as amended in 1994 which is considered to be a better protection (lifetime of the author + 60 years) than the patent protection.

It was in Diamond vs Diehr (US 1981) that the Court, for the first time, had recognized the patentability of the subject matter in computer related program. The claim was a
process for moulding raw and uncured synthetic rubber into cured and precision products, by in-process temperature measurement and control, by use of mathematical equation, fed into computer-based automated device, that formed an integral part of the manufacturing process employed. The algorithm thus helped the device to open the press at the correct time.

Thus, the computer programs and softwares, submerged in manufacturing processes, have been considered as satisfying the statutory requirements of novelty of inventions for patentability purposes. Based on the decision of the above cases, CCPA had modified its two-step analysis and accorded patent recognitions in many other cases. A similar system may be adopted in India as well.

The reformulated test by CCPA is to examine the claim for a mathematical algorithm in the form of a mathematical formula or procedure for solving a mathematical problem. If such a mathematical formula is included, then it is examined further to know whether it is only the mathematical formula. If yes it is an unpatentable subject matter or if it is a part of a manufacturing process by application of the algorithm, then it is a subject matter of patent under the Act. This test is now applied in deciding the cases for patentability.

It has been generally held that living things, like microorganisms, viruses, etc. are outside the purview of patent system. This is based on the principle that they are the results of biological evolutions, capable of reproduction and self propagation and common to all mankind and hence not capable of being treated as monopoly property. But when such living things are the results of human intervention, the question arose whether it could be a patentable subject matter or not.

The US Supreme Court in "Diamond vs Chakrabarthy" (US 1980), for the first time, had accepted such a discovery as a patentable subject matter. Chakrabarthy happened to isolate a bacterium from the genus pseudomonas containing therein at least two stable energy producing plasmids, each providing a separate hydrocarbon degradative pathway. This bacterium is capable of breaking down multiple components of crude oil. No naturally occurring bacteria is known to possess this special property. And it is considered as genetically-engineered bacteria. And it is believed to be novel and exhibit high value addition in the treatment of oil spills. However, his claim for patent protection to the bacteria was rejected by US PTO on the grounds that microorganism is the product of nature and living things are not the patentable subject matter under 35 USC S. 101. But the CCPA had allowed the claim. And, on an appeal by the Government, the US Supreme Court had upheld the decision of the CCPA by heavily relying on the Report of the Committee of the Congress on the 1952 Act, which includes "anything under the sun made by man" is statutorily a subject matter for patent.

However, it is still an unsettled issue whether the microorganism cultured by Chakrabarthy is man made or it is capable of being reproduced by itself under certain conducive conditions besides the difficulty of disclosure of specifications in the patent applications except through microorganism bank depository accession number.

But the contention based on the plant patent Act, 1930 and the plant variety Protection Act, 1970, that exclude patentability of microorganisms, was rejected by the court on the ground that they were meant for natural
products only. And on 16 April 1987, the US PTO had issued an order recognizing patentability of new forms of animal life evolved through gene splicing or genetic engineering or reproductive technologies.

This has invited widespread criticism both for and against and in the US and outside. Many countries in Europe have adopted a modified version subjecting the subject matter to a set of inclusive-exclusive principles to accord patent protections to biotechnological inventions (discoveries).

It is one of the persistent demands of TRIPS in Article 27 to extend patent protection to living things also. It demands patent protection to all inventions, product or process, in all fields of S&T. Though plants and animals may be kept outside patent, for a short while, microorganisms and non-biological processes and microbiological processes be given patent protection. Plant varieties be protected either by patent or an effective sui generis system.

The dispute, here, in the context of Paris Convention, TRIPS and US demands, is not on the monopoly protection of inventions by patent laws but how much of the monopoly grant is desirable and feasible at a given time by a given state. It needs to be compromised in the greater interests of sovereign nation states in harmony with the humanity worldwide.

It is in this changed international context that India needs to evolve a set of new legislations by hindsight to accord protection to the fruits of intellectual labour of individual inventors, corporate investors and communities and discoverers while at the same time protecting the public interests.

It is better done in line with the United Nations (UN) code of conduct on various aspects of national and international relations and blending all that is good and progressive in the IPR systems of various countries including Europe and US with that of India's IPR systems (Indian Patents Act, 1970; Indian Design Act, 1911; Copyright Act, 1957; and Trademark and Merchandise Act, 1958). The new laws should preserve the basic features of Patents Act 1970 and intermingle with other three Acts and Constitution of India and uphold the proprietorship form of property rights of inventors and discoverers to the first generation inventions and discoveries while at the same time respecting the rights of parallel inventors and discoverers in the emerging fields of S&T.

Monopoly rights should be limited to those inventions where parallel or simultaneous developments are difficult to achieve by reverse or re-engineering processes. Intellectual property laws in India are well developed. Their basic features need to be protected by developing a bundle of newer intellectual property laws that take India to international standards.

Certain pharmaceutical companies like Pfizer, which are research intensive, believe that the US Patent laws have helped them to invest continuously in R&D and harvest rich dividends by inventing or discovering new chemical molecules or compounds used as drugs and medicines. Of course, India too needs to learn lessons from such experiences worldwide.

**Fiscal Incentives: Inventions & Innovations**

To promote R&D intensity in the country, fiscal benefits and tax incentives available under Sections 32 and 35 of Income Tax Act, 1961 to indigenous R&D should be popularized. A cess @ 5% on turnover similar to the one imposed on import of foreign technolo-
gies should be imposed on different sectors and made available to sector-wise R&D for inventions, innovations, technology assimilation and diffusion. Investment on R&D equivalent to 2% on GNP or more (i.e., 4 times or more on remittances made on import of technologies) should be made on accelerated basis to raise the country's S&T assimilation and diffusion capabilities beyond the threshold limits.\textsuperscript{32}

**Developing Newer Legislations**

Patents, design rights and trademarks together are called industrial property rights of the capital investor and with copyrights they are called intellectual property rights. Such a system of intellectual property rights separates the intellectual labour from the ownership of the intellectual property. Hence the need for developing newer property laws that identifies ownership rights with the inventors besides investors.

The following are some such suggested new legislations which are subject to a set of exclusive and inclusive principles. They are complementary to the existing laws while at the same time extend protection to human labour, skill, efforts and investment made in invention intensive discoveries. And they are based on the economic principle of let every one work according to his inventive capability and own according to his inventive contribution.

1. Alloys and chemical substances (submerged in processes) protection Act. Trademarks combined with brand and images will extend protection to the specific products if not generic ones. But when product patent accepted for generic chemical and alloy substances its term may be restricted to its economic life from the date of grant and sealing depending on the rate of obsolescence. Higher is the rate of technological obsolescence, lesser is the term.

2. Semiconductor chips (impregnated with commands and instructions) protection Act.

3. Integrated circuits (impregnated with commands and instructions) protection Act.

4. Computer programs and softwares (impregnated with algorithms, commands and instructions and integrated with manufacturing processes and machines) protection Act. At present computer programs are protected under Copyrights Act, as literary works, whose term extends to life term of the author plus 60 years which in the inventive field of S & T is too long a monopoly.

5. Cyber Space (computer networking) Information Publication & Communication Protection Act as complementary to Copyrights Act.

6. Biotechnology processes (Microorganisms over which ownership rights identified with bank deposit numbers) protection Act and the law to regulate the institutional framework for deposit of microorganisms isolated and cultured for specific functions.

7. New plant varieties and seeds (first generation) protection Act on the principle of ownership rights identified by domestication. New plant varieties and seeds are the results of man-made, asexually propagated, genetically-engineered ones, not amenable easily for natural processes and not recorded in the biodiversity reserve.

8. New animal varieties (first generation) protection Act on the principle of ownership rights identified by domestication. New animal varieties should possess the characteristics as described at (7) above.

9. Geographical indicators protection Act to protect native varieties of commodities both agricultural and industrial.
10. National biodiversity (variety) protection Act that recognizes community rights and exercises sovereignty over Acts at (6) - (8) above. A good beginning is now made in the form of a draft Bill for Biodiversity Act.

11. Obvious inventions and serendipity (accidental discoveries) promotion and protection Act.


13. Model code of conduct Act for technology transfer and foreign investment by Multinational Corporations (MNCs) and Transnational Corporations (TNCs) in accordance with the UN code for technology transfer. The foreign trade transactions should be subject to the five principles of peaceful co-existence among the nation states and respecting the constitutional and corporate laws of the concerned states.

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