Patenting in the Emerging Fields of Technology*

K S Kardam†
The Patent Office, Delhi Branch, Intellectual Property Building, Plot No. 32, Sector-14, Dwarka, New Delhi 110 075

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This paper analyses various provisions of the Patents Act, 1970 as amended upto 2005 and the procedure provided for the protection of inventions in the emerging fields of technologies such as biotechnology, bioinformatics, agricultural biotechnology, computer related inventions, communication, nanotechnology, etc. The patent rights being territorial in nature are enforceable within the country, which grants the patent. India follows more or less global standards for patenting any invention. The non-patent able conditions generally differ from country to country and therefore, differentiate certain subject matter for patenting. Now by virtue of amendments in the Patents Act, 1970 in 2002 and 2005, product patents can be granted for pharmaceuticals, agrochemicals, food and chemicals. It is also now possible to grant patent in the field of biotechnology, particularly, for living substances, such as, vaccines, monoclonal antibodies, new diagnostics using microorganisms, polymerase chain reaction (PCR) technology, gene sequencing, etc. However, living material including microorganisms occurring in nature are excluded from patenting under the law. In case of computer related inventions involving software, it is possible to grant patent for embedded software provided there is a technical application.

Keywords: Intellectual property, International Depository Authority, biotechnological inventions, bioinformatics, telecommunication

Although the IP protection system in India had been in existence since 1856, it was yet to meet the growing needs of emerging technologies. Accordingly, India has also taken several initiatives in this direction. This has resulted in comprehensive amendments in the Patents Act, 1970 in 1999, 2002 and finally in 2005. India has also enacted new Trade Marks Act, 1999 replacing the Trade and Merchandise Act 1957, a sui-generic Geographical Indications of Goods (Registration and Protection) Act, 1999 to protect Indian geographical indications and national heritage; and also new Designs Act, 2002 replacing the old Designs Act 1911. Now the new IP regime is fully compliant with international obligations. However, the development and use of new technologies is emerging very fast. Today India’s success in the field of pharmaceutical and information technology is well recognized. The use of bioinformatics, biotechnological products or biotechnological processes in the development of new medicines, diagnostics or in the treatment or in the food sector is increasingly growing not only globally but in India as well. Similarly, the development of information technology and its effective use in the communication field such as mobile phones, networking, Internet, data processing, signaling etc., is also fast emerging. Of late developments are also taking place across the world in the field of nanotechnology. The patenting of any invention including the emerging fields of technologies differs from country to country as each country has its own law. It is quite possible that the subject matter of the invention, may be patentable in India but need not necessarily be patentable in other countries. Similarly, the subject matter of invention may be patentable in other countries but not in India.

However, one can take advantage of Indian patent application, although the subject matter of the invention may not be patentable in India, by claiming the priority date of such application, while filing the corresponding application in foreign countries for the same invention either through Paris Convention priority system or Patent Cooperation Treaty system.

The patentability aspects and procedure given below are only in respect of India.

Patentable Subject Matter

A patentable subject in any field of technology is the one, which satisfies the conditions of patentability as prescribed under the statute. It may differ from
country to country, as the patent rights are territorial in nature. However, TRIPS Agreement has tried to harmonize these conditions to certain minimum standard. Therefore in India, a patent may be granted for any invention in any field of technology which is new, involving an inventive step and capable of an industrial application. These are more or less global standards for patenting any invention. However, this is subject to certain conditions, which exclude certain inventions from patentability. Under the provisions of the Patents Act, 1970, a patentable invention is one which is a new product or process involving inventive step and capable of industrial application provided that such invention does not come within the ambit of the exclusion provisions of Section 3 of the Act. The word ‘product’ connotes a very wide meaning to include any article, apparatus, device, and machine, any engineering or chemical product, composition and substance.

**Patentability Requirements**

The following are the general criteria in India for patentability of any invention in any field of technology:

**Novelty**

One of the foremost requirements for patenting of any invention is that the invention should be novel in comparison with knowledge existing in the prior art on the date of filing of the application. Although in certain countries, the term ‘novel’ or ‘novelty’ has been defined clearly in their patent law, it has not been defined in the Patents Act, 1970 but it becomes very clear from various provisions of the Act such as Section 2(1)(l), Section-13, Section-25, Sections-29-32 and Section-64, etc. An invention may be considered to be new (novel) if the same has not been published in any document in India or elsewhere in the world or the same has not been claimed in other application in India or publicly known or publicly used in the country, before filing of the patent application or priority date as the case may be. In other words, the prior publication of the invention any where across the world in any document or public knowledge or public use (not secret use) in the country before filing of the application or priority date would lead to loss of novelty. For establishing the lack of novelty on the ground of prior publication, it is necessary that information given in the prior publication is same as given in the document (application) under consideration and that too in a single document. In other words, mosaic of prior publication each anticipating a part of the invention, is not permissible. If the product was imported in India before the priority date of patented process by which the product was manufactured, it would be considered to have been publicly used or publicly known except where such importation was made only for reasonable trial or experiment purpose. However, the display of the invention at industrial or other exhibition approved by Government or use thereof with the consent of the inventor or publication of invention in consequence of such display or publication of invention in a paper read by the inventor before the learned society, will not amount to anticipation of invention or loss of novelty provided that the application for patent is filed within twelve months from the date of opening of such exhibition or the reading or publication of the paper as the case may be. Further, in case the published matter of the invention was obtained from the inventor or his assignee and the publication of invention was made without the consent of the inventor or his assignee, then such publication will also not amount to anticipation of invention or loss of novelty provided that the application for patent was filed within one year from the priority date, would not be considered anticipation (loss of novelty) provided that such publication was made for reasonable trial only and reasonably necessary.

**Inventive Step**

Another important requirement for patenting of any invention is that the invention should involve an inventive step or in other words, the invention should not be obvious to a person skilled in the art. The term ‘inventive step’ has been defined in the Act. The lack of inventive step in the invention is commonly known as ‘obviousness’. According to the provisions of Section 2(1)(ja), ‘an invention is said to be non-obvious or involving the inventive step if the feature of the invention that involves technical advance as compared to the existing knowledge or having economic significance or both and that makes the invention not obvious to a person skilled in the art’. Therefore, a patent to an invention cannot be granted if the differences between the subject matter sought to
be patented and the prior art are such that the subject matter as a whole would have been obvious to a person having ordinary skill in the art to which said subject matter pertains. If the difference between the claimed invention as a whole and closest process in the prior art is a modification in the process conditions, which was within ordinary skill in the art, the claimed invention is considered to be obvious and thus non-patentable. In order to consider obviousness or lack of inventive step, it is necessary to identify the closest prior art on the basis of prior publication. The closest prior art can be derived from various relevant documents (mosaic of documents) which, then can be compared with the impugned invention to assess the technical advancement so as to ascertain the inventive step. To assess inventive step under European law, the European Patent Office normally apply ‘the problem and solution approach’. This consists essentially in:

(a) identifying the closest prior art;
(b) assessing the technical result (effect) achieved by claimed invention when compared with the closest state of the art;
(c) defining the technical problem to be solved; and
(d) examining whether or not a skilled person having regard to the state of the art, would have suggested the claimed technical features for obtaining the results achieved by the claimed invention.

Since, Indian law is very close to European law, similar approach is followed in India while deciding the issue of obviousness. However, additionally, economic significance of the technical advancement over the existing knowledge, has to be taken into account while considering the inventive step.

**Capable of Industrial Application**
Industrial application is also an important requirement for patenting the invention in any field of technology. If the invention is lacking the industrial application, in such circumstances, it can not be patented. The term ‘capable of industrial application’ has been defined in the Indian Patent Law. According to the provisions of Section 2(1) (ac), an invention is said to be capable of industrial application if it can be made or used in an industry.

**Non-Patentable Inventions**
Under the Patents Act 1970, the following inventions are not considered patentable:

- Any invention which is frivolous or which claims anything obviously contrary to well established natural laws; perpetual motion machine.
- Any invention, the primary or intended use or commercial exploitations of which could be contrary public order or morality or which causes serious prejudice to human, animal or plant life or health or to the environment.
- Mere discovery of a scientific principle or the formulation of an abstract theory for discovery of any living thing or non-living substances occurring in nature.
- Mere discovery of a new form of a known substance which does not result in the enhancement of the known efficacy of that substance or the mere discovery of any new property or new use for a known substance or of the mere use of a known process, machine or apparatus unless such known process results in a new product or employs at least one new reactant.

For the purpose of this clause, salts, esters, ethers, polymorphs, metabolites, pure form, particle size, isomers, mixtures of isomers, complexes, combinations and other derivatives of known substance shall be considered to be the same substance, unless they differ significantly in properties with regard to efficacy.

- Any substance obtained by a mere admixture resulting only in the aggregation of the properties of the components thereof or a process for producing such substance.
- Mere arrangement or re-arrangement or duplication of known devices each functioning independently of one another in a known way.
- Any method of agriculture or horticulture.
- Any process for the medicinal, surgical, curative, prophylactic diagnostic, therapeutic or other treatment of human beings or any process for a similar treatment of animals to render them free of disease or to increase their economic value or that of their products.
- Plants and animals in whole or any part thereof other than microorganisms but including seeds, varieties and species and essentially biological processes for production or propagation of plants and animals.
- Any mathematical or business method or a computer programme *per se* or algorithms.
• Any literary, dramatic, musical or artistic work or any other aesthetic creation whatsoever including cinematographic works and television productions.
• A mere scheme or rule or method of performing mental act or method of playing game.
• Any presentation of information.
• Topography of integrated circuits.
• Any invention which in effect, is traditional knowledge or which is an aggregation or duplication of known properties of traditionally known component or components.

Patenting Procedure in India

For filing an application for patent, following are the important aspects, which need to be taken into consideration:

Jurisdiction

This is very important aspect in filing of patent application. If the application is filed in the wrong jurisdiction (inappropriate office), then the application may be treated as deemed to have not been filed for lack of proper jurisdiction. The Patents Rules provide that the jurisdiction for filing of an application in an appropriate office is based on the territorial limits of the office within whose limit the applicant or first mentioned applicant in case of joint applicant for patent, normally resides or has his domicile or has a place of business or the place from where the invention is actually originated. However, in case of foreign applicant where he has no place of business or domicile in India the address for service in India given by such applicant or where his patent attorney resides, decides the appropriate jurisdiction of filing of the patent application. Once the appropriate office has been decided for any proceeding, it can not be changed normally. A list of states, which are within the jurisdiction of appropriate office, is given in Table 1.

Application Filing

While filing the application for patent, it should be ensured that application is filed in the prescribed ‘form 1’ and accompanied by the complete specification or provisional specification along with prescribed fee. For natural person, the fee is Rs 1000 and for other than natural person or legal entity, it is Rs 4000 upto 30 pages and 10 claims. If the number of pages and claims are beyond 30 pages and 10 claims, an additional fee at the rate of Rs 100 for each additional page and Rs 200 for each additional claim by natural person and Rs 400 for each additional page and Rs 800 for each additional claim by legal entity or person other than natural person has to be paid. If the application is filed with provisional specification, it should be followed by complete specification within twelve months from the date of the filing of the provisional specification failing which the application will be abandoned. However, no fee is required to be paid while filing the complete specification after filing the application with provisional specification. The provision allowing the applicant to pay the filing fee within one month from the date of filing of the application which allowed the applicant to file the application without any fee or part fee, has been withdrawn from 5th May 2006. The application can be filed either in English or in Hindi. The fee to be paid by the applicants in India is given in Table 2.

Person Entitled to Apply

The application of patent can be filed by a true and first inventor or the person who has been assigned the rights of the invention i.e. assignee or by the legal representatives of any diseased person who was entitled to make an application immediately before the death of such person. Further, the application can be filed by the person himself or jointly with any other person. A partnership firm is also entitled to apply for patent application provided that the application is signed by the all the partners.

<table>
<thead>
<tr>
<th>Patent Office</th>
<th>Name of the States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patent Office, Chennai</td>
<td>Tamil Nadu, Karnataka (Mysore), Andhra Pradesh, Kerala, Pondicherry, Lakshdeep, etc.</td>
</tr>
<tr>
<td>Patent Office, Mumbai</td>
<td>Maharashtra, Gujrat, Madhya Pradesh, Chhatisgarh, Goa, Daman &amp; Diu; and Dadar &amp; Nagar Haveli.</td>
</tr>
<tr>
<td>Patent Office, Kolkata</td>
<td>West Bengal, Assam, Mizoram, Nagaland, Meghalaya, Manipur, Tripura, Arunachal Pradesh, Sikkim and rest of India.</td>
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</table>
Table 2 — Important fee to be paid by the applicant

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Activity</th>
<th>Fee payable (in Rs)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Individual</td>
</tr>
<tr>
<td>1</td>
<td>Filing of application (upto 30 pages and 10 claims)</td>
<td>1000</td>
</tr>
<tr>
<td></td>
<td>For each additional page</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>For each additional claim</td>
<td>200</td>
</tr>
<tr>
<td>2</td>
<td>Request for extension of time</td>
<td>300 p.m.</td>
</tr>
<tr>
<td>3</td>
<td>Request for examination</td>
<td>2500</td>
</tr>
<tr>
<td>4</td>
<td>Request for early examination under rule 20(4)(ii)</td>
<td>3500</td>
</tr>
<tr>
<td>5</td>
<td>Request for early publication</td>
<td>2500</td>
</tr>
<tr>
<td>6</td>
<td>Notice of post-grant opposition</td>
<td>1500</td>
</tr>
<tr>
<td>7</td>
<td>Notice of hearing before Controller</td>
<td>1500</td>
</tr>
<tr>
<td>8</td>
<td>Transmittal fee for international applications</td>
<td>2000</td>
</tr>
<tr>
<td>9</td>
<td>Petitions</td>
<td>1000</td>
</tr>
<tr>
<td>10</td>
<td>Certified copy</td>
<td>1000</td>
</tr>
<tr>
<td>11</td>
<td>Request for inspection of register &amp; document</td>
<td>200</td>
</tr>
<tr>
<td>12</td>
<td>Supply of photocopy</td>
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<tr>
<td>13</td>
<td>Renewal fee</td>
<td>500 each year</td>
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<tr>
<td></td>
<td>(a) 3rd to 6th year</td>
<td>1500 each year</td>
</tr>
<tr>
<td></td>
<td>(b) 7th to 10th year</td>
<td>3000 each year</td>
</tr>
<tr>
<td></td>
<td>(c) 11th to 15th year</td>
<td>5000 each year</td>
</tr>
<tr>
<td></td>
<td>(d) 16th to 20th year</td>
<td>500 before grant</td>
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<td></td>
<td></td>
<td>1000 after grant</td>
</tr>
<tr>
<td>14</td>
<td>Amendment of application or document</td>
<td>1000</td>
</tr>
</tbody>
</table>

**Description of the Invention**

Every specification whether provisional or complete, must describe the invention and should begin with title sufficiently indicating the subject matter of the invention. In case of complete specification, the detail description of the invention and its operation or use and method by which such invention has to be performed should also be given. The applicant should also disclose in the complete specification, the best method of performing the invention which is known to the applicant. The complete specification must disclose and end with a claim or claims defining the scope of the invention for which the protection is sought for failing which no patent can be granted. In case the invention relates to engineering product such as an article or device or apparatus, such article or device should be fully illustrated on the drawings. However, it may be kept in mind that the patent is granted for a single invention. Therefore, it should be ensured by the applicant that specification discloses only a single invention. In case of plurality of inventions, the applicant is required either to file separate application for distinct invention or divisional application dividing out the distinct matter from the original application before the grant of patent as the case may be. The description of the invention therefore, should be clear, unambiguous and sufficient to the extent that by following the description or the directions given in the specification, person having ordinary skill in the art should be able to achieve the same results as was intended by the invention so claimed. In other words, one should not be required to do further experiments or undue experiments to achieve the desired results. In case the description is insufficient, the application can be opposed under pre-grant opposition or patent can be opposed under post grant provision for revocation in the patent office on the ground of insufficient description. The patent can also be revoked in the Appellate Board or in the High Court as the case may be on the same ground.

**Deposition of Biological Material for Biotechnological Inventions**

If the biological material is used in the invention and mentioned in the specification particularly in case of biotechnological inventions, which may not be described fully in order to meet the requirement of sufficient disclosure and such material is not available to the public, then the applicant has to deposit such material in an International Depository Authority (IDA) under the Budapest Treaty on International Recognition of the Deposition of Microorganisms for the purposes of patent procedure, recognized by World Intellectual Property Organization (WIPO). While depositing the material, the care has to be taken...
by the applicant that such deposition of biological material has to be made not later than the date of filing of the application in India or priority date. After deposition of the material, the reference of deposition number (accession number), filing date has to be mentioned in the specification including the name, address of the deposition institution etc. This should also be followed by the disclosure of all the available characteristics of the biological material. In India, at present there is one such IDA recognized by WIPO known as Microbial Type Culture Collection and Gene Bank (MMTC) operated by the Institute of Microbial Technology (IMTECH), Chandigarh. However, there are about 37 such IDAs across the world, where different kinds of biological materials can be deposited. The deposition of such material in any one of the IDA is valid throughout the world, which avoids the multiple depositions for each country for the grant of patent. In addition to this, the applicant is also required to disclose the source and geographical origin of such biological material in the specification since failure to disclose or wrong disclosure of source and geographical origin is not only a ground for opposition but is also a ground for revocation of patent under the Act. India became member of Budapest Treaty on 17th December 2001. The list of IDA is given in the Table 3.

**Sequence Listing**

In case the application discloses the sequence listing of nucleotides or amino acids in the specification, the same has to be filed in electronic

<table>
<thead>
<tr>
<th>Institution</th>
<th>Country</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Biotechnology Center (ABC)</td>
<td>Italy</td>
<td>29 February 1996</td>
</tr>
<tr>
<td>Agricultural Research Service Culture Collection (NRRL)</td>
<td>USA</td>
<td>31 January 1981</td>
</tr>
<tr>
<td>American Type Culture Collection (ATCC)</td>
<td>USA</td>
<td>31 January 1981</td>
</tr>
<tr>
<td><em>Banco Nacional de Algas</em> (BNA)</td>
<td>Spain</td>
<td>28 October 2005</td>
</tr>
<tr>
<td>Belgian Coordinated Collections of Microorganisms (BCCM™)</td>
<td>Belgium</td>
<td>1 March 1992</td>
</tr>
<tr>
<td>CABI Bioscience, UK Centre (IMI)</td>
<td>UK</td>
<td>31 March 1983</td>
</tr>
<tr>
<td>Centraalbureau voor Schimmelcultures (CBS)</td>
<td>Netherlands</td>
<td>1 October 1981</td>
</tr>
<tr>
<td>China Center for Type Culture Collection (CCTCC)</td>
<td>China</td>
<td>1 July 1995</td>
</tr>
<tr>
<td>China General Microbiological Culture Collection Center (CGMCC)</td>
<td>China</td>
<td>1 July 1995</td>
</tr>
<tr>
<td>Colección Española de Cultivos Tipo (CECT)</td>
<td>Spain</td>
<td>31 May 1992</td>
</tr>
<tr>
<td>Collection nationale de cultures demicroorganismes (CNCM)</td>
<td>France</td>
<td>31 August 1984</td>
</tr>
<tr>
<td>Collection of Industrial Yeasts (DBVPG)</td>
<td>Italy</td>
<td>31 January 1997</td>
</tr>
<tr>
<td>Culture Collection of Algae and Protozoa (CCAP)</td>
<td>UK</td>
<td>30 September 1982</td>
</tr>
<tr>
<td>Culture Collection of Yeasts (CCY)</td>
<td>Slovakia</td>
<td>31 August 1992</td>
</tr>
<tr>
<td>Czech Collection of Microorganisms (CCM)</td>
<td>Czech Republic</td>
<td>31 August 1992</td>
</tr>
<tr>
<td>DSMZ – Deutsche Sammlung von Mikroorganismen und Zellkulturen GmbH (DSMZ)</td>
<td>Germany</td>
<td>1 October 1981</td>
</tr>
<tr>
<td>European Collection of Cell Cultures (ECACC)</td>
<td>UK</td>
<td>30 September 1984</td>
</tr>
<tr>
<td>IAFB Collection of Industrial Microorganisms</td>
<td>Poland</td>
<td>31 December 2000</td>
</tr>
<tr>
<td>International Patent Organism Depositary (IPOD), National Institute of Advanced Industrial Science and Technology (AIST)</td>
<td>Japan</td>
<td>1 May 1981</td>
</tr>
<tr>
<td>Korean Cell Line Research Foundation (KCLRF)</td>
<td>Republic of Korea</td>
<td>31 August 1993</td>
</tr>
<tr>
<td>Korean Collection for Type Cultures (KCTC)</td>
<td>Republic of Korea</td>
<td>30 June 1990</td>
</tr>
<tr>
<td>Korean Culture Center of Microorganisms (KCCM)</td>
<td>Republic of Korea</td>
<td>30 June 1990</td>
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<tr>
<td>Microbial Strain Collection of Latvia (MSCL)</td>
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<td>31 May 1997</td>
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<td>Microbial Type Culture Collection and Gene Bank (MTCC)</td>
<td>India</td>
<td>4 October 2002</td>
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<td>National Bank for Industrial Microorganisms and Cell Cultures (NBIMCC)</td>
<td>Bulgaria</td>
<td>31 October 1987</td>
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<tr>
<td>National Collection of Agricultural and Industrial Microorganisms (NCAIM)</td>
<td>Hungary</td>
<td>1 June 1986</td>
</tr>
<tr>
<td>National Collection of Type Cultures (NCTC)</td>
<td>UK</td>
<td>31 August 1982</td>
</tr>
<tr>
<td>National Collection of Yeast Cultures (NCYC)</td>
<td>UK</td>
<td>31 January 1982</td>
</tr>
<tr>
<td>National Collections of Industrial, Food and Marine Bacteria (NCIMB)</td>
<td>UK</td>
<td>31 March 1982</td>
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<tr>
<td>National Institute for Biological Standards and Control (NIBSC)</td>
<td>UK</td>
<td>16 December 2004</td>
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<tr>
<td>National Institute of Technology and Evaluation, Patent Microorganisms</td>
<td>Japan</td>
<td>1 April 2004</td>
</tr>
<tr>
<td>Depositary (NPMD)</td>
<td>Australia</td>
<td>30 September 1988</td>
</tr>
<tr>
<td>National Microbiology Laboratory, Health Canada (NMLHC)</td>
<td>Canada</td>
<td>30 November 1998</td>
</tr>
<tr>
<td>National Research Center of Antibiotics (NRCA)</td>
<td>Russian Federation</td>
<td>31 August 1987</td>
</tr>
<tr>
<td>Polish Collection of Microorganisms (PCM)</td>
<td>Poland</td>
<td>31 December 2000</td>
</tr>
<tr>
<td>Russian Collection of Microorganisms (VKM)</td>
<td>Russian Federation</td>
<td>31 August 1987</td>
</tr>
<tr>
<td>Russian National Collection of Industrial Microorganisms (VKPM)</td>
<td>Russian Federation</td>
<td>31 August 1987</td>
</tr>
</tbody>
</table>
form\textsuperscript{5} such as Compact Disc (CD), etc. This would enable the Examiner to conduct search quickly for novelty for these sequences. This may also avoid additional fee for filing the application as these sequences sometimes run into lots of pages which may go beyond 30 pages as prescribed for minimum filing fee.

Claims

A patent can be granted for the invention if the complete specification is accompanied by a claim or claims clearly defining the scope of the invention for which the protection is sought for. This is a statutory requirement, failing which the patent cannot be granted. While preparing the technical document i.e. complete specification it is very important and necessary to ensure that the complete specification describes the invention fully and also describes the operation or use and method by which the said invention is going to be performed. It should be further ensured that the specification discloses the best method of performing the invention, which is known to the applicant at the time of filing of the applications and for which he is entitled to claim the patent right. Alongwith the complete specification, the applicant should also submit and abstract of the invention containing all the technical information relating to the invention which should not exceed more that 150 words.

Unity of Invention

As mentioned above, the claim or claims of the complete specification should relate to a single invention and should be clear and succinct and should be fairly based on the matter disclosed in the specification. The claims may also be made for a group of inventions linked so as to form a single inventive concept.\textsuperscript{6} This can be done by claiming various embodiments of the invention in a separate claim but in a single application. A few examples of the inventions, which can be claimed in one application within the concept of unity of invention, are:

- Claim 1: A recombinant chimer hepatitis B core (HBC) protein molecule containing an HBC sequence of at least about 130 of N-terminal 150 amino acid.
- Claim 2: Particles formed by the assembling of the recombinant HBC chimer protein molecules as claimed in claim 1.
- Claim 3: Nucleic acid segment that encodes a recombinant HBC protein molecule as claimed in claim 1.
- Claim 4: A microbial host cell transformed with a recombinant nucleic acid molecule.

Unity of invention exists between claim 1, claim 2 and claim 3 as the invention lies in the protein molecule and particles formed, nucleic acid segment are essentially containing the said protein. However, there is no unity of invention between claim 1 and claim 4 as microbial host cell is distinct from the protein.

- Claim 1: A modified culture medium comprising from 30 to 33 g of a sugar selected from sucrose, galactose and maltose, yeast extract from 6 to 8 g, peptone from 2 to 4 g, oleic acid from 2 to 5 ml and glycerol from 3 to 5 ml and other conventional ingredients.
- Claim 2: A process for a preparation of a modified culture medium by intimately mixing the ingredients as described in claim 1.

Therefore, unity exists between claims 1 and 2 as process and product are part of same inventive concept.

- Claim 1: A process for treating textiles comprising spraying the material with a particular coating composition under special conditions (e.g. as to temperature, irradiation).
- Claim 2: A textile material coated according to the process of claim 1.
- Claim 3: A spraying machine for use in the process of claim 1 and characterized by a new nozzle arrangement providing a better distribution of the composition being sprayed.

The process according to claim 1 imparts unexpected properties to the product of claim 2. The special technical feature in claim 1 is the use of special process conditions corresponding to what is made necessary by the choice of the particular coating. Therefore, unity exists between claims 1 and 2. The spraying machine in claim 3 does not correspond to the above-identified special technical feature. Unity does not exist between claim 3 and claims 1 and 2.

- Claim 1: Protein X.
- Claim 2: DNA sequence encoding protein X.
The expression of the DNA sequence in a host results in the production of a protein, which is determined by the DNA sequence. The protein and the DNA sequence exhibit corresponding special technical features. Unity between claims 1 and 2 therefore, is accepted.

- **Claim 1** A fiber having enhanced thermal storage and release properties
- **Claim 2** A method of manufacture of a fiber having enhanced thermal storage and release properties
- **Claim 3** Fabric comprising of plurality of fibers blended together wherein at least one fiber is having enhanced thermal storage and release properties.

The unity of invention exists between claim 1, claim 2 and claim 3 as specially identified feature of the invention is fiber having special feature i.e. enhanced thermal storage and release properties which is also available in the fabric as well.

**Publication of Application**
Before the implementation of the provisions of the Patents (Amendment) Act 2002, all the applications were being examined automatically in the order in which they were filed without filing any request for their examination. However, after 20th May 2003 when the provisions of Patents (Amendment) Act 2002 came into force, this procedure has been changed. Now, the office has adopted a system known as Deferred Examination System (DES). Under this system, all the applications are kept secret and are not open to public for a period of 18 months. After expiry of the said period of 18 months, these applications are published in the official journal, which is published weekly on every Friday. A copy of this journal is available in the patent office library where any member of public can see it without payment of any charge. The journal is also available on the patent office website i.e. www.ipindia.nic.in. A copy of this journal can also be subscribed. On publication of the applications, they are open for public inspection on the payment of prescribed fee. The photocopy of these documents can also be had from the appropriate office on payment.

**Provisional Protection**
When the application for patent is filed, it is published after expiry of 18 months from the date of filing of the application or from the date of priority whichever is earlier. As stated above, the application can also be published earlier than 18 months provided that a request in the prescribed manner can be filed for early publication. From the date of publication of the application and until the patent is granted on the said application, the applicant is entitled to have the like privileges and the rights as if the patent for the said invention has been granted on the date of publication of the application. It means that on the publication of the application, the applicant is entitled to have provisional protection for the invention disclosed in the specification. However, the applicant is not entitled for instituting any legal proceeding for infringement unless and until the patent is granted for the same. In case of application filed under Section 5(2), before the 1st January 2005 (under the old Act) the rights of the patent shall accrue from the date of grant of patent and in case of any use of the invention or manufacturing of the product disclosed in the patent specification, the patent holder shall only be entitled to receive reasonable royalty from such person or enterprises which have made significant investment and are producing and marketing the concerned product prior to 1st January 2005 and continue to manufacture the product until the date of grant of patent. Under these circumstances, the patent holder is not entitled to institute any infringement proceeding against such person or such enterprises.

**Examination**
The examination of any patent application filed in the Patent Office is not automatic. The application will be examined only when the request for examination filed by the applicant or by any third party is received. The request for examination can be filed in Form 18 within 48 months from the date of priority of the application or from the date of filing of the application whichever is earlier. In case where the secrecy directions are imposed under Section 35 in respect of any application, the request for examination in respect of such application can be made within 48 months from the date of priority or within 6 months from the date of revocation of such secrecy direction whichever is later. In case of divisional application, the request for examination can be filed within 48 months from the date of filing of the application or from the date of priority or the first application (parent application) or within 6 months from the date of filing of the divisional application whichever is later. On receipt of the request of the examination, the application is
referred to Examiner concerned and he will examine the application within one month from the date of such reference to him. On examination of the application, the First Examination Report (FER) is sent to the applicant and the applicant is directed to meet all the requirements raised in the examination report within 12 months from the date on which the first statement of the objection is issued to him, failing which the application is abandoned due to non-compliance of the requirement under the Act.

**Opposition**

**Pre-grant Opposition**

When the applicant has complied with the requirement of the Act within the statutory period i.e. 12 months from the date on which the first statement objection is issued, the application is placed in order for grant provided there has been no opposition for the grant of patent u/s 25(1). However, any person can file a pre-grant opposition to such application within six months from the date of publication of the application u/s 11(A) or before the grant of patent. If there is no opposition, the application is preceded further to the grant of patent. After the grant of patent, any interested person can file an opposition u/s 25(2) known as post-grant opposition before the expiry of one year from the date of publication of grant of a patent. The opposition u/s 25(1) (pre-grant opposition) and u/s 25(2) (post-grant opposition) can be filed on the following grounds:

(a) Wrongful obtaining,
(b) prior publication anywhere in the World in any document,
(c) prior claiming of the invention,
(d) prior public knowledge,
(e) prior public use in India before the priority date of the application,
(f) lack of inventive step known as obviousness having regard to the matter published or what has been used in India prior to the filing of the application for priority date or having,
(g) the invention disclosed in the specification is neither invention u/s 2(1)(j) of the Act or is not patentable u/s 3 and 4 of the Act,
(h) insufficiency of the disclosure,
(i) failure to disclose the information regarding corresponding foreign application u/s 8,
(j) failure to disclose or wrongful disclosure of the source or geographical origin of the biological material is used in the invention, and
(k) anticipation of the invention having regard to the knowledge, oral or otherwise available within any local or indigenous community in India or elsewhere.

In this connection, it is pertinent note that an invention relating to a process for which a patent is claimed will be considered to have been publicly known or publicly used in India before the priority date of the claim if a product made by that process has already been imported in India except such importation has been made for the purpose of reasonable trial or experiment only. The pre-grant opposition is disposed off by giving an opportunity of being heard to both the parties.

**Post-grant Opposition**

The post-grant opposition can be filed by any interested person under Section 25(2) of the Act by filing a notice of opposition within 1 year from the date of publication of grant of patent on the same ground as mentioned above in respect of post-grant opposition. However, the disposal of post-grant opposition matter is made by opposition board. The opposition board is responsible for scrutinizing all the documents including the affidavits. After considering all the documents the opposition board gives its recommendation to the controller for final decision.

**Grant of Patent**

When the application is found in order for grant and there is no pre-grant opposition and in case of pre-grant opposition the same has been disposed off in favour of the applicant, the patent is granted to the applicant or in case of joint applicant to the applicant jointly and the patent certificate with the seal of the office is issued to the patentee. After the grant of patent, the same is published in the official journal of the Patent Office. After the publication of the grant, the application specification and other documents are again open for public inspection.

**Term of Patent**

The term of patent for any invention is 20 years from the date of filing of the application. However, in case of international application filed as National Phase application in India under PCT, the term of patent in respect of such applications is 20 years from the international filing date.

**International Cooperation and Arrangements**

In order to file corresponding applications abroad on the basis of Indian application or application in
India on the basis of foreign applications, India has entered into international agreements such as TRIPS, Paris Convention and Patent Cooperation Treaty. Under the Paris Convention, the nationals of member countries can file an application in India claiming the priority of the member country within 12 months from the date of filing of such application in that country. However, under PCT, the applicant can file an application in India within 31 months from the date of priority date, which is called ‘national phase application’. Similarly, the Indian inventor can also file an application in any of the member country of Paris Convention within 12 months from the date of filing in India. The Indian inventor while using the PCT system can file national phase application in the member countries designated under PCT within 30/31 months as the case may be, from the date of priority. Now due to recent amendment in the patent law, for filing any application outside India including international application under PCT, the applicant, who is Indian resident or national, requires permission from the patent office (Controller of patent) or in case the invention relates to defense or atomic energy, from the Central Government through patent office. However, if the application for patent is already filed in India, he is not required to take permission from the patent office provided six weeks time is over and secrecy directions have not been imposed and if imposed, all such directions have been revoked by the Central Government.

Patenting Activities in the Emerging Fields

Biotechnology

The certain biotechnological inventions are barred from patenting under Indian Patents Act such as living and non-living substances occurring in nature. This includes any microorganism available or found in nature but does not include any microorganism which is modified in its character or isolated. However, some of the microorganisms have found use in the war weapon. Therefore, such organisms although modified can not be patented as they are excluded being contrary to public order or morality or which causes serious prejudice to human, animal or plant life or health or to the environment. Apart from these, any process for the medicinal, surgical, curative, prophylactic, diagnostic, therapeutic or other treatment of human beings or any process for a similar treatment of animals to render them free of disease or to increase their economic value or that of their products is also not allowed to be patentable.

Further, the Act also excludes from patenting the plants and animals in whole or any part thereof including seeds, varieties and species and essentially biological processes for production or propagation of plants and animals. Nevertheless, for the last few decades or so the inventions in the field of biotechnology have been growing particularly from classical biotechnology such as fermentation, yeast, isolation of active compounds from natural resources to modern biotechnology such DNA technology, vaccines, monoclonal antibodies, new diagnostics, stem cells, transgenic cells, polymerase chain reaction (PCR) technology, gene sequencing, genomics, bio-remedial applications such as gene therapy, etc. Prior to amendments in the Patents Act, 1970 in 2002, inventions relating to organisms or material per se, viz;

(a) living entities of natural or artificial origin such as animals, plants and microorganisms, biological material such as plasmids, viruses, gene, recombinant DNA, bacteria, fungi, algae and other material having self replicating properties and part thereof;
(b) naturally occurring substances from living entities, biological material and also process for their production, were not considered patentable.

However, the inventions relating to processes or methods of production of tangible and non-living substance by bioconversion or using such microorganisms or by utilizing the above referred biologically active substances were considered and held patentable. Although, there was no specific mention in the Act of 1970, regarding patentability of live forms such as microorganisms, gene-cell lines etc, the spirit of patent law was to exclude them from patentability. In the past, the patent office refused to grant patent for living entities or biological material which have replication properties.

In 2001, however, the Kolkata High Court in a landmark judgment by single bench clarified the position relating to patentability of biotechnology inventions, particularly in a case where a process of manufacture of vaccine involving a living end product was involved. A Swiss Company, Dimminaco AG, filed an application (application no.135/CAL/98) dated 28th January 1998 for an invention relating to a process for the preparation of Bursitis vaccine, which was capable of protecting poultry against infectious Bursitis infection and with isolation, and preparation
of novel virus useful for preparing such vaccines. In India, till date, no patent could be granted for living organism or biological material either product per se or for process of their preparation. Accordingly the Controller of Patents, while deciding the case held that since the preparation of infectious Bursitis vaccines involves a living entity, it has never been considered as a manufacture in the past because it has never been patented in India. If the same has now to be allowed as a product of manufacture, the term ‘manufacture’ is to be given a wider meaning to that what has been attributed to it previously. The Controller of Patents and Designs, while refusing the application, held that only an inanimate object could be denoted as a thing or item, but not living one. Living microorganisms therefore, cannot be considered as an inanimate object as it cannot be converted to other products by physical, chemical or like process. Hence, the process of preparing vaccines with the living virus cannot be considered as a product of manufacture under clause (i) of Section 2(1)(j) of the Patents Act 1970. The Hon’ble Court, while quashing the impugned order of the Controller of Patents and Designs refusing the application and directing the Controller for reconsideration, held that the word ‘manufacture’ had not been defined in the Patents Act and the dictionary meaning of the word or the meaning attributed to it in this particular trade or business must be accepted if the end product was a commercial entity. The Hon'ble Court further, held that the expression ‘manner of manufacture’ is of special significance. The dictionary meaning of the word manufacture does not exclude the process of preparing a vendible commodity, which contains a living substance. The said vendability test is satisfied if the invention results in the production of some vendible items or it improves or restores former condition of a vendible item or its effect is the preservation and prevention from deterioration of some vendible products. In other words, a vendible product means some thing which can be passed from one man to another by the transaction of purchase and sale. Therefore, there is no statutory bar to accept a manner of manufacture as a patentable even if the product contains a living organism.

This judgment therefore, opened the doors in India for granting the patents for the process of preparing an end product containing living substance or organism provided it is commercial entity. Now after the amendments in the Act in 2005 which enabled the grant of product patent in all fields of technology, the product patents in biotechnology are also being granted. This includes patent for microorganisms not occurring in nature, r-DNA, vaccines, gene sequence, monoclonal antibodies, new diagnostics, polymerase chain reaction (PCR) technology etc. for example:

- A composition comprising:
  (a) an admixture comprising a cancer, viral or parasitic antigen expressed by said cancer, virally or parasitically infected cells and a micro fluidized antigen formulation, wherein said antigen formulation comprising:
    (i) a stabilizing detergent,
    (ii) a micelle-forming agent, and
    (iii) a biodegradable and biocompatible oil, said antigen formulation being formulated as a stable oil-in-water emulsion; and
  (c) at least one agent which is capable of neutralizing or down regulating the activity of immunosuppressive factors.

- A process for the preparation of synergistic microfluidised antigen formulation for use in cancer, viral or parasitic vaccines, characterized in that the said process comprises of mixing the following:
  (i) a stabilizing detergent of the kind such as herein described,
  (ii) a micelle-forming agent of the kind such as herein described, and
  (iii) a biodegradable and biocompatible oil of the kind such as herein described, wherein said stabilizing detergent is taken in amount of at least 0.05%, said micelle-forming agent is taken in amount of at least 0.001 %, said biodegradable and biocompatible oil is taken in amount of at least 1 %, and the remainder is water, the said antigen formulation is formulated as a stable oil-in-water emulsion.

- An isolated nucleic acid which comprises a coding sequence for the BRCA1 polypeptide defined by the amino acid sequence set forth in SEQ ID NO.2, or an amino acid sequence with at least 95% identity to the amino acid sequence of SEQ ID NO.2.

- An attenuated Salmonella strain, wherein the strain comprises a first attenuating mutation decreasing the LD.sub.50 of said strain at least 50,000 times when compared to wild-type strain, comprises a mutation that prohibits the strain from making a functional RecA protein, and is a Salmonella gallinarum 9R strain.
• Vaccine for combating Salmonella infection, comprising: an attenuated Salmonella strain as herein described, and a pharmaceutically acceptable carrier.

• A method for the preparation of a vaccine for combating Salmonella infection, comprising admixing: an attenuated Salmonella strain and a pharmaceutically acceptable carrier.

Bioinformatics
Apart from this, another area within biotechnology, which is emerging rapidly, is bioinformatics. This encompasses the application of computing science and technology to analyse and manage biological data. The bioinformatics has application in gene prediction and counting, gene sequence and expression analysis, SNP (single nucleotide polymorphisms) mapping, genome annotations, etc. The patenting of bioinformatics tools including computer program, algorithms is becoming very common in the United States but not in Europe and India. Although under Europe law computer programs are excluded but EPO Board of Appeal applies these exclusion provisions liberally considering the nature of technical effect. As far as India is concerned, the computer programs per se, algorithms and business methods are completely excluded from patenting. However, the present provisions are still to see the legal interpretation by Courts. An example for a bioinformatic patent application follows:

• A computer system comprising at least one database selected from database correlating the presence of at least one mutation in a human immunodeficiency virus (HIV) reverse transcriptase and resistance of at least one strain of HIV.

Agriculture Biotechnology
A method of agriculture or horticulture is excluded under Section 3(h). Thus, an invention relating to a method for cultivating an alga was held not patentable by the Patent Office. Similarly, a method of producing a new form of a known plant was held not patentable even if it involved a modification of the condition which natural phenomena would pursue their inevitable course. The Controller of Patents also held an invention relating to a method for the production of mushroom as non-patentable.9 The method for cultivation of an alga and method for the production of mushroom were held not patentable for the reasons that the production of mushrooms and cultivation of an algae were considered analogous to agriculture since they belong to plant kingdom.10 However, in the agriculture biotechnology use of microorganisms for crop improvement or to make them pest resistant or disease free or to increase the yield of fruits or vegetables and aqua-culture in use of marine microorganisms with unusual capabilities, fish culturing, prevention and control of fish diseases, have been emerging and have commercial importance and invention for processes could be considered for patents. It is also important to note that although the methods of agriculture and horticulture are excluded but not the implements used in these fields. However such methods of agriculture and horticulture are not excluded abroad.

Traditional Knowledge
Although, the provisions of the Patents Act 1970 exclude from patenting any invention which in effect, is traditional knowledge or which is an aggregation or duplication of known properties of traditionally known component or components. However, various ayurvedic preparations in the form of synergistic compositions for the treatment of various diseases are being patented in India and abroad as well. In addition to this, the applicants are also filing applications for patents for isolation of active ingredients from the plants which may be traditionally known. For instance, the hypoglycemic properties of bitter gourd (Karela) for reducing the blood sugar are traditionally well known but the active ingredient responsible for reducing the blood sugar may not be known traditionally. Therefore, the person who has isolated such chemical compounds (polypeptide) is entitled for the grant of patent. It is also possible for synthesis of active ingredient or chemical compound from other traditionally known plants for which patent protection may not be possible. A typical example of ayurvedic preparation which has been allowed to be patented is:

• A process of preparing plant based Ayurvedic formulation for the treatment of Parkinson's disease comprising the following steps;
  a) Selecting ripened seeds from Mucuna pruriens bak (Atmagupta) plant,
  b) Pulverizing the said seeds of Mucuna pruriens into fine powder,
  c) Mixing powder ripened seeds of step (b) in at least 80% to 90% by weight of the total Ayurvedic formulation with 20% to 10% by weight of the total formulation of the antioxidant, stabilizer etc.
• A plant based Ayurvedic formulation for the treatment of Parkinson's disease comprises of:
  a) 80% to 90% by weight of the total formulation, powder of ripened seeds of *Mucuna pruriens* plant,
  b) 20% to 10% by weight of the total formulation, the antioxidants, stabilizer etc.

**Computer Related Inventions**

A computer program as such is not patentable. However, a computer program embedded in the hardware, in such a case entire device is patentable. A method of calculating square route in the binary functioning of a computer by eliminating division and restricting multiplication to specify binary function which could be given a form in the electronic circuitry of read only memory (ROM) was held unpatentable, for the reason that application is nothing but a mathematical procedure for producing number. However, a claim to a computer so programed as to be able to process digital images in accordance with a given mathematical procedure expressed as an algorithm was held patentable by the European Patent Office (Vicom’s application). An application for computer program analysing data in an automated market for shares and similar security which could analyse the customers order to buy and sell against given criteria was held not patentable for lack of technical effect. However, a claim to a computer so programed as to enable an expert to store his knowledge in a hierarchical form (a computer system shell) resulting in a system (an expert system) from which expert advice could be obtained was held not patentable by UK Patent Court. It was held that a claim to steps leading to an answer could be a claim to an invention for a method for performing a mental act or computer program *per se*. Similarly, a computer so programmed that an expert could store his knowledge in a hierarchical form (a computer system shell) resulting in a system (an expert system) from which expert advice could be obtained was held not patentable by UK Patent Court. It was held that a claim to steps leading to an answer could be a claim to an invention for a method for performing a mental act and would still be excluded if the method was performed by a computer whether or not the computer programme adopted steps that would not ordinarily be used by the human mind. However, a computer programmed to carry out a system to produce a required result is an apparatus or device or system modified or programmed to operate in a new way, can be patentable (IBM application, 1980). In India, a computer program in a computer readable medium (hardware) could be considered for patent. Applications related to computer inventions may broadly relate to method or process, apparatus or system and computer program product.

**Method/Process**

The method claim should clearly define the steps involved in carrying out the invention. It should have a technical character. In other words, it should solve a technical problem. The description of such claims should be supported by details regarding the mode of implementation through hardware or software, for better clarity.

**Apparatus/System**

The apparatus claim should clearly define the inventive constructional hardware features.

**Computer Program Product**

In practice, the computer program product is claimed as ‘A computer program product in computer readable medium’, or ‘A computer-readable storage medium having a program recorded thereon’, etc. In such cases, the claim shall characterize the technical aspect of the claimed feature, for example:

• A data communication system, comprising: An image processing unit including a register and a number of information processing units, wherein the number of information processing units provide data in parallel in the register; and a processor coupled to the image processing unit for receiving serial data therefrom, the serial data including the stored data in the register; wherein the information processing unit includes auxiliary data in the serial data when the stored data have changed from data previously stored in the register, the auxiliary data identifying the change.

• A computer-readable medium recorded with a set of computer-executable instructions for causing a computer to control storing of data into and reading of data from a register provided on a computer network, the register provided for storing data to be exchanged with other computers for cooperative processing through the computer network, the set of instructions for controlling the computer for:
  - storing data from the computer in parallel in the register; serially reading the data from the register to form new
serial data; when the new serial data contain data that have been altered from serial data previously formed, adding auxiliary data for identifying the altered data to a predetermined portion of the new serial data; and sending the new serial data to one of the other computers through the computer network.

**Telecommunication**

Communication including telecommunication is another area which is growing very fast. Lots of innovative activities are taking place particularly in the area of networking which includes servers, operating systems, switches, system interface, internet, mobile technology, wireless, etc. The applicants are claiming internet-based operating systems whereby use of data and application software stored on a server may be selectively downloaded to a client device upon request therefrom allowing server-based applications to be accessed and executed on the client device. In a wireless telecommunications system including a wireless telecommunications network which communicates with a plurality of mobile terminals using radio signals, wherein each mobile terminal includes a display for displaying information. A data communication system, such as a local area network, provided with a capability of transmitting isochronous data are also being claimed in the patent applications. Therefore, in the field of communication, following are typical examples of various types of claims being made in the patent applications. These claims may be in combination of software and hardware, for example:

- A mobile communication device, comprising: A housing; a mobile telephone operably supported by said housing; and a self-contained audio recorder operably supported by said housing, wherein said mobile telephone comprises: a first microprocessor supported by said housing; microprocessor support circuitry configured to communicate with said first microprocessor; an interface controller operably connected to said microprocessor support circuitry; a display screen configured to communicate with said interface controller; a keypad operably connected to said interface controller; a first speaker coupled to the mobile telephone; transmitter receiver circuitry operably connected to said audio processing and operably connected to said microprocessor support circuitry; and an antenna communicating with said transmitter receiver circuitry, wherein said self-contained audio recorder comprises: a second microprocessor supported by said housing; an input device configured to communicate with said second microprocessor; record and playback circuitry coupled to said second microprocessor for recording a signal on a recording medium; a first microphone configured to communicate with said second microprocessor through said record and playback circuitry; and a second speaker configured to communicate with said second microprocessor through said record and playback circuitry, wherein the first speaker is different than the second speaker.

- A system interface, comprising: A packet switching network comprising a plurality of crossbar switches; a cache memory; a plurality of directors, one portion of such directors being coupled to a host computer/server and another portion of the directors being adapted for coupling to a bank of disk drives, the plurality of directors and cache memory being interconnected through the packet switching network; each one of the directors being coupled to a corresponding one of the plurality of crossbar switches; wherein the corresponding one of the plurality of crossbar switches is directly connected to at least two other ones of the plurality of crossbar switches and indirectly connected to other ones of the crossbar switches through the at least two directly connected crossbar switches.

- In a data communication network for communicating data between a plurality of data stations over a communications medium under control of a processor which outputs a plurality of control signals, apparatus comprising: a receive memory means and a transmit memory means; a receive datapath corresponding to each data station coupled between said communications medium and said receive memory means; a transmit datapath corresponding to each data station coupled between said transmit memory means and said communications medium; each said receive datapath including: a deserializer configured to receive serial data from said communications medium and output at least a portion of said received serial data in parallel; means for selectively transmitting, in response to
The Act also provides certain public interest provisions including an opportunity to third party to intervene in the procedure before the grant of patent in order to maintain the balance between the rights of the patent applicants or inventors and the rights of the public. It has also been observed that patenting activities in the emerging fields of technology are increasingly growing. However, India has a long way to go to attain what has been achieved by indigenous inventors in developed countries such as US, Japan and even developing countries like China and South Korea in terms of patenting activities where applications for patents filed by natives are more than foreigners.

Table 4 — Number of patent applications filed in various fields

<table>
<thead>
<tr>
<th>Field</th>
<th>2001-02</th>
<th>2002-03</th>
<th>2003-04</th>
<th>2004-05</th>
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<td>Chemical</td>
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<td>Drug</td>
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<td>966</td>
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<td>Food</td>
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<td>3304</td>
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<tr>
<td>Electronics/Computer</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2787</td>
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<tr>
<td>Biotechnology</td>
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<td>4241</td>
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<td>12613</td>
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</tbody>
</table>

*Excluding PCT National phase.

Nanotechnology

This is an upcoming technology and is about the size of articles or particles. In nanotechnology, devices which are being created have involvement of fundamentally different processes from those which normally exist today. And known in the prior art. In India, we are yet to see the patent application in this area. Therefore, application of provisions of existing patent law are to be applied particularly those which prohibit the patenting of known substance merely changing the particle size to achieve better results which may be technically non obvious to the person skilled in the art.

The trend of filing of patent applications in India for last five years under various fields is given in Table 4. Further, details and guidelines for patenting the invention in the field of biotechnology, chemicals and computer related inventions can be had from the Patent Office website.

Conclusion

The current provisions of the Indian Patents Act 1970 as amended are not only in conformity with the international obligations but are also sufficient to provide protection to the emerging fields of technology. The procedure for patenting has also been simplified, which includes reduction in processing time in order to grant patents within minimum time. The Act also provides certain public interest

References

1. However, by the recent amendment to the Patents Act 1970 in 2005, the word ‘new invention’ has been defined as ‘any invention or technology which has not been anticipated by publication in any document or used in the country or elsewhere in the world before the date of filing of the patent application with complete specification, i.e. the subject matter has not fallen in public domain or that it does not form part of the state of art’. This means that prior public knowledge or prior public use outside India would also lead to loss of novelty. This amendment, however seems to be in conflict with the provisions of Section-25 of the Act.

2. Explanation to clause (d) of Section 25(1) and (2) of the Patents Act 1970.

3. Section 31 of the Patents Act 1970. This provision has been amended in 2005 by the Patents (Amendment) Act, 2005 wherein the period of six months to file the application for patent (prior to the amendment) has been extended to twelve months.

4. Rule 7 has been amended by the Patents (Amendment) Rules, 2006.


6. Section 10(5) of the Act [as amended by the Patents (Amendment) Act, 2002].

7. Section 11A(7) inserted by the Patents (Amendment) Act, 2005.

8. In case the invention is relevant for defense purpose or atomic energy, the Controller shall not grant permit without the prior consent of the Central Government [Amended by the Patents (Amendment) Act 2005].


