

# Trends in post-WTO patenting by India in USA

V. K. Gupta

*The establishment of the World Trade Organisation (WTO) marked a significant step in institutionalizing the international framework for trade and intellectual property rights. The Indian R&D institutions should evolve a suitable patenting strategy in order to meet the challenge of the new regime. The paper examines the trends in patenting by India in USA since WTO. The results indicate that CSIR is the leading organization which obtained 53% of the total Indian patents in the post-WTO phase. The private sector firms in the area of drugs and pharmaceuticals have shown the maximum interest in post-WTO patenting activity in USA. This activity is considered in the light of the Exclusive Marketing Rights provisions in the 1999 amendments of the Indian Patents Act.*

SCIENCE and technology play an important role in the process of economic growth and national development. In recent times, there has been a re-thinking on this role on account of the reforms and the process of liberalization in the economic policies, and the emergence of new generic technologies such as biotechnology, new materials technologies, micro-electronics and information technology. These developments have profound implications for the future patterns of social and economic growth.

Most of these transformations taking place in the domain of science and technology are characterized by increasing integration of world markets for goods and services, capital and technology flows. As a result, the comparative advantage and international competitiveness of a nation has become more dependent on the capacity of a nation to generate value-added processes and products and ensure their application into the production processes leading to technological innovations. The competitiveness now arises from possessing technological knowledge rather than from minimizing the costs of production. Effective application of new knowledge leads to improved machinery, new products, reduction of costs and improvements in productivity, all of which are important parameters of competitiveness.

The establishment of the World Trade Organization (WTO) on 1 January 1995 marked an important step in institutionalizing the international framework for trade and intellectual property rights. India is a member of the WTO. In order to meet the challenge of the post-WTO regime, it is essential that the Indian R&D institutions evolve a strategy of aggressively seeking protection of their intellectual property and compete in the international market place.

Such a strategy will depend upon the ability of her scientific and industrial organizations to generate innovative technologies and seek their protection by patenting them in the countries of commercial importance.

The patenting activity in USA is a good indicator to evaluate the technological and competitive strengths of an organization, firm or a country. This may as well reflect upon the nature and direction of the technological innovations and areas in which respective institutions are developing their core competencies. An attempt is made in this paper to examine the trends in patenting by the Indian R&D organizations including the publicly-funded research institutions, private and public sector industrial enterprises and other non-profit organizations.

## Data

In view of the importance of the implication of the WTO and the emerging competitive international order, the patenting activity from India was analysed in terms of pre- and post-WTO trends. The data on patents by Indian organizations in USA was obtained from the US government patent database. The data covered the period from 1980 to 30 September 1999. Table 1 indicates the overall trends of Indian patenting in USA. Table 2 presents the data with respect to public sector enterprises and government S&T departments and agencies. Table 3 gives the patenting activity by the private sector industrial enterprises during the pre- and post-WTO period. Table 4 gives the status of patenting in USA by the other non-profit organizations.

## Results

### Overall trends

The analysis of Table 1 indicates that there is a distinct shift in the Indian patenting activity in USA since India

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Table 1. Overall trends of Indian patenting in USA

Year	Patents by CSIR	Patents by other Indian organizations	Year	Patents by CSIR	Patents by other Indian organizations
1999*	26	56	1988	2	2
1998	27	12	1987	–	2
1997	19	7	1986	1	3
1996	10	5	1985	1	1
1995	9	5	1984	1	1
<b>S. Total</b>	<b>91</b>	<b>80</b>	1983	–	5
1994	7	5	1982	1	1
1993	7	4	1981	–	–
1992	4	2	1980	–	2
1991	3	6	<b>S. Total</b>	<b>34</b>	<b>34</b>
1990	6	3	<b>Total</b>	<b>125</b>	<b>114</b>
1989	1	4			

\*Data up to 30 September 1999.

Table 2. Leading public sector enterprises/government and other organizations

Name of the assignee	Number of patents		Main technology areas
	Post-WTO	Pre-WTO	
<i>Public sector enterprises</i>			
Indian Oil Corporation Ltd	4	–	Detergent, catalysis
Indian Petrochemicals Ltd	2	1	Chemicals, catalyst
Indian Explosives Ltd	–	8	Explosive compositions, Water containers
Oil and Natural Gas Commission	–	2	Pressure gauge inclinometer
<i>S&amp;T departments and agencies</i>			
Council of Scientific and Industrial Research	91	34	Chemicals, polymers, catalysts, nology, natural products
National Institute of Immunology	3	2	Immunorepressive agent, vaccine
Defence Research and Development Organization	2	–	Alloys and superalloys
Indian Space Research Organization	1	1	Polyols
Sree Chitra Tirunal Institute for Medical Sciences and Technology	1	–	Heart valve
National Informatics Centre	1	–	Analog video add-on card
All India Institute of Medical Sciences	–	2	Medical technology, antipregnancy vaccine
Jadavpur University	–	1	Drugs and pharmaceuticals

became a member of the WTO. The annual average number of patents obtained by Indian organizations was only 3.4 in the pre-WTO phase. This average rose suddenly in the post-WTO phase and an average of 34.2 patents was obtained. The result clearly indicates that there is a greater effort by the Indian R&D organizations to obtain patents in USA since WTO was established.

The spurt in Indian patenting in USA is marked by a steep rise in the patenting activity of both the Council of Scientific and Industrial Research (CSIR) and other organizations in the private and public sector industry and other government S&T departments and agencies. CSIR leads the patenting activity in the post-WTO phase and has obtained 91 patents since 1 January 1995, which is 53% of the total Indian patents in the post-WTO phase. The annual average of patenting by other Indian organi-

zations in the post-WTO phase is 16 patents. The performance of none of the other individual or private, public or government – matches with the pioneering performance by the CSIR.

#### *Other publicly-funded institutions*

Contrary to the expectations, the institution government S&T departments and agencies a significant share of the patenting activity in the post-WTO phase. Table 2 gives information on the patents obtained by other publicly-funded institutions. The institutions which have taken patents in USA include National Institute of Immunology – 3 patents, Defence Research and Development Organization – 2 patents,

Table 3. Leading private sector enterprises

Name of the assignee	Number of patents		Main technology areas
	Post-WTO	Pre-WTO	
<i>Private sector enterprises</i>			
Ranbaxy Pvt Ltd	13	8	Drugs and pharmaceuticals
Lupin Laboratories Ltd	9	–	Drugs and pharmaceuticals
Dr Reddy's Laboratories	8	–	Drugs and pharmaceuticals
Panacea Biotech Ltd	5	–	Drugs and pharmaceuticals
Gem Energy Industries Ltd	3	–	Herbal products
VIP Industries Ltd	2	1	Luggage case
Cadilla Lab Ltd	1	–	Drugs and pharmaceuticals
Premier Polytronics Ltd	1	–	Electricals
Vijay Electricals Ltd	1	–	Alloys
Grind Well Norton (with US firm)	1	–	Tools
Vitara Chemicals Ltd	1	–	Chemicals
Premier Polytech Ltd	1	–	Aeromechanical
Sami Chemicals Ltd	1	–	Chemicals
J.B. Chemicals	1	–	Drugs and pharmaceuticals
Fortune Biotech Ltd	1	–	Insect repellent
SWIL Ltd	1	–	Machining/wire electro.
Carborandum Universal Ltd	1	–	Materials
Vitamed Remedies Pvt Ltd	1	–	Drugs and pharmaceuticals
USV Ltd	1	–	Drugs and pharmaceuticals
Godrej Soaps Ltd	–	2	Chemicals
Hawkins Cooker Ltd	–	2	Chemicals
Walchandnagar India Ltd	–	2	Sugarcane mill roller
Atul Products Ltd	–	2	Dyes
Iel Ltd	–	2	Chemicals
Cadbury India Ltd	–	2	Vegetable fats
Kalke Mhatre Associates	–	1	Drugs and pharmaceuticals
ICI India Ltd	–	1	Chemicals
Hitek Fine Chemicals Pvt Ltd	–	1	Chemicals
Paramount Sintas Pvt Ltd	–	1	Chemicals
Tube Investments of India Ltd	–	1	Sleeved compression
Business Forms Ltd	–	1	Sugarcane mill roller
Kirloskar Oil Engines Ltd	–	1	Internal combustion engines
Klenzoids Engineers Pvt Ltd	–	1	–
Garware Plastic & Polyester Ltd	–	1	Polyester
Wheels India Ltd	–	1	Vehicles
Dynacraft Machine Co	–	1	Electrochemicals
Mehta Engineering Enterprises	–	1	Switch indicator
Sarabhai Chemicals Ltd	–	1	Chemicals
<i>Design patents</i>			
Titan Industries Ltd	5	–	Watch case
Fine Jewellery Ltd	4	–	Earring, ring

Table 4. Other non-profit organizations

Name of the assignee	Number of patents		Main technology areas
	Post-WTO	Pre-WTO	
Mallya Scientific Research Foundation	2	–	Drugs and pharmaceuticals
Dalmia Centre for Biotechnology	1	–	Natural products
Dalmia Institute of Scientific and Industrial Research and Orissa Cement Ltd	–	1	Chemicals
Bombay Textile Research Association	–	1	Dye
Individual	–	1	Jacking device

Space Research Organization, Sree Chitra Tirunal Institute for Medical Sciences and Technology and National Informatics Centre – one patent each.

### *Public sector enterprises*

Amongst the public sector enterprises, Indian Oil Corporation and Indian Petrochemicals have taken some patents in the post-WTO phase. The key areas of their patenting included catalysis and chemicals. The other two public sector organizations, namely, Indian Explosives Ltd and Oil and Natural Gas Commission have not taken any patents in the post-WTO phase although they were active in the pre-WTO phase.

### *Private initiatives*

The post-WTO patenting activity is characterized by the emergence of an entirely new class of private sector enterprises. These enterprises were absent in patenting during the pre-WTO phase. Firms in the area of drugs and pharmaceuticals have shown the maximum interest in the post-WTO patenting activity.

Ranbaxy Laboratories leads the patenting activity by acquiring 21 patents. Eight of these patents were filed in early 1990s, indicating that Ranbaxy responded to the global challenge by taking early steps in establishing a pro-active R&D programme of developing new molecules well ahead of signing of the WTO agreement. Lupin Laboratories, Dr. Reddy's Laboratories and Panacea Biotech are other leading firms that have taken patents in the post-WTO phase. There are thirteen other firms with one patent each in the post-WTO phase. Most of these firms are in the areas of drugs and pharmaceuticals.

Data indicate that none of the other firms that had taken patents in the pre-WTO phase has been able to respond to the emerging challenge in the post-WTO phase. Notable firms that have no patenting in the post-WTO phase include Godrej Soaps Ltd, ICI India Ltd, Hitek Fine Chemicals Ltd, Sarabhai Chemicals Ltd and Garware Plastic and Polyester Ltd.

### **Technology areas**

Analysis of the data on the Indian patents in USA indicated that the Indian inventive activity continued to hold onto its strengths in the area of drugs and pharmaceutical technologies since the 1970s. In the 1970s, the other areas in which Indian organizations took patents in USA were in synthetic resins and chemical compositions, composite materials, adhesive bonding and hydrocarbon technologies. In the early 1990s, patents were also taken in areas like bioengineering, calculators, computers and

data processing systems, information technology, electronics and optics.

The patenting activity of CSIR has been in a large number of S&T areas. The main thrust of the patenting activity of the CSIR in the post-WTO phase has been in the areas of chemicals, polymers, catalysis, biotechnology and natural products.

In the post-WTO phase, the key thrust of the private sector is in the area of drugs and pharmaceuticals. Materials, alloys and catalysis are other areas in which patents have been taken.

### **Indian Patents (Amendment) Ordinance, 1999**

One of the implications of India joining the WTO is the requirement to comply with all the provisions of the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPs). The Government of India introduced the Patents (Amendment) Ordinance on 8 January 1999 to meet part of the obligations under TRIPs. The main features of the amendment were to provide for (i) a mail box facility to enable filing of product patents in the areas of drugs, pharmaceuticals and agrochemicals on or after 1 January 1995 and (ii) an option for obtaining Exclusive Marketing Rights (EMR) in drugs, pharmaceuticals and agrochemicals<sup>1</sup>.

Residents of India could now take a global view of their inventions and business priorities and make the first filing of their patent applications anywhere in the world without first filing in India. After taking this priority further applications may be filed in other countries including India.

For inventions relating to drugs and pharmaceuticals, after filing a product patent application in India, there is a provision for the product to qualify for the grant of EMR to sell or distribute the article or substance in India on meeting certain conditions. One such condition is that the applicant must have filed an application for a patent in any convention country for an identical invention and must have obtained the patent and the approval to sell or distribute the said article in that country on or after 1 January 1995. The grant of a product patent in USA on or after 1 January 1995 qualifies the applicant to acquire EMR in India.

The post-WTO patenting behaviour of Indian R&D institutions and firms in USA is likely to be affected by such stipulations as well. Table 5 examines the filing of patent applications in India<sup>2</sup>. One observes that the Indian filing as a percentage of the foreign applications decreased from 48.5% in 1994–95 to 24% in 1996–97 and to 23.3% in 1997–98. In the field of drugs and pharmaceuticals, all applications for product patents are kept in a black box – to be opened only after 31 December 2004 for consideration of the grant of patent. Between 1 January 1995 and 15 February 1997, a total of

Table 5. Number of patent applications filed in India

Year	Indian	Indian (percentage of foreign)	Foreign	Total
1986-87	983	39.2	2506	3489
1987-88	930	36.8	2527	3457
1988-89	1077	42.8	2516	3593
1989-90	1039	39.6	2621	3660
1990-91	1180	45.7	2583	3763
1991-92	1293	57.2	2259	3552
1992-93	1228	54.8	2239	3467
1993-94	1266	48.6	2603	3869
1994-95	1741	48.5	3589	5330
1995-96	1606	29.5	5430	7036
1996-97	1661	24.0	6901	8562
1997-98	1926	23.3	8229	10155

1339 such applications were received<sup>3</sup>. Although there is no published data as to how many of these applicants have sought EMR, it is believed that the number is very small to draw any objective conclusion at this stage to directly correlate the post-WTO patenting in USA to the amendments in the Indian Act.

### Future perspectives

The emerging global presence of India in the field of technology in the post-WTO phase is just one small

step. There is a long way to go for the country to strengthen its technological base and carve out a niche in the international technology trade and market. For this purpose, it is important that the R&D organizations in the public and private sectors join hands to develop a portfolio of patents on narrower fields of critical technologies based on their core competencies. Patent analysis can help in finding out such niche areas.

We have obvious strengths in terms of lower costs of research, high quality of scientific competence and flexibility to respond to these new global changes. We need to keep pace with the changes taking place in the global R&D scenario and evolve appropriate responses to them. The external orientation of R&D institutes in India would need to be balanced by an appropriate thrust towards the requirements of the Indian industry and business. While some of the Indian companies are taking steps to re-engineer their structures, a vast majority has to learn to use knowledge to create wealth and transform their business to be driven by research and development.

1. The Patents (Amendment) Ordinance, 1999, Government of India, *The Gazette of India*, 8 January 1999, New Delhi.
2. Annual Report, Controller General of Patents, Design and Trade Marks, 1997-98, Government of India.
3. Gangly, P., *Chem. Ind. News*, April 1999, XLIV.

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## Gentle drugs: A new paradigm for drug development

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*Searching for new drugs is guided by their specificity and potency. The methodology, including the statistical approaches, orients itself to do exactly that. More potent drugs also have more side effects, a technology trap that requires a radical re-examination regarding how to go about drug discovery. It is relevant in an era when quality of life is emerging as more important than the ill-kept promise of dramatic therapies. Interestingly, the problem statement can be formalized and a strategy can be identified that requires new methodological grounds to be covered within the scope of allopathy.*

AN analysis of the current information and trends, commercial and scientific, regarding the status of drug development indicates an outline of an unfilled niche in

drug development of interest to the pharmaceutical and related industries. The high cost of drug development is remediable by a major effort in rethinking on its science. What is more interesting is that this very rethinking would involve matters that would lead to a new emphasis in drug development. One such direction may be

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