



Two Decades of TRIPS Compliant Patents Act: Impact on Transfer and Dissemination of Technology in India

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The basic intent of TRIPS Agreement is to promote innovation, transfer and dissemination of technology to society and to strike balance in the rights and obligations of patentee. Analysis of the patenting activities in India shows that patent filing by Indians gained momentum in the initial years of post-TRIPS Agreement and finally in the Financial Year 2022-23 outnumbered the filing by foreign applicants in India. Present study is focused on the impact of TRIPS Agreement on transfer of patent embedded technologies from overseas to India as a part of foreign technical collaborations, FDI in India and working of patents granted in India and to examine how far there is dissemination of technical knowledge as advocated under Article 7 of TRIPS Agreement and Section 83 of TRIPS compliant Patents Act, 1970. The study reveals that dissemination of technical knowledge in society is far from satisfactory despite increase in number of transfer of patent embedded technologies from overseas, FDI in India and the patenting activities. Exploration of reasons for this kind of situation calls for a separate study.

Keywords: TRIPS, Patent, FDI, Transfer of Technology, Dissemination, Working of Patents

The Uruguay Round of Negotiations on multilateral trade was concluded in the year 1994 in Marrakesh in Morocco after 123 members agreed to establish World Trade Organization (WTO) and to bring, *inter-alia*, Trade in Goods, General Agreement on Trade in Services (GATS), Trade Related Investment Measures (TRIMS), Trade Related Aspects of Intellectual Property Rights (TRIPS) Agreement, and Dispute Settlement under its ambit. The WTO was established on 1st January, 1995 with India becoming one of its founder members.

Each country, depending upon its socio-economic necessities and technological development, makes appropriate provisions in patent law. Therefore, deviations in the patent laws made by the developed, developing and least developed countries are very likely to be there. Member countries of WTO are obligated to provide minimum standards of IP protection as per TRIPS Agreement. Further, the Agreement fixed separate timelines for each group to make their respective national laws fully compliant with it. India was required to amend the then prevailing Patents Act, 1970 by 1st January, 2005 to make it compliant with TRIPS Agreement.

Incidentally it would be relevant to mention that the basic objectives of the protection and enforcement of IPRs is given in Article 7 of the TRIPS Agreement which is reproduced below:

Article 7: Objectives

The protection and enforcement of intellectual property rights should contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge and in a manner conducive to social and economic welfare, and to a balance of rights and obligations.¹

The other provisions of TRIPS Agreement which need special attention are the Articles 27 and 33. The portion of Article 27 relevant to the study and Article 33 are reproduced below:

“Article 27: Patentable Subject Matter

-- patents shall be available for any inventions, whether products or processes, in all fields of technology, provided that they are new, involve an inventive step and are capable of industrial application.

-- patents shall be available and patent rights enjoyable without discrimination as to the place of invention, the field of technology and whether products are imported or locally produced.

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Article 33: Term of Protection

The term of protection available shall not end before the expiration of a period of twenty years counted from the filing date.”

As can be seen from the above, Article 27 of TRIPS Agreement permits patents in all fields of technology. Article 33 lays down the term of protection of 20 years from the date of filing.

Compliance with TRIPS Agreement

India amended the Patents Act, 1970 from time to time. Finally, with the promulgation of Patents (Amendment) Act, 2005, the Patents Act, 1970 was made fully compliant with TRIPS Agreement effective from 1st January, 2005.²

It may be mentioned that through the Patents (Amendment) Act, 2002 which came into force on 20th May, 2003, the term of patent granted under the amended Act and every valid patent which was in force as on 20th May, 2003 was made of 20 years from the date of filing of application.³ Thus one full cycle of term of patent of 20 years got over in the year 2023. The time is now ripe enough to study as to what extent the objectives as laid down in Article 7 of TRIPS Agreement have been fulfilled.

Hypothesis

It is hypothesized that after coming in to force of the TRIPS compliant Patents Act, 1970, patents filing as well as technology transfer and dissemination of knowledge will rise in India.

The focus of this paper being on transfer and dissemination of technology through patents, the impact of TRIPS on it has been studied in depth. Yet, for the sake of completeness, impact on patents filing has also been dealt with briefly before dealing with the detailed study.

Impact of TRIPS Compliant Patents Act, 1970 on Innovation Activities

Initiatives taken by the Government in a holistic manner by reforming its S&T policies, establishment of specialized education/academic and R&D institutions and related infra-structure, promotion and support to R&D, modernization of Patent Office coupled with the changes made in Patents Act and Rules, launching of National IPR Policy and streamlining of procedure of patenting after India became party to the TRIPS Agreement, have enormously helped in fostering innovations and

cultivated a culture to patent inventions by the researchers in India. In addition, the concerted efforts made by scientists, academic and scientific institutions, and industries in making use of the promotional schemes for R&D and schemes supporting patenting activities launched by the Government have equally contributed in attaining patent related performance indicators such as up-gradation of India on the scale of Global Innovation Index (GII) from 81st position in 2015 to 39th in 2024.⁴

The Tables 1 & 2, processed by the authors, reveal that the total number of patents filed (159762) in the block of five financial years (FYs) from 2005-06 to 2009-10 is 2.63 times higher than the patents filed (60640) in the block of previous five FYs from 2001-02 to 2004-05.

Also, for the first time during the last two decades, the filing of patent applications by Indian applicants in the FY 2022-23 is higher than the filing in India by foreign applicants.

Some of the achievements-cum-performance indicators mentioned in the World Intellectual Property Indicators 2024 (WIPI 2024 Report) published by WIPO in November, 2024, being relevant in this regard, are reproduced below:

- For the first time, applicants residing in India submitted more than half of all patent applications (55.2 percent) received by India’s IP Office (page 10 of WIPI 2024 Report).
- The IP Office of India granted a patent to approximately 80 percent applications processed in 2023 (page 20 of WIPI 2024 Report)
- India recorded a fifth consecutive year of double digit growth, patents in force increasing from 76,556 in 2019 to 188785 in 2023 (page 19 of WIPI 2024 Report).⁵

Patent filings in India have gone up during the two decades of TRIPS compliant Patents Act, 1970 to the extent that the number of filings by Indian applicants has surpassed the filings by the foreign applicants thereby reversing the past trend of so many years. It may be mentioned that this reversal in the number of filing of patent applications is perhaps due to the patent awareness program initiated and undertaken by the Patent Office as well as the design of concession in the fee structure which has worked as catalyst in escalating number of applications filed for grant of patents by start-ups/SMEs/education/academic institutions/universities in India as shown in Table 3.

Table 1 — Number of patents filed and granted year-wise

Financial Year	Patents Filed			Patents Granted					
	Indian (% of Total Filing)	Foreign (% of Total Filing)	Total Filing	Indian (% of Total Grant)	% of filling (Indian Applicants)	Foreign (% of Total)	% of filling (Foreign Applicants)	Total	% of Total Filing
2000-01	2179 (25.62)	6324(74.37)	8503	399(30.27)	18.31	919(69.73)	14.53	1318	15.50
2001-02	2371 (21.80)	8221(77.62)	10592	654(41.11)	27.58	937(58.89)	11.40	1591	15.02
2002-03	2693 (23.48)	8773(76.51)	11466	494(35.82)	18.34	885(64.18)	10.09	1379	12.03
2003-04	3218 (~25.0)	9395(74.49)	12613	945(38.27)	29.36	1524(61.73)	16.22	2469	19.58
2004-05	3630 (~21.0)	13836(79.22)	17466	764(39.98)	21.05	1147(60.02)	8.29	1911	10.94
2005-06	4521 (18.44)	19984(81.55)	24505	1396(32.31)	30.88	2924(67.69)	14.63	4320	17.63
2006-07	5314 (~18.0)	23626(81.64)	28940	1907(25.30)	35.89	5632(74.70)	23.84	7539	26.05
2007-08	6040 (~17.0)	29178(82.85)	35218	3173(20.79)	52.53	12088(79.21)	41.43	15261	43.33
2008-09	6161 (16.73)	30651(83.26)	36812	2541(15.82)	41.24	13520(84.18)	44.11	16061	43.63
2009-10	7044 (20.54)	27243(79.46)	34287	1725(27.97)	24.49	4443(72.03)	16.31	6168	17.99
2010-11	8312 (20.46)	31088(78.90)	39400	1273(16.95)	15.32	6236(83.05)	20.06	7509	19.06
2011-12	8921 (20.65)	34276(79.35)	43197	699(15.96)	7.83	3682(84.04)	10.74	4381	10.14
2012-13	9911 (22.69)	33763(77.31)	43674	716(17.35)	7.22	3410(82.65)	10.10	4126	9.45
2013-14	10941 (25.47)	32010(74.53)	42951	634(15.00)	5.79	3592(85.00)	11.22	4226	9.84
2014-15	12071 (28.22)	30692(71.77)	42763	684(11.44)	5.67	5294(88.56)	17.25	5978	13.98
2015-16	13066 (28.00)	33838(72.14)	46904	918(14.51)	7.03	5408(85.49)	15.98	6326	13.49
2016-17	13219 (29.20)	32225(70.91)	45444	1315(13.35)	9.95	8532(86.65)	26.48	9847	21.67
2017-18	15550 (32.50)	32304(67.51)	47854	1937(14.85)	12.46	11108(85.15)	34.39	13045	27.26
2018-19	17005 (33.60)	33654(66.43)	50659	2511(16.43)	14.77	12772(83.57)	37.95	15283	30.17
2019-20	20843 (37.05)	35424(62.96)	56267	4003(16.05)	19.21	20933(83.95)	59.09	24936	44.32
2020=21	24326 (41.58)	34177(58.42)	58503	5629(19.83)	23.14	22756(80.17)	66.58	28385	48.52
2021-22	29508 (44.41)	36932(55.59)	66440	6395(21.26)	21.67	23678(78.74)	64.11	30073	45.26
2022-23	43301 (52.29)	39510(47.71)	82811	9239(27.07)	21.34	24895(72.93)	63.01	34134	41.22

Source: Patent Office, Annual Reports 2000-01 to 2022-23

Table 2 — Total number of patent applications filed by Indian and foreign applicants during FYs 2000-01 to 2009-10

Financial Year	Applications	Financial Year	Applications
2000-01	8503	2005-06	24505
2001-02	10592	2006-07	28940
2002-03	11466	2007-08	35218
2003-04	12613	2008-09	36812
2004-05	17466	2009-10	34287
Total	60640	Total	159762

Source: Patent Office, Annual Reports 2000-01 to 2009-10

Table 3 — Category-wise distribution of patent applications

Year	Natural Person (NP)		Start-ups (SU)		Small Entity (SE)		Other than Natural Persons		Total		Grand Total
	Indian	Foreign	Indian	Foreign	Indian	Foreign	Indian	Foreign	Indian	Foreign	
2018-19	7250	1193	801	10	607	75	8347	32376	17005	33654	50659
2019-20	8792	1182	1650	2	576	272	9825	34169	20843	35625	56468
2020-21	10844	1053	1598	13	744	53	11150	33048	24326	34167	58503
2021-22	12451	1324	1482	19	985	384	14590@	35205+	29508	36932	66440
2022-23	14599	1261	2016	25	1329	429	25357 x	37795*	43301	39510	82811

@ includes 7405 applications by educational institutes (Indian)

+ includes 96 application by educational institutes (Foreign)

x includes 19155 applications by educational institutes (Indian)

* includes 275 applications by educational institutes (Foreign)

Source: Patents Office, Annual Report 2022-23

The above performance indicators reflecting higher patenting activities stand testimony to India moving towards meeting the objectives of Article 7 of TRIPS Agreement, but only partly. Article 7 also advocates for the transfer and dissemination of technology for mutual advantage of producer and user of this knowledge. These two aspects have been studied separately based on the data available from the RBI publications and annual reports of the Patent Office.

Quite often researchers in education/academic institutions/universities are made to file patent applications well in advance to ensure and secure novelty criterion of patent granting process (India follows first to file system for ascertaining novelty of invention). Their applications are primarily for academic interest so that they could be suitably awarded in their career and are not much concerned with commercialization aspect of the invention in general.

Further, the rise in number of applications filed for grant of patent by Indian applicants may not necessarily reflect the higher level of innovative content. But such patents originating from education/academic institutions/universities can play an important role in economic growth of India. The start-ups and industries do get innovative ideas from these patents' publications. They can do R&D around the inventions disclosed in these patents by using them as research tools and invoking exemption permitted under the Patents Act, 1970. In case they get suitable/favourable results of commercial interest they can enter into licensing agreement with the education/academic institutions/ universities for the purpose of commercialization of these inventions. This arrangement would benefit education/academic institutions/ universities as well as the start-ups and industries ultimately contributing to the economic growth of India. For this segment of innovation chain (from academic institutions' patent to commercialization), necessary financial support from Government or other funding organizations is expected.

In addition to rise in patent filings, the number of patents granted has also gone up from 4320 in FY 2005-06 to 34134 in FY 2022-23. Here it is relevant to mention that patent is granted only when the requirements of novelty, inventive step and industrial application are satisfied apart from the condition that the product or process does not fall in the category of non-patentable inventions. It can, there-fore, be concluded that the objectives of Article 7 are met but partly only to the extent of promotion of innovation in India. Rise in the number of patent

filings and grants does not necessarily mean that there is enhancement in transfer and dissemination of technical knowledge. In this context, it will not be out of place to mention about a finding of the study on patents commercialization profile of select national research labs and higher education institutions (HEI) made by Mamta Bharadwaj *et al.*⁶ This study reveals that only 22% patents out of total patents granted to the former category (Research Labs) were reported as worked during the period 2010-17 where as it was only 8% in the case of latter (HEI). For commenting specifically on the aspect of impact on transfer and dissemination of technical knowledge one has to examine the working of patents on commercial scale in India.

Factors Affecting Working of Patents on Commercial Scale in India

For an invention to be commercialised, patent is neither essential nor sufficient. An invention without patent can be commercialised by maintaining secrecy but carries the risk of being imitated and/or patented and exploited by others. The first inventor has no remedy to stop the later entrant and thus can't recover the cost incurred on R&D of innovative process or product. A patent is a powerful business tool allowing innovators to gain exclusivity over new product or process, develop a strong market position, appropriate the revenue and earn additional revenue through licensing.

A company, including innovator, would invest in another country for commercialisation purposes if the latter provides protection to the investment made by a foreign company by providing a strong patent protection regime. The interest of patentee in working of patented invention depends upon number of factors such as demand in the market, availability of suitable finance, raw materials, trained and skilled manpower, location along with infra-structure, regulatory requirements and clearances required for launch of new technology or product, enforcement of patent rights through the legal system, ease of doing business, applicable tax and custom duty regime etc. India has taken many steps to improve regulatory environment in the country by eliminating un-necessary requirements and procedures for easing of business environment with the object of shifting from compliance to competition. A law titled Jan Vishwas (Amendment of Provisions) Act, 2023 has been introduced from August, 2023 to reduce compliance burden on citizens and business

activities.⁷ The law covers 42 Acts including the Patents Act, 1970. As per Jan Vishwas (Amendment of Provisions) Act, 2003, Sections 120, 121, 122, 123 and 124 of the Patents Act, 1970 have been amended for ease of doing business in India.⁷ Thus in India, the existing skill-set and talent is enormous and the market size is so large that a patentee might be too keen to work the patented invention by himself or transfer the patented technology through his licensee.

Modes of Technology Transfer

Transfer of technology may take place between two parties and within an organization through two modes namely horizontal mode and vertical mode respectively. Under horizontal mode, technology is transferred from parent organisation to some other organisation by way of licensing or assignment or any other form as agreed upon between the parties. Under vertical mode, technology moves from one stage to the next stage in the same organization. Thus transfer of technology can take place through FDI in India, transfer of patents under licensing and assignment and transfer of know-how. Dissemination of technology is a step further to transfer of technology. Under dissemination, technology is to be worked at commercial scale within a reasonable period and reach the user at affordable price.

New Economic Policy – 1991: Impact on FDI

India in her own national interest decided to liberalise her economic policy by moving from the controlled economy to open market economy. India launched its New Economic Policy-1991 on 24th July, 1991. The objects of NEP-1991/Indian Industrial Policy-1991 are as under:

- Liberalisation, Privatisation and Globalisation (LPG),
- Facilitate global trade in goods, services, capital, and technology,
- For increase in international competitiveness to provide better IPRs protection.

Impact of opening up of economy on FDI can be seen from the Fig. 1 and Table 4. It can be seen that in 1991 when this process began, the FDI was of the order of Rs. 3160.0 Million.⁸ In the following year, it rose to Rs. 9650.0 Million and in 1995 it swelled to Rs. 71720.0 Million. The foreign direct investment in 2005, the year of implementation of TRIPS compliant Patents Act was significantly high as compared to previous years. It touched the figure of Rs. 394570.0 Million. In the following year, 2006, the FDI rose to 1906450.0 Million. During the period from 2008 to 2021, the FDI remained fluctuating following no fixed pattern. In 2021, it remained all time high touching Rs 4187630.0 Million (Fig. 2).⁹

Table 4 — Foreign Direct Investment in India (1991-1995)

Year	1991	1992	1993	1994	1995
Rs. in Million*	3160	9650	18380	41260	71720

*1 Million = 10 Lakhs

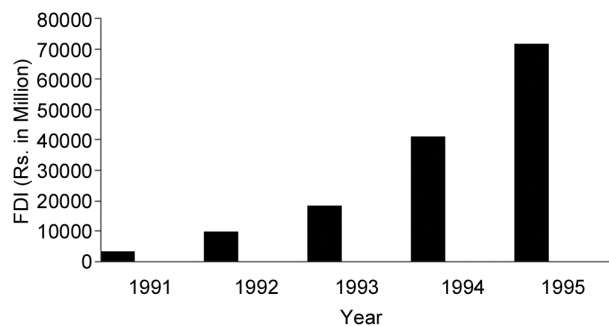


Fig. 1 — Foreign direct investment in India (1991-1995)

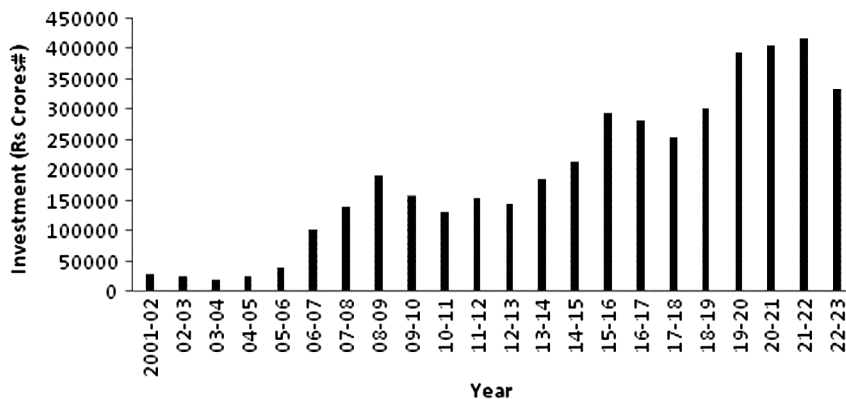


Fig. 2 — Foreign Direct Investment in India

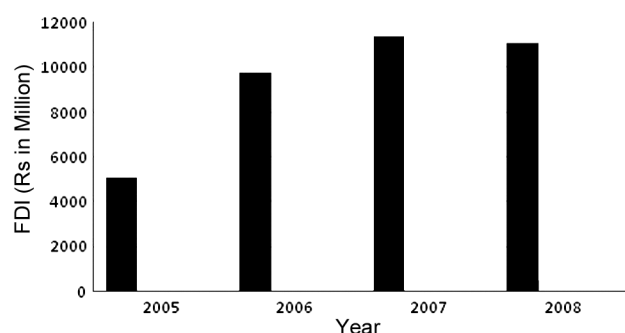


Fig. 3 — Year-wise FDI Inflows (Rs in Million) in Drugs & Pharma Sector

Table 5 — Transfer of patents under FTC

Block of Years*	Patents in No.	% of FTC	FTC (Number)
2021 to 2022-23	8	1.2%	674
2019 to 2020-21	7	0.8%	929
2016 to 2017-18	14	2.3%	620
2014 to 2015-16	4	0.7%	590
2012 to 2013-14	11	2.1%	528
2010 to 2011-12	5	1.5%	334
2007 to 2009-10	5	3.1%	160
1994 to 2000-01	3	0.5%	603

*Data for the year 2018-19 and 2000-01 to 2006-07 is not available

Source: RBI Publications

Impact on FDI in Pharmaceutical Sector

FDI in drug and pharmaceutical sector has been specifically presented here as there was major change in the Patents Act, 1970 in this field of invention. It may be recalled that product patent in this sector was introduced as per TRIPS compliance in 2005. The Fig. 3 shows that FDI in this sector during 2005 (Jan. to Dec.) was of the order of Rs 5107.0 Million.¹⁰ This number rose to Rs 9757 Million in 2006 (Jan. to Dec.) and to Rs 11405.0 Million in 2007 (Jan. to Dec.). One can easily see positive impact on FDI in this sector after 2005, the year in which India adopted TRIPS compliant Patents Act, 1970.

Transfer of Patents through FTC

The moot question to examine is whether there is a change in the trend of number of transfer of patents under foreign technical collaborations (FTCs). For this purpose, data as published by Reserve Bank of India for the years 1994 to 2022-23 was analyzed.¹¹ Table 5 shows that number of patents transferred in the block of 7 years, from 1994 to 2000-01, was only 3. Not even 1 patent per year was transferred. This

number rose to 5 during a period of 3 years from 2007 to 2009 and further it rose to 14 during the period 2016 to 2017 at the average rate of as high as 7 per year. The trend in number of transfer of patents under FTCs during the subsequent years does reflect a positive impact of TRIPS compliant Patents Act on transfer of patents.

From the above details it appears that patents do play role as an empowering business tool in transfer of technology. However, the impact of TRIPS compliant Patents Act in pushing and transferring technology in actual terms cannot be derived from limited information available in the RBI publications. For this an extensive study is required.

Impact of TRIPS Compliant Patents Act on Dissemination of Technical Knowledge

To understand the transfer and dissemination of technical knowledge, it would be pertinent to study the dynamics of innovation activities which will be evident not from patent filing but from patent grant and further from grant to the actual working of patents in India. The data, as presented below, show that not all applications reach up to the last stage of patent grant. There could be many reasons for this state of affairs. Some applicants, after submission, do not stick to the timelines of the process and hence dropped, whereas some other applications may not fulfil the criteria of grant of patent *viz*: novelty, inventive step and industrial application. Table 6 shows the number of applications filed and the patents granted year wise.

Transfer and Dissemination of Technical Knowledge

For effective diffusion and transfer of technology, India made several changes in Section 83 of the Patents Act, 1970. One of such changes was addition of Section 83(c) in the Act as given below:

Section 83 (c): That the protection and enforcement of patent rights contribute to the promotion of technological innovation and to the transfer and dissemination of technology, to the mutual advantage of producers and users of technological knowledge and in manner conducive to social and economical welfare, and to a balance of rights and obligations.

The guiding purpose of the Patents Act, 1970, as revealed in Section 83 is to encourage inventions and to secure that the inventions are worked in India on commercial scale and to the fullest extent without

Table 6 — Number of patents filed and granted during the year

Year	Patents Filed			Patents Granted		
	Indian (% of Total)	Foreign (% of Total)	Total	Indian (% of Total)	Foreign (% of Total)	Total
2000-01	2179 (25.62)	6324(74.37)	8503	399(30.27)	919(69.73)	1318
2001-02	2371 (21.80)	8221(77.62)	10592	654(41.11)	937(58.89)	1591
2002-03	2693 (23.48)	8773(76.51)	11466	494(35.82)	885(64.18)	1379
2003-04	3218 (~25.0)	9395(74.49)	12613	1078(43.66)	1391(56.34)	2469
2004-05	3630 (~21.0)	13836(79.22)	17466	764(39.98)	1147(60.02)	1911
2005-06	4521 (18.44)	19984(81.55)	24505	1396(32.31)	2924(67.69)	4320
2006-07	5314 (~18.0)	23626(81.64)	28940	1907(25.30)	5632(74.70)	7539
2007-08	6040 (~17.0)	29178(82.85)	35218	3173(20.79)	12088(79.21)	15261
2008-09	6161 (16.73)	30651(83.26)	36812	2541(15.82)	13520(84.18)	16061
2009-10	7044 (20.54)	27243(79.46)	34287	1725(27.97)	4443(72.03)	6168
2010-11	8312 (20.46)	31088(78.90)	39400	1273(16.95)	6236(83.05)	7509
2011-12	8678 (20.09)	34519(79.91)	43197	699(15.96)	3682(84.04)	4381
2012-13	9911 (22.69)	33763(77.31)	43674	716(17.35)	3410(82.65)	4126
2013-14	10941 (25.47)	32010(74.53)	42951	634(15.00)	3592(85.00)	4226
2014-15	12071 (28.22)	30692(71.77)	42763	684(11.44)	5294(88.56)	5978
2015-16	13066 (28.00)	33838(72.14)	46904	918(14.51)	5408(85.49)	6326
2016-17	13219 (29.20)	32225(70.91)	45444	1315(13.35)	8532(86.65)	9847
2017-18	15550 (32.50)	32304(67.51)	47854	1937(14.85)	11108(85.15)	13045
2018-19	17005 (33.60)	33654(66.43)	50659	2511(16.43)	12772(83.57)	15283
2019-20	20843 (37.05)	35424(62.96)	56267	4003(16.05)	20933(83.95)	24936
2020-21	24326 (41.58)	34177(58.42)	58503	5629(19.83)	22756(80.17)	28385
2021-22	29508 (44.41)	36932(55.59)	66440	6395(21.26)	23678(78.74)	30073
2022-23	43301 (52.29)	39510(47.71)	82811	9239(27.07)	24895(72.93)	34134

Source: Patent Office, Annual Reports 2000-01 to 2022-23

undue delay, and secondly that they are not granted merely to enable the patentees to enjoy monopoly for the importation of the patented articles.

Decision to commercialise depends upon several factors as mentioned earlier under the heading “Factors Affecting Working of Patents on Commercial Scale in India”. Another factor is the sector of industry and the concerned technology. For instance, patent might have been granted to an invention pertaining to chemical sector (process or product) based on the results obtained at laboratory scale. However, a lot of research and development (R&D) work is needed to up-scale the invention’s operating parameters from laboratory scale to pilot scale, from pilot scale to semi-commercial and finally to commercial scale for its working as per the requirement of the Patents Act. In case of working of invention on commercial scale related to a pharmaceutical patent (process or product) in addition to the R&D work, necessary pre-clinical and clinical trials are also to be carried out. For these trials regulatory approvals are to be obtained. Formulation,

purity and stability studies have to be conducted. Each of these multi-stages R&D work required for working of patented inventions (chemicals, pharmaceuticals and agro-chemicals etc.) on commercial scale require money and time. Therefore, there could be delays in working of patented inventions in these sectors of industries in India. However, not submitting the required periodic statement by the patentee/licensee regarding working of patent on commercial scale in India is difficult to hold justifiable.

A patent is valid for twenty years if renewed as per the laws. If the patent is not commercially valuable or otherwise, the patentee may choose to allow the patent to lapse at any stage before the full term of 20 years by not paying the renewal fee. Therefore, the number of patents in force varies from year to year depending on the number of patents lapsed (after full term of 20 years or opted by the patentee not to seek renewal), and the patents added every year after grant. Table 7 shows the number of patents in force, year wise. As on March 31st 2023, the total number of patents in force in India is 137333 of which major

Table 7 — Patents in force

As on 31st March	Indian	(% of Total)	Foreign	(% of Total)	Total
2001	1495	18.63	6530	81.37	8025
2002	1578	18.97	6742	81.03	8320
2003	1479	18.49	6519	81.51	7998
2004	2075	32.39	4331	67.61	6406
2005	2200	32.08	4657	67.92	6857
2006	4486	27.32	11933	72.68	16419
2007	3473	20.35	13593	79.65	17066
2008	7966	26.83	21722	73.17	29688
2009	6158	19.98	24664	80.02	30822
2010	6781	18.16	30553	81.84	37334
2011	7301	18.44	32293	81.56	39594
2012	7545	18.87	32444	81.13	39989
2013	8308	18.92	35612	81.08	43920
2014	7464	17.51	35168	82.49	42632
2015	7561	17.48	35695	82.52	43256
2016	7306	16.41	37218	83.59	44524
2017	7660	15.71	41105	84.29	48765
2018	8830	15.56	47934	84.44	56764
2019	9787	15.13	54899	84.87	64686
2020	12181	14.99	69098	85.01	81279
2021	15687	15.86	83211	84.14	98898
2022	19700	17.00	96216	83.00	115916
2023	26165	19.05	111168	80.95	137333

share belongs to non-residents. The details regarding patents in force indicate that the foreign applicants appear to have continued interest in Indian market.

Transfer and Dissemination of Technical Knowledge through Working of Patents

Patent is a tool to recover the cost incurred on invention, but its grant is at the social cost of invention's use during the term of patent. Therefore, it is necessary to optimize the working of patented inventions at commercial level in the country in order to mitigate the social cost. This requires rigorous process of examination of patent applications with regard to the patent criteria with a focus on industrial application of the alleged invention particularly in the areas where patents were not allowed before TRIPS compliance, namely the chemical, pharmaceuticals, drugs and food. Similarly, keeping track of working of patent is equally important for dissemination of technology.

The Patents Act, 1970 requires every patentee and licensee to furnish statement to the Controller of Patents regarding working of patented invention on commercial scale in India in the prescribed manner

under Section 146(2). Further, not furnishing or furnishing false statement to the Controller is punishable as specified under Section 122. Thus the Controller has been empowered to collect information regarding commercialisation of patented inventions in India enabling him to keep a close watch on the vital aspect of commercial exploitation of the patented invention in India. This provision was introduced in the pre-revised Patents Act, 1970 for the first time and therefore shows the intent of the legislatures while inducting such a provision.

Annual Reports of the Patent Office were scanned to call information regarding working of patented inventions on commercial scale in India. The Table 8 shows the number of patents in force, Forms 27 (F27) received and patents reported as worked on FY basics.

For better appreciation, graphic view of the data pertaining to Form 27 received and patents reported as working is presented below. Figure 4 shows the number of Form 27 received by the Patent Office as a percentage of patents in force, year wise. For a period ranging from FY 2009-10 to 2015-16, there is no set pattern but from FY 2015-16 onwards the receipt of

Table 8 — Working of patents

Year	Patents in Force	Form 27 Received	%age of F27 Received	Reported as Working	%age of Working Patents
2007-08	29688	N/A	*	3499 (u/s 83)	*
2008-09	30822	N/A	*	4752 (u/s 83)	*
2009-10	37334	24009	64.31	4189	11.22
2010-11	39594	34112	86.15	6777	17.12
2011-12	39989	27825	69.58	7431	18.58
2012-13	43920	27946	63.63	6201	14.12
2013-14	42632	33088	77.61	8435	19.79
2014-15	43256	31990	73.96	7900	18.26
2015-16	44524	39507	88.73	8589	19.29
2016-17	48765	42870	87.91	11318	23.21
2017-18	56764	46618	82.13	12246	21.57
2018-19	64686	51104	79.00	14277	22.07
2019-20	81279	57192	70.37	16181	19.91
2020-21	98839	58633	59.32	13924	14.09
2021-22	115916	55014	47.46	9616	8.30
2022-23	137333	4781	3.48	560	0.41

*Because of Non-availability of data, % age could not be shown, Source: Patents Office Annual Reports 2007-08 to 2022-23

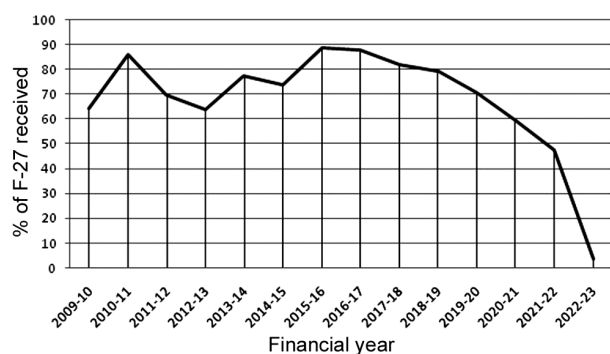


Fig. 4 — Form 27 Received as a Percentage of Patents in Force
Source: Patents Office Annual Reports 2009-10 to 2022-23

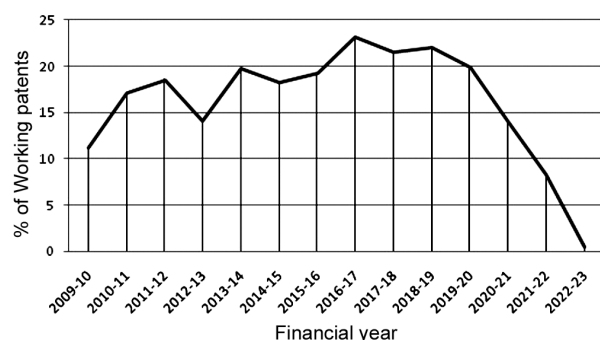


Fig. 5 — Working of patents as a percentage of patents in force
Source: Patents Office Annual Reports 2009-10 to 2022-23

forms is declining remarkably and continuously from 88.73% in FY 2015-16 to 3.48% in FY 2022-23.

Similar trend emerges for patents reported as worked, year-wise, as can be seen from the Fig. 5.

While there is no set pattern up to FY 2018-19, but thereafter, a continuous decline reaching as low as 0.415 % in FY 2022-23 from 22% in FY 2018-19 is observed.

From Table 8 and Figs 4 & 5, it is noted respectively that in FY 2009-10, the annual statements regarding working of patents were 64.31% of total number of patents in force and only 11.22% of patents were reported as worked presuming that all the non-respondents were those who had not worked the patented inventions on commercial scale in India. Surprisingly, in the FY 2022-23 this number of annual statement and working of patents at commercial scale fell down to 3.48% and 0.41% respectively. Beyond this quantitative analysis, it is not possible to identify the sectors which are responsive or non-responsive in submitting information to the Patent Office.

Discussion

From the above details of working of patents, it is clear that number of patentees/licensees submitting annual statements of working of patented invention on commercial scale in India has fallen down to 3.48% in the FY 2022-23. Further, it also reveals that number of patents, worked at commercial scale in India (0.41%), is abysmally low. This information regarding working of patents gives insightful details about competitive and monopolistic role adopted by the patentees. Such careless disregard to statutory

requirement by the patentees is a matter of great concern. Despite such an extremely poor reporting about working of patent on commercial scale in India, the Government, in place of invoking penalising provision available in the Patents Act 1970, has chosen to scale down the requirement of submission of Statement of working of patents. Through the Patents (Amendment) Rules 2024 of 15th March, 2024, the periodicity of furnishing of the Statement regarding working of patented invention(s) has been relaxed to furnishing once in respect of every period of three financial years in place of filing annually by all patentees/licensees. Also, the prescribed pro-forma (Form 27) for furnishing of this statement has been modified probably to reduce compliance burden and make it patentee/licensee friendly. How far will the change in periodicity, from annually to once in three financial years, coupled with changes in nature of details to be furnished by the patentee/licensee, would be helpful in pushing working of patent is difficult to comprehend. Simply diluting the pertinent details and relaxing the requirement of submission of the statement from annual to once in three financial years in the present context, is no remedy. The possible concerns of the users of patent information could be multifaceted like examining the steps taken and strategy followed by the patentee/licensee towards working of patent. These concerns become even more logical, important and relevant in case of working of patents pertaining to fast changing technologies.

It may also be mentioned that the base of information regarding working of patented inventions needs expansion on the pattern of patent applications filed where details about categories of applicants - Indian and foreign with their sub-categories (natural person, small entity, educational institutions, others etc.) are given. It also gives break up of applications filed and patents granted in different fields of inventions such as chemicals, pharmaceuticals, food, mechanical, electrical etc. This expansion of base of information as reported in annual reports of Patent Office would be of immense value and help in knowing the categories of patentees/licensees and fields of inventions where the patentees/licensees tend not to furnish periodic statement of working of patents or work the patented invention on commercial scale. From the current pattern of information, it is not possible to meaningfully analyse as to what percentage of patents in various sectors of industry are worked and their contribution to economic and

industrial development of India. This information will also expose the developed countries who argued in Uruguay Round of Negotiations that they were unable to transfer technology due to the then prevailing IP regime in India. Compiling of the Performance Indicators in respect of applications filed for grant of patent, patents granted and those worked along with split up of the categories of patentees (domestic and foreign including their sub-categorisation), and patentees in India along with their respective fields of inventions would be useful in guiding specific actions and policy formulation for working of patents as given in the study herein.

The statement as given at the end of Form 27 "Subject to conditions specified under the Patents Act 1970 a patented invention shall not be considered as 'not worked' merely on the ground that the patented product has been imported in India" needs a re-look.¹³ This means a patentee may meet the market requirement by importing the patented product and may not undertake commercial production in India. This statement does not seem to be in consonance with MAKE IN INDIA mission of the Government. It also defeats the objective of grant of patent as envisaged under Article 7 of TRIPS Agreement and Section 83 of the Patents Act, 1970. In such a scenario, feasibility of imposing suitable tariffs on the import of valid patented products may be explored keeping interest of Indian citizens in mind.

Suggestions for Encouraging Working of Patents

The Patents Act, 1970 under section 84 has provision for the grant of compulsory licence if patent is not worked within a period of three years from the grant of patent or patented invention is not available at reasonable price or adequately to meet the public needs. Despite this provision, the commercialization of patented inventions in India is very less. Therefore, there is need to formulate fiscal policies in a manner to make commercialization of patent an attractive proposition and also to facilitate IP licensing. Indian industries may not only be encouraged but also helped to produce quality products at competitive cost using latest patented technologies to minimize India's dependence on import and to maximize export of products made in India. For this purpose, IP Licensing Help Desks be established in IP offices and appropriately linked with National Research Development Corporation and Technology Transfer Offices to be expanded in academic and R&D institutions in the country. The policy reforms could be

flexible, context-based and industry sector-specific. Initially, the policy decisions of the government, on similar lines, could be on pilot scale for a short but practically feasible duration say 3 to 5 years. They could be reviewed for extension or otherwise, based on the experience and results of pilot scheme. Such incentives have been extended in the past. For example, in the Union Budget 1996-97, excise duty exemption was given by the Government for commercialisation of patents subject to certain conditions.¹²

The Government may design the renewal fee structure in such a manner that only the patentees of commercially viable products or processes opt to continue for full term of the patent thereby enjoying secured and conducive environment encouraging them to commercialize while others may get discouraged to opt for renewal thereby allowing their patents to lapse so as to fall in public domain at much earlier stage than 20 years' life of patent. While revisiting the renewal fee structure, the interest of grass-root innovators may be adequately protected.

Experience, as mentioned earlier, shows that the design of concession in fee structure has worked as catalyst in escalating number of applications filed for grant of patent by educational/academic institutions/universities. This aspect of re-visiting of the renewal fee structure is quite important and calls for serious thought and deep consultation particularly when the WIPI 2024 Report mentions that the average age of patent in India decreased by 2.6 years from 12.9 years in 2018 to 10.3 years in 2023 (pages 19 and 48 of WIPI 2024 Report). Such a change in patents renewal fee structure could be context based and sector specific.

Conclusion

Initiatives taken by the Government towards modernization of patent office coupled with changes in the Patents Act 1970 to make it TRIPS compliant and streamlining of processes of patenting have enormously helped in fostering innovations and nurturing a culture of protecting innovations among the researchers/innovators in India. The performance indicators released by WIPO in its report WIPI 2024 testify the same.

On the front of impact on transfer of technology protected by patents, the present study reveals that opening of the economy on the direction of New Economic Policy, 1991 along with TRIPS compliance played positive role in transfer of patents through

FTC and FDI in India. Consequently, the FDI and transfer of patents under FTC in India have also gone up during the post-TRIPS compliant patent regime.

Patent is not an end in itself but it is a tool for transferring and disseminating technical knowledge embedded in it for socio-economic development of society. For this to happen, it is essential that patented products are manufactured in the country. The data as presented earlier under "Transfer and Dissemination of Technical Knowledge through Working of Patents" reveals a gloomy picture about submission of 'Statement' regarding working of the patented invention on commercial scale in India by patentees/licensees, and the patents reported as working in India as on 31st March, 2023. Merely 3.48% of annual statements were submitted and 0.415% of total patents (137333), in force, were reported as working. This kind of indifferent behaviour of patentees/licensees regarding submission of periodic statements pertaining to working of patented inventions defeats the basic concept and intent of patent law in India. It requires calling of information to this effect pro-actively by the Patent Office in a consistent manner.

From the details available in the Annual Reports of the Patent Office, as of now, it appears that the patent is largely being used in India to enjoy monopoly and secure protected market from the rival manufacturers thereby hindering competition and distorting international trade. Despite having TRIPS compliant Patents Act, the impact on contribution of patents in transfer of modern technology and industrial growth by way of working/licensing of patents on commercial scale in India appears rather very insignificant and dis-satisfactory. True ATMANIRBHARTA (self reliance) would be achieved when reasonably significant number of patents is worked in India. Working of patents in India is quite relevant in context of the emerging tariff scenario in relation to international trade of the products such as pharmaceuticals, medical devices, batteries, semi-conductors, communication devices. Attaining self reliance will be accelerated when rise in working of patents happens particularly in manufacturing sector.

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