# Naïve perceptions about patents in India

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Knowledge about patents in India, even at decision and policy-making levels in important public and private bodies, is meagre. Scientific researchers, used to freely sharing information, seem to be particularly unaware of the history behind the patents, and why they dominate modern global economies.

Venice in 1594 granted Galileo a 'privilege' (patent) on a machine he had invented[1] 'for raising water and irrigating land with small expense and great convenience', on the condition that it had never before been thought of or made by others. In his petition for the privilege he argued, 'it not being fit that this invention, which is my own, discovered by me with great labor and expense, be made the common property of everyone'; and that if he were granted the privilege, 'I shall the more attentively apply myself to new inventions for universal benefit'. Even Galileo, the father of modern science, was unwilling to divulge his invention only to have it copied for free exploitation by others. The Venetian Council saw in Galileo's petition an opportunity to put a limited monopoly to good use and granted him a 'privilege' for 21 years. Modern patent laws are justified using similar arguments.

Limited-period monopoly was meant to prevent undue concentration of economic power; it was meant to reward inventors fairly with a head start, not a lifetime entitlement. In return, the inventor must provide enough information upfront to enable one skilled in the art to improve upon the invention or once the patent has expired, practice it. On expiry of a patent, the invention described therein may be freely used by anyone. The goal has been to get as many useful inventions into the public domain as soon as possible and thus enrich society as a whole without being unfair to the inventor. The grant of a patent does not override any other legislation that might regulate the use of the invention.

It is doubtful that without patent protection, epoch-defining technological innovations built around inventions such as the electric dynamo, the combustion engine, and the transistor would have occurred as quickly. It is equally doubtful that chemical, pharmaceutical, and electrical engineering industries would have flourished, or that the world would have seen the rise of corporations, which led to the rapid expansion of the middle class. Patents are now at least as valuable as what in the nineteenth century were prized mineral rights and trading concessions[2].

Since the past several decades, the main drivers of advanced economies have been technology and technological innovations rather than manufacturing and agriculture. In fact, in the US, its unparalleled system of research universities and their association with the industry has been an important driver of the new economy. This university–industry association includes exchange of knowledge, expertise, work culture and funds. The growth of the biotechnology sector in the past few decades has further intensified that association. The future is about capitalizing on economies of expertise, not just on economies of scale in manufacturing.

## Whither India?

It is no secret that our research output is meagre and seldom of any value. Even the fame of the IITs rests on the quality of their BTech students and, only secondly, on the quality of their teaching; it sadly does not rest on their research output. Moreover, of the little research they produce, it is the science departments that produce the bulk of quality research rather than the engineering departments. In short, the ability of the country to generate novel, useful, patentable inventions is negligible, and practically non-existent in biotechnology, nanotechnology, information technology, robotics, etc. – disciplines which have already been targetted as economic growth areas by the US, several advanced European countries, and in our neighbourhood, by Japan, South Korea, Australia and Singapore. The targetted disciplines require close interactions with university researchers, require huge funding, carry high business risks and rely on patents for survival.

The cited countries take for granted the central role to be played by university–industry research collaborations in furthering their economic goals. Their action plans emphasize restructuring of the university system, removing barriers to university–industry collaborations, developing new funding frameworks to strengthen science and technology education (especially for the gifted), sourcing creative talent by relaxing immigration laws (to promote brain circulation rather than brain drain), and strengthening technology transfer mechanisms.

The need for harmonious patent laws across the world is widely recognized, as is the need to develop financial agencies and technology-appraisal agencies so that, in concert, they can support commercialization of high-value patents owned by small and medium enterprises by taking patents rather than materials as securities. The future will see 'mega research agreements' between companies and universities in cutting-edge technology areas. The building of state-of-the-art research centres, initiated by governments but jointly funded using public and private capital, has already begun in some countries. Japan's recent restructuring of its national universities as independent corporate entities to promote innovation is being watched by others.

India has some unusual problems. For decades, the majority of our best talent has migrated abroad for better opportunities. We called it the brain drain. In the past decade, a substantial part of the talent graduating from universities has joined the domestic information technology (IT) industry to do well-paid but menial jobs. This is an internal brain drain where the IT sector has siphoned-off the talent which the country desperately needs in its other more intellectually demanding industrial and R&D sectors. The country currently produces only a few thousand Ph Ds, when tens of thousands are needed. R&D establishments in defence, aerospace, energy, biotechnology, and other sectors are simply unable to refill vacancies created by routine retirement of scientists and technologists. R&D in the public sector is the hardest hit, especially in defence and space, where it has ceased to attract even modest talent.

Our ability to generate patentable inventions is so close to zero that while the Government has set aside several hun-

dred crores to support intellectual property (IP) generation, it is hard-pressed to find suitable recipients even for this modest fund. The biotechnology sector alone should have been able to gobble up the entire fund, had it been in good shape.

To be a player in a global knowledge-based economy we must create knowledge, and innovate. However, the brain drain to the IT sector has severely depleted the pool of scientists and technologists needed for the task. Further, while some scientists and engineers may leave the IT sector due to its decline in the next few years, they would essentially be unemployable in non-IT sectors because they have been away from science and technology for too long. The IT revolution has already cost the country dearly in terms of the lost manpower that should have been leading the country's development projects now.

Globally, companies regard their patent portfolios as corporate profit centres. Indian multinationals are aware of this fact. To eventually mature as big global players, they will have to license IP from others and attract 'brains in circulation' from elsewhere.

## Only few patents make money

The belief that if I have a patent I will become rich is patently false. Few patents make enough money, if at all, that would recover the expenses of acquiring them. More importantly, a patent is a property right granted to an inventor by a Government. The patents granted by a country, like its laws, have no extraterritorial effect. A patent gives the right to inventors to exclude others from making, using, selling or offering to sell, and importing the claimed invention; it does not confer any right to practice the invention. In short, a patent does not give you the right to do anything; it only excludes others from doing something! This is because in practising your invention, you may well need patents held by others unwilling to cooperate. For example, if you hold a patent related to colour television, you cannot build a colour television if others hold enforceable patents on other related technologies, say black-and-white television.

Most people are unaware that potentially profitable patents tend to attract litigation. Defending the validity of a patent when it is contested, or suing someone who has infringed a patent is expensive, more so if litigation is to be pursued in more than one country. Acquiring a patent is far easier than succeeding in litigation. That is why corporations with deep pockets build patent portfolios to counter-sue others if sued, cross-license their portfolios with their competitors to avoid litigation, to improve their chances of practising their patents, to spread risk where successful patents cover the losses incurred on unproductive patents, etc. Few lone patents make money and we usually hear of them when they are involved in high-profile litigation.

## Paranoia

Lacking genuine inventions of our own, we have become adept at making a mountain of a molehill. The hype created around the turmeric and neem patents granted by the US Patent and Trademark Office (USPTO) are good examples. A basic fact regarding patents is that a product or a process that has been used publicly and traditionally is not new, and therefore cannot be patented. If errors are made in granting patents, legal remedies exist.

In March 1995, Suman Das and Hari Cohly (University of Mississippi Medical Center) were granted a patent (US 5401504) related to the use of turmeric for healing wounds. Following an uproar, the Council of Scientific and Industrial Research (CSIR), New Delhi requested the USPTO to re-examine the patent citing prior art going back to thousands of years of turmeric being used as a medicine. CSIR presented ancient Sanskrit text and a 1953-paper published in the *Journal of the Indian Medical Association*. In view of the evidence, the USPTO cancelled the patent in April 1998. Revocation of wrongly granted patents happens routinely in all countries, including India. What is not clear is why the (Indian?) inventors were unaware that their invention was unpatentable based on prior art before filing their patent application.

Even though Indian companies own neem-related patents for a range of products, including a contraceptive (National Institute of Immunology in 1993) and a pesticide (Godrej Soaps in 1994), certain neem-related patents owned by the US corporation, WR Grace & Co, came under fire in India. They are:

- US 4946681 (1990) for improving the storage stability of neem seed extracts containing azadirachtin.
- US 5124349 (1992) for storage of stable insecticidal composition comprising neem seed extract.
- European patent 0436257 (1994) for a 'method of controlling fungi on plants by the aid of a hydrophobic extracted neem oil'.

Under pressure from farmers and NGOs, the Indian Government filed a complaint with the USPTO, accusing WR Grace of copying an Indian invention. The Government later withdrew the complaint when it realized that the company had in fact, created a new invention for the neem extraction process, and that the patent was not based on traditional knowledge. The Grace-owned patents are quite specific. The 1990 patent is for a method of producing neem extract that can be stored well, and the 1992 patent is for a specific method of extracting and treating active substances from neem seeds, so that the resulting solution is stable enough to store. It is only these specific, novel processes that are protected by the patents. They do not prevent anyone, including farmers, from freely using neem in any traditional way they desire.

The European patent was revoked by the EPO in 2000, because the fungicidal effect of extracts of neem seeds had been known and used for centuries in Indian agriculture to protect crops.

1. Inkster, I., http://www.lse.ac.uk/collections/economicHistory/GEHN/GEHNPDF/PotentiallyGlobal-IInkster.pdf
2. Warshofsky, F., *The Patent Wars*, John Wiley, Chichester, 1994.

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