

Waiver of Patent Rights.

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The recent move of the USA (under the Biden administration) backing the waiver of patents on vaccines against COVID has been reported, by Nature on May 06, as a shock move that has drawn “cheers from public-health researchers and ire from drugmakers”.

We think we understand why drug-makers are angry. But why is this considered to be a shock move? Because the Patent and Copyright Clause of the US Constitution states that: [The Congress shall have power] “To promote the progress of science and useful arts, by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries.” Financial benefits are considered essential for the progress of science and useful arts. Contrast this with our cultural belief that “Vidhya daanam vardhate”, or knowledge grows when it is imparted to others.

This belief, that financial benefits are considered essential, did not originate in USA. It is widely accepted that the Industrial Revolution had been facilitated by laws in which the supremacy of the mind was recognized in very material terms.

While researching for the book *“Steam Power and Transparent Glass: Two phase transition related turning points in human civilization”*, I learnt that patent rights played a role in the development of transparent glass also. The culture of patents, as we know them today, is believed to have actually started in a systematic way in Venice around 1450. These patents were mostly in the field of glass making. The rapid spread of glass-making technology led to the diffusion of patent systems to other parts of Europe. The concept of patents spread from Venice to Europe and England. This was followed by Ravenscroft being granted a patent, from King Charles II, for producing lead crystal glassware on an industrial scale. This was in 1674, about a hundred years before the Industrial Revolution. The British patent system was the first modern patent system that actually rewarded intellectual property and thereby ‘stimulated’ invention. By 1696, but only *after the patent expired*, twenty-seven glasshouses in England were producing flint glass and were exporting all over Europe. This rapid growth of a new innovation *after the expiry of its initial patent* is what was repeated, as

we now discuss, by inventors and engineers waiting for Watt's patent for a steam engine to expire.

Savery in 1698, and Newcomen in 1712 developed engines using steam power to suck water out of flooded mines. Newcomen had developed his steam engine when Savery's patent was still active, and was forced to come to a commercial arrangement with Savery. Watt made many modifications to these devices, starting in 1765. The major new idea was to condense steam in a different chamber so that the piston did not have to be cooled and re-heated in every cycle. His changes drastically improved the efficiency for pumping water and allowed the pumps to be much smaller in size. He was continuously modifying the design and his final commercial design of the Steam Engine, with major changes that enhanced the efficiency many fold, came in 1776. A few years later he introduced a system to turn the linear motion of the engines into rotary motion and these were no longer simple water pumps. These developments really caused the Industrial Revolution, and Watt is rightfully given credit for the Steam Engine. But, akin to some monopoly practices we observe currently, Watt was making a vigorous legal defense of his patents. This had financial implications that deterred other innovators from building on his ideas while his patent was valid. This resulted in the continued use of the inefficient Newcomen engine by other inventors as its patent had expired, in an effort to avoid royalty payments to Watt. There was a rush to install the Watt engines only around 1800 when his patent expired. The development of patent laws is believed to have also inhibited new ideas from competitors because of monopolistic actions of original patent holders.

Financial benefits have been considered, by our existing civilization, as essential for the progress of science and useful arts. We scientists try to reconcile this, in our attempts to understand nature with "Vidhya daanam vardhate". New ideas are needed to improve on existing patented ideas, and patent laws should not inhibit such improvements.

The waiver on Covid vaccines is an essential need for survival of mankind in the face of this raging pandemic. The news item in Nature gives a glimmer of hope that there will be a serious rethink on patent laws, and on these coming in the way of the general good to humanity.