Patents beyond land: applicability and infringement of inventions in outer space

Vidushi Bhardwaj from LexOrbis takes us out of this world and onto the undiscovered planet that is intellectual property in outer space

For years, inventors have been filing and obtaining patents for technologies that have either exclusive applicability in outer space or dual-use applicability both on earth and in space. But these inventions are only protected on earth.

At the beginning of commercial space flight, the technology and cost of entry from joining the commercial space launch industry was a barrier, which kept the number of companies in the field relatively small.

The private sector was allowed to launch a spacecraft for the first time in 1984.

With privatisation, soon space applicable innovations needed protection. Patents seem to be the obvious way. Because patents are granted by national governments, they are inherently territorial and may only be enforced within the jurisdiction of the granting government.

This jurisdictional issue presents many problems of protecting where the inventions have extra-terrestrial markets as no one has jurisdiction over the space.

In order to address these issues, several international treaties and conventions have been formulated, including the Moon Convention and Registration Convention. None of them have been able to address the issue satisfactorily.

The problem remains with the extra-terrestrial patent infringement as it is not easy to even detect the infringing activities going on in space and trace the infringer.

Even if it is traced, the major issue is that of jurisdiction as there is no clear law establishing the jurisdictional boundaries in relation to inventions in space.

The issues pertaining to such subjects include:

- Territorial jurisdiction and the extension of national laws to objects in space
- Detection of extra-territorial patent infringement
- Flags of convenience and the mitigation measures for the same
- The doctrine of temporary presence and space inventions

In the absence of any appropriate consigning solution for the above-mentioned issues, we attempt to arrive at a solution based on the prevalent laws and practice provisions in various jurisdictions.

Status of applicability of national/regional patent law in outer space

Getting a patent in India cannot protect the invention in other countries and vice versa. One has to apply in all the countries where he wishes to seek protection over his invention in view of the commercial or other feasibility factors. In order to simplify the process, the laws of different countries have been rationalised to a level for the convenience of all the stakeholders. Signing the multilateral treaty Patent Cooperation Treaty (PCT) between the different countries is one such significant step.

Despite this, the patent laws of different countries are still different from each other in various aspects. The difference in the patentable subject matter can also be seen in the various patent laws. With this, we can say that

there is still disparity on the substantive as well as on the procedural grounds of patents.

Although the inventions related to space are protected by way of patents, the following issues related to such patents will still arise.

Which nation has territorial jurisdiction over space?

In order to address the aforementioned issues, space inventions must be categorised in the following broad categories:

1. Invented on Earth and applied in space
2. Invented in space and applied on Earth
3. Invented in space and applied in space

For the first category, the solution is easy as the patent system of the country where it has been invented will be followed and will be registered for getting patented in that country only.

Followed by this, the space object may be launched into space duly complying with the various international treaties and other laws related to space. One such example is inventions related to space suits. To be precise, the state inventing the said object has the jurisdiction.

For the second and third categories, the problem still exists as one cannot easily ascertain as to which jurisdiction would be applicable to the inventions done outside the territorial jurisdiction of the countries. However, the level of hardship faced in finding the solution of the second instance is still easier in comparison to the other one. The inventors can get their inventions registered with the patent office of the country whose resources they used, whom they are nationals of, for the country they intended to develop the invention, and other convenience factors (some will be discussed further). The issue related to the third instance becomes complex due to the fact that the inventions which are not only done in space but are also applied in space are most susceptible to being infringed. The general approach of determining patent infringement is through market analysis. If a product shows up in the market, and that product or the process it is based on has already been patented in the name of someone else, it forms a good claim of infringement. But when the invention is being used in space, it poses a challenge on determining the act of infringement in the absence of proper monitoring in the space. Even if it is determined, then also it won't be clear under which law, the recourse action is to be taken.

In order to address the above issues, it has been suggested that the jurisdiction should be determined based on the nationality of the inventors who perform the invention. The solution is simple, but still has a shortcoming and that can be experienced when the states involved in such invention are more than one. In this situation, there might be a clash between nations over claiming their jurisdictions.

One example is the International Space Station (ISS). The ISS is the largest human-made single structure ever put into space. In January 2018, around 230 scientists visited the shuttle to pursue further research and experiments. In total, 15 counties are contributors. The space shuttle had been launched with the aim of performing research in space and these inventions are

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definitely expected to be remarkable and significant in the near future. Now, protecting them by way of patents is crucial in light of the aforementioned reasons. But the issue was that how the jurisdiction could be decided to get the inventions registered under the patent laws of any country when the scientists belonging to different countries performed the same. The proposed solution for the same can better be understood if we analyse the different international laws that somehow relate to the present subject matter and address the issue to an extent.

These include:

Outer Space Treaty

The treaty is believed to have given rise to international space laws. 102 countries have implemented the treaty in their countries, while 27 others are yet to ratify, though have signed it.

UN Convention on Registration of Objects Launched into Outer Space

Post the inception of space laws, this convention was introduced in 1976 with a view to get registered space objects launched into space by any of the nations. The contracting states and international intergovernmental organisations were to establish a registry mandatorily and publicise the information pertaining to the launch of any object in the outer space.

To be precise, the relevant provisions extracted from the international instruments in regard to the present subject matter include:

- The right to use outer space, but not to appropriate it
- Applicable international laws on such space activities
- It is obligatory for nations to use outer space for peaceful purposes only
- The state that has registered the space object with its own registry shall retain jurisdiction, as well as control, over that object
- The 'launching state' is required to register the space object with an appropriate registry
- Where two or more launching states are present, they shall jointly determine under whose registry the object is to be registered

These provisions pave the way to a better solution. Instead of an approach based on nationality, the Registration Convention can be relied on, while the 'launching state' shall get the object registered and will retain jurisdiction. This suggests that the unauthorised manufacture, use or sale of a patented invention on a space object under the jurisdiction of the US will be treated as if it were an infringement under US patent laws. However, when a space object is launched into the Earth's orbit or beyond, the launching state must register the space object and so the jurisdiction of the space object will be retrievable. The solution still seems to be a theoretical one as in order to apply it, the other countries should also have some reference of the concept. If a country does not acknowledge the provision of applicability of its patent laws beyond the territorial jurisdiction, the derived solution seems to be difficult to be applied. In this reference, some of the countries have modified their laws to address the matter.

Detection of extra-territorial patent infringement

Even if it is ascertained which state will have jurisdiction over the patented invention, it is still difficult to determine if the invention is being infringed while being used in space. For example, if the invention relates to a method of operating a heating module, detecting the act of infringement cannot be done unless one is present on the space object where the method is being performed. It is preposterous to monitor and safeguard an invention being infringed in space. Even if it is assumed that the act of infringement has been detected by one, what will happen if the space object never returns to Earth. The recourse to the act is possible only on earth. Also, what if the object returns to some other territory and not the one where it has been registered. In that case also, recourse is not possible.

Flags of convenience

The term 'flags of convenience' originated primarily from maritime law where commercial ships were registered under the laws of another country, other than the one its owner belongs to.This has become a very prominent practice in the recent past performed for availing tax benefits, escaping the stringent norms of the land, and for other benefits. International space laws have inherited the same concept from maritime laws. The Registration Convention states that the 'launching state' shall have the right to get the space object registered under its national registry. However, the scope of the term 'launching state' is not well defined and so it carries a very broad

meaning. In order to escape the stringent laws, heavy taxes and procedural constraints, the companies often get their inventions registered under the laws of desired countries such as Sri Lanka and Bangladesh. Such an act has a devastating effect on the entire patent regime and this is even worse in case of space objects that in that of ships. In the case of space, if one wants to invoke the provisions of patent protection over his invention being used by the competitor in spacecraft, they must rely on the laws of the country where the spacecraft has been registered. In case the patent has not been registered in that country or if that country offers a weak protection to such inventions, they cannot succeed in protecting their invention. Others might take advantage of this fact and will exploit the invention.

Doctrine of Temporary Presence and space inventions

Once this is established, a step can be taken ahead in the direction of strengthening the patent laws related to space inventions. The Doctrine of Temporary Presence is one of the exceptions to Patent Infringement which has been incorporated in the Indian Patent Act under section 49. It allows a vessel or aircraft registered in foreign country to use a protected invention on board in case of necessity or for the purpose of construction or working of the vehicle while being within the Indian territories. This act does not amount to infringement. At present, it is not clear whether it relates to the space inventions. But on the parallel approach, the same can be applied on the space-related inventions in order to curb chances of any urgency or other necessity demanding the use of protected invention in a well-developed patent regime.

Conclusion

Every proposed solution has a shortcoming, and it is not acceptable at this point to mitigate the problems related to the patentability of space inventions. There seems to be one feasible solution that can address the same to some extent. It would be beneficial for the largest space-faring countries to sign a treaty banning companies or inventors from gaining by using the technology that violates the patents of any of the signing countries. This will force the innovators and applicant companies to follow the system proposed in order to gain from their own inventions. In case the companies don't abide by the said provisions, they won't be able to make a profit out of the object. The aforementioned practices are performed by the companies with an intention to gain economic benefits. These benefits are obtained by encashing the difference between the patent laws of different countries. If none of the countries acknowledges any invention which violates the patent laws of any other member countries, these calculative beneficiaries would definitely stop practicing this.

However, for any clear and effective solution, it is necessary for the states to first revise their IP laws patentability of space-related inventions. Though, some of the countries, including the US and Canada, have amended their national patent laws.

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