

PROBLEMS AND REALITIES IN APPLYING THE PROVISIONS OF THE OUTER SPACE TREATY TO INTELLECTUAL PROPERTY ISSUES

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¹Abstract

Several potential conflicts may be discerned between basic tenants of the Outer Space Treaty (OST) and modern patent practice. The temporary, territorially- limited monopoly granted to a patent proprietor by a national patent office shall be difficult to reconcile with the "Space Benefits clause" of OST art.1, particularly in the case of essential patents (e.g. Williams, assigned to HAC). Extension of national territory to Outer Space (e.g. US Space Bill) would seem at odds with the "non-appropriation clause" of OST art. 2, as would patent claims whose scope is expressed in terms of geographical regions of Outer Space (e.g. Horstein et al., assigned to TRW).

The first problem encountered in applying the provisions of the OST to Intellectual Property (IP) law and practice is that the different national patent legislations have no mechanisms to allow for any effects of international law within the delivery procedure up until grant.

Furthermore, the rights granted to the patentee are uniform throughout the territory of validity of the patent, including any artificial extensions of national territory on orbit and beyond.

In such a situation, there is no provision which foresees the introduction of the notions of the OST before a judge in a case of alleged patent infringement in Outer Space. Anyway, judges who are competent in patent cases are by and large surely ignorant of the OST provisions and their possible impact on the judgement concerning inventions made or used in Outer Space.

These problems may be stated in a more general manner. In sum, there is no truly competent body for granting or denying patents in accordance with the provisions of the OST. Further, there is no competent judicial body for judging whether the use of a space-related patent is consistent with the OST provisions.

The authors propose that the UN legal subcommittee of the COPUOS should take the initiative in indicating how the provisions of the OST should be implemented with respect to IPR legislation and its use before the courts.

The recent UN resolution (Feb., 1997) is a first step in this direction. However, in order to be efficiently implemented into national legislations, an agreement similar

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to the GATT/TRIPS treaty, and its implementation mechanisms could be proposed. The provisions of the OST will only be effectively implemented with respect to IP legislation and practice when the different national legislations are modified to take the OST provisions into account, and a competent judicial body is designated for enforcement of the OST.

Basic Principles

In order to examine conflicts which may arise between application of existing Intellectual Property (IP) law and the basic tenants of the Outer Space Treaty (OST), we shall first recall the principles as expressed in the various legal instruments, as well as some specific US IP-related legislation and the IP clauses of the InterGovernmental Agreement (IGA) for the International Space Station Alpha (ISS α).

The basic principles underlying national IP laws may be illustrated by one of the most venerable texts on the matter, the United States Constitution (1787). Article 1, section 8, paragraph 8 states :

"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."
(emphasis added)

The first national patent law was enacted in the US in 1790, followed shortly thereafter by a similar law enacted in France. All modern national patent laws are based on the same basic principles, giving rise to codification of Intellectual Property Rights (IPR) in the respective countries.

A general definition of IPR emerges from the mosaic of national laws. IPR is a legal right, which is obtained, exercised, interpreted, and judged according to nationally enacted legislation and ensuing case law. It is the right to forbid third party exploitation, or to allow such exploitation by license on terms dictated by the registered IPR owner or his designated successor.

The scope of the protection of IPR is defined by the filed instruments, for example by the claims of a patent. The geographical scope of the protection is that of the territory of the State which has registered the IPR. And the IPR has a limited lifetime, for example twenty years after the filing date for patents.

We shall now recall some basic principles of the Outer Space Treaty for comparison.

OST Article 1, Paragraph 1 states, in what has been called the "Space Benefits" clause :

"The exploration and use of outer space ... shall be carried out for the benefit and in the interest of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind."

Outer space... shall be free for exploration and use by all states without discrimination of any kind, on a basis of equality and in accordance with international law, ..."

There shall be freedom of scientific investigation in outer space ... and States shall facilitate and encourage international co-operation in such investigation."

Article II continues :

"Outer space ... is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means."

Until this point, the only potential conflict which could be pointed out is that between a monopoly granted to an inventor, on the one hand, and the sharing implied by the Space Benefits clause of the OST on the other.

However it is also important to note that the US has taken the lead in extending the applicability of its national IPR legislation into orbit and beyond, through the "US Space Bill", and the NASA act.

Unilateral Territorial Extension for IPR

President Bush, when commenting on his signature of the US Space Bill, ² explained how this bill would promote progress of science and useful arts by securing a temporary monopoly for US commercial entities which would apply also to space in the same manner that they would receive if their activities were conducted on earth (i.e. in the US).

The motivation for the US Space Bill as expressed by President Bush, was to obtain legal certainty that US patent law protection would be extended to Outer Space for US entities under certain broad conditions. The US Space Bill adds an article ³ to US patent law, which reads in part :

" Any invention made, used or sold in outer space on a space object or component thereof under the jurisdiction or control of the United States shall be considered to be made, used or sold within the United States for the purposes of this title, except with respect to any space object or component thereof that is specifically identified and otherwise provided for by an international agreement to which the United States is a party, or ... carried on the registry of a foreign state in accordance with the Convention of Registration of Objects Launched into Outer Space."...

The US Space Bill thus follows the "flagship principle" ⁴ as applied to vessels on the high seas, or aircraft flying over international waters. In a logical extension of the Flagship concept, US legislation enacted in the "NASA act" ⁵ concerning US

² S459, Nov. 16, 1990, publ. in BNA vol. 41, pp. 90-93 (11/22/90).

³ 35 U.S.C. 105

⁴ cf. Senate Report on S 459, publ. in BNA vol. 41, p. 91 (11/22/90) : "Extraterritorial application of the patent laws".

⁵ U.S.C. 42, § 2457(k), in J.M. Samuels, Patent Trademark & Copyright Laws, 481 1997.

Government Interests in Patents issued from space activities :

(k) "...Any object intended for launch, launched, or assembled in outer space shall be considered a vehicle for purpose of section 272 of title 35, United States Code." (temporary presence).

Patchwork Territorial Solution for ISS α

This "flagship principle" is pursued to its logical limits in the provisions governing applicable law (including, but not limited to IPR law) in the Inter Governmental Agreement (IGA) for the International Space Station Alpha (ISS α) , which states ⁶ :

"... for purposes of intellectual property law, an activity occurring in or on a Space Station flight element shall be deemed to have occurred only in the territory of the Partner State of that element's registry, except that for ESA-registered elements any European Partner State may deem that the activity to have occurred within its territory.

For avoidance of doubt, participation by a Partner State, its Cooperating Agency, or its related entities in an activity occurring in or on any other Partner's Space Station flight element shall not in and of itself alter or affect the jurisdiction over such activity provided for in the previous sentence."

Forum Shopping via UN Registry

The Flagship principle as embodied by the IGA solves the forum shopping dilemma for this project by agreement between the partners. However, the Flagship principle in maritime law has lead to convenience registry. Could this also happen for registry of space objects under the most favorable regime ?

⁶ IGA art, 21, para. 2 (1988).

US patent law and IGA make explicit reference to the State of Registry to determine the applicable law. However, for space activities undertaken by entities in the private sector there remains the possibility of a willful choice of the State of Registry.

U.N. Registry : In Which Country ?

Several legal consequences may govern the choice of a registry state for space objects : Ownership, liability, jurisdiction and control, hence applicable law.

The 1975 U.N. Registry Convention⁷ provides that the "Launching State" will register each object launched in a national register, and inform the U.N. Secretary General. However the "Launching State" has multiple definitions in art. 1 of the 1975 treaty :

- the State that launches ;
- the State that procures the launching ;
- the State from whose territory an object is launched ; or
- the State from whose facility an object is launched .

Example : Sea Launch Project

A current example of the Registry problem is given by the Sea Launch ⁸ Project . Which is the "Appropriate State" for U.N. Registry in a consortium comprising a US firm (Boeing, the leader), a Norwegian firm (Kvaerner) for platform and boat construction, a Ukrainian firm (Yuzhnoye) for two-stage rockets, and a Russian firm (Energia) for the third rocket stage ? Considering also that the Sea Launch firm itself is registered for tax purposes in the Cayman Islands, a British Crown Colony, and that the Sea Launch vessel has its permanent berth in Long Beach, California,

⁷ A/AC.105/572/Rev.1

⁸ For a thorough discussion, cf. Kerrest, A., "The Launch of Spacecraft from the Sea", in Outlook on Space Law over the Next 30 Years, pp. 217-233, Kluwer Law International, Netherlands, 1997.

and is flying a Liberian Flag ? Furthermore, the Sea Launch may launch from any territorial waters (with permission), or international waters if more convenient.

As it turns out, the Sea Launch consortium has opted for the US as a Launching State, perhaps as it is financially preferable to do so in light of the bilateral agreements concerning the former USSR launch offers on the civilian launch market. As a consequence, US IPR law also applies to Sea Launch activities.

Which is the Applicable IPR Law in Outer Space ?

In view of the US Space Bill, the IGA, and provisions on UN Registry for determining the "nationality" of a space object, it appears that the US law is the law which is most often applicable. Indeed, in the case where US law is not applicable, it would seem that there is no clear answer, as no other country has passed space-specific IPR legislation.

However US patent law has no explicit mechanisms to take into account the provisions of the Outer Space Treaty (OST) in the examination procedure leading to the grant of a patent. This means that the U.S.P.T.O. can (and does) grant patents in conflict with the basic principles of the OST.

Possible Conflicts with OST

Is there conflict between 1) IPR use in outer space ; 2) OST principles in articles 1 & 2 ; 3) basic principles of IPR ?

There would seem to be a fundamental conflict between a temporary monopoly granted to the owner of IPR, and the broad general terms of the OST Space Benefits clause. In some cases, IPR may also conflict with the non-appropriation clause of OST (Art. 2). We will illustrate such possible conflict by reference to a couple of real cases in the following paragraphs, which may also lead us to ask if there may be a contradiction between the use of IPR in space, and the basic underlying principle of IPR itself, i.e. to

promote the progress of science and the useful arts.

Our first example concerns a US patent granted to TRW in July 1995⁹. This first issue has been followed by similar patents issued from the same parent application via the US procedure "Continuation in Part" (CIP). The most recent of this series, which also has the broadest claims, issued in September 1996¹⁰.

The main claim of the first ('726) patent has the following features :

•Launch of a constellation of satellites to between 5,600 and 10,000 nautical miles above the earth;

•At least one satellite to have a reduced antenna field of view, FOV, less than full earth coverage;

•The satellites to be oriented in a plurality of predetermined orbital planes;

•Receiving radio frequency signals by at least one satellite from a plurality of mobile handsets with omnidirectional antennae;

•Overlapping of a portion of the coverage region of a departing satellite with a portion of the coverage region of an arriving satellite;

•Predetermined criteria for the assignment of calls to or from users within the coverage overlap region from a departing satellite to an arriving satellite (call hand-over).

The main claim of this patent may be interpreted as reserving an orbital "shell" surrounding the earth between the altitudes of 5600 and 10,000 nautical miles, for virtually all conceivable practical applications in the field of satellite-based communications to mobile handsets.

As soon as the patent was granted, a foreign (non-US) competitor, ICO Global Communications Ltd., was warned that its planned satellite system was considered to be a potential infringement of that patent.

⁹ US-A-5,433,726 to Horstein et al., 1995.

¹⁰ US-A-5,551,624 to Horstein et al., 1996.

The warning was followed by a lawsuit in a California court to enforce the monopoly, and purporting to exclude that foreign competitor from implementing a global mobile satellite communications system having satellites in the forbidden (appropriated) altitude range mentioned in the main claim.

This action based on legitimately obtained US IPR seems to be in direct conflict with both the non-appropriation (Art.II) and the Space Benefits (Art. I) provisions of the OST.

The TRW-ICO case was recently dismissed in the first instance, according to press reports, by the conclusion that no infringement has yet occurred, as although the satellites are now under construction, they are not in and of themselves infringing *per se*. In a more recent development, Odyssey (TRW and Teleglobe Canada), is apparently having financial difficulties and industry speculations are that TRW will never realise a system according to its patent. According to the terms of the GATT/TRIPS agreement, this could be considered sufficient and valid grounds for obtaining a compulsory license in many countries, but not the US.

TRW Vice President and Managing Director of Odyssey Bruce Gerding was quoted in the press¹¹ during Telecom Geneva as having boasted :

"We have built a fence around our real estate", said Gerding. The patents now allow "us to build that fence higher, thicker and stronger. We will rigorously protect our intellectual property rights."

This belligerent, "no-trespassing" attitude of the patent proprietor betrays a direct conflict with the non-appropriation principle of the OST.

Our second example concerns the famous Hughes Aircraft Company (HAC) Williams patent¹², concerning a method for obtaining and maintaining satellite attitude on orbit. Proper attitude is necessary in

¹¹ "Satellites of Regulation", Network Europe, Nov.-Dec. 1995.

¹² US-A-3,758,051, 1973.

order to allow the satellite to properly aim its directional antennas in order to fulfill communications missions, and in some platform architectures, to orient the solar energy collectors to supply electrical energy to the payload.

Once again, shortly after this patent was granted in 1973, HAC attacked the US Government for infringement in the same year, followed by multiple attacks on foreign entities. In this case, litigation dragged on for years, practically during the whole term of the patent, and by the time the first judgement was handed down in 1983, there were 108 allegedly infringing craft, although when the litigation started there were only 14 satellites incriminated.¹³ HAC had not sought an injunction or a temporary restraining order to prevent the launches of the additional satellites, and was then encouraged to assert its patent against other, non-US entities by the successful judgement against the US government and the substantial (multibillion dollar) damages awarded in the first instance¹⁴.

However, it would have theoretically been possible, especially concerning foreign entities, to request the court to halt the alleged infringing activities pending final judgement of the case. If this had happened, in view of the necessity of a method for maintaining the satellite attitude in order to fulfill communications missions, this patent could be seen to hinder, rather than to promote, the progress of science and the useful arts, at least during its term of enforcement.

These two examples serve to illustrate that in practical situations in the

¹³ For discussions of the Hughes case, cf. BNA vol. 52, pp. 250-252, idem vol. 46, pp. 428-430, idem vol. 36, pp. 555-556, idem vol. 26, pp. 491-492.

¹⁴ For discussion of the dispute on the evaluation of damages in the Hughes case, see Christol, C. "Damages and Intellectual Property " An Up-Date on Hughes Aircraft Company vs. USA", in Proc. 39th Colloquium on the Law of Outer Space, pp.210-214 ,AIAA, Washington D.C. 1996.

use of IPR, conflicts may arise with the basic tenants of the OST, and even with the fundamental underlying principles of IPR itself.

Existing attempts to obtain legal certainty for IPR in space activities through extension of territorial sovereignty via the flagship principle (e.g. US Space Bill, IGA) present only ad-hoc, piecemeal solutions concerning the forum for IPR enforcement. However these efforts do not attempt to address the fundamental underlying conflicts illustrated above.

Current Situation and Tendencies

Space activities are attracting multi-billion dollar investments from the private sector. The use of IPR in space activities is becoming more and more aggressive, with attempts tending towards the total exclusion of competitors from certain activities or certain regions of space (or both). The founding principles of IPR and the OST seem to have been forgotten by the main players. This may be simply because the main players are no longer those States who signed the Outer Space Treaty thirty years ago, but rather private enterprises hoping to cash in on the enormous revenues foreseen in consumer mass markets. In the opinion of the authors, it is high time to take corrective action before it is too late.

Possible Corrective Actions : Harmonisation

In order to resolve apparent or potential conflicts with the fundamental principles which may arise from the use of IPR in space activities, one possible corrective action could be an attempt towards harmonisation of applicable law. Harmonisation would require that there be at least one other national law in addition to the US law, which is for now the only explicitly applicable law for IPR in outer space.

Shouldn't some of the other space-faring nations consider legislation similar to that of the US Space Bill ?

In Europe, a unique opportunity for such legislation is presented by the

European Commission's Green Paper on the Community Patent¹⁵. Interested parties are invited to comment on this proposition for a patent legislation having a uniform effect in the countries of the European Community, up until 7 November 1997.

However, even if other space powers eventually undertake appropriate legislation to make their national IPR laws applicable to space activities, we will still be confronted with a patchwork of virtual territorial considerations in order to determine which is the applicable law in a given case, and forum shopping is likely to become a favorite pastime under such a regime.

Possible Corrective Actions : Globalisation

A preferable solution would be "Globalisation" of the jurisdiction in outer space activities, i.e. a single, worldwide IP legislation for space activities. This could be imagined as a treaty under the auspices of the UNCOPUOS. We could recommend to **establish space and its accesses (launch sites, vehicles) as a single territory with a single, uniform law.**

A "Space Patent" could be imagined as a new "Country" designation on a PCT (Patent Cooperation Treaty) application, to be examined and granted under the auspices of the WIPO (World Intellectual Property Organisation).

Such a space patent, once granted, should be administered and interpreted by a **single, universal enforcement body** such as an international court of law or an international arbitration authority. Perhaps such an arbitration authority could be created under the auspices of the World Trade Organisation (WTO), aided by the World Intellectual Property Organisation (WIPO) for the IPR aspects. WIPO has already established a board of arbitration for Intellectual Property matters, and it should not be difficult for them to acquire the necessary competence to act on space matters.

¹⁵ COM(97)314 final, 24.6.97

This board could be empowered to arbitrate on matters such as space patent validity and compatibility with international law, alleged infringement, conditions of licensing to third parties, etc.

To aid the Board in its considerations, we propose that a code of conduct be elaborated for the use of such patents. This code of conduct should reflect the basic principles and rely on them for its terms. We are committed to promoting the progress of science and the useful arts, while rewarding inventors for their efforts, and procuring Space Benefits for all mankind. Any appropriation (or monopoly) of any region of space for any use should be formally precluded. Patentability, if incompatible with the basic principles, should be excluded. Such exclusion would be most effective if operated in the patent examination phase.

As for licensing conditions to third parties, in order to fulfill the principles of the OST, licenses should be made on a non-exclusive, non-discriminatory basis, on fair and reasonable terms and conditions. Such fair and reasonable conditions may depend on the economic and scientific development of the Licensee, as reflected in the UN Resolution on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interests of All States, Taking into Particular Account the Needs of Developing Countries,¹⁶ which states in particular :

in Para. 2 : " States are free to determine all aspects of their participation in international cooperation ... on an equitable and mutually acceptable basis. Contractual terms in such cooperative ventures should be fair and reasonable and they should be in full compliance with the legitimate rights and interests of the parties concerned, as, for example, with intellectual property rights. "

And in Para. 5, last alinea : "International cooperation, while taking into particular account the

¹⁶ A/RES/51/122, 4 Feb. 1997

needs of developing countries, should aim, *inter alia*, at the following goals ...

... Facilitating the exchange of expertise and technology among States on a mutually acceptable basis."

We urge the necessity of a globalisation of applicable law, which could be obtained through the efforts of an international treaty organisation such as UNCOPUOS.

Possible Corrective Actions : Enforcement

The efficacy of the Outer Space Treaty, thirty years after, is cast under doubt by the lack of interpretation and enforcement. In the opinion of the authors, if the OST cannot be enforced, it cannot be applied and respected. One way of obtaining enforcement would be to introduce litigation for violation of OST provisions.

Litigation could be introduced by any interested party before the US Federal District court for invalidity of a US patent granted in violation of OST provisions. This would help define the limits within which the USPTO should grant patents on vast regions of outer space, for the exclusive use of patentees for certain lucrative commercial applications.

Also, any Party to the OST could sue the US government for non-respect of its treaty obligations, as the Signatory State is responsible for the acts of its nationals (i.e. U.S.P.T.O. or TRW). However any Signatory State contemplating such action will surely be aware of the considerable trade sanctions which may be applied, under the super 301, for such untowardly behavior.

If no Action is Taken, OST will Fade Away

As exposed above, the problems arising in space activities in the field of IPR put the OST to the test of its applicability and efficacy. A thirty-year old legal instrument which has never been interpreted nor used in the courts runs the risk of becoming obsolete and useless. If not used, the OST provisions will succumb to economic forces, which are too strong and inevitable to be resisted by the lofty principles of the Outer Space Treaty.

Save the Outer Space Treaty

If the OST is to survive into the 21st century, which promises to be really the golden age of commercial space endeavors, then a few essential accessories need to be added by OST defenders. We need binding legal interpretation of the obligations of the OST for the signatories, and clear mechanisms for applying this to the activities of nationals of the signatory states. In addition, we need to create an efficient enforcement means, which protect the legitimate interests of inventors and patent proprietors, to the extent which they are not in conflict with the basic principles of the OST and the founding principles of IPR, i.e. promotion of the progress of science and the useful arts, the sharing of Space Benefits, and the non-appropriation of Outer Space.