FÉDÉRATION INTERNATIONALE DES CONSEILS EN PROPRIÉTÉ INTELLECTUELLE
INTERNATIONAL FEDERATION OF INTELLECTUAL PROPERTY ATTORNEYS
INTERNATIONALE FÖDERATION VON PATENTANWÄLTEN

AIPLA
AMERICAN INTELLECTUAL PROPERTY LAW ASSOCIATION

ASSOCIATION INTERNATIONALE POUR LA PROTECTION DE LA PROPRIÉTÉ INTELLECTUELLE
INTERNATIONAL ASSOCIATION FOR THE PROTECTION OF INTELLECTUAL PROPERTY
INTERNATIONALE VEREINIGUNG FÜR DEN SCHUTZ DES GEISTIGEN EIGENTUMS
AIPPI

2019 COLLOQUIUM ON ARTIFICIAL INTELLIGENCE

A focus on AI and Patent Procurement

27th-29th March 2019
(Starhotels Majestic Torino)

Thematic Summary

Consent to publication of this Thematic Summary has been explicitly received from all Speakers or has been assumed in the absence of any contrary indication. The Thematic Summary was prepared from a full Transcript of the Colloquium by a third party. The Speakers do not warrant its accuracy or completeness. The remarks of two of the speakers have been redacted according to their requests.

[Day 1]

I. Opening remarks

Sheldon Klein, President of AIPLA and AIPPI U.S., opened the colloquium.

Present in the audience were about 100 delegates from all over the world, included expert IP practitioners, representatives from the IP5 offices and policy makers.

Ms. Lisa Jorgenson, AIPLA's Executive Director, added her words of welcome and moderated the proceedings for the morning and the first afternoon session.

II. Introduction to AI

Mr. Alessandro Cremonesi, Vice President of MST Electronics, introduced the topic of AI with a focus on its technology aspects and provided examples of its application in different industries. The importance of data and the three main enablers as far as AI is concerned were illustrated: the semi-conductor industry, the cloud and the telecom industry. All industries will benefit from the transformation enabled by AI and market dynamics are changing as a consequence. AI will enable a shift towards better connectivity and the ability to collect data everywhere will offer a lot of opportunities, but also pose several challenges. In this scenario, security plays an increasingly important role and human beings need to interact with new technologies brought about by automation.

Some concerns were raised about the possibility of machines weakening the link between invention and claim subject matter required by U.S. law.

III. Impact of AI on IP

AI and the Patent Offices

Patent Office representatives discussed the impact of AI within the IP5 and its application to Office operations. Mr. David Kappos, Partner at Cravath, Swaine & Moore LLP, acted as moderator.

Mr. Weilin Liu, Deputy Director of the International Cooperation Division of the Patent Examination Administration Department (CNIPA), talked about the examination practice regard to inventorship, patent eligibility, adequacy of disclosure and inventive step on AI applications in the CNIPA.

- Inventorship: Chinese jurisdiction requires that the inventor is a human being.
- Patent eligibility: no specific requirement exists as far as patent eligibility on AI applications is concerned. However, AI inventions usually fall into the category of computer-implemented inventions (CII) and any relevant examination guidance concerning CII may be applied.
- Adequacy of disclosure: the description of the invention should be sufficiently clear and complete so as to enable a person skilled in the art to carry out the invention.
- Inventive step: currently, no specific requirement exists on assessing inventive step on AI applications.

Mr. Yoshiaki Kodachi, Senior Director for Intellectual Property at JETRO Düsseldorf (JPO), focused on patent examination of AI-related inventions and on JPO's use of AI for its operations. Even though the basic concepts of patent examination in the field of computer-related inventions remained unchanged, the JPO took several initiatives to further clarify how the patentability of AI-related inventions can be assessed. However, in Japan, there are no specific provisions for AI-related inventions, since they are perceived as a variation of computer-related ones. Since 2017, the JPO has been applying AI to its day-to-day operations according to a specific action plan, which aims at optimising the allocation of human resources within the Office.

Mr. Robert Bahr, Deputy Commissioner for Patent Examination Policy (USPTO), discussed about some legal issues pertaining to the examination of AI-related applications and went through some UPSTO's initiatives in relation to AI.

In the past years, the UPSTO issued guidelines pertaining to patent eligibility, identifying the concept of abstract idea and three categories to classify abstract ideas: mathematical concepts, mental steps and certain methods of organising human activity. In order to move on to patentability, a claim needs to integrate abstract ideas into practical applications.

As far as inventorship is concerned, the U.S. law makes it clear that the inventor must be a human being. With regards to adequacy of disclosure, some guidelines relating specifically to computer-implemented inventions – and therefore also AI – were published, stressing the importance of claim definiteness and the treatment of claims. As for non-obviousness, the focus

is on the ever-increasing quantity of available data, which could prompt some applications stemming from the use of AI.

The USPTO is exploring the possibility to use AI in order to improve its processes in relation to search, classification and examination of applications, such as synonym-providers and image recognition.

Mr. Yoshiyuki Takagi, Assistant Director General for the Global Infrastructure Sector (WIPO), mentioned how the WIPO has been following two tracks for the last two years and a half: AI tools components and AI-related policy matters. The WIPO carried out an international survey to find out how many IP offices have already started using AI tools and inventions and identify which areas are already mature enough to use AI.

As for the number of patent applications received and the patent families they belong to, China and the U.S. receive the largest number of patent applications. AI techniques are applied to several fields, but what drives a successful development is the application of deep learning and neural networks in some particular areas: computer vision, predictive data analytics, robotics and natural language processing.

During their discussion, the panellists stressed the need for the IP offices to experiment with the AI tools they are trying to implement.

How are IP practitioners implementing AI?

Dr. Alexander Esslinger, Partner at Betten & Resch, illustrated how – apart from more generally accepted AI tools – more ambitious tasks are sometimes performed with the help of AI, especially case law search. The example mentioned concerned specifically the assessment of trademark similarity, where AI can be exploited to search for trademarks: although it is very useful, there are still some issues with this specific tool, which make the presence of a human instance necessary. In addition, such systems should also include some human input and not be based exclusively on machine-performed training.

As for patent prosecution, because of the complicated nature of this field, the application of AI seems still far off, even though a higher level of automation would be extremely desirable.

Mr. Sandro di Giuseppe, European Patent Attorney at Google, focused on trademarks and patents, mentioning the fields where AI has already been applied: document review (including contracts review), prosecution, patent litigation, legal research and patent search, automated patent landscaping and IP business intelligence. Nevertheless, examination still requires a human being capable of analysing the claims and with the freedom to take action.

There are several service providers and different entities offering their preparatory tools. This also results in a shift as far as the role of in-house counsels is concerned: routine work will be automated, but humans will still be responsible for the most interesting work.

IV. AI in the non-patent IP landscape

In this session – moderated by Dr. Guillaume Henry, Assistant Reporter General (AIPPI) – the panellists discussed issues revolving around AI in areas of IP other than patents.

Mr. Jule Sigall, Associate General Counsel of IP Policy & Strategy at Microsoft corp., provided the delegates with an overview of AI at Microsoft from a legal perspective and delved into two aspects of copyright: the former concerning the use of copyright material to train AI models, the latter focussing on the ability of AI to create actual work and on the possibility of protecting it using copyright. The importance of AI for the present and the future arises from a combination of three factors: big data, the access to data and massive computing power, in addition to algorithms. Data is gathered by an ever-increasing number of endpoints, such as smartphones and cars, and the amount of data centres has also been increasing all over the world.

From a legal perspective, copyright implies the identification of works of authorship and gives their authors control over the copying of those same works. However, some governments suggested that copyright only kicks in when the work is used as a work, whereas there should be an exception when the work is used only as data. One of the first issues may be getting the necessary data to train AI and several countries are trying to affirm the idea that using copyright material for training purposes does not imply the invocation of copyright.

With regards to the question of AI being able to actually create something, the debate resembles the one taking place in 1868 in relation to the use of photos and photography technology. Only humans should get copyright and the struggle lies in determining whether a specific work can be considered as the product of human activity.

Mr. Héctor Elías Chagoya, Partner and Patents & Technology Director at BC&B, focused on the issue of trade secrets, which are regarded as extremely important for AI and as the potential core of any project. As far as the IT continuum is concerned, the complexity stems from the various stakeholders revolving around it: IP contributes to managing risks for investors, which is where copyright, trade secrets and IP protection come into play.

An AI system will be as good as the information stored in it and the difference between competitors will lie in the information used to learn.

The balance between a proprietary position and the decision of not disclosing information and get a trade secret still exists and is now integrated by a third position, which implies going open-source and makes the balance itself even more complex.

One of the main issues lies in understanding whether machines are actually entitled to human rights and can therefore be recognised as inventors and whether this is even possible without changing the law; also, the situation where a human right above the creative right of a machine exists should be discussed, focussing on the need of fundamental human rights (such as safety and health) to always come first.

The great advantage of a trade secret is that it is not based on inventorship or authorship, but rather on possession and control of the information, since the existence of a competitive advantage and of confidentiality measures must be proved in order to get access to this protection. Trade secrets can also coexist with other IP rights, which allows companies to decide what to disclose and what to keep confidential.

The regulation issue will probably put pressure on the trade secret system and the right balance, especially for AI, will have to be established.

V. AI and patenting

During this session – moderated by Mr. Jonathan Osha, Reporter General of AIPPI – a hypothetical fact situation was presented in order to illustrate how AI will affect four key patent issues: inventorship, patent eligibility, adequacy of disclosure and assessment of the inventive step.

Mr. Thomas Kretschmer, European and Swiss Patent Attorney at IPrime Rentsch Kaelin AG, discussed AI and patenting in Europe, stressing how AI and machine learning inventions are considered algorithms and computational models, treated as a form of mathematical method. Mathematical methods are – *per se* – unpatentable, but they can be tied to the control of a technical system, thus gaining technical character and moving toward the realm of patentable inventions.

The exclusion from patentability applies whenever a claim is specifically directed to a purely mathematical method and does not require any technical means. For the assessment of the inventive step, all features contributing to the technical character are usually taken into account: these also include whether the method serves a technical purpose in the context of the invention. According to the EPC, the inventor is entitled to the European patent and this assumes a person or legal person. The EPC does not define the term inventor and there's no case law. A solution might be defining a new person, such as an electronic person.

In Europe, two hurdles exist concerning the patentability of AI and machine learning: the claimed subject matter must have a technical character and must be novel and inventive.

Ms. Lili Wu, Partner at Hankun Law, illustrated the situation in China, where most AI applications (submitted by both Chinese and foreign companies) relate to computer vision, machine learning and natural language processing.

In China, the same rules applying to software solutions also apply to AI patents. For AI, no specific criteria relating to patentability exist and examiners rarely issue a challenge as long as claims contain at least some technical means.

When assessing inventiveness, the invention is considered as a whole, therefore not only technical features, but also algorithms and non-technical features, are taken into account. Pure AI algorithms are granted no protection and the technical effect has to be described with accurate, objective words, while emotional words are not allowed.

Sufficient disclosure is one of the most controversial issues, since deciding which information to disclose always poses a challenge. In this sense, it is also important determining who the person skilled in the art is.

Mr. Jesung Ahn, Managing Partner at AnK Intellectual Property, opened his presentation indicating the recent surge in AI applications in Korea and showing how top applicants are both corporations and research organisations.

In Korea, AI inventions are generally treated as computer-related inventions: an invention is defined as the advanced creation of a technical idea using the law of nature and software cooperating with hardware qualifies as eligible subject matter. Therefore, computer-related

inventions may be considered as patent eligible if they implement information processing by using hardware. The recently updated guidelines for examination state that AI-related inventions may be regarded as eligible subject matter as well according to the same principle.

As for patent eligibility, AI-related inventions need to be reproducible and repeatable, thus making it necessary to clearly detail how the AI is structured and trained in the specifications.

With regards to the inventive step, simply applying an AI technique to a conventional process may not be inventive.

As far as inventorship is concerned, the current Korean patent law assumes that the inventor is a human being, hence only the owner or operator of an AI system producing something new are entitled to a patent.

Mr. Takeshi Aoki, Partner at PRIMEWORKS IP Attorneys, showed the significant increase in AI-related applications filed in Japan.

In Japan, the inventive entity must be a natural person: in the case of AI, someone can be considered an inventor if he or she presents a problem related to the invention to the AI system so that it can solve it.

As for patent eligibility, an invention achieved by means of an AI tool is called AI invention, which is considered a variation of a computer-related invention and for which the same guidelines apply. In order for it to be patent eligible, the claims have to specifically describe how the process involving the software is concretely carried out using hardware. With regards to AI-created inventions, called inventive AI, their patentability is still an open question, since the Patent Act assumes the inventor to be a human being.

As far as adequacy of disclosure is concerned, the specifications must clearly disclose the means to achieve an invention so that a person with ordinary skill in the art (PHOSTA) can carry it out. However, there is no specific requirement as to how detailed the disclosure of AI elements must be.

With regards to the assessment of the inventive step, there is no specific standard at the moment, even though this topic is at the heart of an ongoing debate.

Dr. Kate Gaudry, Partner at Kilpatrick Townsend, discussed AI patenting in the U.S. and showed that AI filings have nearly doubled in the last decade, even though the contribution of U.S. has been consistently falling over the last four years, not because U.S. applicants are filing fewer AI applications, but rather because foreign countries are filing them increasingly faster.

Thanks to the data gathered, it is also possible to assign AI applications to different clusters in the overall AI industry.

As far as eligibility is concerned, any new and useful process, machine, manufacture or composition of matter, or any new and useful improvement thereof, can be patented. Looking at the case law, court decisions state that it is not possible to patent abstract ideas, laws of nature, natural phenomena or products of nature. However, these terms keep dynamically changing.

When assessing whether a claim is directed to an abstract idea, it must fall into one of these three categories: a mathematical concept, a method of organising human activity or a mental process.

According to PTO rules, in the U.S. inventors must be human beings and cannot be corporations, since IP is considered a personal property right.

There has always been uncertainty in terms of what kind of software innovations can be patented in the U.S. and there is no rule to distinguish AI from other types of software.

The debate went on with a hypothetical situation relating to the pharmaceutical industry, based on the possibility of filtering and classifying social media content by means of AI.

Each panellist proceeded to explain the approach of their national systems to this hypothesis.

VI. Closing remarks

Mr. Jonathan Osha expressed his gratitude to the panellists and remarked the interesting prompts the following day's sessions would be based on.

[End of Day 1]

[Day 2]

VII. Ethics session

This session and the following one were moderated by Mr. Julian Crump, President of FICPI.

Mr. Ray Freiwirth of IP & General Counsel at RF IP Law, PLLC, showed a video clip of a hypothetical fact situation to illustrate how AI can pose challenges for both lawyers and examiners in the field of IP.

The hypothesis revolved around a situation where a patented AI invention behaving unexpectedly produced new and relevant results, thus opening the possibility of getting a new patent for the invention.

After showing the video, the ethical issue up for debate was presented, that is to say trying to identify who actually owns the invention. The possibility of a lawyer having ethical concerns in filing a new application was raised as well. The delegates were asked to think about who the inventor should be and whether he should be granted a patent as sole inventor or as co-inventor.

VIII. Where do we go from here?

This session aimed at producing a set of policy considerations that should be taken into account when reviewing IP systems to ensure effective IP protection for AI-related and AI-enabled inventions. It was not the intention to come up with any concrete recommendations as to how the law might be amended. The debate was centred around issues and questions arising from the previous day's sessions thanks to the input from the IP5 offices and other panellists and delegates.

The panellists focused on four main patent-related areas: inventorship, eligibility, sufficiency of disclosure and inventive step. They provided a summary of the previous day's sessions and identified issues they perceived to be key elements. After that, some policy issues were postulated and put on screen for each topic in turn to foster discussion.

The panellists stressed how AI has not yet reached a stage where it can be considered as an inventor, even though this might not be the case in the future and does not solve potential issues. The ambiguity of inventorship and the possibility of connecting it to a real person having insight into a certain problem and the necessary data were identified as issues.

The issue of inventorship was brought back to two policy considerations:

- Does a human inventor need to conceive an end-product or process of an invention?

- If there is a lacuna between where human activity stops and where an invention is made, is there a need to fill that void with some sort of notional, fictitious electronic person (maybe the AI itself) to afford a mechanism to attribute *ownership* of the invention?

The need for an electronic person and the definition of conception were then discussed among the delegates, also with a focus on sole inventorship and co-inventorship.

The debate on subject matter eligibility was opened with the question of why algorithms cannot be regarded as technical; after all, one talks about "software engineers". The discussion also considered whether there is an actual need to protect algorithms.

The lack of harmonisation between the European system and the more flexible Chinese system was highlighted, as well as the struggle which likely awaits the U.S. with regards to the technical side of AI. From the European perspective, the need to define better the meaning of "technical" was brought to attention.

The critical value of data was brought to the forefront as well and the question arose of whether data should be afforded some kind of sui generis protection to encourage sharing data whilst allowing ownership of it, which is difficult to accomplish via existing laws on confidentiality. Possibly block-chain could play a role in this.

Furthermore, some interventions raised the issue of privacy or personal property around data, which was then discussed by the panellists.

The discussion moved on to the topic of sufficiency of disclosure as far as AI inventions are concerned, with a special focus on the extent to which data used to train the model need to be disclosed. The panellists highlighted the need to explain AI, the problem of using data belonging to different individuals (which brought forward the suggestion of only disclosing what kind of data are needed together with a possible source of it), the need to disclose datasets and the possibility that – just as happened before for computer-implemented inventions – the issue will fix itself as the general state of the art becomes more developed.

The fourth topic – that of the inventive step – was introduced. One of the issues was a question of whether the use of AI to make or assist in making an invention renders that invention obvious *per se*. Further questions concerned inventions involving partial co-invention by an AI system:

the panellists discussed whether the notion of a person skilled in the art is still relevant and whether non-obviousness or inventiveness should be limited to the specific field of a particular invention, given that an AI could easily search in all technical fields.

The panellists remarked how it is not the discussion about AI *per se* which is interesting, but rather the application of AI to different fields and the discussion in the legal domain.

An extract of the EPO Board of Appeal decision no. T 1150/09 was read to show that the use of machine learning to solve problems is obvious per se; therefore applicants need to present specific methods of learning and training.

The problem of defining a person's ordinary skill in the art arose, too, especially because inventive AI itself may be used as such person with ordinary skill in the art.

The session closed with the panellists agreeing on the need to question the fitness for purpose of all their respective IP systems and to frame the policy discussion in terms of innovation and prosperity, so as to make it more attractive for policy makers.

IX. Closing remarks

Julian Crump stressed the need to draft a press release and to frame it so as to catch the attention.

He then expressed his gratitude to the panellists and to the delegates for their participation.