KCAB's Arbitration of U.S. Patent Exhaustion Disputes Over Artificial Intelligence and Internet of Things Technologies*

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Technological innovations can be protected by patents, and patent applications are filed in various patent offices around the world including the United States Patent and Trademark Office (USPTO). Recently, the U.S. exportation of artificial intelligence and internet of things patents in the form of foreign sales of articles embodying U.S. patents and international technology licenses has grown substantially. However, due to the U.S. Supreme Court's Lexmark decision reconfirming an international patent exhaustion doctrine, the asian or korean importers importing such U.S. goods embodying U.S. patents do not have to worry about patent infringement liability, even when they try to resell the patented goods to the third parties. KCAB can play a substantial role in resolving such patent disputes due to qualified expert arbitrators and the International Rules of KCAB which ensure impartiality and independence of the arbitrators.

Key Words : KCAB, U.S. patent exhaustion disputes, AI, IoT, arbitration

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Ⅰ. Introduction

Technological innovations can be protected as intellectual property, specifically by patents, as the industries are being developed.[1] Recently, a rapid transition to the Fourth Industrial Revolution has been driven by the emerging technologies, including artificial intelligence ("AI") and the internet of things ("IoT").[2] Patent applications are filed in various patent offices around the world including the United States Patent and Trademark Office (USPTO). Recently, the U.S. exportation of these patents in the form of foreign sales of articles embodying U.S. patents and international technology licenses has grown substantially. However, due to the U.S. Supreme Court's Lexmark decision[3] reconfirming an international patent exhaustion doctrine, the asian or korean importers importing such U.S. goods embodying U.S. patents do not have to worry about patent infringement liability, even when they try to resell the patented goods to the third parties. This article attempts to analyze the contents of AI and IoT patents registered at U.S. PTO, and explains the role of Korean Commercial Arbitration Board (hereinafter referred to as "KCAB") in resolving the U.S. patent exhaustion disputes for AI and IoT in an international arbitration context.

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1) Kim, Dookyu, "Intellectual Property in the Fourth Industrial Revolution Era", les Nouvelles, Vol. 53 at 20; 2018.
2) See Footnote 1 at 21.
3) Impression Prods. v. Lexmark Int'l, Inc., 137 S.Ct 546(2016).

Ⅱ. Definition and Features of AI and IoT

1. Definition and Features of AI

AI is "the study of mental faculties through the use of computational models."[4] AI is used in almost every industry and includes various technologies and tools, all enabled by big data, the cloud, and modern processing. AI's deep-learning capability enables it to improve by means of self-learning.[5]

AI has the elements of machine processing, machine learning and machine perception. Machine learning is a subset of artificial intelligence in the field of computer science that uses statistical techniques to enable computers to "learn" (i.e., progressively improve performance on a specific task) with data, without being programmed.[6] Machine perception is the ability of processors to analyse data to accurately recognize and describe people, objects and actions.[7] Features of machine perception include computer's face, object and activity recognition, speech recognition, and internet of things.[8]

2. Definition and Features of IoT

The IoT has been described as "a concept that interconnects uniquely identifiable embedded computing devices, expected to offer Human-to-Machine (H2M) communication replacing the existing model of Machine-to-Machine communication."[9] The OECD defined the IoT as "Machine to Machine communication (M2M)" and the European Commission describes the IoT as something that "merges physical and virtual worlds … where objects

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4) Robinson, W. Keith, Smith, Joshua T., "Emerging Technologies Challenging Current Legal Paradigms", *Minnesota Journal of Law, Science & Technology*, Vol. 19 at 355; 2018.

5) See Foonote 1 at 22.

6) Samuel, Arthur (1959). "Some Studies in Machine Learning Using the Game of Checkers". IBM Journal of Research and Development. 3 (3): 210-229.

7) Kemp, Richard, "Legal Aspects of Artificial Intelligence", *Cyberspace Lawyer*, Vol. 22 at 2; 2017.

8) Tung, Liam, "Microsoft's newest milestone? World's lowest error rate in speech recognition", *ZDNet.com* (14 Sept. 2016), available at http://www.zdnet.com/article/microsofts-newest-milestone-worlds-lowest-error-rate-in-speech-recognition/.

9) LexInnova, "The Internet of Things: Patent Landscape Analysis", (Nov. 2014), *available at* http://www.lex-innova.com/resources-reports/?id=33; Ghafele, Roya, "What Young Innovative Companies Want: Formulating Bottom-Up Patent Policy For the Internet of Things", NYU Journal of Intellectual Property and Entertainment Law, Vol. 7 at 85; 2017.

and people are interconnected through communication networks and report about their status and/or the surrounding environment."[10] IoT technology basically consists of three elements: (1) smart devices, (2) protocols for facilitating communication between the smart devices, and (3) systems and methods for storing and analyzing data acquired by the smart devices.[11] Further, IoT related technologies are utilized in various technical fields. The IoT related technologies: (1) acquire various data, (2) manage data collected via networks, (3) analyze and learn big data using AI etc., and (4) utilize data while finding out new values and services.[12]

Ⅲ. AI and IoT Patent Analysis via US PTO Website

1. Major Application of AI and IoT technologies

The major application of AI and IoT technologies can be cybersecurity, robots, autonomous driving and drones (unmanned aerial vehicles). In order to analyze what companies are currently applying AI and IoT related technologies into the specific fields of industry, the 100 worldwide companies selected by CB Insights in 2017 and their applied technologies were reviewed.[13]

(1) Cybersecurity

Cyber security comprises technologies, processes and controls that are designed to protect systems, networks and data from cyber attacks. Effective cyber security reduces the risk of cyber attacks, and protects organizations and individuals from the unauthorised exploitation of systems, networks and technologies.[14]

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10) European Commission, "*The Internet of Things*", (Oct. 2013) available at https://ec.europa.eu/digital -single-market/en/policies/internet-things.
11) Robinson, W. Keith, "Patent Law Challenges For the Internet of Things", *Wake Forest Journal of Business and Intellectual Property Law*, Vol 15 at 655; 2015.
12) Examination Guideline pertinent to IoT Related Technologies, Japan Patent Office, 2017.
13) "The AI 100", CB Insights (2017), https://s3-us-west-2.amazonaws.com/cbi-content/research-reports/C B-Insights_AI-100-2017.pdf.
14) "What is cyber security?", IT Governance, 2017, https://www.itgovernance.co.uk/ what-is-cybersecurity.

(2) Autonomous Driving

Autonomous driving means the driving of a vehicle to a specific target in real traffic without the intervention of a human driver. When a vehicle reacts autonomously - without active intervention from a driver - through algorithms that force the vehicle to react in a specific way, we can call this as an autonomous driving.[15)]

(3) Autonomous Robots

In the age of Industry 4.0, robots are equipped with enormous computational power in order to carry out instructions to achieve a certain objective. Although machine learning is performed by a computer through a series of computation processes, human involvement is necessary. The results from the robots are creations of artificial intelligence, which are extensions of people's creations.[16)]

(4) Unmanned Aerial Vehicles

A UAV is defined as a "powered, aerial vehicle that does not carry a human operator, uses aerodynamic forces to provide vehicle lift, can fly autonomously or be piloted remotely, can be expendable or recoverable, and can carry a lethal or nonlethal payload".[17)] Drone refers to an unmanned aerial vehicle (UAV), which is also known as unmanned aircraft system. In past few years, various types of drones have been introduced in market, and thus it becomes crucial to protect new drone designs, innovations, technology, methods of operation, new drone applications, drone software, and drone mobile applications in the form of intellectual property, especially patent.

2. AI and IoT Patent Analysis via US PTO Website

In order to analyze patents of Cybersecurity, Autonomous Driving, Robots and Unmanned Aerial Vehicles via U.S. Patent Trademark Office website, the author used

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15) "Defining autonomous driving", Daimler, https://www.daimler.com/innovation/autonomous-driving/special/ definition.html.
16) Sabine Pfeiffer, "Robots, Industry 4.0 and Humans, or Why Assembly Work Is More than Routine Work", Societies (2016) 1-26.
17) "unmanned aerial vehicle", https://en.wikipedia.org/wiki/ Unmanned_aerial_vehicle#cite_note-10

the name of the companies listed as the 100 companies worldwide in the fields of AI and IoT selected by SB Insights. For example, in the field of cyber security, in order to find out the registered patents for Endgame Systems, Inc., the research query "AN/Endgame" was used with titles that include the terms "ttl/(cyber AND security)", "ttl/(computer AND security)", or "ttl/(IT AND security)". The author refined the results of the search to utility patents (i.e., patents that protect function versus design patents that protect appearance) that had been assigned (e.g., from an inventor to a company).

In the field of autonomous driving, in order to find out the registered patents for Zoox, Inc., a major venture company for autonomous driving, the research query "AN/Zoox" was used with titles that include the terms "ttl/(autonomous AND driving)", "ttl/(autonomous AND cars)", or "ttl/(autonomous AND vehicles)". Then, in the field of autonomous robots, in order to find out the registered patents of Vision Robotics Corporation, one of the selected companies by SB Insights, the research query "AN/Vision Robotics" was used with titles that include the terms "ttl/(autonomous AND robots)". Finally, in the field of unmanned aerial vehicle, in order to find out the registered patents of Israel Aerospace Industries Ltd., the research query "AN/Israel Aerospace Industries" was used with titles that include the terms "ttl/(unmanned AND aerial AND vehicles)", "ttl/(unmanned AND aircraft AND vehicles)", or "ttl/(drones)".

Aa a result, in the field of cyber security, the following companies and their representative patents were extracted. That is, for Endgame Systems, Inc., US PTO Patent No. 9,246,779, January 26; and for CrowdStrike, Inc., US PTO Patent No. 9,043,903, May 26, 2015 Registered, US PTO Patent No. 9,256,730, February 9, 2016 Registered, and US PTO Patent No. 9,292,881, March 22, 2016 Registered.[18] Further, in the field of autonomous driving, extracted patents for Zoox, Inc. are US PTO Patent No. 9,494,940, November 15, 2016 Registered, US PTO Patent No. 9,507,346, November 29, 2016, US PTO Patent No. 9,612,123, April 4, 2017 Registered, and US PTO Patent No. 9,632,502, April 25, 2017 Registered.[19] Further, in the field of autonomous robots, the following

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18) The specific features of the representative patents are techniques of an improved user interface that permits a user to customize the user interface to be able to select the data of interest (US 9,246,779), Symantec Endpoint Protection that utilizes signature-based and heuristic techniques to detect malware (US 9,043,903), techniques for detecting security exploits associated with return-oriented programming (US 9,256,730) and techniques for forming groups of entities and automatically sharing security information of the entities belonging to a group with each other (US 9,292,881).

companies and their representative patents were extracted. That is, for Vision Robotics Corporation, US PTO No. 7,228,203, June 5, 2007 Registered; for ALSTOM Technology Ltd., US PTO Patent No. 8,369,990, February 5, 2013 Registered; and for Toyota Jidosha Kabushiki Kaisha, Albert-Ludwigs University Freiburg, US PTO Patent No. 8,630,456, January 14, 2014 Registered.[20] Finally, in the field of unmanned aerial vehicles, the following companies and their representative patents were extracted. That is, for Jed Margolin, US PTO Patent No. 8,838,289, September 16, 2014 Registered,; for Israel Aerospace Industries Ltd., US PTO Patent No. 8,905,358, December 9, 2014 Registered; for McWilliams, George, and Alley, US PTO Patent No. 8,942,964, January 27, 2015 Registered, and for Maier, Nicholas, Eisner, and Gerald, US PTO Patent No. 9,094,816, July 28, 2015 Registered.[21]

Ⅳ. Why Arbitration Is Ideal for High-Tech and Emerging Technology Disputes Including AI and IoT Technologies

1. Characteristics of High-Tech and Emerging Technology Companies

In order to resolve a dispute in a high-tech or emerging technology business one needs to understand the complicate technology behind the business.[22] Further, high-tech

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19) The specific features of the representative patents are modular construction techniques to assemble an autonomous vehicle from multiple structural sections (US 9,494,940), teleoperation system and method for trajectory modification of autonomous vehicles (US 9,507,346), adaptive mapping techniques to navigate autonomous vehicles responsive to physical environment changes(US 9,612,123), and machine-learning systems and techniques to optimize teleoperation and/or planner decisions (US 9,632,502).

20) The specific features of the representative patents are system for autonomous vehicle navigation with carrier phase DGPS and laser-scanner augmentation (US 7,228,203), robot platform for remotely controlled and/or autonomous inspection of technical facilities (US 8,369,990) and method and apparatus for maximizing the number of radiological images displayed on a display screen (US 8,630,456).

21) The specific features of the representative patents are system and method for safely flying unmanned aerial vehicles in civilian airspace (US 8,838,289), unmanned aerial vehicle having an improved aerodynamic configuration (US 8,905,358), optical state estimation and simulation environment for unmanned aerial vehicles (US 8,942,964), and Method and system for an emergency location information service (E-LIS) from unmanned aerial vehicles (US 9,094,816).

22) Bender, Jr., Raymond G., "Arbitration - An Ideal Way to Resolve High-Tech Industry Disputes", Dispute Resolution Journal, Vol. 65 at 44; 2011.

companies and companies developing emerging technologies such as AI and IoT technologies possess proprietary and confidential information, including trade secrets, from which they derive significant economic value. Examples include computer programs (particularly, source code). Data analysis software is an integral part of AI technology, since softwares enable AI technology to do the function of machine processing, machine learning and machine perception. In addition, storing and analyzing data acquired by the smart devices, which is an element of IoT technology[23] inevitably requires the intervention of softwares. Companies do not want for this information to be made public, let alone to be revealed to an actual or potential business competitor in litigation.[24]

2. Why Arbitration Is Ideal for High-Tech and Emerging Technology Disputes

The lack of an expert decision maker in litigation is the principal reason why arbitration is better equipped to resolve complex technical or scientific disputes. In court litigation, trial judges are randomly assigned to cases.[25] Further, since judges are often burdened by a heavy caseload, they have limited time in which to deeply analyze the factual and legal complexities of a high-tech dispute.[26] In addition, in arbitration, the parties can agree in their contract to appoint an experienced arbitrator who has knowledge of the industry at issue, knows the "customs" or "usages" in the trade, has expertise in the science and technology involved, and is familiar with the applicable legal and regulatory framework.[27]

The parties can determine the qualifications they want the arbitrator or panel to have and specify them in their arbitration agreement.[28] Such qualifications include technical and scientific expertise, experience in deciding high-tech or emerging technology

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23) See Footnote 21 at 48.
24) Hornick, John F., "Trade Secrets: What Your Company Needs to Know," *IP Litigator* 1 (July/August 2004), available at www.finnegan.com/resources/articles.
25) See Footnote 21 at 51.
26) Holt, L. Tyrone, "Whither Arbitration? What Can Be Done to Improve Arbitration and Keep Out Litigation's Ill Effects," 7(3) *DePaul Bus. & Com. L.J.* 455, 463 (2009).
27) See Footnote 21 at 56.
28) Kim, Kap-You, The Procedural Benefits of Arbitrating Patent Disputes, Arbitral Studies, Vol. 26, No.3, pp. 51-66(2016).

disputes, solid arbitration management skills, and a reputation for impartiality.[29] Another advantage favoring the use of arbitration over litigation is that it is less adversarial and can cause less damage to established long-term relations with suppliers, business partners and customers.[30] Moreover, arbitration enables the parties to enter into a confidentiality agreement shielding from public access, not only the documents and other information exchanged, but also the very existence of the arbitration and the award.[31]

Ⅴ. U.S. Supreme Court's Decision on International Patent Exhaustion and Its Implication

In this case[32], Lexmark made and sold patented ink cartridges in the United States and abroad for use in Lexmark printers. Some of Lexmark's cartridges were sold subject to no-resale restriction. Impression Products collected spent Lexmark cartridges prevously sold in the United States and abroad, and resold the restricted cartridges in the United States in violation of the imposed restriction. The U.S. Supreme Court unanimously decided that the doctrine of patent exhaustion precluded a finding that the actions of Impression Products were patent infringement.

According to the traditional rule[33] of patent exhaustion doctrine in the U.S., when a patent-embodying good passes from a licensee or manufacturer to a user, it cuts off the patent owner's interest in the good under patent law. For the purpose of patent exhaustion, the Supreme Court has declined to recognize territorial restrictions on the right to use when purchased lawfully and transported outside the territorial rights of the patent owner.[34]

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29) Lee, Ju-Yeon, Identifying Effective Dispute Resolution Mechanisms for Intellectual Property Disputes in the International Context, Arbitral Studies, Vol. 25, No.3, pp. 155-184(2015).
30) See Footnote 21 at 55.
31) See Footnote 21 at 60.
32) 137 S.Ct. 1523 (U.S. 2017)
33) Quanta Computers, Inc. v. LG Elecs., Inc., 553 U.S. 618 (2008).
34) Id. at 619.

Ⅵ. KCAB's Role As an Arbitral Institution to Resolve AI and IoT Patent Disputes

The U.S. exportation of AI and IoT patents in the form of foreign sales of articles embodying U.S. patents and international technology licenses has grown substantially. Alexa, an AI platform of Amazon, is one of the examples. In this context, an arbitral institution in charge of arbitrating the commercial disputes between U.S. exporter and a Korean importer needs to pay attention to the governing law of the license/international supply contract. If the license contract is drafted from the viewpoint of U.S. exporter, the governing law will be likely to be a U.S. law. When a Korean importer tries to resell the good to the third parties, the doctrine of patent exhaustion comes into play.

However, patent rights are territorial in nature, creating rights in the country in which they are adopted. In Korea, Korean Patent Court has also recognized the doctrine of patent exhaustion.[35] Thus, when an arbitral institution examines any breach of the contract by Korean importer, the institution considers whether the Korean importer breached the license contract by infringing the U.S. patents embodied in the imported good. In this context, an arbitral institution may examine the infringement of the U.S. patent rights or the exhaustion of the patent rights. Further, the arbitral institution in this case could be Korean Commercial Arbitration Board ("KCAB"). In addition, when the contracting parties do not want to go to a court for contractual disputes, they can agree on ad hoc arbitration.

(1) KCAB's advantages over American Arbitration Association

In the context of international license agreement to sell the goods embodying AI or IoT, the major consideration for an arbitral institution is whether the obligations under the agreement have been fully complied, and whether any possible infringement of embodying patent technologies has occurred. In order to examine these issues, AA usually tends to use E-Discovery procedure for all the correspondence and documents. However, if narrowed down to only the relevant evidence, most times cost and burden of E-Discovery often becomes unbearable. Further, if the performance of the license

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35) Korean Patent Court 2009.12.18. 2008Hur13299.

agreement occurred in Korea, which is the most likely situation, all the evidence remain in Korea. Thus, bringing all the evidence including key witnesses and the third parties into AAA is not feasible. In addition, even when a asian importer has agreed to import the goods embodying U.S. patent rights, necessary documents and key witness can be better reviewed by KCAB rather than by AAA because Korea, China and Japan's cultural similarity makes it easier to communicate and thus enables KCAB to seek for substantive truth in fairly resolving the license disputes.

(2) Korea's Abundant Human Power Pool of IT experts

Until recently, Korea has many leading IT companies, establishing many worldwide business branches. These companies have encountered many IT-related patent disputes worldwide and, in the course of overcoming the disputes, helped many IT-related legal staff and employees to become experienced IT experts. Accordingly, Korea possesses sufficient human power pool of experienced arbitrators for handling high-tech and software technology such as AI and IoT technology disputes. These experienced arbitrators are better equipped than most judges in order to reach a sound and reliable decision in AI and IoT disputes.

Further, according to the Article 27, Sub-article 1 of the KCAB's International Arbitration Rules, the arbitral tribunal may appoint one or more experts to report to it on specific issues to be determined by the arbitral tribunal and communicated to the parties. Thus, experienced expert arbitrators can fully utilize the expert pool in order to seek substantive truth via arbitration procedure. In addition, according to the Article 27, Sub-article 2 of International Rules, a copy of the expert's terms of reference, established by the arbitral tribunal, shall be communicated to the parties. The arbitral tribunal may require a party to give the expert any relevant information or to provide access to any relevant documents, goods or other property for his inspection. Accordingly, the parties may have an opportunity to cross-examine the credibility of the expert statement.

(3) KCAB arbitrator's impartiality and independency

KCAB has further revised International Arbitration Rules in 2016 so that arbitrator's impartiality and independency can be ensured. According to Article 13 of the 2016 International Rules, the Secretariat is capable of screening the nominated arbitrator before

confirming the appointment of the arbitral tribunal. After an arbitrator is nominated by both parties, the Secretariat will confirm the final appointment of arbitrator. Then the arbitrator is required to sign a "statement of impartiality and independence" to ensure the arbitrator's duty of disclosure. This confirmation procedure is essential because the tribunal has the discretion to confirm or, at situations where the Secretariat determines that the nomination is inappropriate, reject the nomination of arbitrator. If the nomination is not confirmed by the Secretariat, the nominating party or arbitrators shall nominate another arbitrator within the period of time as fixed by the Secretariat.

Ⅶ. Conclusion

As the U.S. exportation of AI and IoT patents in the form of foreign sales of articles embodying U.S. patents and international technology licenses has grown substantially, U.S. patent disputes and patent exhaustion can be considered by KCAB when KCAB examines the breach of the license agreement in the arbitration proceeding. Due to many advantages, KCAB, can play a substantial role in resolving such patent exhaustion disputes.

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