MODEL COURTS OF JUSTICE 2023

World Intellectual Property Organization

Study Guide

WRITTEN BY EREN YALÇIN
ZEYNEP YILMAZ

SUPERVISED BY UMUT EROL

LETTER OF THE SECRETARY-GENERAL

Esteemed Participants,

It is my pleasure to welcome you all to the twelfth edition of the Model Courts of Justice as the Secretary-General. My name is Umut Erol, and I am a senior law student at Ankara University.

The participants of the Model Courts of Justice 2023 will be focusing on information technology law and artificial intelligence for the first time in the Model Courts of Justice in the World Intellectual Property Organization. The case that will be simulated is a fictional case named *YSKIN v. Watson Solutions*'. The judges and advocates of the Court will have a chance to elaborate on the legal responsibility of artificial intelligence upon its innovations and patentability of such inventions.

I would like to thank Miss Zeynep Yılmaz and Mr. Eren Yalçın for their outstanding discipline, creativity, and dedication during the whole process. Second, I would like to thank the Director-General of the Model Courts of Justice 2023 and my beloved partner, Miss Selin Özgören for enduring organizational excellence and professionalism with her wonderful organization team.

Before attending the sessions, I highly recommend all the participants read the Study Guide and Rules of Procedure and bring the printed versions of these documents with them while coming to the Conference.

If you have any questions or hesitations about the Conference, please do not hesitate to contact me at secretarygeneral@modelcj.org

Sincerely,

Umut Erol

Secretary-General of the Model Courts of Justice 2023

THE LETTER OF UNDER-SECRETARY-GENERAL

Dear Participants,

I, Eren Yalçın, studying at TED University as a third-year student at Business Administration. It is a great pleasure that I welcome you to the Model Courts of Justice and extend my heartfelt gratitude for your active engagement in addressing one of the most pressing and dynamic challenges in today's technological landscape - the intersection of patent incompatibility and artificial intelligence.

It was a great honor for me to be the first non-law student to be Under-Secretary-General of this conference, which has been held for more than ten years. I participated in this adventure first as an Academic Trainee and then as an Academic Assistant. My interest and knowledge in this subject combined with her academic and legal counseling has resulted in the best study guide on this subject ever. I would like to thank Mr. Umut Erol, our Secretary General, for his trust and support to me. Zeynep and Umut were always there for me whenever I needed them. And without Zeynep, this study guide would never have been so perfect.

You can be sure that this issue, which is one of the world's hot topics, will take an important place in the lives of all of us in the near future. As the Under-Secretary-General responsible for the World Intellectual Property Organization (WIPO), I am excited to witness the thoughtful discourse and innovative solutions that will undoubtedly emerge during the course of this court. The central theme of this year's WIPO, "Information Technology Law and Patents" encapsulates the intricate interplay between intellectual property rights and the rapid advancements in AI technology. The application of AI in various industries has redefined traditional boundaries and propelled us into uncharted territories of invention and creation. This brings to the forefront a multitude of questions, from issues of inventorship and ownership to the need for adapting existing patent frameworks to accommodate the nuances of AI-generated innovations.

I wish you all a rewarding and successful court experience and look forward to witnessing your remarkable insights and contributions.

Kind Regards,

Eren YALÇIN, Under-Secretary-General of World Intellectual Property Organization

THE LETTER OF UNDER-SECRETARY-GENERAL

Distinguished Participants,

My name is Zeynep Yılmaz and it is my utmost pleasure to serve you as the one of the Under Secretary Generals Responsible for the World Intellectual Property Organization Arbitration and Mediation Center at the twelfth annual session of the Model Courts of Justice Conference Upon receiving my assignment from the Secretary-General, I was well-informed about the challenges and enthusiastic about the committee. Constructing a committee from scratch is a totally demanding work, in this context I am very thankful to our Secretary General Umut Erol. It was an excellent pleasure working with Eren Yalçın as he provided me with wonderful insight and showed great dedication.

The insights and perspectives I acquired during my time as a participant have proven to be instrumental in my professional journey. The depth of understanding I gained in intellectual property law has been of immeasurable benefit as navigating the complexities of my responsibilities and helped us deliver you this fictional case on artificial intelligence. This year, the case concerning the registration of a patent whose inventor is being disputed by the parties involved with the invention and inventorship of artificial intelligence applied to legal domain.

In my current capacity as Under Secretary General, I have been presented with a unique opportunity to give back to the community and field that have nurtured my growth to drive meaningful change and advance the cause of intellectual property. It is my fervent belief that the contributions of Eren and I to this conference will also serve to inspire others with your participations.

I wish you all a wonderful time and believe you will only leave with good memories.

Best Regards,

Zeynep Yılmaz, Under-Secretary-General of World Intellectual Property Organization

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I.General Information about the World Intellectual Property Organization

i.Historical Background

The World Intellectual Property Organization (the WIPO) arose from a common thought and desire: building external protection for intellectual properties.[1] In the 18th century, it can be determined as a universal requirement since the world started to globalize and, in that context, products that related to intellectual property were spreading with pace.[2] Furthermore, in order to handle these developments and providing monologisism, the Organization was established through a few conventions.[3]

The Paris Convention for the Protection of Industrial Property was born out of fear that foreigners would steal each other's ideas and exploit them commercially.[4] The Convention, which is adopted in 1883, is the biggest first step taken to ensure the protection of intellectual works in other countries.[5] The Convention is applied to industrial property, including the prevention of unfair competition such as trademarks, patents, service marks, and trade names. The Paris Convention was seeming to renovate the intellectual property law, especially in the international context, a new Union, which is also called as Paris Convention, to work upon the intellectual property instituted through the Paris Convention.[6]

The Union has two main bodies including: the Assembly and the Executive Committee.[7] The Convention regulated the important subjects of intellectual property, particularly patents, trademarks, industrial designs, and unfair competition.[8] After one and a half-century, Paris Convention is still placed as a cornerstone for intellectual property. After three years, in 1886, another significant treaty came to the table namely Berne Convention, since there were many blanks in the Paris Convention.[9] Berne Convention, as known as the '*Berne Convention for the*

[1] Kapteyn, P. (1997). *International organization and integration* . 4th ed. The Hague: Nijhoff, p.7.
[2] Bogch, A. (1989). *Symposium on Creativity and the Promotion of Inventive Activities* . Geneva: WIPO, p.5.
[3] ibid.
[4] 'WIPO — A Brief History' (*Wipo.int*) <https://www.wipo.int/about-wipo/en/history.html> accessed 20 July 2022.
[5] ibid.
[6] WIPO Publications (2013). *Summaries of the Intellectual Property Convention* , p.12,
[7] ibid.
[8] May, op. cit.
[9] WIPO Publications (2007) *Summary of the Berne Convention* , p.4,

Protection of Literary and Artistic Works' arranged copyright notion thoroughly, in a very detailed way, and in that respect, since the Paris Convention did not regulate or handle the copyright intricacy, both treaties complemented each other.[10] Similar to the Paris Convention, the Berne Convention established the '*Berne Union*' to cooperate in a more organized way.[11] The Berne Convention formulated some new concepts in copyright law such as moral rights, free uses internationally, and possible subsequent agreements, such as the WIPO Copyright Treaty.[12]

On July 14th of 1967, a conference was held in Stockholm to discuss international property with entire detail.[13] As the outcome of the Stockholm Conference, the committee decided upon unifying both conventions namely Berne and Paris Conventions.[14] In 1893, to control the Berne and Paris Conventions, the two secretariats merged in Bern, Switzerland. It was established to form the United International Bureaux for the Protection of Intellectual Property. It is known by the abbreviation 'BIRPI'.[15]

With the amending and unifying merging of two conventions, the founding charter of the WIPO was materialized in 1967.[16] Eventually, the two Unions were quite similar to each other, however, WIPO was trying to put the role of the states and their administrative organ in the center, while BIRPI cared about the owner of these rights.[17] Finally, BIRPI was replaced by WIPO, and enters into force in Geneva, Switzerland.[18]

One of the milestones of this organization was being an UN-Specialized organization on January 17th, 1974.[19] In that context, WIPO and the United Nations signed the "*Relationship Agreement*". Through the Agreement, WIPO can demand an advisory opinion from the

[10] Kapteyn Paul, op.cit.
[11] 4757 Berne Convention for the Protection of Literary and Artistic Works (2014), United Nations Treaty Series, p. 217,
[12] Bogch, Arpad. p.12
[13] 'Inside WIPO' (*Wipo.int*) <https://www.wipo.int/about-wipo/en/> accessed 20 July 2022.
[14] 'Madrid Agreement Concerning The International Registration Of Marks' (*Wipo.int*) <https://www.wipo.int/treaties/en/registration/madrid/index.html> accessed 13 August 2022.
[15] ibid.
[16] *May* Christopher. Op Cit.
[17] *Kapteyn* Paul, *Lauwaars,* R.H. p.7
[18] 'Madrid Agreement Concerning The International Registration Of Marks' (*Wipo.int*) <https://www.wipo.int/treaties/en/registration/madrid/index.html> accessed 13 August 2022.
[19] ibid.

International Court of Justice and take place in the United Nations events.[20] With its 193 member states, WIPO is a self-funding agency of the UN, acting as an international forum providing services, policy, information, and cooperation regarding intellectual property. Furthermore, WIPO is aiming to provide innovation and creativity for all by developing a more balanced and effective international intellectual property regime.[21] For these purposes, WIPO deals with the tasks of cooperating with governments and organizations, administering treaties, governing global registration systems, providing forums for debate, offering its expertise, and so on and so forth.[22]

II.WIPO Arbitration and Mediation Center

The organizational structure of WIPO consists of the Director General (the DG) who is responsible for the overall leadership of the organization and seven Sectors which are governed by either Deputy Director Generals (the DDG) or Assistant Director Generals (the ADG).[23] These seven sectors are focus on such fields as Brands & Designs, Copyright & Creative Industries, Development, Patents & Technology, Administration & Management, Global Infrastructure. The Patents & Technology Sector comprises Patent Law Division, Patent Cooperation Treaty (PCT) Legal and International Affairs & Operations Departments, and finally WIPO Arbitration and Mediation Center.[24]

WIPO Arbitration and Mediation Center was established in 1994 to promote the usage of Alternative Dispute Resolution (ADR) mechanisms for intellectual property disputes and is based in Switzerland.[25] Another office of the WIPO Arbitration and Mediation Center is located in Singapore.[26] WIPO Arbitration and Mediation Center has a database consisting of over 1,500 intellectual property and alternative dispute resolution specialists. These neutrals offer mediation, arbitration, expedited arbitration, and expert determination to applicants on issues concerning Patents, Telecommunications/IT Law, Copyright, and Trademarks.[27] Additionally,

[20] WIPO Publications (1976) *WIPO and United Nations* , p.2,
[21] WIPO, *Inside WIPO*, Available at: http://www.wipo.int/about-wipo/en,
[22] WIPO, *World Intellectual Property Organization: An Overview*, WIPO Publications, (2007), at p. 1
[23] WIPO, *Activities by Unit*, Available at: http://www.wipo.int/about-wipo/en/activities_by_unit,
[24] ibid.
[25] WIPO Arbitration and Mediation Center, *Guide to WIPO Arbitration*, WIPO Publications, (2004), at p. 2
18 ibid.
[26] 'Alternative Dispute Resolution' (*Wipo.int*) <https://www.wipo.int/amc/en/> accessed 29 July 2022.
[27] WIPO Arbitration and Mediation Center, *Guide to WIPO Arbitration*, WIPO Publications, (2004), at p. 8

the Center provides specialized WIPO Alternative Dispute Resolution Rules, advice on WIPO Clauses and Rules, and workshops for arbitrators and users.[28]

The Center offers four methods for disputants, namely Arbitration, Expedited Arbitration, Expert Determination, and Mediation. All four methods have some specific sides, for instance, one of the most important dividedness between mediation and arbitration is the bindingness of the verdict.[29]

ADR has the expense and complexity of multiple litigations and significantly inconsistent decisions can be avoided if the parties agree to resolve a dispute involving intellectual property protected in many countries in a single procedure.[30] For the Parties, ADR proceedings are private, and the parties may agree to keep the proceedings confidential.[31] Unlike the court proceedings, the parties can choose the most appropriate decision-makers for themselves. The parties can choose the issues such as the applicable law, language, and place of jurisdiction to obtain faster results.[32]

In addition to that, nearly all ADR methods have an unarguable advantage compared to the litigation process. However, the litigation process has specific hardships. To give example, when the dispute is being dispatched to the court, the costs belong to the disputants. So, it can be determined as a financial loss for both parties.[33] Another important point is trade secrets. Undoubtedly, judges may urge the disputants to disclose their trade secrets and private information in order to handle the situation in an elaborate way. Although, in the case of the refusal of the request of judges could cause loss of sue.[34]

Another substantial point is the qualifications of the mediator/arbitrator.[35] These officials are named as the neutrals since mediators shall be overseen the interests of both parties.[36] In that

[28] Wilbers, Erik, *Arbitration – An Alternative Approach*, WIPO Arbitration and Mediation Center, at pp. 369-370
[29] WIPO Publications,(2016) WIPO Mediation, Arbitration, Expedited Arbitration and Expert Determination Rules and Clauses, p.4.
[30] 'Alternative Dispute Resolution' (*Wipo.int*) <https://www.wipo.int/amc/en/> accessed 29 July 2022.
[31] ibid.
[32] ibid.
[33] WIPO Publications (2016) "Guide to WIPO Mediation" p.2.
[34] ibid.
[35] WIPO Publications,(2016) WIPO Mediation, Arbitration, Expedited Arbitration and Expert Determination Rules and Clauses, p.7
[36] WIPO Publications (2014), Resolving IP and Technology Disputes Through WIPO ADR. pp.4-7

context, the nature of the mediation requires pure objectivity and impartiality from neutrals. The notion of mediation bases upon that balancing the interests of both disputants and achieving a long-lasting agreement.[37] Last but not least, the verdict of the court can be determined as the assessment of judges and in this sense, such decisions can polarize the relationship from its roots which means that new disputes can always rise. Since bilateral and fruitful agreements could not be reached by court decision, the agreements itself may become a possible problem soon.[38]

Alternative Dispute Resolution Services seem to find a cure for this problem since mediation and arbitration offer a method that includes an active participation of both disputants and reaches an agreement that is built by both of the parties.[39] On the other hand, Expedited Arbitration expresses a shortened arbitration process in order to settle disputes in less time, ordinarily, parties prefer this method if there is a conflict that needs to be solved immediately.[40]

Expert determination can be assessed as a beneficial method when there is a specific question such as arise of technical dispute.[41] Disputants are free to choose the number of experts, however, according to the statistics, applicants prefer to one-two experts as decision-makers. Lastly, parties are free to determine the bindingness of the verdict. If disputants wish to get a binding decision, outcomes of the mediation/arbitration would be implemented directly.[42]

Other analyses show that the patent problem is one of the most cases that WIPO interested in with %27 majority.[43] Second place belongs to intelligence and technology disputes with %20.[44]

[37] ibid.
[38] ibid.
[39] UNCTAD and Dispute Settlement. (2017). *WIPO Publications* , 4.1, pp.7-10.
[40] WIPO Publications (2016) “Guide to WIPO Mediation” p.5.
[41] ibid.
[42] de Castro, I. Op. Cit.
[43] WIPO Guide to Mediation, Op. Cit.
[44] Sergey Medvedev,(2016) 'Domain Name Dispute Resolution Practice' 259 Managing Intell Prop 87

i.WIPO Arbitration versus WIPO Expedited Arbitration

1) WIPO Arbitration

Arbitration is a procedure in which the parties, are submitted to one or more arbitrators who form a binding decision on the dispute by agreement of the parties.[45] The most important thing in arbitration occurs when both parties agree and is consensual. Unlike mediation, arbitration cannot be withdrawn unilaterally. For any dispute that may arise due to a contract in the future, the parties put an arbitration clause in the contract. An existing dispute may be submitted to arbitration by means of a delivery agreement between the parties.[46]

Under the WIPO Arbitration Rules, both parties may jointly elect a single arbitrator. If it is decided to establish a three-member arbitral tribunal, each party appoints an arbitrator, and then both parties agree on joint decisions on the presiding arbitrator. As another remedy, the Center may propose to the parties' potential arbitrators with relevant expertise or appoint members of the arbitral tribunal directly.[47] For that reason, the Center has a large staff of arbitrators, from experienced dispute resolution professionals to highly specialized practitioners and experts.[48]

In addition, arbitration is impartial, and parties can choose important elements such as applicable law, language, and place of arbitration. Thus, neither side can take advantage of the home-court advantage. The arbitration protects the confidentiality of the explanations made during the procedure and the decision specifically in accordance with the WIPO Rules. In certain circumstances, arbitration allows a party to restrict access to trade secrets or other confidential information submitted to the arbitration court or private counsel.

As a result, the arbitral tribunal's decision is final, the parties quickly agree to uphold the arbitral tribunal's decision and in accordance with the WIPO Rules.[49]

[45] 'What Is Arbitration?' (*Wipo.int*) <https://www.wipo.int/amc/en/arbitration/what-is-arb.html> accessed 4 September 2022.
[46] ibid.
[47] ibid.
[48] ibid.
[49] ibid.

Furthermore, arbitration resolution of disputes involving intellectual property rights is increasing day by day. Because intellectual property rights, like any other private property rights disputes, are generally accepted to be arbitrable. Intellectual property disputes yield better results through arbitration because of the nature of arbitration rather than court cases.[50] One of the most important points is the essence of arbitration is purely consensual. Any decision made is binding only on the parties concerned and thus will not affect third parties.[51]

2) WIPO Expedited Arbitration

WIPO Expedited Arbitration is an arbitration model that takes place in a shorter time frame, and it is more cost-effective than normal arbitration. In the Expedited Arbitration, the Statement of Claim must accompany, similarly, the Statement of Defense must accompany the Response to the Request.[52] There is always only one arbitrator unless the contrary is revealed and agreed. Due to the expedited nature of the proceedings, the hearings before the Arbitrator are intense and do not exceed three days, except in exceptional circumstances.[53]

The closure of the case must be announced within three months (rather than nine months under the WIPO Arbitration Rules) after the Statement of Defense is submitted or after the Tribunal has been established. And the final decision should be made within one month (rather than three months according to the WIPO Team Rules) whenever possible.[54]

3) Differences Between the Arbitration and Expedited Arbitration

A table named '*Comparison Table: WIPO Arbitration and Expedited Arbitration Rules*' is shown below to illustrate and point out the differences between Expedited Arbitration and Arbitration.

[50] 'Why Arbitration In Intellectual Property?' (*Wipo.int*) <https://www.wipo.int/amc/en/arbitration/why-is-arb.html> accessed 4 September 2022.
[51] ibid.
[52] 'What Is WIPO Expedited Arbitration?' (*Wipo.int*) <https://www.wipo.int/amc/en/arbitration/what-is-exp-arb.html> accessed 4 September 2022.
[53] ibid.
[54] *WIPO Mediation, Arbitration, Expedited Arbitration And Expert Determination Rules And Clauses* (WIPO ADR 2020) <https://www.wipo.int/edocs/pubdocs/en/wipo_pub_446_2020.pdf> accessed 4 September 2022. Page.68

WIPO Arbitration	WIPO Expedited Arbitration
• Request for Arbitration • Answer to Request for Arbitration • Appointment of Arbitrator(s) • Statement of Claim • Statement of Defense • Further Written Statements and Witness Statements • Hearings • Closure of Proceedings • Final Award	• Request for Arbitration and Statement of Claim • Answer to Request for Arbitration and Statement of Defense • Appointment of Arbitrator(s) • Hearing • Closure of Proceedings • Final Award

III. Structure of the WIPO ADR

The three main bodies of the WIPO are the WIPO General Assembly, The WIPO Conference, and The WIPO Coordination Committee.[55]

(i) The General Assembly

The General Assembly meets every two years and consists of all states that are party to the WIPO Convention and are members of any union. Also, the General Assembly has the highest authority among the three bodies. Furthermore, the Chairman of the General Assembly is elected for a period of 2 years.[56]

[55] 'Structure - The World Intellectual Property Organization (WIPO) - Located, General Assembly, Conference, Coordination Committee, International Bureau' (*Nationsencyclopedia.com*) <https://www.nationsencyclopedia.com/United-Nations-Related-Agencies/The-World-Intellectual-Property-Organization-WIPO-STRUCTURE.html> accessed 20 July 2022.

[56] Carolyn Deere-Birkbeck, *The World Intellectual Property Organization (WIPO)* (Edward Elgar 2016).

Figure 2- *WIPO Assembly*[57]

Appointing the Director-General upon nomination by the Coordinating Committee, reviewing and approving the Director-General's reports and giving all necessary task instructions on strategic and policy matters, approving measures for the implementation of international treaties, seeking to invite states to become parties to the WIPO Convention, and approving the organization's financial arrangements; and more are the main duties of the General Assembly.[58]

(ii) The WIPO Conference

All member states that are party to the WIPO Convention, without seeking membership in another union, form the Conference. The Conference meets every two years and discusses determining WIPO's technical legal assistance and budget program.[59]

(iii) The Coordination Committee

The Coordination Committee, which meets once a year, consists of the executive committee members of the Paris and Bern Union.[60] The functions of the Coordinating Committee are both advisory and executive.

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[57] *WIPO Assemblies Open: Director General Calls on Delegates to Transform IP into a Powerful Catalyst for Growth and Development, Geneva, July 14, 2022*
[58] ibid. [PAGE 70]
[59] ibid.
[60] ibid.

To advise the General Assembly, the Conference, the Director-General, and the bodies of the Unions on all administrative, financial, and other matters of common interest and in particular on the common budgetary expenditures of the Unions, to prepare the draft and agenda, draft program and budget of the Conference, and to nominate a Director-General candidate for the General Assembly are among the duties of the WIPO Coordination Committee.[61]

A member of a WIPO who is not a member of the Coordinating Committee have the right to participate in the discussions but can observe its meetings without voting rights.[62]

II. THE INTERFACE BETWEEN INTELLECTUAL PROPERTY & INFORMATION TECHNOLOGY LAW

I.Emergence of Information Technology Law

The legal profession has evolved from a paper-based system to a digital one, allowing lawyers and clerks to collaborate remotely from offices worldwide. Technology has significantly impacted the practice of law, enabling automation and business-like operations. The COVID-19 pandemic highlighted the importance of online dispute resolution, prompting a shift in how disputes are resolved. Crises like this have historically led to positive changes, with many professionals favoring virtual hearings even beyond the pandemic. A report from Baker McKenzie[63] showed strong support for attending virtual interim hearings in the future. Preferences for final hearings varied between in-person and hybrid formats.

i.Sway of Technology on Legal Field

For several reasons, people, who are a part of legal field are seldom considered advanced technology users. Given the Fourth Industrial Revolution's extraordinarily fast technological and social change, relying only on government legislation and incentives to ensure the right outcomes is ill-advised. These are likely to be out-of-date or redundant by the time they are

[61] Carolyn Deere-Birkbeck, *The World Intellectual Property Organization (WIPO)* (Edward Elgar 2016). [PAGE 72]
[62] ibid. [PAGE 73]
[63] Baker McKenzie (2021). *The Future of Disputes: Are Virtual Hearings Here To Stay?* Available at: https://www.bakermckenzie.com/-/media/files/insight/publications/2021/01/future-of-disputes-campaign-brochure.pdf.

implemented.[64] Regulation, combined with serious enforcement, is required to guide our behaviour and ensure the rule of law. New ambiguities may arise because it is unclear whether new forms of conduct fall within the scope of existing laws. Even where this is clear, the inclusion or exclusion of new forms of conduct might be inappropriate. In addition, the law that does apply may be inadequate to meet legitimate concerns arising out of the new conduct. It is the rate at which the law is clarified or amended to overcome such hurdles that might be thought of as its rate of 'adaptation'.[65] The technology department of most businesses have limited experience when it comes to legal technology.

Technology advancements have enabled legal professionals to work from home offices with virtual addresses, offering services across states. The use of legal tech is rising, benefiting lawyers and clerks by increasing efficiency and profits through tools like online client portals.

ii.Future Topics and Issues

Nowadays, law firms operate more like other businesses then they did a generation ago, making the legal profession is an ideal market for technology investment. Legal departments are intensifying the usage of legal-tech to help with the work load and improve productivity, improve client experience, increase automation with an expectedly low cost of high-tech. Firms also expect to decrease the damages they face resulting from risk management following the technology leaders, as they are the most resilient sector to the events within the reasonable control of the companies. In support of this change, despite the financial challenges and cost pressures many companies faced as a result of the pandemic, 57% of legal departments expect to increase their technology investment over the next three years.

Law firms and business services firms that are technology leaders also outperform their colleagues in terms of profitability. While the pandemic took a financial toll for many, Technology Leaders weathered the year better than others: they were most likely to increase profitability during the past year with 47%, compared to 28% for transitioning firms and just 13% for trailing firms, they were also more likely to report their business increased, despite the

[64] World Economic Forum (2016) *Values and the Fourth Industrial Revolution Connecting the Dots Between Value, Values, Profit and Purpose.*
[65] MOSES L. (2004) *Adapting The Law To Technological Change: A Comparison Of Common Law And Legislation.*

pandemic: 43% of technology leaders reported this compared to 24% of transitioning and 19% of trailing.[66]

II. Influence of Information and Communication Technologies in Intellectual Property Sector

Information and Communication Technology industries are one of the most vibrant and innovative part of modern economies, that use Intellectual Property Rights (the IPRs) exhaustively. In relation to their significant role in Digital Single Market, the digital economy opens unrivalled business opportunities while advancing the challenges in context of IPR. New advanced challenges make it hard for IPR to find a balance between encouragement of new technology and the circulation of knowledge surrounding them.

Recent advancements in information and communication technologies have accelerated the innovation process, resulting in shorter lifespans for new products. The Intellectual Property Sector faces scrutiny due to issues with poor-quality patents, patent thickets in high-tech industries, and the emergence of patent assertion entities in information and communication technologies.

Figure 1 *- AI and IP Policy: The WIPO Conversation*[67]

[66] Wolters Kleuwer (2021) *Future Ready Lawyer*
[67] *WIPO, (2020),The second session of the WIPO Conversation on IP and AI.*

Innovation rate is not enough to put a hold onto imitation information and communication technology markets are experiencing. A tactable example to that would be, mobile apps. In terms of the number of developers and publishers involved in the app market, figures are quite impressive: In February 2014 more than 600 thousand developers published at least one app on iTunes or Google Play, with an increase of nearly 10% with respect to the previous month[68]. By looking at the price paid by large incumbents for the acquisition of new apps it is possible to ascertain that the innovation generated in app markets is also extremely valuable. As illustrative instances, Facebook made a $1 billion acquisition of Instagram and Google purchased the Sparrow email app for $25 million. Apps often contain subject matter that is patentable, but especially in the U.S., majority of the app developers do not rely on patents to protect their apps, instead the much more convenient instrument which they use it to make profit would be 'lead time.', which is an informal yet highly sufficient intellectual property appropriation mechanism. Besides, the positive outcomes of the new adjustments IPR systems has accomplished, same research by Priori revealed that nearly 900.000 Android Apps were cloned. The traditional view on IPR would believe to be this amount of innovation is going to be followed by a substantial protection of intellectual property.

The subject of patent law is legal protection provided to 'inventions', fresh and practical technological breakthroughs of all types. Patent law has a significant 'administrative law' component because of the part the Patent and Trademark Offices plays in the evaluation and granting of patents all around the globe. The phrase 'original works of authorship' refers to creative expression found in literary, musical, visual, and other predominantly 'artistic' works that are protected by copyright laws. All types of signs or symbols including logos, slogans, phrases, musical jingles that are used in business to indicate the origin and source of products or services are protected by trademark law. The boundaries or, scope of 'technology law' are somewhat ambiguous and challenging to precisely delineate.

[68] Priori (2014) *Global Insights Report - Android Platform & iOS Platform*

i. Trends in the Digital (Sharing Economy): Impacts on the Right to Control Publication and Performance

Legal problems involving new and emerging technologies may be governed by numerous bodies of law including Contracts, Sales, Commercial Law. Technology has historically been important to IP law, especially patent law. Patent lawyers frequently find themselves at the forefront of technological advancement due to the crucial role that patents have always played in the development of new technologies. The significance of patents becomes most apparent when examining their role in Patent Cooperation Treaty (PCT) filings, especially concerning abundant medical technology patents and showing a greater growth than pharmaceutical patents for the last decade. In the recent past, productivity in healthcare R&D has slowed; the identification of new cures for new diseases is painstakingly long. Due to the complexity of the health innovation ecosystem and the diverging incentives of healthcare actors at play, moving medical innovations from 'bench to bedside' is a long process, sometimes takes over decades. This obstacle can be bowled overusing internationally recognized inventions.

Global economic growth appears to be losing momentum relative to last year. Productivity growth is at a record low, trade battles are brewing, economic uncertainty is high. Despite this gloomy perspective, innovation is blossoming around the world. In developed and developing economies alike, formal innovation—as measured by research and development (R&D) and patents—and less formal modes of innovation are thriving. However, the other IP law specialties are increasingly focusing on technology challenges.

III. OVERVIEW OF PATENTS

Patents offer inventors an even more constrained monopoly over the use of their inventions, while copyrights grant creators a restricted monopoly over the expression of their ideas and the distribution of their works. The monopoly is intended to encourage someone to share their idea in both situations. Anyone can learn to play a song that has been written, and anyone can learn to build a contraption that has been invented.[69] However, because of the temporary monopoly, only those who have approval are able to capitalize on your ideas in the market.

[69] Aram Sinnreich, *The Essential Guide To Intellectual Property* (2019), Yale University Press.

There are three basic varieties of patent:

- *Utility patents* cover paper clips, mousetraps, and any other 'new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof'.
- *Design patents* protect any 'new, original, and ornamental design for an article of manufacture,' which can include both the general form and surface details of an object, such as the filigree on a guitar neck, as well as a mix of both, such as a printed lampshade.
- New plant varieties that explorers and horticulturists have discovered or developed are covered under *plant patents*.

A remarkably wide variety of innovations, designs, and organisms can be—and are—legally protected as monopolies within these three categories. Although "laws of nature, physical phenomena, and abstract ideas" are exempt from patent protection, "anything under the sun that is made by man" is.[70] This is according to a decision by the U.S. Supreme Court. The only restrictions are that inventions must be "useful" in the sense of achieving a specific stated goal; "novel" in comparison to prior art and in terms of general public awareness; and "non-obvious," a vague, frequently contested, and relatively new requirement.

Contrary to copyrights, patents do not automatically become valid upon the development of new innovations; rather, they must first be registered. After confirming that the innovation does not already belong to another patent holder or to the public domain, an inventor must submit an application to the U.S. Patent and Trademark Office (USPTO) in order to secure a patent.[71] This used to require a laborious search through reams of paper records in the past. Today, it is considerably simpler for a person, business, or patent attorney to confirm that there is no "prior art" (the legal title for existent IP) that conflicts with the patent's core concept thanks to the USPTO's online maintenance of its entire database.

Except for design patents, which have a fifteen-year lifespan, a patent is awarded for a single twenty-year nonrenewable term that begins on the filing date. Although this is much less than

[70] *Diamond v Chakrabarty* (447 US 303).
[71] Holbrook, Timothy R. "Extraterritoriality in US Patent Law." Wm. & Mary L. Rev. 49 (2007)

the "functionally infinite" author's life plus the 70 years granted to copyrights, it is nevertheless long enough to provide American patent holders with billions of dollars in economic incentives each year.[72] At three and a half, seven and a half, and eleven and a half years after the patent was granted, utility patent holders must pay maintenance fees to keep their patents active. If they fail to do so, the IP may lapse into the public domain and cease to be property.

A worldwide "world patent" or "international patent" is not currently attainable to obtain. Patents provide spheres of its influence.[73] In general, each country in which you seek patent protection for your innovation requires that a patent application be submitted, the patent be granted, and the patent be enforced in compliance with local legislation.[74] As a result, submitting a national patent application to each competent national patent office is one manner to get patents in a number of nations.

A regional patent office may accept regional patent applications or grant patents in particular regions. Examples are the European Patent Office (EPO) and the African Regional Intellectual Property Organization (ARIPO). These have the same influence as patents issued or applications made in the member states of the region.[75] This indicates that in some areas, you can apply to a regional patent office for a regional patent that is recognized by some or all of its member states.

An effective choice if you want to obtain patent protection across several nations is to submit an international application under the Patent Cooperation Treaty (PCT), which is overseen by WIPO. Any citizen or resident of a state party to the PCT (Contracting State) may submit a single international application, which is equivalent to filing multiple national patent applications (and some regional patent applications) in some or all PCT contracting nations.[76] This can often be a simpler option than attempting to complete multiple applications in each and every nation where you need protection.

[72] Chisum, Donald S., et al. *Understanding Intellectual Property Law*. LexisNexis, 2011.
[73] Anne M. Schneiderman, 'Filing International Patent Applications under the Patent Cooperation Treaty (PCT): Strategies for Delaying Costs and Maximizing the Value of Your Intellectual Property Worldwide'.
[74] Durham, Alan L. *Patent law essentials: A concise guide*. ABC-CLIO, 2018.
[75] ibid.
[76] Peter Watchorn and Andrea Veronese, *PCT Procedures and Passage into the European Phase, Third Edition* (2016).

There are three main methods for obtaining international patent protection for an invention. The first approach, which is also the costliest one, involves filing individual patent applications in the national patent offices of each desired country or region. Typically, these applications are filed on the same day. However, a disadvantage of this approach is that legal and filing fees for each country start accumulating as soon as the application is submitted.[77]

The second approach for obtaining international patent protection is to file a patent application in accordance with the Paris Convention for the Protection of Industrial Property.[78] Under this approach, the applicant files a patent application in a single member country of the Paris Convention, typically the country of residence of one of the inventors. This initial filing establishes a first or priority filing date for the application. The applicant then has the option to delay filing in other member countries of the Paris Convention for up to 12 months from the priority filing date.

Patent Cooperation Treaty (PCT)	Paris Convention
Applicants can submit one global patent application to secure protection in all 117 PCT member countries simultaneously.	Applicants must individually submit applications in the desired countries within 12 months of the local filing date to assert priority rights.
Formalities, international searches, preliminary review reports, and centralized international publications under the PCT system are standardized.	Applicant needs to comply with formality requirements of each Contracting State
During the international phase, the PCT provides a maximum of 18 months for preparing national phase entry.	Within the 12-month convention cycle, the applicant can secure funding, perform market research, and transform their idea into a marketable product, all through a single filing enabled by the convention, without incurring losses.

[77] *WIPO Publication No. 849(E): A Brochure on Intellectual Property Rights For Universities and R&D Institutions in African Countries.*
[78] Christoph Laub, *Legal Validity as a Worldwide Quality Standard for Patent Offices* (2012).

I.Paris Convention

The member countries of the Paris Convention agree to recognize the priority date of a patent application filed in one member country and extend the benefit of that priority date to corresponding applications in all member countries. By following this approach, the costs associated with international patent procurement are postponed for one year.[79] Initially, the procurement costs accrue in the country of the first filing, and it is only after that one-year period that the costs associated with filing applications in other member countries of the Paris Convention start to accumulate.

II.Patent Cooperation Treaty

To address the financial difficulties posed by global patent protection, the Patent Cooperation Treaty (the PCT) is a crucial mechanism for IP protection. A PCT patent application provides an effective way to manage, postpone, or combine the costs of international patent protection for a specific innovation by facilitating the filing of concurrent patent applications in any number of the PCT member nations.[80] The PCT can buy time for a strategic assessment of an innovation's entire potential worth, giving you enough time to decide how to proceed in the best interests of your creation.

The person applying for a patent or owning the intellectual property must assess the qualities and advantages of their invention, determine if there is a commercial demand for the product or process it offers, and evaluate the likelihood of its success in the market.[81] They also need to decide which specific countries to seek patent protection in, taking into account the likelihood of the patent application being approved by the national patent office and meeting the requirements for patentability.[82] Seeking the guidance of a patent attorney, patent agent, or another professional with expertise in patent law is advisable for making these assessments and decisions.

[79] Wolfram Meyer and Manfred Cassens, *Abenteuer Innovation - Von Der Zündenden Idee Zum Erfolgreichen Produkt* (2010).
[80] Stefan Luginbuehl, *European Patent Law - Towards a Uniform Interpretation* (2011).
[81] World Intellectual Property Organization (WIPO), (2023), 'PCT Applicant's Guide (Volumes 1 and II)'.
[82] Marcus O. Müller and Cees A. M. Mulder, *Proceedings Before the European Patent Office - A Practical Guide to Success in Opposition and Appeal* (Marcus O Müller and Cees A M Mulder 2020).

It is recommended to conduct these analyses before choosing the countries to file patent applications in.[83] Therefore, any approach that allows for an extension of the time limit for filing a patent application in a particular country, while retaining the priority date of the initial application, can potentially provide the patent owner with additional time for analysis and decision-making[84]. This additional time allows for a more informed assessment before making the financial commitment to pursue patent protection in foreign jurisdictions.

I.Options and Steps for Filing under the PCT

i.*Option 1:* File an international PCT application that complies with PCT formality requirements and pay one set of fees.

To file an international patent application under the Patent Cooperation Treaty (PCT), one inventor must reside in a PCT contracting state. Applications go to the inventor's national patent office, acting as a PCT receiving office. In certain situations, the PCT application can be directly filed with WIPO in Geneva.[85]

WIPO's website offers guides on PCT filing requirements and a time-limit calculator to assist with crucial application deadlines.. Time limits under the PCT are typically calculated from the priority date of the application, which is the date of the initial filing.[86]

The time limits for an international patent application under the PCT are determined based on the earliest priority date of the application. These time limits include:

1. PCT patent application time limits are based on the earliest priority date and include:

1. Priority document submission deadline: This is for providing the document that establishes the priority date from a prior application.
2. Earliest potential international publication date: Usually 18 months after the priority date, marking when application details become public.

[83] Peter Watchorn and Andrea Veronese (n 13).
[84] Marcus O. Müller and Cees A. M. Mulder (n 19).

[85] World Intellectual Property Organization (WIPO) (n 18).
[86] ibid.

3. International preliminary examination demand deadline: A set time to request an examination by an authorized International Searching Authority.
4. National/regional phase entry deadline: Marks the move from the international phase to seeking protection in desired countries or regions.

These time limits are crucial for applicants to comply with in order to ensure the timely progression of their PCT application.

ii. *Option 2:* File a national application first and then a PCT application within 12 months

Under this alternative approach, the applicant can choose to file a national application in a specific country first, establishing the priority date for their invention. Within 12 months of the priority date, they can file a PCT application, which enters the international phase.[87]

After filing the PCT application, there's an 18-month window to defer entering the national phase and filing in chosen PCT member countries, which aids in evaluating patent protection merits and delaying costs..[88]

Within the 30-month period from the priority date, comprising the 12-month PCT application phase and an additional 18 months, enter the national phase in desired PCT contracting states. This extended period allows for careful consideration of patent protection strategies and provides time to evaluate the potential commercial value of the invention in different countries.[89]

This approach allows for a phased and strategic approach to international patent protection, providing flexibility and time for analysis and decision-making.

[87] ibid.
[88] ibid.
[89] 25/08/2023 01:08:00

IV. KEY CONCEPTS

I.R&D Collaborations

We have a new function dedicated to legal services innovation, comprising lawyers, legal technologists, continuous improvement professionals and project management capability. The aim of Research and Development (the R&D) is to maintain a business competitive by supplying market insights, introducing innovative services or products, and enhancing existing ones. The R&D department is very much responsible for the future growth of the company. According to the academics[90], technology entrepreneurs report that the patent system is neither horrendous nor particularly favourable for their industries and their businesses. Surprisingly, software companies perceive patents as the least a major vehicle for extracting the benefits of their R&D work.

i.Product Innovation

Numerous postulations imply that the significance of intellectual property rights (the IPRs) in industries with highly amassed innovation is not that concise. Broader patents -patents that grant broad rights to the patent holder and may be seen as covering applications invented later by someone else, for example, may provide positive funding to early innovators while discouraging follow-on inventors ground-breaking and incremental technical advancements. from investing in R&D operations in the Information and Communication Technology Industry (the ICT) is typically characterized by the existence of large, fixed costs on the one end and minor variable costs on the contrary.[91] Large-fixed costs can occur as results of induces such as the investment required to install physical infrastructure for telecom companies or the cost of producing the 'first copy' of a software product. Furthermore, as previously said, ICT sectors are R&D heavy, implying the importance of fixed costs over variable costs.

Early inventions lay the groundwork for future technical advancements, and so their desirability is tied not only to the utility generated by their use, but also to the contribution they make to future advances.[92] The possibility of becoming embroiled in protracted and costly patent

[90] Dernis, H., Dosso, M., Hervás, F., Millot, V., Squicciarini, M. and Vezzani, A. (2015). World Corporate Top R&D Investors: Innovation and IP bundles, a JRC and OECD common report, Luxembourg: Publications Office of the European Union.
[91] Hall, B. H. (2007). Patents and Patent Policy. Oxford Review of Economic Policy,
[92] Peter Lee ,(2018),Innovation and the Firm: A New Synthesis

litigations, or simply the licensing payments of the relevant patents, may significantly diminish follow-on inventors' motivation to invest in research activities. Furthermore, the delay is intensified when courts are keen to issue injunctions against alleged patent infringers.

ii.Background and Foreground Intellectual Property

'Background intellectual property' is traditionally described as relevant intellectual property developed prior to the commencement of the alliance by either partner of the collaboration. In some scenarios, the parties may agree to define background intellectual property to include time of pre intellectual property produced by a party outside of the bounds of the alliance's operations. The term 'foreground intellectual property' refers to relevant intellectual property developed throughout the alliance. Using the definition of background intellectual property as that made by a party before to the start of the alliance, foreground intellectual property is that developed by either or both parties jointly during the time of the alliance.

iii.Boundaries of the Alliance

Boundaries are a straightforward declaration of the alliance's scope. The firms are tied inside the boundaries. They will adhere to the rules stipulated in the alliance agreement. Outside of the boundaries, the companies are not affiliated, and a distinct set of rules applies.

i) Sole Option versus Joint Option

Businesses form collaborative research partnerships to develop new technology. Both parties anticipate being able to economically use the newly developed technology under predetermined limits. However, there is a thorny issue inherent in all collaborative R&D alliances, known as the 'joint vs. sole' debate, which must be addressed during the alliance agreement negotiation. The joint vs. sole question is: Will the rights to use of partners be determined by whose scientist or engineer is the legal inventor of the patentable invention? The answer has a significant impact on the working relationship throughout the R&D partnership as well as the market impact of inventions.

So, to draw you a picture of what those mean, the point of difference of the joint option is that the counterparties have no vested interest in determining the source of just about any foreground invention. The 'Rights to Use' are independent of the source of the invention. Since there is no single perfect answer and reconciliation involves in the choice, the parties must consider before agreeing on the choice. If the business partners do not explicitly address this option in the alliance dialogue, the sole option becomes the legal default and applies to any patentable invention that arises from the collaboration.

Because RTU is dependent on generating a source, technical staff will be cautious in their contacts with the other entity. Open technical discussions should be avoided until novel concepts are thoroughly documented.[93]

II.Artificial Intelligence

i.Defining AI

Artificial intelligence (AI) sparks ongoing debates, raising questions in people's minds. AI's pervasive influence in daily life is expanding, quietly assimilating into various domains. Put simply, AI mirrors human actions, streamlining tasks necessitating human-like intelligence. Yet, AI's precise definition remains elusive due to overlapping sub-branches, fueling ongoing researcher discourse.

In short, it is common to describe it as an application of artificial intelligence when an event that requires cognitive activity by humans is automated by engineers.[94] Other branches that relate artificial intelligence are linguistics, electrical engineering, mathematics, neuroscience, economics, philosophy, and logic.[95],

[93] Graham, S.J., Merges, R.P., Samuelson, P., and Sichelman, T. (2010). High Technology Entrepreneurs and the Patent System: Results of the 2008 Berkeley Patent Survey. Berkeley Technology Law Journal
[94] ibid.
[95] ibid.

Figure 2: Ongoing Studies on Artifical Intelligence[96]

However, today's AI systems cannot match high-level human abilities such as abstract reasoning, concept comprehension, flexible understanding, and general problem-solving skills. Rather, AI is successful in limited environments with certain features, such as the game of chess.[97] It is seen that rapid calculations of artificial intelligence provide advantages compared to humans when there are specific patterns and structures, 0 and 1's as in logic in mathematics.[98]

c) Artificial Intelligence and Law

Along with the development and progress of AI, the steps taken in this regard in law also showed parallelism.[99] From 1970 to 1990, most of the early Artificial Intelligence and Law projects focused on formally modeling legal arguments in computable form, modeling legislation, and legal rules. But most of the new applications in Artificial Intelligence and Law have come from legal technology startups.[100]

[96] ibid.
[97] ibid.
[98] 'Definition Of Logic 0' (*PCMAG*) <https://www.pcmag.com/encyclopedia/term/logic-0> accessed 6 October 2022.
[99] Harry Surden, 'Artificial Intelligence And Law: An Overview' (2019) 35 Georgia State University Law Review.
[100] ibid.

Today, AI technologies can create many intellectual products that can be the subject of intellectual rights. For example, AI can compose music, paint, compose musicals with the flow of the words and music in the story.[101]

[102]We do not pay attention to who is the author of intellectual products for consumers. In general, we focus on whether the product is useful for consumers or not. However, the legal consequences of the resulting works are ignored in this way. This situation actually raises the biggest question, the question of who will own the intellectual property rights of an AI work.[103]

Should the intellectual property owners be the people who develop and create the AI? Should it be people creating something new using artificial intelligence? Should the rights holder be the Artificial Intelligence itself? Or should the rights be both artificial intelligence and the human who created the AI?[104]

ii.Machine Learning and Deep Learning

Breakthroughs in mathematical optimization methods began in the 1980s. Machine learning can be defined as a general-purpose technique as it can be applied across all industries to facilitate innovation and optimize decision making.[105] Most machine learning methods work by detecting useful patterns in large amounts of data.[106] In order for a person to learn something, he or she should spend time and experience it. Similarly, machine learning systems can improve their performance over time by being subjected to certain tasks. Thus, we can roughly define what learning is for machines in a functional sense.[107]

The machine learning process is based on algorithms. Algorithms can be detected by the computer and are coded in software to ensure their readability. The algorithm is the design of

[101] Hasan Kadir Yılmaztekin, 'Türk Fikrî Haklar Hukuku Yapay Zekâ Tarafından Meydana Getirilen Eserleri Korumak İçin Hazır Mı?' [2020] Galatasaray Üniversitesi Hukuk Fakültesi Dergisi.

[103] ibid.
[104] ibid.
[105] Josef Drexl and others, 'Technical Aspects Of Artificial Intelligence: An Understanding From An Intellectual Property Law Perspective' [2019] Max Planck Institute for Innovation and Competition Research Paper Series.
[106] Harry Surden, 'Artificial Intelligence And Law: An Overview' (2019) 35 Georgia State University Law Review.
[107] ibid.

each step individually and sequentially to make a job happen. For example, cooking is also related to the algorithm. You have to go step by step to make the food.[108]

Deep learning is a machine learning technique based on the use of artificial neural networks.[109] It is based on artificial imitation of the communication between neurons, which are nerve cells in the human brain. In this way, deep learning is a subset of machine learning; and machine learning is a subset of artificial intelligence.[110]

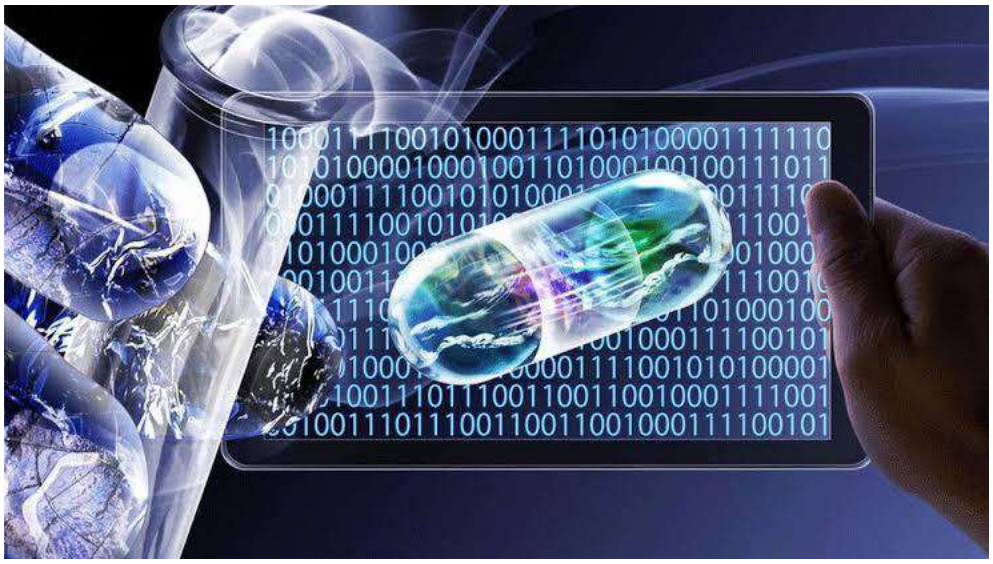

Figure 3: Artifical Intelligence created medicine[111]

iv. Types of Artificial Intelligence

Artificial Intelligence can be divided into four types according to classification.

(0) Reactive Machines

The first type of AI, which is 'Reactive Artificial Intelligence', specializes in only one area. This type of AI does not have the ability to interact socially like humans. However, it still perceives the elements in the contextual environment in which it is constructed and takes action to react to it.[112] These machines do not have memory-based functions. This means that such

[108] Josef Drexl and others, 'Technical Aspects Of Artificial Intelligence: An Understanding From An Intellectual Property Law Perspective' [2019] Max Planck Institute for Innovation and Competition Research Paper Series.
[109] Hasan Kadir Yılmaztekin, 'Türk Fikrî Haklar Hukuku Yapay Zekâ Tarafından Meydana Getirilen Eserleri Korumak İçin Hazır Mı?' [2020] Galatasaray Üniversitesi Hukuk Fakültesi Dergisi.
[110] ibid.
[111] "Artificial Intelligence-Created Medicine to Be Used on Humans for First Time". *BBC News*, 30 January 2020. *www.bbc.com*, https://www.bbc.com/news/technology-51315462. accessed 6 October 2022
[112] ibid.

machines cannot use prior experience to inform their current actions, meaning they are not capable of ‘learning’.[113] Machines and systems based on such AI have neither the concept of the past nor the ability to understand historical data, inferences from it, or infer a future. Such machines work on a script or just one task.[114] The chess-playing AI named ‘Deep Blue’ belonging to IBM Company and the AI playing the 'go' game ‘AlphaGo’ owned by Google Company are examples of this type.[115]

(1) Limited Memory

The second type, ‘Limited Memory Artificial Intelligence’, can make decisions. But it has a limited memory capacity to make appropriate decisions.[116] To the extent that it is programmed, it applies current data by using its past experiences. To give an example of this type, we can say the chat robot 'Siri' produced by Apple, and 'Alexa', the personal digital assistant of Amazon.[117]

(2) Theory of Mind

The third type of AI is ‘Artificial Intelligence Based on the Theory of Mind’. This type of Artificial Intelligence has the ability and capacity to understand the thoughts and emotions that affect human behavior.[118] Also, this type has active learning ability. However, the development of this type is still not fully completed today. An example of this genre is the 'R2-D2' character in the 'Star Wars' movie.[119]

[113] 'Reaktif Makineler | Yapay Zeka 3M' (*Yapayzeka3m.com*, 2019) <http://yapayzeka3m.com/reaktif-makineler/> accessed 6 October 2022.
[114] ibid.
[115] Dr. Armağan Ebru BOZKURT YÜKSEL, 'YAPAY ZEKÂNIN BULUŞLARININ PATENTLENMESİ' [2018] Uyuşmazlık Mahkemesi Dergisi <https://dergipark.org.tr/en/download/article-file/495005> accessed 6 October 2022.
[116] ibid.
[117] ibid.
[118] Hasan Kadir Yılmaztekin, 'Türk Fikrî Haklar Hukuku Yapay Zekâ Tarafından Meydana Getirilen Eserleri Korumak İçin Hazır Mı?' [2020] Galatasaray Üniversitesi Hukuk Fakültesi Dergisi.
[119] ibid.

(3) Self-Awareness

The last and fourth type of AI is 'Self-aware Artificial Intelligence'. It is the type of Artificial Intelligence that can be shown closest to humans. They are machines that are aware of their own existence and their environment.[120] It is an improved version of AI based on the theory of mind. They also have intuition and consciousness. They can make guesses about the feelings of the people around them, and they recognize their inner world. In this way, they can make abstractions and inferences. The 'Ava' character from the 'Ex-Machina' movie or the 'Terminator' characters are examples of this genre.[121]

v. Issues on Patent Protection for AI-Generated-Invention

(1) Inventorship of AI Inventions

In the context of inventions produced by AI, the problem of innovativeness is becoming more complex by the day. The concept of an invention has traditionally been attributed to individuals who have made significant contributions to the concept of an invention. However, with AI, there is a debate as to whether AI systems can be considered inventors. Currently, most jurisdictions require a human investor for patent purposes. However, as AI systems become more advanced and capable of generating novel inventions independently, there are ongoing discussions about the need to revise patent laws to accommodate AI-generated inventions and determine how inventorship should be attributed.

The most notable example that can explain this discussion is the ‘DABUS’ AI system example.[122] In 2019, DABUS was an AI system responsible for inventing two, an improved container and a device for attracting attention. Applications for these inventions have been filed in more than one jurisdiction. However, because DABUS is a non-human inventor artificial intelligence system, patent offices rejected applications for not meeting the human inventor requirement. As a result, this case sparked debate about whether to update existing laws to

[120] ibid.
[121] ibid.

[122] Mathew BR, ‘The Artificial Inventor Project’ (*The Artificial Inventor Project*, 28 July 2021) <https://artificialinventor.com/467-2/> accessed 1 March 2023

recognize AI systems as inventors and how to handle intellectual property rights associated with AI-generated inventions.[123]

The concept of 'innovation' still centers on intellectual creation. It's widely agreed that even highly autonomous artificial intelligence cannot originate something, leading to the idea of "inventions without an inventor." However, this perspective remains largely unnoticed. Autonomous AI searches are often considered AI-assisted or AI-generated inventions, where the human involved may become the legal inventor.

While human involvement is necessary, there's a debate about whether instructions from autonomous AI can meet innovation criteria. The argument challenges the importance of the 'non-obviousness' criterion, focusing on the inventive outcome rather than the method itself.

Ipso facto, as per established doctrine, any uncertain AI innovations fall under the category of "AI-made inventions," even if AI merely provides mechanical assistance to a human inventor. The human's role is paramount, regardless of AI's scale or impact. The absence or nature of human input is inconsequential; merely pressing an AI device's on/off switch could qualify as an inventor's action, given the human operator.

The prevalent doctrine, however, ignores the fact that if AI finds a technical answer on its own, humans will become non-inventing bystanders. It may be accurate to say that AI cannot currently decide on research and development questions or define its own aims for invention on its own. AI can still provide ‘conception’ as the crucial component of an invention nowadays.

In pharmaceutical research, there are numerous such instances where AI, rather than humans, offer the conception. Finding a specific substance may be the answer to the problem and, consequently, the key component of the invention, or, to put it another way, the inventive step and conception, if the job is to locate a therapeutic agent. Court did find that conception only happens when the claimed inventor has a ‘mental image’ of the structure of a pharmaceutical drug when the invention of pharmaceutical substances is in question.[124] It is insufficient to

[123] ibid.
[124] *Burroughs Wellcome Co. v. Barr Labs., Inc.*, 40 F.3d 1223 (Fed. Cir. 1994)

define the drug only in terms of its primary biological features. Conception necessitates isolating the problematic chemical.[125] The human actor may define the task and the substance's attributes in an autonomous AI search. However, the task of finding a solution will fall to the AI application. Of course, while choosing from a list of options that the application has eventually generated, the human actor may still offer creative input[126]. However, if the application solely offers a small number of options or a single material as the result of its search, conception is wholly AI-made.

An additional utility criterion for an invention is that it must be functional and capable of producing advantageous outcomes, a requirement that isn't overly restrictive. Ultimately, inventions are designed for a purpose and to be effectively utilized. Establishing utility is often not a hindrance, since the involvement of AI—whether “created by AI” or "assisted by AI”—doesn't alter its practical usefulness. This is evident from everyday examples like toothbrushes and pharmaceutical compounds.

Novelty hinges on an objective approach, detached from the inventor's understanding. The evaluation focuses on constructive knowledge, necessitating an ideal standard. This approach raises questions about the actual information state, where the inventor is assumed to know all prior art disclosed during their alleged invention period, regardless of others' familiarity with earlier disclosures.

The second, to be able to use the cumulative approach regarding the ‘knowledge’ used in making of invention, what was accessible must be sundered. Courts frequently require "a satisfactory showing that such document has been disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter or art asserting reasonable diligence can locate it"[127] for a given reference to be considered explicitly and widely available.[128] Even while the accessibility test rarely limits the scope of prior art, the issue of what is "sufficiently available to the public to be constituted a printed publication" may be problematic in some situations (particularly for web articles that are not indexed and so

[125] Thomas Meitinger, (2020) Künstliche Intelligenz als Erfinder?
[126] Mariya Popova, Olexandr Isayev & Alexander Tropsha, (2018) Deep Reinforcement Learning for De Novo Drug Design
[127] Brett M. Frischman & Mark A. Lemley (2007) Spillovers
[128] William Samore (2013) Artificial Intelligence and the Patent System: Can a New Tool Render a Once Patentable Idea Obvious?

difficult to find). Human cognitive constraints may limit actual accessibility, and thus constructive knowledge, in this sense.

Above all this, when it comes to profitability of the patented invention, we also face issues related to ownership of the patent. The growth model of patent protection encompasses the micro perspective on incentives of individual actors. However, we need a broader perspective to establish if an individual rights protection system is really functioning in the first place. When seen from a broad viewpoint, it is clear that an ecosystem for AI that fosters innovation requires more than just protection for new discoveries; it also fundamentally requires an environment with open data marketplaces.

(2) Ownership of an AI-Generated Invention

Data consumption is necessarily connected to AI innovation. AI training as we know it is impossible without a plethora of information. Access to and ownership of data are thus the essential prerequisites for AI innovation. The AI sector is relocating toward consolidation since data ownership and innovation are so tightly related. In other words, the giant IT corporations that already own data control the majority of the AI market.[129] . It's likely that some areas and nations will dominate the race for AI supremacy on a global scale. This is dependent in part on various approaches to the administration and regulation of the data economy. Some areas, like the European Union, may create more AI regulations based on individual rights, particularly in terms of data security.[130] As a result, a world of the "data rich," primarily in Silicon Valley and China, and a world of the "data poor," primarily in Europe, may develop.

It is obvious that patent reform alone may not be sufficient against this backdrop of business consolidation and global market disparity. A macro-regulatory framework is required for the data economy.[131] Data sharing is crucial because having access to data is crucial for innovation. Legal frameworks that support possessor-friendly principles and less individual rights-focused data usage and commercialization rules appear unconcerned with the sharing and accessibility of private companies' data portfolios.

[129] William Vorhies, (2018) Comparing AI Strategies: Vertical vs. Horizontal
[130] Michael Webb, Nicholas Bloom, Nick Short & Josh Lerner, (2018)Some Facts of High-Tech Patenting
[131] *Peter Lee ,(2018),Innovation and the Firm: A New Synthesis*

There may be a chance for international conflict if private enterprises are encouraged and, if necessary, required to provide their data as a "public good." 1 It will be interesting to see how other countries' policymakers—as well as the current tech and data oligopolies—react to the new European approach of coerced data sharing. Ultimately, patent law continues to be a crucial tool for maintaining the microstructures of an ecosystem for AI innovation, in addition to the control of data marketplaces. In this regard, it is important to remember that patent protection can help smaller players compete with bigger ones. At least for the AI sector, the granting of intellectual property rights can help to sustain market competition frameworks and boost innovation potential.

V. CASE BEFORE THE COURT (Y SKIN v. WATSON SOLUTIONS)

I.Overview

i.Sunscreen Testing and Drug Regulations

Sunscreens have been U.S. Food and Drug Administration (FDA) gained recent attention. The FDA's 2019 proposed rule aimed to modernize sunscreen requirements, including ingredients, SPF levels, broad spectrum criteria, and labeling for consumer clarity. This update aimed to align with scientific insights, acknowledging skin absorption of certain ingredients. The 2020 Coronavirus Aid, Relief, and Economic Security Act, also known as the CARES Act, modernized FDA regulation of Over-The-Counter (OTC) monograph drugs, like sunscreens, using an administrative order approach for updates. This replaced the rulemaking process and introduced deemed final orders for OTC categories, effective since March 2020. Regarding sunscreens specifically, the CARES Act mandates that the FDA must also issue a proposed order to modify and update the deemed final order for sunscreens, in addition to establishing the initial deemed final order.

Should sufficient evidence emerge to address the lingering uncertainties regarding the suitability of a sunscreen containing any of the eight specified ingredients as "generally recognized as safe and effective" (GRASE), the FDA intends to issue a final order reflecting its determination regarding the ingredient's status. However, if conclusive data is lacking by the conclusion of the proposed order comment period to resolve queries about each of these ingredients, the FDA might consider postponing further action on the GRASE classification for

sunscreens containing those specific ingredient(s). This extension could facilitate the collection and submission of additional safety information if the FDA is satisfied with the diligent and timely progress made by the requesting party in obtaining such data.

Furthermore, if the FDA initially defers ongoing action concerning sunscreens containing a particular active ingredient, the agency plans to periodically reassess the advancement of relevant studies. In cases where the studies exhibit insufficient progress or productivity, the FDA anticipates proceeding with a final order regarding sunscreens featuring the ingredient in question. Going forward, the administrative order process established by the CARES Act will guide the FDA's determinations concerning the GRASE status of over-the-counter sunscreen products with specific active ingredients. This statutory provision grants the FDA the authority to employ the order process to introduce, eliminate, or modify conditions for an over-the-counter monograph drug.

ii. International Cooperation Surrounding AI

The Intellectual Property Office of Singapore (IPOS) has unveiled a plan to expedite the processing of artificial intelligence (AI)-related patent applications, aiming to advance the nation's digital economy efforts. Under this initiative, applications could now be processed in as little as six months, a significant reduction from the typical two to four years.[132] This move positions Singapore as the world's fastest in patent processing, although the United States Patent and Trademark Office has offered a similar fast track option since 2012 for a fee. Eligible inventions cover areas such as image recognition, speech and voice recognition, natural language processing, and autonomous systems. This step aligns with broader commitment of Singapore to embrace AI, as outlined in the 2023 plan of the government[133], aiming to integrate AI projects across ministries. The accelerated patent scheme is also open to international AI innovators, reinforcing the status as an intellectual property hub for cutting-edge technologies. Despite the smaller population, quicker patent approval may attract inventors seeking funding and enable them to swiftly approach investors with granted patents. Moreover, less restrictive approach of Singapore to software-related patents could encourage companies to use the country as a starting point for patent filings before pursuing broader international protection.

[132] *WIPO Technology Trends, (2019) , WIPO*. Available at *https://www.wipo.int/publications/en/details.jsp?id=4386*

[133] Smart Nation and Digital Government Office (SNDGO), (2023), National Artificial Intelligence Strategy,

ii.Regulating AI in medicine

In the United States, the FDA introduced a regulatory framework for AI applications in medicine in April 2019, followed by an action plan in January 2021 (ref. 1). The FDA's regulatory leadership aligns with the broader US strategy, emphasizing specific federal agency responsibilities over comprehensive AI regulation to encourage innovation and prevent overregulation[134].

In contrast, approach of the Singapore government to AI regulation in medicine (AIM) is characterized by combining sector-specific and cross-sectional regulations. The recent proposal of the AI Act by the Singaporean government underscores a comprehensive risk-based regulatory framework for AI, prioritizing medicine as a high-impact sector. AIM must adhere to the AI Act and existing Health Products Act (HPA) and its Health Products (Medical Devices) Regulations 2010.

Despite variations in AI regulation, both the United States and Singapore share the goal of advancing AI development in medicine. A comparison of focal areas in AIM regulation—lifecycle management, algorithmic bias, and user transparency—reveals both commonalities and differences.

iii. Lifecycle Regulatory Framework

In both the United States and Singapore, provisions are introduced to predetermine changes and improvements in AIM performance during initial authorization. The FDA advocates for a predetermined change control plan, outlining the 'what' and 'how' aspects of algorithmic adaptation to ensure safety and effectiveness. While improvements in performance and expanded indications are permissible changes, certain scenarios necessitate new authorizations. For instance, evolving lowrisk AIM to highrisk AIM through the predetermined change control plan is deemed inappropriate.[135] The Singaporean regulatory framework requires manufacturers to establish a quality management system, mandating the documentation of modification strategies, quality control techniques, testing procedures, and validation methodologies.

[134] Food and Drug Administration. (2021). Artificial intelligence/machine learning (AI/ML)-based software as a medical device (SaMD) action plan.

[135] Vokinger, K. N., Feuerriegel, S., & Kesselheim, A. S. (2021). Continual learning in medical devices: FDA's action plan and beyond.

The FDA emphasizes the reporting of postmarket real-world performance to ensure adaptive AI system safety and effectiveness. Conversely, approach of the Singapore entails a more detailed post-market monitoring system, aiming to systematically collect, document, and analyze AIM performance data throughout their lifecycles, thus facilitating efficient risk mitigation.[136] Consistency in performance and alignment with state-of-the-art accuracy and robustness standards are integral components of AIM's lifecycle in both jurisdictions.

Despite similarities, the Smart Nation and Digital Government Office (SNDGO) stipulates more rigorous prerequisites, placing a heightened burden on manufacturers. While this approach may enhance trust, it could also elevate the workload of manufacturer and efforts, potentially impacting AIM innovation and development.

(1) Transparency to Users

Transparency in AIM authorization and application has been set as a precedent by the US and Singapore regulatory system, characterized by the FDA's publication of summaries and statements for approved medical devices Singapore Medical Device Register (SMDR) remaining inaccessible to the public.

(2) Core Values and Regulatory Approaches

Both the United States and Singapore confront similar challenges in the regulation of AI in medicine (AIM) through the lifecycle oversight of adaptive AIM, the recognition of addressing algorithmic bias, and the promotion of transparency. However, a comparative analysis uncovers notable distinctions. Singapore's regulatory approach leans towards a more rigorous AIM oversight, while the United States prioritizes innovation with a focus on principles over intricate specifics. These differences are poised to yield varying outcomes concerning AIM innovation and adoption rates, both within healthcare and more broadly.

[136] Oren, O., Gersh, B. J., & Bhatt, D. L. (2020). Artificial intelligence in medical imaging: switching from radiographic pathological data to clinically meaningful endpoints. The Lancet Digital Health

Of particular significance is how these regulatory variations could impact prior policy choices. Many AIM algorithms rely heavily on electronic health data[137]. In the United States, the early adoption of electronic health records and the availability of diverse data sources, including demographic details, diagnoses, medications, medical procedures, and self-reported questionnaire responses, have enriched datasets[138] Coupled with proposed regulations, manufacturers might face challenges in sourcing sufficient health data within Singapore to train AIM for regulatory authorization.

Nevertheless, amidst these diverse trajectories, it remains crucial to acknowledge that both the United States and Singapore share a fundamental set of core values and principles. As a result, fostering enhanced information exchange and collaboration among authorities in both regions, along with facilitating interactions among research communities, emerges as a favorable approach. Such collaboration serves to bolster the successful advancement of AIM, serving the interests of patient well-being and societal progress—an objective that unites the United States and Singapore.

II.Timeline of the Case

1. Watson Solutions submitted a patent application to the United States Patent and Trademark Office (USPTO) on 1 May 2023, establishing the priority date.
2. The patent application has also been publicly published in the Patents Journals Singapore on 12 May 2023.
5. To ease the search and examination phase of the patent application in the various jurisdictions the patent is being filed in, Watson Solutions has begun to produce international search report and written opinion on 15 June 2023.
3. During the preliminary examination by the Registrar of Patents of Singapore the Registrar has requested the Watson Solutions on 2 July 2023 to amend the application that, the filed designation of the inventor does not comply with the regulations on the basis of inventor.

[137] *Rajkomar, A., Oren, E., Chen, K., Dai, A. M., Hajaj, N., Hardt, M.,& Dean, J. (2018). Scalable and accurate deep learning with electronic health records*
[138] *Toscano, F., O'Donnell, E., Unruh, M. A., Golinelli, D., Carullo, G., Messina, G., & Casalino, L. P. (2018). Electronic health records implementation: can the European Union learn from the United States?. European Journal of Public Health*

4. YSkin has reached out to Watson Solutions on 6 July 2023 regarding the patent that had been wrongly published and requested termination of the labor contract concerning the employment of Mrs. Thami and Mrs. Chatter no later than 30 September 2023.
5. YSkin has submitted a Request for Arbitration in writing to the WIPO Arbitration and Mediation Center on 20 July 2023.
6. The WIPO Center has informed the parties in writing of the receipt by it of such Request and of the date of commencement of the arbitration on 24 July 2023.

III. Facts of the Case

1. Mrs. Thami and Mrs. Chatter are scientists who work for two competitor companies under the Research and Development Department. Mrs. Thami works for Watson Solutions as a product engineer, a US-based company, to create business-ready tools, applications and solutions, designed to reduce the costs and hurdles of AI adoption while optimizing outcomes and responsible use of AI. While Mrs. Chatter is working for YSkin as a chemical engineer, a company headquartered in Singapore, that mainly provides pathologic interpretations of skin specimens in an atmosphere of close cooperation with clinicians. While providing training and clinical research to propel scientific progress, mainly contributes to the design of materials that are used for protection from the sun.

2. To reduce duplicated investment in this project, as a team of two, Mr. Thami and Mrs. Chatter began to work on a project using AI tool that they named DERMA-BOT to produce a sunscreen that protects against UVB and UVA, does reduce the quantity of the UV radiation that reaches the skin, does not change the quality of the UV radiation that hits the skin -before an alliance agreement was reached. Each of the hundreds of brain modules used by DERMA-BOT to carry out successive pairings of chemicals associated with a specific reaction. An associated chemical is triggered when a properly coded reaction is input into the module.

3. They created a new system that reportedly conceived two inventions: transformer material and nanotechnological ivy blanket. The Transformer Material is a non-UV absorbing precursor that converts to UV absorber upon natural UV irradiation. The product will be manufactured using different substitution patterns that allow adapting the final absorbance to specific situations and need to reach maximum UV absorption. And Nanotechnological Ivy Blanket is to give SPF enhanced attention to reduce the amount of re-application by its consumer. The

input of the nanoparticles will absorb the ultraviolet rays in sunlight. These nanoparticles are transparent, water resistant, and non-toxic to living cells. They block UV radiation four times more effectively than do metal nanoparticles and are broken down naturally over time by enzymes on the skin. This profile also provides hypo-allergic skin extra care by preventing any type of bacterial formation, so the first thing contacting the skin is the active ingredients of the sunscreen.

4. Watson Solutions and Skin have entered into a formal alliance with the aforementioned agreement. Parties agreed on the 'circumstances' under which they will not be working together in the marketplace but rather proceeding independently of each other. These do not include any effort to connect the marketplace intent to the allocation of patent rights.

5After the two scientists progressed in their project. YSkin wanted to allocate patent rights to AI that developed the sunscreen to resolve any upcoming conflict may arise from that. If the collaborating parties allocate ownership of jointly developed inventions based on inventorship (in principle), as prescribed by the legislator, but refrain from following national patent exploitation default rules.

6Watson Solutions argued that the legislator cannot alter existing normative default rules to reflect the preferences of the majority. Thus, collaborative work should be licensed based on the opportunities for patent exploitation rather than on inventorship.

7. The R&D team of Watson Solutions later drafted a patent claim for each firm to grant the other licenses to back- ground intellectual property, but only as needed to exploit foreground intellectual property outside the boundaries. This draft included each firm's responsibility related to drafting and prosecuting patent claims, selection of country to file for patent protection as the United States, patent maintenance, and enforcement. But since the firms were unable to come to an agreement on the RTU because the R&D team of the YSkin strongly denied this draft solution in an attempt to prevent a royalty flow from the non-inventing party to the inventing party.

8. The international patent license that in the case scenario Watson Solution is subject to obtain, between a U.S. entity and a foreign one might reference the law of the state of the principal

place of business of the U.S. entity. Yet, the foreign licensed patents arise only under the laws of the foreign States that granted them, and even the U.S. patent arises under federal and not state law.

9. YSkin has refused the patent claim through The Patent Cooperation Treaty, in the sense of the of licensing agreement proposal submission , the intent of how the patented technology will be harnessed to achieve mutual goals and outlining the terms under which the licensing partnership will operate being misappropriated by Watson Corp and is perceived as inadvertently infringement by premature utilization of technology and anticipatory breach of the potential licensing agreement under this patent claim.

10. The WIPO acknowledged receipt of the request for arbitration in September 2023.

IV.Claims of the Parties

i.Claims of the Y SKIN

- DERMABOT should obtain the patent rights because it functionally fulfills the conceptual act that forms the basis for inventorship,

- There would be no question that AI was the only inventor if it was a natural person. The right approach is for the AI to be listed as the inventor and for the AI's owner to be the assignee or owner of its patents.

- The licensing agreement needs to address how updates, improvements, or changes to the AI algorithms of the DERMA-BOT will be handled, ensuring that the licensed medical product remains up-to-date and effective, thus terminating the contract will damage the collaborative work scientists has put into creating these compounds.

- YSKIN invested significant resources into the research and development of the new sunscreen, which as MRS. Chatter stated was " costly and time-consuming process". To recover these expenses and make a profit, YSKIN typically recover the cost of the development and research of the drug.

- The patent claim for a first medical indication may be formulated as: "Compound(s) X for use as a pharmaceutical". But YSKIN - as the applicant for a patent for a first medical indication, is under no obligation to extend the protection to the whole of the medical field.

- Because the social costs of patenting are so high (particularly for pharmaceuticals), some fora might become 'information havens', over-eager to invalidate patents on a worldwide basis.

- Differing discovery opportunities could lead to important differences in outcome, particularly on issues, like priority of invention, that are unique to the law of the United States, where broad discovery is available.

- Neither party has carefully considered the problems of determining the source of inventions or the phenomenon of stimulated invention between the two technical staff. Therefore, one party alone is eligible to act, regarding the protection of the final product. Interactions are more collaborative in the joint option. While technical experts want credit for technological innovations (as is typical in intra-company work), there is considerably less hesitation to engage in informal and open idea exchanges with employees from the other corporation.

- If the single registry of the by-product is done using the Paris Convention, then there would be no such issue on classification matters and parties only have to agree to pay the multiple class registration fee.

ii.Claims of Watson Solutions

- It is not discussed in the DERMABOT specification how the purported invention was devised. If it really was by the machine, there is no explanation to that extent in the patent specification nor has it been given throughout the procedure.

- YSKIN overlooks that, according to Singapore law, it is irrelevant for the assessment whether an invention exists and is based on an inventive step in the sense of § 29 of the

Patent Act on which actual development the invention is based and whether designated persons are to be regarded as inventors in an appropriate manner.

- The co-owners of the resulting IPR must mutually decide on the party responsible for timely prosecution and maintenance of said IPR. The designated party will have the right to charge the other co-owners a predetermined percentage of the associated costs, as agreed upon between them. In the absence of any agreement to the contrary between joint owners, the cost of research and development shall be equally shared.

- Patents exist only after application and/or registration, and they are the creatures of the State that created them. They have little or no effect outside the borders of that State and are thus territorial.

- In the event of the patent claim drafted under United States law to file for patent protection, the final product will be protected as a drug. Thus, the Singaporean company will be forced to bear so much more responsibility than YSkin. But if the product is protected as cosmetics, it will be easier to market to a product with a close amount of testing and a wider range of customers.

- The interest of Watson Solutions in legal protection cannot be denied. His conviction that an AI must be considered as inventor in the same way as a natural person and that the designation of a corresponding system as inventor must be admissible reflects a legal opinion which, by now, is regarded as justifiable. In the United States the term of protection may be extended for an additional period in order to compensate the title holder for delays in patent examination or for the period required for the marketing approval of pharmaceuticals, which will create a disadvantage on the market for Watson Solutions during the International Phase of the patent application.YSKIN also demands Watson Solution to submit an auxiliary request to United States Patent and Trademark Office (USPTO) under the name of both companies as the primary inventor of DERMA-BOT and file a new claim to the Intellectual Property Office of Singapore (IPOS) regarding the final product that is in commercialization phase.

VIII. AGENDA OF ARBITRATORS

1. Whether a machine create like “human beings”? Should creative ability only be exercised by human inventors,
2. Whether there is a sui-generis protection just for them in the law as it is? What is the best way to protect AI-created inventions-systems,
3. Whether the partners’ RTU (rights to use) foreground patents depend on which firm’s scientist is the legal inventor of the patentable invention,
4. Whether the WIPO accept a single registry of a patent if the states have different regulations on the countries which manufacture said product, when the product is in a different Nice Classification,
5. Whether the biotech company is entitled to terminate the contract and would it be in the interest of the parties to continue to cooperate towards the development of the pharma-tech compounds,
6. Whether the parties are eligible to use a choice-of-law clause to avoid the application of a law like that in the United States, which provides for reversionary rights in assigned or registered patents,
7. Whether the injured party may invoke the damages caused by the patent application before the international preliminary examination

APPLICABLE LAW

II. Patent Cooperation Treaty

I. Article 14 “Certain Defects in the International Application”

*“**(1) (a)** The receiving Office shall check whether the international application contains any of the following defects, that is to say:*

***(i)** it is not signed as provided in the Regulations;*

***(ii)** it does not contain the prescribed indications concerning the applicant;*

(iii) *it does not contain a title;*

(iv) *it does not contain an abstract;*

(v) *it does not comply to the extent provided in the Regulations with the prescribed physical requirements.*

(b) *If the receiving Office finds any of the said defects, it shall invite the applicant to correct the international application within the prescribed time limit, failing which that application shall be considered withdrawn and the receiving Office shall so declare.*

(2) *If the international application refers to drawings which, in fact, are not included in that application, the receiving Office shall notify the applicant accordingly and he may furnish them within the prescribed time limit and, if he does, the international filing date shall be the date on which the drawings are received by the receiving Office. Otherwise, any reference to the said drawings shall be considered non-existent.*

(3)(a) *If the receiving Office finds that, within the prescribed time limits, the fees prescribed under Article 3(4)(iv) have not been paid, or no fee prescribed under Article 4(2) has been paid in respect of any of the designated States, the international application shall be considered withdrawn and the receiving Office shall so declare.*

(b) *If the receiving Office finds that the fee prescribed under Article 4(2) has been paid in respect of one or more (but less than all) designated States within the prescribed time limit, the designation of those States in respect of which it has not been paid within the prescribed time limit shall be considered withdrawn and the receiving Office shall so declare.*

(4) *If, after having accorded an international filing date to the international application, the receiving Office finds, within the prescribed time limit, that any of the requirements listed in items (i) to (iii) of Article 11(1) was not complied with at that date, the said application shall be considered withdrawn and the receiving Office shall so declare."*

The recipient Patent Office has the authority to request the applicant to rectify the error. The deadline for rectification is determined by the recipient Patent Office and must be reasonable, ranging from a minimum of 10 days to a maximum of one month from the correction invitation date. If the correction is completed within this timeframe, the date of correction receipt becomes the PCT international patent filing date; otherwise, the application won't be considered a PCT

international patent application. In instances where the necessary components of the PCT international patent application aren't in a language accepted by the recipient Patent Office, the application will be forwarded to the PCT international Bureau as the receiving Patent Office.

II. **Article 17 "Procedure before the International Searching Authority"**

*"**(1)** Procedure before the International Searching Authority shall be governed by the provisions of this Treaty, the Regulations, and the agreement which the International Bureau shall conclude, subject to this Treaty and the Regulations, with the said Authority.*

***(2)(a)** If the International Searching Authority considers*

***(i)** that the international application relates to a subject matter which the International Searching Authority is not required, under the Regulations, to search, and in the particular case decides not to search, or*

***(ii)** that the description, the claims, or the drawings, fail to comply with the prescribed requirements to such an extent that a meaningful search could not be carried out, the said Authority shall so declare and shall notify the applicant and the International Bureau that no international search report will be established.*

***(b)** If any of the situations referred to in subparagraph (a) is found to exist in connection with certain claims only, the international search report shall so indicate in respect of such claims, whereas, for the other claims, the said report shall be established as provided in Article 18.*

***(3)(a)** If the International Searching Authority considers that the international application does not comply with the requirement of unity of invention as set forth in the Regulations, it shall invite the applicant to pay additional fees. The International Searching Authority shall establish the international search report on those parts of the international application which relate to the invention first mentioned in the claims ("main invention") and, provided the required additional fees have been paid within the prescribed time limit, on those parts of the international application which relate to inventions in respect of which the said fees were paid.*

(b) *The national law of any designated State may provide that, where the national Office of that State finds the invitation, referred to in subparagraph (a), of the International Searching Authority justified and where the applicant has not paid all additional fees, those parts of the international application which consequently have not been searched shall, as far as effects in that State are concerned, be considered withdrawn unless a special fee is paid by the applicant to the national Office of that State."*

Upon receipt of the PCT international patent application and corresponding fees, the receiving Patent Office conducts a formal assessment to ascertain adherence to PCT language, format, and content requirements. Should deficiencies arise in fees, language, form, or content, the applicant is prompted to address them. If compliance with PCT criteria is confirmed, an official PCT international patent filing date is designated. Subsequently, the receiving Patent Office transmits copies of the application, any applicable translations, and related materials to the PCT International Patent Searching Authority and the PCT international Bureau, enabling their respective roles in the subsequent application processing.

III. Article 34 "Procedure before the International Preliminary Examining Authority"

*"**(1)** Procedure before the International Preliminary Examining Authority shall be governed by the provisions of this Treaty, the Regulations, and the agreement which the International Bureau shall conclude, subject to this Treaty and the Regulations, with the said Authority.*

(2)(a) *The applicant shall have a right to communicate orally and in writing with the International Preliminary Examining Authority.*

(b) *The applicant shall have a right to amend the claims, the description, and the drawings, in the prescribed manner and within the prescribed time limit, before the international preliminary examination report is established. The amendment shall not go beyond the disclosure in the international application as filed.*

(c) *The applicant shall receive at least one written opinion from the International Preliminary Examining Authority unless such Authority considers that all of the following conditions are fulfilled:*

(i) *the invention satisfies the criteria set forth in Article 33(1),*

(ii) *the international application complies with the requirements of this Treaty and the Regulations in so far as checked by that Authority,*

(iii) *no observations are intended to be made under Article 35(2), last sentence.*

(d) *The applicant may respond to the written opinion.*

(3)(a) *If the International Preliminary Examining Authority considers that the international application does not comply with the requirement of unity of invention as set forth in the Regulations, it may invite the applicant, at his option, to restrict the claims so as to comply with the requirement or to pay additional fees.*

(b) *The national law of any elected State may provide that, where the applicant chooses to restrict the claims under subparagraph (a), those parts of the international application which, as a consequence of the restriction, are not to be the subject of international preliminary examination shall, as far as effects in that State are concerned, be considered withdrawn unless a special fee is paid by the applicant to the national Office of that State.*

(c) *If the applicant does not comply with the invitation referred to in subparagraph (a) within the prescribed time limit, the International Preliminary Examining Authority shall establish an international preliminary examination report on those parts of the international application which relate to what appears to be the main invention and shall indicate the relevant facts in the said report. The national law of any elected State may provide that, where its national Office finds the invitation of the International Preliminary Examining Authority justified, those parts of the international application which do not relate to the main invention shall, as far as effects in that State are concerned, be considered withdrawn unless a special fee is paid by the applicant to that Office.*

(4)(a) *If the International Preliminary Examining Authority considers*

(i) *that the international application relates to a subject matter on which the International Preliminary Examining Authority is not required, under the Regulations, to carry out an international preliminary examination, and in the particular case decides not to carry out such examination, or*

(ii) *that the description, the claims, or the drawings, are so unclear, or the claims are so inadequately supported by the description, that no meaningful opinion can be formed on the novelty, inventive step (non-obviousness), or industrial applicability, of the claimed invention, the said Authority shall not go into the questions referred to in Article 33(1) and shall inform the applicant of this opinion and the reasons therefor.*

(b) *If any of the situations referred to in subparagraph (a) is found to exist in, or in connection with, certain claims only, the provisions of that subparagraph shall apply only to the said claims."*

To seek another thorough assessment of the application before moving to the national phase, the PCT applicant can file a Chapter II demand accompanied by an Article 34 amendment and supplementary fees. This amendment allows changes not only to claims but also to the description and drawings without introducing new content. Subsequent to the demand and amendment submission, the application proceeds to an International Preliminary Examining Authority (IPEA) for preliminary examination, incorporating applicant-provided amendments and arguments. Typically, the IPEA coincides with the previously involved ISA, issuing at least one additional written opinion, with potential for more if the applicant responds promptly. This process fosters increased dialogue and argument potential prior to entering the national phase of prosecution.

III. Regulations under the PCT

a. **Rule 91** ***"Rectification of Obvious Mistakes in the International Application and Other Documents"***

"91.1 Rectification of Obvious Mistakes

(a) *An obvious mistake in the international application or another document submitted by the applicant may be rectified in accordance with this Rule if the applicant so requests.*

(b) *The rectification of a mistake shall be subject to authorization by the "competent authority", that is to say:*

(i) *in the case of a mistake in the request part of the international application or in a correction thereof—by the receiving Office;*

(ii) *in the case of a mistake in the description, claims or drawings or in a correction thereof, unless the International Preliminary Examining Authority is competent under item (iii)—by the International Searching Authority;*

(iii) *in the case of a mistake in the description, claims or drawings or in a correction thereof, or in an amendment under Article 19 or 34, where a demand for international preliminary examination has been made and has not been withdrawn and the date on which international preliminary examination shall start in accordance with Rule 69.1 has passed—by the International Preliminary Examining Authority;*

(iv) *in the case of a mistake in a document not referred to in items (i) to (iii) submitted to the receiving Office, the International Searching Authority, the International Preliminary Examining Authority or the International Bureau, other than a mistake in the abstract or in an amendment under Article 19—by that Office, Authority or Bureau, as the case may be.*

(c) *The competent authority shall authorize the rectification under this Rule of a mistake if, and only if, it is obvious to the competent authority that, as at the applicable date under paragraph (f), something else was intended than what appears in the document concerned and that nothing else could have been intended than the proposed rectification.*

(d) *In the case of a mistake in the description, claims or drawings or in a correction or amendment thereof, the competent authority shall, for the purposes of paragraph (c), only take into account the contents of the description, claims and drawings and, where applicable, the correction or amendment concerned.*

(e) *In the case of a mistake in the request part of the international application or a correction thereof, or in a document referred to in paragraph (b)(iv), the competent authority shall, for the purposes of paragraph (c), only take into account the contents of the international application itself and, where applicable, the correction concerned, or the document referred to in paragraph (b)(iv), together with any other document submitted with the request, correction or document, as the case may be, any priority document in respect of the international application that is available to the authority in accordance with the Administrative Instructions, and any other document contained in the authority's international application file at the applicable date under paragraph (f).*

(f) *The applicable date for the purposes of paragraphs (c) and (e) shall be:*

(i) in the case of a mistake in a part of the international application as filed—the international filing date;

(ii) in the case of a mistake in a document other than the international application as filed, including a mistake in a correction or an amendment of the international application—the date on which the document was submitted.

(g) *A mistake shall not be rectifiable under this Rule if:*

(i) *the mistake lies in the omission of one or more entire elements of the international application referred to in Article 3(2) or one or more entire sheets of the international application;*

(ii) *the mistake is in the abstract;*

(iii) *the mistake is in an amendment under Article 19, unless the International Preliminary Examining Authority is competent to authorize the rectification of such mistake under paragraph (b)(iii); or*

(iv) *the mistake is in a priority claim or in a notice correcting or adding a priority claim under Rule 26bis.1(a), where the rectification of the mistake would cause a change in the priority date;*

provided that this paragraph shall not affect the operation of Rules 20.4, 20.5, 26bis and 38.3.

(h) *Where the receiving Office, the International Searching Authority, the International Preliminary Examining Authority or the International Bureau discovers what appears to be a rectifiable obvious mistake in the international application or another document, it may invite the applicant to request rectification under this Rule.*

91.2 Requests for Rectification

A request for rectification under Rule 91.1 shall be submitted to the competent authority within 26 months from the priority date. It shall specify the mistake to be rectified and the proposed rectification, and may, at the option of the applicant, contain a brief explanation. Rule 26.4 shall apply mutatis mutandis as to the manner in which the proposed rectification shall be indicated.

91.3 Authorization and Effect of Rectifications

(a) *The competent authority shall promptly decide whether to authorize or refuse to authorize a rectification under Rule 91.1 and shall promptly notify the applicant and the International Bureau of the authorization or refusal and, in the case of refusal, of the reasons therefor. The International Bureau shall proceed as provided for in the Administrative Instructions, including, as required, notifying the receiving Office, the International Searching Authority, the International Preliminary Examining Authority and the designated and elected Offices of the authorization or refusal.*

(b) *Where the rectification of an obvious mistake has been authorized under Rule 91.1, the document concerned shall be rectified in accordance with the Administrative Instructions.*

(c) *Where the rectification of an obvious mistake has been authorized, it shall be effective:*

(i) *in the case of a mistake in the international application as filed, from the international filing date;*

(ii) *in the case of a mistake in a document other than the international application as filed, including a mistake in a correction or an amendment of the international application, from the date on which that document was submitted.*

(d) *Where the competent authority refuses to authorize a rectification under Rule 91.1, the International Bureau shall, upon request submitted to it by the applicant within two months from the date of the refusal, and subject to the payment of a special fee whose amount shall be fixed in the Administrative Instructions, publish the request for rectification, the reasons for refusal by the authority and any further brief comments that may be submitted by the applicant, if possible together with the international application. A copy of the request, reasons and comments (if any) shall if possible be included in the communication under Article 20 where the international application is not published by virtue of Article 64(3).*

(e) *The rectification of an obvious mistake need not be taken into account by any designated Office in which the processing or examination of the international application has already started prior to the date on which that Office is notified under Rule 91.3(a) of the authorization of the rectification by the competent authority.*

(f) *A designated Office may disregard a rectification that was authorized under Rule 91.1 only if it finds that it would not have authorized the rectification under Rule 91.1 if it had been the competent authority, provided that no designated Office shall disregard any rectification that was authorized under Rule 91.1 without giving the applicant the opportunity to make observations, within a time limit which shall be reasonable under the circumstances, on the Office's intention to disregard the rectification."*

A candidate has the option to seek permission for the correction of evident errors in the global application. The evaluator (in the event that the appeal pertains to the description, assertions, or illustrations) must evaluate whether such a request can be granted based on the standards detailed in Rule 91. If the receiving office has mistakenly granted authorization for such rectification, this could impact the search process.

IV. **United States Patent Act**

I. ***Section 101 of Title 35 "Inventions patentable"***

"Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title."

While section 101 of the Manual of Patent Examining Procedure defines patentability, it has certain boundaries. Double patenting is disallowed, and only the inventor can be the applicant for a patent. The invention must possess a specific, substantial, and credible utility. Additionally, subject matter eligible for patenting is constrained to the four categories specified in section 101: process, machine, manufacture, or composition of matter. Moreover, it must meet the criteria for "patent-eligible subject matter," preventing patenting of abstract ideas, scientific laws, and natural phenomena, such as chemical compounds.

II. ***Section 103 of Title 35 "Conditions for patentability; non-obvious subject matter"***

"A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made."

The "person of ordinary skill in the art" is a hypothetical individual assumed to possess knowledge of the relevant field during the invention's time. Factors for determining their skill level include problem types, previous solutions, innovation speed, technology complexity, and educational level of practitioners. These factors might not all apply, and some could be more significant. This person isn't an automaton but someone with ordinary creativity. They can combine teachings from various patents and understand relevant scientific and engineering principles.

III.***Section 116 of Title 35 "Inventors"***

*"**(a)Joint Inventions***

When an invention is made by two or more persons jointly, they shall apply for patent jointly and each make the required oath, except as otherwise provided in this title. Inventors may apply for a patent jointly even though (1) they did not physically work together or at the same time, (2) each did not make the same type or amount of contribution, or (3) each did not make a contribution to the subject matter of every claim of the patent.

(b)Omitted Inventor

If a joint inventor refuses to join in an application for patent or cannot be found or reached after diligent effort, the application may be made by the other inventor on behalf of himself and the omitted inventor. The Director, on proof of the pertinent facts and after such notice to the omitted inventor as he prescribes, may grant a patent to the inventor making the application, subject to the same rights which the omitted inventor would have had if he had been joined. The omitted inventor may subsequently join in the application.

(c)Correction of Errors in Application

Whenever through error a person is named in an application for patent as the inventor, or through error an inventor is not named in an application, the Director may permit the application to be amended accordingly, under such terms as he prescribes."

The initial paragraph is implied in existing statutes, while the latter paragraph, which concerns the omission of a mistakenly joined inventor, is addressed in Patent Office rules. The rest of the text introduces that rectifying the error of improperly including someone as an inventor and submitting an application when a joint inventor is untraceable.

IV. *Section 371 of Title 35 "National stage: Commencement"*

*"**(a)** Receipt from the International Bureau of copies of international applications with any amendments to the claims, international search reports, and international preliminary examination reports including any annexes thereto may be required in the case of international applications designating or electing the United States.*

***(b)** Subject to subsection (f) of this section, the national stage shall commence with the expiration of the applicable time limit under article 22(1) or (2), or under article 39(1)(a) of the treaty.*

***(c)** The applicant shall file in the Patent and Trademark Office—*

> ***(1)** the national fee provided in section 41(a);*
>
> ***(2)** a copy of the international application, unless not required under subsection (a) of this section or already communicated by the International Bureau, and a translation into the English language of the international application, if it was filed in another language;*
>
> ***(3)** amendments, if any, to the claims in the international application, made under article 19 of the treaty, unless such amendments have been communicated to the Patent and Trademark Office by the International Bureau, and a translation into the English language if such amendments were made in another language;*
>
> ***(4)** an oath or declaration of the inventor (or other person authorized under chapter 11) complying with the requirements of section 115 and with regulations prescribed for oaths or declarations of applicants;*
>
> ***(5)** a translation into the English language of any annexes to the international preliminary examination report, if such annexes were made in another language.*

***(d)** The requirements with respect to the national fee referred to in subsection (c)(1), the translation referred to in subsection (c)(2), and the oath or declaration referred to in subsection (c)(4) of this section shall be complied with by the date of the commencement of the national stage or by such later time as may be fixed by the Director. The copy of the international application referred to in subsection (c)(2) shall be submitted by the date of the commencement*

of the national stage. Failure to comply with these requirements shall be regarded as abandonment of the application by the parties thereof. The payment of a surcharge may be required as a condition of accepting the national fee referred to in subsection (c)(1) or the oath or declaration referred to in subsection (c)(4) of this section if these requirements are not met by the date of the commencement of the national stage. The requirements of subsection (c)(3) of this section shall be complied with by the date of the commencement of the national stage, and failure to do so shall be regarded as a cancellation of the amendments to the claims in the international application made under article 19 of the treaty. The requirement of subsection (c)(5) shall be complied with at such time as may be fixed by the Director and failure to do so shall be regarded as cancellation of the amendments made under article 34(2)(b) of the treaty.

(e) *After an international application has entered the national stage, no patent may be granted or refused thereon before the expiration of the applicable time limit under article 28 or article 41 of the treaty, except with the express consent of the applicant. The applicant may pre-sent amendments to the specification, claims and drawings of the application after the national stage has commenced.*

(f)*At the express request of the applicant, the national stage of processing may be commenced at any time at which the application is in order for such purpose and the applicable requirements of subsection (c) of this section have been complied with."*

There are four main distinctions between a National Application filed under 35 U.S.C. 111(a) and a National Stage Application submitted under 35 U.S.C. 371.

In terms of the filing date, a National Application's filing date is determined by the date it is received by the USPTO, while a National Stage Application's filing date is often linked to the international filing date as per PCT Article 11 requirements.

Regarding priority requirements, a National Application necessitates the filing of a priority claim within a specified timeframe, accompanied by a certified copy of the foreign priority application. On the other hand, a National Stage Application mandates the provision of the priority claim and a certified copy during the PCT international stage.

The concept of unity of invention is handled differently between the two. A National Application adheres to U.S. restriction practice, whereas a National Stage Application adheres to unity of invention practice.

Lastly, in terms of filing fees, a National Application is subject to U.S. national application filing fees, whereas a National Stage Application is subject to fees associated with the PCT international stage.

V. **United States Sunscreen Innovation Act**

I.***Section 586 (b) of Title 21 "Eligibility Determinations; Data Submissions; Filing"***

*‘‘**(a) Eligibility Determinations***

(1) In General.

Not later than 60 calendar days after the date of receipt of a request under section 586A, the Secretary shall;

(A) determine, in accordance with paragraph (2), whether the request is eligible for further review under subsection (b) and section 586C;

(B) notify the sponsor of the determination of the Secretary; and

(C) make such determination publicly available in accordance with paragraph (3) and subsection (b)(1).

(2) Criteria For Eligibility

(A) In General

To be eligible for review under subsection (b) and section 586C, a request shall be for a nonprescription sunscreen active ingredient or combination of nonprescription sunscreen active ingredients, for use under specified conditions, to be prescribed, recommended, or suggested in the labeling thereof, that

(i) is not included in part 352 of title 21, Code of Federal Regulations (or any successor regulations) concerning nonprescription sunscreen; and

(ii) has been used to a material extent and for a material time under such conditions, as described in section 201(p)(2).

(B) Establishment of Time and Extent

A sponsor shall include in a request under section 586A the information required under section 330.14 of title 21, Code of Federal Regulations (or any successor regulations) to meet the standard described in subparagraph (A)(ii).

(3) Public Availability

(A) Redactions for Confidential Information

If a nonprescription sunscreen active ingredient or combination of nonprescription sunscreen active ingredients is determined under paragraph (1)(A) to be eligible for further review, the Secretary shall make the request publicly available, with redactions for information that is treated as confidential under section 552(b) of title 5, United States Code, section 1905 of title 18, United States Code, or section 301(j) of this Act.

(B) Identification of Confidential Information by Sponsor

At the time that a request is made under section 586A, the sponsor of such request shall identify any information that such sponsor considers to be confidential information described in subparagraph (A).

(C) Confidentiality During Eligibility Review

The information contained in a request under section 586A shall remain confidential during the Secretary's consideration under this section of whether the request is eligible for further review consistent with section 330.14 of title 21, Code of Federal Regulations (or any successor regulations).

(b) Data Submission and Filing Requests.

(1) In General

In the case of a request under section 586A that is determined to be eligible under subsection (a) for further review under this section and section 586C, the Secretary shall, in notifying the public under subsection (a)(1)(C) of such eligibility determination, post the eligibility determination on the Internet website of the Food and Drug Administration, invite the sponsor of such request and any other interested party to submit comments, and provide a period of not less than 45 calendar days for comments in support of or otherwise relating to a GRASE

determination, including published and unpublished data and other information related to the safety and efficacy of such request.

(2) Filing Determination

Not later than 60 calendar days after the submission of data and other information described in paragraph (1) by the sponsor, the Secretary shall determine whether the data and other information submitted by the sponsor under this section are sufficiently complete, including being formatted in a manner that enables the Secretary to determine the completeness of such data and information, to enable the Secretary to conduct a substantive review under section 586C with respect to such request. Not later than 60 calendar days after the submission of data and other information described in paragraph (1) by the sponsor, if the Secretary determines:

(A) that such data and other information are sufficiently complete, the Secretary shall

(i) issue a written notification to the sponsor of the determination to file such request, and make such notification publicly available; and

(ii) file such request made under section 586A; or

(B) that such data and other information are not sufficiently complete, the Secretary shall issue a written notification to the sponsor of the determination to refuse to file the request, which shall include the reasons for the refusal, including why such data and other information are not sufficiently complete, and make such notification publicly available.

(3) Refusal to File a Request

(A) Request for Meetings; Submisson of Additional Data or Otjer Information

If the Secretary refuses to file a request made under section 586A, the sponsor may:

(i) within 30 calendar days of receipt of written notification of such refusal, request, in writing, a meeting with the Secretary regarding the filing determination; and

(ii) submit additional data or other information. ‘

(B) Meetings

(i) In General

If a sponsor seeks a meeting under subparagraph (A):

(i), the Secretary shall convene the meeting within 30 calendar days of the request for such meeting.

(ii) Actions After Meeting

Following any meeting held under clause (i):

(I) the Secretary may file the request within 60 calendar days;

(II) the sponsor may submit additional data or other information; or

(III) if the sponsor elects, within 120 calendar days, to have the Secretary file the request (with or without amendments to correct any purported deficiencies to the request):

(aa) the Secretary shall file the request over protest, not later than 30 calendar days after the sponsor makes such election;

(bb) at the time of filing, the Secretary shall provide written notification of such filing to the sponsor; and

(cc) the Secretary shall make such notification publicly available.

'(C) Submissions of Additional Data or Other Information

Within 60 calendar days of any submission of additional data or other information under subparagraph (A)(ii) or (B)(ii)(II), the Secretary shall reconsider the previous determination made under paragraph (2) with respect to the applicable request and make a new determination in accordance with paragraph (2).

(4) Public Availability

(A) Redactions for Confidential Information

After the period of confidentiality described in subsection (a)(3)(C), the Secretary shall make data and other information submitted in connection with a request under section 586A publicly available, with redactions for information that is treated as confidential under section 552(b) of title 5, United States Code, section 1905 of title 18, United States Code, or section 301(j) of this Act. '

(B) Identification of Confidential Information by Sponsor

A person submitting information under this section shall identify at the time of such submission the portions of such information that the person considers to be confidential information described in subparagraph (A).”

The US Food and Drug Administration (FDA) requires more data to evaluate the safety and efficacy of additional sunscreen ingredients. Some argue this delay limits protective options for people. Efforts to gain approval for new ingredients have faced challenges despite the 2014 Sunscreen Innovation Act. The FDA acknowledges these issues and is researching sunscreen safety for updated regulations.

VI. Patents Act of Singapore

I.Article 13 “Patentable inventions”

*“**(1)** Subject to subsections (2) and (3), a patentable invention is one that satisfies the following conditions:*

***(a)**, the invention is new;*

***(b)**, it involves an inventive step; and*

***(c)**, it is capable of industrial application.*

***(2)** It is hereby declared that the following (among other things) are not inventions for the purposes of this Act, that is to say, anything which consists of —*

***(a)**, a discovery, scientific theory or mathematical method;*

***(b)**, a literary, dramatic, musical or artistic work or any other aesthetic creation whatsoever;*

***(c)**, a scheme, rule or method for performing a mental act, playing a game or doing business, or a program for a computer; or*

***(d)**, the presentation of information,*

but the foregoing provisions shall prevent anything from being treated as an invention for the purposes of this Act only to the extent that a patent or an application for a patent relates to that thing as such.

(3) *An invention the publication or exploitation of which would be generally expected to encourage offensive, immoral or anti-social behaviour is not a patentable invention.*

(4) *For the purposes of subsection (3), behaviour shall not be regarded as offensive, immoral or anti-social only because it is prohibited by any law in force in Singapore.*

(5) *The Minister may, by order published in the Gazette, vary the provisions of subsection (2) for the purposes of maintaining them in conformity with developments in science and technology."*

Prior to initiating a patent application for an invention, the invention must satisfy the prerequisites mandated by law for patent eligibility. These prerequisites encompass the need for the invention to possess novelty, incorporate an inventive element, and demonstrate suitability for industrial application. Failure to fulfill any of these prerequisites renders the invention ineligible for patent protection.

II.Article 46 "Co-ownership of patents and applications for patents"

"(1) *Where a patent is granted to two or more persons, each of them shall, subject to any agreement to the contrary, be entitled to an equal undivided share in the patent.*

(2) *Where two or more persons are proprietors of a patent, then, subject to this section and subject to any agreement to the contrary —*

> ***(a)****, each of them shall be entitled, by himself or his agents, to do in respect of the invention, for his own benefit and without the consent of or the need to account to the other or others, any act which would, apart from this subsection and section 61, amount to an infringement of the patent; and*
>
> ***(b)****, any such act shall not amount to an infringement of the patent.*

(3) *Subject to sections 20 and 47 and to any agreement for the time being in force, where two or more persons are proprietors of a patent, one of them shall not without the consent of the other or others grant a licence under the patent or assign or mortgage a share in the patent.*

(4) *Subject to sections 20 and 47 where two or more persons are proprietors of a patent, anyone else may supply one of those persons with the means, relating to an essential element of the*

invention, for putting the invention into effect, and the supply of those means by virtue of this subsection shall not amount to an infringement of the patent.

(5) *Where a patented product is disposed of by any of two or more proprietors to any person, that person and any other person claiming through him shall be entitled to deal with the product in the same way as if it had been disposed of by a sole registered proprietor.*

(6) *Nothing in subsection (1) or (2) shall affect the mutual rights or obligations of trustees or of the personal representatives of a deceased person, or their rights or obligations as such.*

(7) *This section shall have effect in relation to an application for a patent which is filed as it has effect in relation to a patent and —*

> ***(a)****, references to a patent and a patent being granted shall accordingly include references respectively to any such application and to the application being filed; and*

(b)*, the reference in subsection (5) to a patented product shall be construed accordingly."*

Challenges emerge regarding each co-owner's exploitation and enforcement of jointly owned intellectual property, encompassing concerns about their respective ownership stake, the ability to use the invention without infringing others, and the authorization to license, transfer, or encumber their IP share. Contract law principles govern assignments and licenses, serving as contractual agreements. No specific legal mandates govern jointly owned IP, necessitating unanimous endorsement of relevant documents unless otherwise agreed upon. Notably, under Article 46 of the Patents Act, a co-owner of a patent requires consent from other co-owners to license or assign their patent share.

III. Article 87 "Adaptation of provisions in relation to international application"

*"**(1)** Where an international application for a patent (Singapore) is accorded a filing date under the Patent Co-operation Treaty —*

> ***(a)****, that date or, if the application is re-dated under the Treaty to a later date, that later date shall be treated as the date of filing the application under this Act;*
>
> ***(b)****, any declaration of priority made under the Treaty shall be treated as made under section 17(2), and where in accordance with the Treaty any extra days are allowed, the*

period of 12 months specified in section 17(2) shall be treated as altered accordingly; and

***(c)**, any statement of the name of the inventor under the Treaty shall be treated as a statement filed under section 24(2).*

***(2)** If the application, not having been published under this Act, is published in accordance with the Patent Co-operation Treaty it shall be treated, for purposes other than those mentioned in subsection (3), as published under section 27 when the conditions mentioned in section 86(3)(a) are complied with.*

***(3)** For the purposes of section 61 (use of invention for service of the Government) and section 76 (infringement of rights conferred by publication) the application, not having been published under this Act, shall be treated as published under section 27 —*

***(a),** if it is published in accordance with the Patent Co-operation Treaty in English, on its being so published; and*

***(b)**, if it is so published in a language other than English —*

***(i)**, on the publication of a translation of the application in accordance with section 86(7); or*

***(ii)**, on the service by the applicant of a translation into English of the specification of the application on the Government department concerned or, as the case may be, on the person committing the infringing act.*

***(4)** The reference in subsection (3)(b)(ii) to the service of a translation on a Government department or other person is to its being sent by post or delivered to that department or person.*

***(5)** During the international phase of the application, section 20 does not apply (determination of questions of entitlement in relation to application under this Act); but after the end of the international phase, that section shall apply.*

The PCT application doesn't become a patent; instead, it enters the National/Regional Phase in chosen countries or regions for patent pursuit. This should be done within around 30 months from the priority date. Each country/region's patent application is then pursued separately to obtain granted patents. The option to enter the National/Regional Phase “early” is also available. Even if the applicant refers them as rectifications and even if they are allowable amendments that do not introduce new subject matter beyond the original application, certain

changes like reformulating claims, removing technical terms, limiting or deleting claims, and moving content from the description to the claims, will still be rejected during this phase. This is because they are considered substantive amendments rather than mere rectifications.

VI. RELEVANT CASE LAW

1. *Telstra Corporation Limited v Phone Directories Company Pty Ltd [2010] FCAFC 149 - FEDERAL COURT OF AUSTRALIA*

[… *Whatever else might be said of the kind of efforts required of an author, they must be efforts which result in the material form of the work. The important creative steps which involve the fashioning of the ideas on which a literary work's ultimate form rests are not actions which the Act counts as authorial and this is because what is protected by the copyright monopoly is the form of a work and not the ideas which presage or prefigure it. And this is so even if those ideas can plainly be discerned in the fabric of the material form. The travels reduced to a touring guide, the toils in the library underpinning a substantive work of history and the life led which finally results in an autobiography are not authorial activities however essential they might be to the creation of the work in question. No doubt the quality of many literary works will be much enhanced if their form reflects ideas of sophistication or merit but those ideas go not to the work's originality for copyright purposes save only to the limited extent that they show that the work is not copied from elsewhere. Much skill and hard work – "sweat of the brow" – may be involved in the steps preparatory to the making of the material form of a work but those labours are not what is protected by copyright and are relevant only to show that the work is not copied. That is not, however, to put at nought such ideas but only to emphasise that the skill and labour in a copyright context must always be fixed upon the creation of forms and not ideas* ...]

[… *But a computer program is a tool and it is natural to think that the author of a work generated by a computer program will ordinarily be the person in control of that program. However, care must taken to ensure that the efforts of that person can be seen as being directed to the reduction of a work into a material form. Software comes in a variety of forms and the tasks performed by it range from the trivial to the substantial. So long as the person controlling the program can be seen as directing or fashioning the material form of the work there is no particular danger in viewing that person as the work's author. But there will be cases where the person operating a program is not controlling the nature of the material form produced by*

it and in those cases that person will not contribute sufficient independent intellectual effort or sufficient effort of a literary nature to the creation of that form to constitute that person as its author: a plane with its autopilot engaged is flying itself. In such cases, the performance by a computer of functions ordinarily performed by human authors will mean that copyright does not subsist in the work thus created...]

2. Novartis (Singapore) Pte Ltd v Bristol-Myers Squibb Pharma Co ([2017] SGHC 322*)*

Bristol-Myers filed a PCT application from a US provisional patent application with a priority date of June 11, 1998. However, a typographical error led to the incorrect priority being claimed from a different provisional patent application. This mistake went unnoticed during the PCT application process, and the error was also carried over to subsequent divisional applications.

Then Novartis challenged the validity of priority claim of Bristol-Myers, arguing that the claimed priority was for a different invention. Bristol-Myers attempted to rectify the errors through various means, including an unsuccessful application for corrections using Patents Form 1. They later wrote to Intellectual Property Office of Singapore (IPOS), asserting the obvious nature of the error and the lack of impact on third parties. IPOS ultimately granted the correction under Patents Rule 58, which deals with errors in documents filed for registration.

However, the Singapore High Court ruled that the correction should not have been granted, as the correct priority application number was accurately recorded in the Patent Register and in the published materials. The court's decision prompted IPOS to clarify its rules. It was determined that Patents Form 1 is not a document related to registration, and Rule 91, which pertains to correcting errors in patent specifications, would be the appropriate rule for correcting such errors. IPOS emphasized that correction requests under Rule 91 would be allowed only in exceptional circumstances. Factors for considering exceptional grounds include the impact on third-party rights, the nature of the error, its obviousness, the time since publication, and the reasons for the delay.

3. Shenzhen Tencent Computer System Co., Ltd. v. Shanghai Yingmou Technology Co., Ltd. 2019 - Senior Judge of the IPR Division of the Supreme People's Court of China

The Court determined that the substance produced by the Dreamwriter program qualified as a written work, but it did not depart from the common legal principle that the work must be the product of the author's original creative thought. The Court specifically noted that the article in question was created by the development department of the plaintiff Shenzhen Tencent utilizing Dreamwriter software in order to make the case that the AI-generated object was a work. In terms of data input, trigger condition setup, template and corpus style selections, the arrangement and choosing of the creative team are intellectual activities that directly relate to the particular expression of the article in question.

The presentation of the article was determined by the unique arrangements and decisions made by the target of the plaintiff's production team. As a result, the work in question exhibits some originality and is covered by China's Copyright Law. In other words, the work cited by the Court in the case was hardly inherently independent of human intellectual endeavors and was produced entirely by AI. The literary material was just the outcome of human intellectual work helped by an AI rather than being generated independently by an AI. In this regard, products created with AI's assistance are, of course, covered by copyright laws.

There are numerous pre-written human algorithms in the existent AI, which manifests as a system of machines and systems. It is challenging to claim that a generation created using these algorithms is free from human interference factors, regardless of whether humans actively gave its data. However, given its strengths in machine learning and deep learning, AI may create its own algorithms in addition to those already established by humans. The outcomes of this artificially constructed AI algorithm appear to be autonomously generated outcomes of AI.

There have been no cases involving whether autonomously created products of AI qualify as works covered by the Copyright Law, according to the present judicial practice of the Chinese courts. Naturally, certain judges made clear in their ruling that "The creation of a natural person should still be a required prerequisite for a work to be copyrighted under the Copyright Law." Overall, it is still unclear whether an AI-generated output can qualify as a piece of creative expression covered by the Copyright Law.

4. *T 0161/18 (equivalent aortic pressure/ARC SEIBERSDORF) of 12.5.2020 - European Patent Office*

[… *The appellant argued that the use of an artificial neural network had the technical effect of reliably and accurately determining cardiac output based on the arterial blood curve measured at the periphery, taking into account the narrow-band nature and resonance phenomena in the low-frequency range of the transmission path between the aorta and the periphery with the computing effort being kept within reasonable limits, which enables integration into a mobile and correspondingly handy device. The Chamber is not convinced that the artificial neural network according to claim 1 takes into account the narrow-band nature and resonance phenomena in the low-frequency range of the transmission path between the aorta and the periphery, since neither the claim nor the description contain details regarding the training of the artificial neural network. In the Chamber's view, the mere reference to the fact that weight values are determined by learning does not go beyond what a person skilled in the art understands by an artificial neural network. In the present case, the claimed neural network is therefore not adapted for the specific, claimed application. In the Chamber's opinion, the weight values are only adjusted here without further specification, which is in the nature of every artificial neural network. The board is therefore not satisfied that the claimed effect is achieved in the claimed method over the entire claimed range. Therefore, this effect cannot be taken into account in the sense of an improvement over the prior art when assessing the inventive step...*]

5. *EPO J 0008/20 - 3.1.01*

The Legal Board of Appeal of the European Patent Office issued its decision in J08/20, rejecting an application for an AI-generated invention naming a machine as the inventor. The decision holds that only a natural person can be designated as an inventor under the European Patent Convention (EPC) (Art 81), that inventorship designations need to satisfy specific requirements under the EPC, and it discusses the role of the EPO and the extent to which it can object to inventorship designations. Not only does an inventor need to be a natural person, but where no human inventor can be identified an application designating a machine as an inventor is unprotectable because no rights can be transferred to an applicant. This is the case even if some

EPO Member States allows derivation to patent rights other than through transfer, and even if some Member States do not require inventors to be natural persons. This is the case even if it means there will patentable inventions (under Art 52(1)) for which there is no right to a patent (under Art 60(1)), because in the Board's view allowing these applications would ignore a formal requirement of the EPC. However, "[t]he Board is not aware of any case law which would prevent the user, or the owner of a device involved in an inventive activity to designate himself as inventor under European patent law." Also, if an applicant wishes to report an invention is AI-generated in the specification, they may do so. This approach is similar to the approach of the Bundespatentgerict in Germany (now being appealed by the German Patent Office to their Supreme Court), which allowed the applicant to designate himself as the inventor but to note that the invention was AI-generated in the specification of the patent. The approach solves the problem of lack of patentability, though it is not consistent with jurisdictions such as the US and UK where the inventor must have "conceived" of, or "devised", respectively, the invention—not just someone who owns a computer. A divisional previously filed in the case will allow it to proceed on this basis, namely that the owner of the inventive AI is listed as the inventor, and the AI is designated as having invented the subject matter in the specification.

VII. CONCLUSION

Multinational deposits, registrations, and associated grant processes are made easier by some international accords. Generally speaking, under these agreements, a single deposit, registration, or grant made with or by a central authority is regarded to have the same impact in all countries that the depositor, registrant, or applicant has chosen.

In the case of a multi-State patent license in which the choice-of-law provision refers to the laws of one of the United States, three issues arise: (1) did the parties intend to incorporate federal level concepts such as misuse with respect to both United States and foreign patents, (2) can they do so, and (3) what should be done in the absence of such an understanding? Regarding the first, it would be unexpected to learn that the parties had ever considered this level of issue, much less reached any type of consensus on it. Thus, the following argument is academic. The third question cannot be answered generally since it depends on a variety of factors, including the nature of law in dispute and the location of the seat of the arbitration, among others.

While some principles of application may be helpful in assessing choice-of-law problems in international IP arbitrations, many of the aforementioned issues cannot be answered by making use of a broad range of rules. In these instances, good judgment of the tribunal will be required to strike a balance between what might be opposing factors in order to arrive at a decision that is just, accurately reflects the intentions of the parties, and makes sense within the framework of the law of the various jurisdictions whose IP may be at issue in the arbitration.

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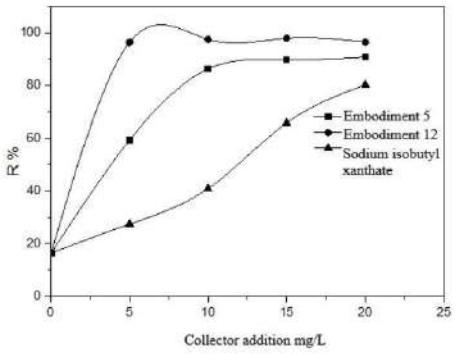
IX. ANNEX (FIRST EVER PATENT AWARDED FOR AN INVENTION MADE BY AI)

JULY 2021 PATENT JOURNAL

21: 2021/03155. 22: 5/10/2021. 43: 6/30/2021
51: B03D
71: BGRIMM TECHNOLOGY GROUP
72: ZHANG, XINGRONG, LU, LIANG, ZHU, YANGGE, ZHAO, ZHIQIANG, LUO, SIGANG, HAN, LONG, XIONG, Wei
33: CN 31: 202110278558.6 32: 2021-03-16
54: SULFIDE ORE FLOTATION COLLECTOR, APPLICATION THEREOF AND SULFIDE ORE FLOTATION METHOD
00: -
The present invention provides a sulfide ore flotation collector, an application thereof and a sulfide ore flotation method. A sulfide ore flotation collector, having the following structural formula:  wherein R is selected from alkylene, aromatic ring, heterocyclic group or C2-C6 alkyl; R1 and R2 are independently selected from H or C2-C12 alkyl; A is selected from C, N, O, S or P; and X1 and X2 are independently selected from groups containing carbon-sulfide bond structures. A sulfide ore flotation method, comprising the following steps: using the sulfide ore flotation collector to carry out flotation on sulfide ore raw material. An application of the sulfide ore flotation collector, which is used for flotation of sulfide ore containing one or more of Cu, Pb, Zn, Fe, Au and Ag, or used for deep desulfurization of iron ore concentrate. The sulfide ore flotation collector provided by the present application has strong ore collecting capacity and high selective collecting performance for useful minerals.



21: 2021/03242. 22: 13/05/2021. 43: 6/24/2021
51: A61M; B65D
71: THALER, Stephen L.
72: DABUS, The invention was autonomously generated by an artificial intelligence
33: EP 31: 18275163.6 32: 2018-10-17
33: EP 31: 18275174.3 32: 2018-11-07
54: FOOD CONTAINER AND DEVICES AND METHODS FOR ATTRACTING ENHANCED ATTENTION
00: -
A container (10) for use, for example, for beverages, has a wall (12) with and external surface (14) and an internal wall (16) of substantially uniform thickness. The wall (12) has a fractal profile which provides a series of fractal elements (18-28) on the interior and exterior surfaces (14-16), forming pits (40) and bulges (42) in the profile of the wall and in which a pit (40) as seen from one of the exterior or interior surfaces (12, 14) forms a bulge (42) on the other of the exterior or interior surfaces (12, 14). The profile enables multiple containers to be coupled together by inter-engagement of pits and bulges on corresponding ones of the containers. The profile also improves grip, as well as heat transfer into and out of the container. Devices for attracting enhanced attention include: an input signal of a lacunar pulse train having characteristics of a pulse frequency of approximately four Hertz and a pulse-train fractal dimension of approximately one- half; and at least one controllable light source configured to be pulsatingly operated by the input signal; wherein a neural flame emitted from at least one controllable light source as a result of the lacunar pulse train is adapted to serve as a uniquely-identifiable signal beacon over potentially-competing attention sources by selectively triggering human or artificial anomaly-detection filters, thereby attracting enhanced attention.

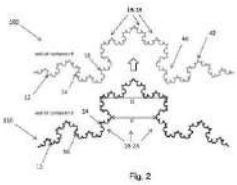
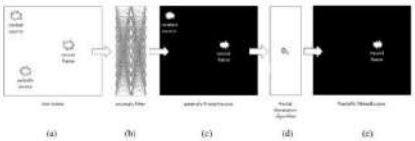


Fig. 2



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