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ARTICLES

COMMENTS

QUESTIONABLE PATENT-ELIGIBILITY OF IOT TECHNOLOGY

PING-HSUN CHEN[1]

ABSTRACT

This article explores whether a claim for Internet of Things ("IoT") technology is patent-eligible. The analysis is based on five Federal Circuit decisions that follow the *Alice* standard. These cases were chosen because the patented technology they discuss is similar to IoT technology. The key issue is whether an IoT claim can pass the step two analysis of the *Alice* standard. The Federal Circuit case law suggests that recitation of an unconventional system may make an IoT claim more likely to be patent-eligible. Even a system composed of existing devices may be unconventional in terms of patent-eligibility. It is very important to describe a technical problem intended to be fixed in the specification. Explaining how those devices actually work to achieve the purpose of the invention is also helpful.

Keywords: Patent, Internet of Things, patent-eligibility, Alice

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INTRODUCTION

The Internet of Things ("IoT") is technology connecting any objects that are capable of transmitting data through the Internet.[2] Those objects include a built-in sensor (e.g., a health and fitness sensor, automobile sensor, home and electricity sensor, employee sensor, and smartphone sensor), which can generate data.[3] IoT technology is beyond the Internet.[4] One machine can communicate with another machine without human intervention.[5] IoT technology enables people to monitor or control their homes through their cell phones.[6] IoT is the foundation of a smart world in the future.[7]

There is an architectural aspect of IoT technology.[8] The IoT architecture comprises four layers: applications, common services, network services, and devices.[9] The application layer is the top level programming that implements business applications or operational logic applications.[10] The common service

2. *See, e.g.*, Jacob Morgan, *A Simple Explanation of 'The Internet of Things'*, FORBES (May 13, 2014), http://www.forbes.com/sites/jacobmorgan/2014/05/13/simple-explanation-internet-things-that-anyone-can-understand/#6bece3876828 [https://perma.cc/522E-GXXW] ("Simply put, [the Internet of Things] is the concept of basically connecting any device with an on and off switch to the Internet (and/or to each other). This includes everything from cellphones, coffee makers, washing machines, headphones, lamps, wearable devices and almost anything else you can think of. This also applies to components of machines, for example a jet engine of an airplane or the drill of an oil rig."); Jamie Lee Williams, *Privacy in the Age of the Internet of Things*, 41 HUM. RTS. 14, 14 (2016) ("The 'Internet of Things' is a loosely defined term referring to a future in which everyday objects have built-in sensors and network connectivity, allowing them to send and receive data on their own—i.e., without human-to-human or human-to-computer interaction."); LEXINNOVA, INTERNET OF THINGS: PATENT LANDSCAPE ANALYSIS 4, *available at* http://www.wipo.int/edocs/plrdocs/en/internet_of_things.pdf [https://perma.cc/SUE9-2WZX] ("Internet of Things (IoT) is a concept that interconnects uniquely identifiable embedded computing devices, expected to offer Human-To-Machine (H2M) communication replacing the existing model of Machine-To-Machine communication.").

3. *See* Scott R. Peppet, Regulating the Internet of Things: First Steps Toward Managing Discrimination, Privacy, Security, and Consent, 93 TEX. L. REV. 85, 98–117 (2014).

4. *See* Daniel Minoli, Building the Internet of Things with IPv6 and MIPv6: The Evolving World of M2M Communications 6 (2013).

5. *See id.*at 5.

6. *See id.* at 7.

7. *See* Hakima Chaouchi, *Introduction to the Internet of Things*, *in* THE INTERNET OF THINGS: CONNECTING OBJECTS TO THE WEB 1, 1 (Hakima Chaouchi ed., 2010).

8. *See* Swaroop Poudel, *Internet of Things: Underlying Technologies, Interoperability, and Threats to Privacy and Security*, 31 BERKELEY TECH. L. J. 997, 1000–03 (2016) (describing the architectural models of IoT provided by two industrial organizations).

9. *See id.* at 1001.

10. *See id.*

layer provides functions, such as storage and processing, necessary to facilitate IoT applications.[11] The network service layer provides data transport, connectivity, and other service functions.[12] The device layer means devices that upload information and receive commands through the network layer or other gateways.[13]

Although IoT technology may cover "sensing, communications, networking, computing, information processing, and intelligent control technologies,"[14] it is still based on Internet technology.[15] Therefore, the patent-eligibility of IoT technology is questionable under *Alice Corporation v. CLS Bank International*,[16] a decision from the Supreme Court in 2014.[17]

Under *Alice,* the standard for patent-eligibility is a two-step test.[18] The first step asks "whether the claims at issue are directed to one of those patent-ineligible concepts."[19] If so, then the second step "consider[s] the elements of each claim both individually and 'as an ordered combination' to determine whether the additional elements 'transform the nature of the claim' into a patent-eligible application."[20] Specifically, the second step searches "for an 'inventive concept'—*i.e.*, an element or combination of elements that is 'sufficient to ensure that the patent in practice amounts to *significantly more than* a patent upon the [ineligible concept] itself.'"[21]

In addition, *Alice* has clarified that "[t]he introduction of a computer into the claims does not alter the analysis at [the second step]."[22] That is, "the mere recitation of a generic computer cannot transform a patent-ineligible abstract idea into a patent-eligible invention."[23] It is not enough to make patent-eligible a claim of an abstract idea by "adding the words 'apply it.'"[24] Even if "the use

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11. *See id.*
12. *See id.*
13. *See id.* at 1001–02.
14. MINOLI, *supra* note 4, at 6.
15. *See id.* at 2 ("[T]he IoT is a new type of Internet application that endeavors to make the thing's information (whatever that may be) available on a global scale using the Internet as the underlying connecting fabric[.]").
16. Alice Corp. v. CLS Bank Int'l, 134 S. Ct. 2347 (2014).
17. *See* Mauricio Paez & Mike La Marca, *The Internet of Things: Emerging Legal Issues for Businesses*, 43 N. KY. L. REV. 29, 62–64 (2016).
18. *See* Annal D. Vyas, Alice in Wonderland v. CLS Bank: The Supreme Court's Fantastic Adventure into Section 101 Abstract Idea Jurisprudence, 9 AKRON INTELL. PROP. J. 1, 13 (2015).
19. *Alice Corp.*, 134 S. Ct. at 2355.
20. *Id.* (quoting Mayo Collaborative Servs. v. Prometheus Labs. Inc., 566 U.S. 66, 78–79 (2012)).
21. *Id.* (emphasis added) (quoting *Mayo*, 566 U.S. at 73).
22. *Id.* at 2357.
23. *Id.* at 2358.
24. *Id.* (quoting *Mayo*, 566 U.S. at 72).

of an abstract idea" in a claim is limited "to a particular technological environment," patent-eligibility cannot be satisfied.[25] Thus, "adding the words 'apply it with a computer'" cannot support patent-eligibility.[26] If the "recitation of a computer amounts to a mere instruction to 'implemen[t]' [sic] an abstract idea 'on . . . a computer,'" such recitation cannot work either.[27]

The *Alice* standard demands a case-by-case approach.[28] Neither the Supreme Court nor the Federal Circuit has defined a "patent-ineligible concept."[29] However, the Federal Circuit has recognized "mathematical algorithms, including those executed on a generic computer" and "fundamental economic and conventional business practices" as abstract ideas.[30] The Federal Circuit case law also suggests that patent-ineligible abstract ideas may be "plainly identifiable and divisible from the generic computer limitations recited by the remainder of the claim."[31]

IoT technology basically has three elements: devices that generate data; communication mechanisms between different devices; and systems or methods for storing and analyzing the data.[32] Based on these characteristics of IoT technology, there have been some cases from the Federal Circuit applying the *Alice* standard to IoT-like inventions where the disputed claims also have the steps of data-generating, data-transmitting (or communication), and storing or analyzing of data.[33] Those cases provide some requirements an IoT invention must meet to be patent-eligible.

This article will explore whether the *Alice* standard makes an invention of IoT technology more likely to be patent-ineligible. Part II describes the

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25. *Id.* (quoting Bilski v. Kappos, 561 U.S. 593, 610 (2010)).

26. *Id.*

27. *Id.* (quoting *Mayo*, 566 U.S. at 84).

28. *See* David B. Heedy, Has Alice Brought Us to Patent Wonderland?: Can the Supreme Court's New Analysis of Abstract Ideas Affect the Current Problems Associated with Business-Method and Software Patents, 15 FLA. ST. U. BUS. REV. 57, 71 (2016).

29. *See* Amdocs (Israel) Ltd. v. Openet Telecom, Inc., 841 F.3d 1288, 1294 (Fed. Cir. 2016) ("The problem with articulating a single, universal definition of 'abstract idea' is that it is difficult to fashion a workable definition to be applied to as-yet-unknown cases with as-yet-unknown inventions.").

30. *See* DDR Holdings, LLC v. Hotels.com, L.P., 773 F.3d 1245, 1256 (Fed. Cir. 2014).

31. *See id.*

32. *See* W. Keith Robinson, *Patent Law Challenges for the Internet of Things*, 15 WAKE FOREST J. BUS. & INTELL. PROP. L. 655, 657 (2015).

33. *See, e.g.*, Content Extraction & Transmission LLC v. Wells Fargo Bank, Nat. Ass'n, 776 F.3d 1343, 1345 (Fed. Cir. 2014), *cert. denied*, 136 S. Ct. 119 (2015); Vehicle Intelligence & Safety LLC v. Mercedes-Benz USA, LLC, 635 F. App'x 914 (Fed. Cir. 2015), *cert. denied*, 136 S. Ct. 2390 (2016); Elec. Power Grp., LLC v. Alstom S.A., 830 F.3d 1350, 1351 (Fed. Cir. 2016); TDE Petroleum Data Sols., Inc., v. AKM Enter., Inc., 657 F. App'x 991 (Fed. Cir. 2016); *Amdocs (Israel) Ltd.*, 841 F.3d at 1291.

selection of five Federal Circuit cases by introducing the claims in dispute and the relationship between the patented inventions and IoT technology. Part III analyzes the application of step one of the *Alice* standard in those five cases and the implications of whether IoT claims are considered directed to an abstract idea. Part IV discusses the application of step two of the *Alice* standard in those five cases and possible patent-eligible features of IoT claims.

I. FEDERAL CIRCUIT CASES CONCERNING IOT-LIKE TECHNOLOGY

IoT technology relies on devices to detect information and transform the information into data for analysis.[34] Although apparatus or product claims covering IoT devices may be patent-eligible, method claims for using or operating these IoT devices individually or as a system may not be patent-eligible. There are five Federal Circuit cases where the inventions involved were not referred to as IoT technology, but the inventions are similar to IoT technology. These cases are briefly introduced in chronological order.

A. Content Extraction & Transmission LLC v. Wells Fargo Bank, National Ass'n

In *Content Extraction & Transmission LLC v. Wells Fargo Bank, National Ass'n*, four patents were allegedly infringed.[35] The representative patent was U.S. Patent No. 5,258,855 ("855 Patent") covering a system of processing information originating from a hard copy document.[36] The invention was software enabling an automated teller machine ("ATM") to scan a check, recognize certain information on the check, and place that information in certain data fields of a memory device.[37] The representative claim of the 855 Patent was claim 1, which recites:

> 1. A method of processing information from a diversity of types of hard copy documents, said method comprising the steps of:
> (a) receiving output representing a diversity of types of hard copy documents from an automated digitizing unit and storing information from said diversity of types of hard copy documents into a memory, said information not fixed from one document to the next, said receiving step not preceded by scanning, via said automated digitizing unit, of a separate document containing format requirements;
> (b) recognizing portions of said hard copy documents corresponding to a first data field; and

34. *See* Peppet, *supra* note 3, at 98–117 (explaining different kinds of sensors).
35. Content Extraction & Transmission LLC, 776 F.3d at 1345.
36. U.S. Patent No. 5,258,855 col. 1 ll. 5–10.
37. Content Extraction & Transmission LLC, 776 F.3d at 1345.

> (c) storing information from said portions of said hard copy documents corresponding to said first data field into memory locations for said first data field.[38]

The Federal Circuit held that the disputed claims were patent-ineligible, because "none of [the disputed] claims amount to 'significantly more' than the abstract idea of extracting and storing data from hard copy documents using generic scanning and processing technology."[39]

The technology in *Content Extraction* is similar to sensors used in IoT technology. The "automated digitizing unit" in claim 1 of the 855 Patent is actually a scanner that detects a check inserted into an ATM machine.[40] The information on the check is similar to the environmental information a sensor is designed to detect.[41] Thus, *Content Extraction* can be applied to cases concerning a method claim for using a sensor to collect and analyze data in general.

B. Vehicle Intelligence & Safety LLC v. Mercedes-Benz USA, LLC

In *Vehicle Intelligence & Safety LLC v. Mercedes-Benz USA, LLC*,[42] the disputed patent was U.S. Patent No. 7,394,392 ("392 Patent").[43] The invention covered a system designed to detect whether an equipment operator is impaired and, if the operator was impaired, then the system would start to control the equipment.[44]

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38. *Id.*

39. *Id.* at 1349.

40. *See* '855 Patent col. 4 ll. 53–63; *see also Content Extraction & Transmission LLC*, 776 F.3d at 1348 ("There is no 'inventive concept' in CET's use of a generic scanner and computer . . . .")

41. *See* '855 Patent col. 4 ll. 53–63; *see also Content Extraction & Transmission LLC*, 776 F.3d at 1348 ("At most, CET's claims attempt to limit the abstract idea of recognizing and storing information from hard copy documents using a scanner and a computer . . . .")

42. Vehicle Intelligence & Safety LLC v. Mercedes-Benz USA, LLC, 635 F. App'x 914 (Fed. Cir. 2015), *cert. denied*, 136 S. Ct. 2390 (2016).

43. *Id.* at 915.

44. U.S. Patent No. 7,394,392 col.5 ll. 26–38.

Claims 8 and 16 of the 392 Patent were representative claims.[45] Claim 8 recited:

> 8. A method to screen an equipment operator for impairment, comprising:
>
> screening an equipment operator by one or more expert systems to detect potential impairment of said equipment operator;
>
> selectively testing said equipment operator when said screening of said equipment operator detects potential impairment of said equipment operator; and
>
> controlling operation of said equipment if said selective testing of said equipment operator indicates said impairment of said equipment operator, wherein said screening of said equipment operator includes *a time-sharing allocation of at least one processor executing at least one expert system*.[46]

Claim 16 recited:

> 16. A system to screen an equipment operator, comprising:
>
> a screening module to screen and selectively test an equipment operator when said screening indicates potential impairment of said equipment operator, wherein said screening module utilizes one or more expert system modules in screening said equipment operator; and
>
> a control module to control operation of said equipment if said selective testing of said equipment operator indicates said impairment of said equipment operator, wherein said screening module includes one or more expert system modules that utilize *at least a portion of one or more equipment modules selected from the group of equipment modules* consisting of: an operations module, an audio module, a navigation module, an anti-theft module, and a climate control module.[47]

The Federal Circuit concluded that the disputed claims merely stated "the abstract idea of testing an equipment operator for impairments using an unspecified 'expert system' running on equipment that already exists in various

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45. *See Vehicle Intelligence*, 635 F. App'x at 916.
46. *Id.* (emphasis added).
47. *Id.* (emphasis added).

vehicles."[48] Therefore, the court held that the disputed claims were not patent-eligible.[49]

The technology in *Vehicle Intelligence* is similar to the IoT technology that deploys sensors in a workplace to monitor employees.[50] For example, a hand-hygiene monitoring system uses different sensors near sinks or soap-dispensers and on workers' uniforms to monitor whether workers wash their hands before touching a customer's personal items.[51] Monitoring whether an operator is impaired is similar to monitoring whether a worker washes his hands. Thus, *Vehicle Intelligence* can be applied to IoT technology for monitoring employees.

More importantly, *Vehicle Intelligence* shows that the recitation of "system" in an IoT claim cannot support patent-eligibility. Thus, while this paper focuses on method claims, the analysis of the patent-eligibility issue is also applicable to system claims.

C. Electric Power Group, LLC v. Alstom S.A.

In *Electric Power Group., LLC v. Alstom S.A.*, the defendant was accused of infringing three patents, and U.S. Patent No. 8,401,710 ("710 Patent") was the representative patent for the patent-eligibility analysis.[52] The patented invention covered "systems and methods for performing real-time performance monitoring of an electric power grid by collecting data from multiple data sources, analyzing the data, and displaying the results."[53]

The representative claim was claim 12 of the 710 Patent, which recites:

> 12. A method of detecting events on an interconnected electric power grid in real time over a wide area and automatically analyzing the events on the interconnected electric power grid, the method comprising:
>
> receiving a plurality of data streams, each of the data streams comprising sub-second, time stamped synchronized phasor measurements wherein the measurements in each stream are collected in real time at geographically distinct points over the wide area of the interconnected electric power grid, the wide area comprising at least

48. *Id.* at 920.
49. *Id.*
50. *See* Peppet, *supra* note 3, at 112.
51. *See id.*
52. Elec. Power Grp., LLC v. Alstom S.A., 830 F.3d 1350, 1351 (Fed. Cir. 2016).
53. *Id.*

two elements from among control areas, transmission companies, utilities, regional reliability coordinators, and reliability jurisdictions;

receiving data from other power system data sources, the other power system data sources comprising at least one of transmission maps, power plant locations, EMS/SCADA systems;

receiving data from a plurality of non-grid data sources;

detecting and analyzing events in real-time from the plurality of data streams from the wide area based on at least one of limits, sensitivities and rates of change for one or more measurements from the data streams and dynamic stability metrics derived from analysis of the measurements from the data streams including at least one of frequency instability, voltages, power flows, phase angles, damping, and oscillation modes, derived from the phasor measurements and the other power system data sources in which the metrics are indicative of events, grid stress, and/or grid instability, over the wide area;

displaying the event analysis results and diagnoses of events and associated ones of the metrics from different categories of data and the derived metrics in visuals, tables, charts, or combinations thereof, the data comprising at least one of monitoring data, tracking data, historical data, prediction data, and summary data;

displaying concurrent visualization of measurements from the data streams and the dynamic stability metrics directed to the wide area of the interconnected electric power grid;

accumulating and updating the measurements from the data streams and the dynamic stability metrics, grid data, and non-grid data in real time as to wide area and local area portions of the interconnected electric power grid; and

deriving a composite indicator of reliability that is an indicator of power grid vulnerability and is derived from a combination of one or more real time measurements or computations of measurements from the data streams and the dynamic stability metrics covering the wide area as well as non-power grid data received from the non-grid data source.[54]

54. *Id.* at 1351–52 (emphasis added).

The Federal Circuit held the disputed claims patent-ineligible because they did not "state an arguably inventive concept in the realm of application of the information-based abstract ideas."[55]

The technology in *Electric Power* is comparable to power line communication ("PLC") technology that "enables sending data over existing power cables" and uses "power cables running to an electronic device (for example) [to] both power it up and at the same time control/retrieve data from it."[56] The PLC technology is applied to private electricity networks.[57]

In addition, *Electric Power* suggests that the complexity of information processing does not change the nature of abstractness of a patent-ineligible claim. The Federal Circuit held that "a large portion of the lengthy claims is devoted to enumerating types of information and information sources available within the power-grid environment."[58] By characterizing such portion as "merely selecting information, by content or source, for collection, analysis, and display," the court found "nothing significant to differentiate a process from ordinary mental processes, whose implicit exclusion from § 101 undergirds the information-based category of abstract ideas."[59]

D. TDE Petroleum Data Solutions, Inc., v. AKM Enterprise, Inc.

In *TDE Petroleum Data Solutions, Inc., v. AKM Enterprise, Inc.*, the patent in dispute, U.S. Patent 6,892,812 ("812 Patent"), covered "various processes for determining the state of an oil well drill . . . by receiving data from sensors deployed on the oil well."[60]

The representative claim was claim 1 of the 812 Patent, which recites:

> 1. An automated method for determining the state of a well operation, comprising:
>
> storing a plurality of states for a well operation;

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55. *Id.* at 1356.

56. Cypress Semiconductor, *What is Power Line Communication?*, EE TIMES, Aug. 17, 2011, https://www.eetimes.com/document.asp?doc_id=1279014 [perma.cc/3DN9-Y2EL] (last visited Dec. 28, 2017).

57. *See* Xavier Carcelle & Thomas Bourgeau, *Power Line Communication Technology Overview*, *in* THE INTERNET OF THINGS: CONNECTING OBJECTS TO THE WEB 97, 98 (Hakima Chaouchi ed., 2010).

58. *Elec. Power Grp., LLC*, 830 F.3d at 1355.

59. *Id.*

60. TDE Petroleum Data Sols., Inc., v. AKM Enter., Inc., 657 F. App'x 991, 992 (Fed. Cir. 2016).

> receiving mechanical and hydraulic data reported for the well operation from a plurality of systems; and
>
> determining that at least some of the data is valid by comparing the at least some of the data to at least one limit, the at least one limit indicative of a threshold at which the at least some of the data do not accurately represent the mechanical or hydraulic condition purportedly represented by the at least some of the data; and
>
> when at least some of the data are valid, based on the mechanical and hydraulic data, automatically selecting one of the states as the state of the well operation.[61]

The Federal Circuit found that "claim 1 is the sort of data gathering and processing claim that is directed to an abstract idea under step one of the *Alice* analysis."[62] In addition, the court criticized that the patentee "does not and cannot argue that storing state values, receiving sensor data, validating sensor data, or determining a state based on sensor data is individually inventive" and that the disputed claims merely represent "the most ordinary of steps in data analysis and are recited in the ordinary order."[63] Eventually, the court concluded that the disputed claims were patent-ineligible because they recited "the *what* of the invention, but none of the *how* that is necessary to turn the abstract idea into a patent-eligible application."[64]

The technology in *TDE Petroleum* is comparable to IoT technology concerning smart manufacturing.[65] Smart manufacturing includes "a network of advanced sensors, data analytics, and process controls so they can communicate and exchange data throughout a factory or even across multiple manufacturing sites."[66] The purpose of smart manufacturing is to improve energy efficiency and productivity.[67]

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61. *Id.*

62. *Id.* at 993.

63. *Id.*

64. *Id.* (alteration in original).

65. *See* Kevin O'Marah, *The Internet of Things Will Make Manufacturing Smarter*, INDUSTRYWEEK, Aug. 14, 2015, http://www.industryweek.com/manufacturing-smarter [https://perma.cc/N8C5-AMYH] (last visited Jan. 1, 2018).

66. Office of Energy Efficiency & Renewable Energy, U.S. DEP'T OF ENERGY, *Smart Manufacturing: Transforming American Manufacturing with Information Technology*, https://energy.gov/eere/amo/articles/smart-manufacturing-transforming-american-manufacturing-information-technology [https://perma.cc/S3S9-VNQV](last visited Jan. 3, 2018).

67. *Id.*

E. Amdocs (Israel) Ltd. v. Openet Telecom, Inc.

In *Amdocs (Israel) Ltd. v. Openet Telecom, Inc.*, four patents were involved.[68] They were originated from U.S. Patent No. 6,418,467.[69] Two of them, United States Patent Nos. 6,947,984 ("984 Patent") and 6,836,797 ("797 Patent"), are relevant to the IoT technology. The 984 Patent covered "a system and accompanying method and computer program for reporting on the collection of network usage information from a plurality of network devices."[70] The 797 Patent covered "a system, method, and computer program for generating a single record reflecting multiple services for accounting purposes."[71] Both patents were found patent-eligible.[72] They all passed step two of the *Alice* standard, and the Federal Circuit did not go through step one.[73]

The Federal Circuit chose claim 1 of the 984 Patent as the representative claim.[74] Claim 1 recited:

> 1. A method for reporting on the collection of network usage information from a plurality of network devices, comprising:
>
> (a) collecting network communications usage information in real-time from a plurality of network devices at a plurality of layers utilizing multiple gatherers each including a plurality of information source modules each interfacing with one of the network devices and capable of communicating using a protocol specific to the network device coupled thereto, the network devices selected from the group consisting of routers, switches, firewalls, authentication servers, web hosts, proxy servers, netflow servers, databases, mail servers, RADIUS servers, and domain name servers, the gatherers being positioned on a segment of the network on which the network devices coupled thereto are positioned for minimizing an impact of the gatherers on the network;
>
> (b) filtering and aggregating the network communications usage information;

68. Amdocs (Israel) Ltd. v. Openet Telecom, Inc., 841 F.3d 1288, 1290 (Fed. Cir. 2016).
69. *Id.* at 1291.
70. *Id.*
71. *Id.*
72. *Id.* at 1305–06.
73. *See id.* at 1304–05.
74. *Id.* at 1304.

(c) completing a plurality of data records from the filtered and aggregated network communications usage information, the plurality of data records corresponding to network usage by a plurality of users;

(d) storing the plurality of data records in a database;

(e) allowing the selection of one of a plurality of reports for reporting purposes;

(f) submitting queries to the database utilizing the selected reports for retrieving information on the collection of the network usage information from the network devices; and

(g) outputting a report based on the queries.[75]

Claim 1 of the 797 Patent was the other representative claim in the court's analysis and recited:

1. A method for generating a single record reflecting multiple services for accounting purposes, comprising:

(a) identifying a plurality of services carried out over a network;

(b) collecting data describing the plurality of services; and

(c) generating a single record including the collected data, wherein the single record represents each of the plurality of services;

wherein the services include at least two services selected from a group consisting of a hypertext transfer protocol (HTTP) session, an electronic mail session, a multimedia streaming session, a voice over Internet Protocol (IP) session, a data communication session, an instant messaging session, a peer-to-peer network application session, a file transfer protocol (FTP) session, and a telnet session;

wherein the data is collected utilizing an enhancement procedure defined utilizing a graphical user interface by:

listing a plurality of available functions to be applied in real-time prior to end-user reporting,

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75. *Id.*

> allowing a user to choose at least one of a plurality of fields, and
>
> allowing the user to choose at least one of the listed functions to be applied to the chosen field in real-time prior to the end-user reporting.[76]

The technology in *Amdocs* relates to management of accounting information for services in a computer network.[77] Thus, *Amdocs* is helpful for considering the patent-eligibility issue of IoT applications in the accounting field, such as day-to-day auditing,[78] cloud accounting,[79] and real-time accounting.[80]

II. IOT TECHNOLOGY AND STEP ONE ANALYSIS OF THE *ALICE* STANDARD

Electric Power identified three categories of claims directed to an "abstract idea" under step one of the *Alice* standard: (1) a claim of "collecting information, including when limited to particular content (which does not change its character as information)";[81] (2) a claim of "analyzing information by steps people go through in their minds, or by mathematical algorithms, without more";[82] and (3) a claim of "merely presenting the results of abstract processes of collecting and analyzing information, without more (such as identifying a particular tool for presentation)."[83] In addition, a claim with the combination of collecting, analyzing, or presenting information may be an additional category of "abstract idea."[84] The disputed claims in *Electric Power* were characterized as "the combination of those [three] abstract-idea processes" because they focused on "collecting information, analyzing it, and displaying certain results of the collection and analysis."[85] Therefore, the

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76. *Id.* at 1305.

77. *See, e.g.*, U.S. Patent No. 6,947,984 col. 1 ll. 26–27; U.S. Patent No. 6,836,797 col. 1 ll. 21–28.

78. *See* Jean Loh, *Accounting and the IoT: Time to Simplify Processes*, DIGITALIST MAGAZINE, June 13, 2017, http://www.digitalistmag.com/finance/2017/06/13/accounting-and-the-iot-time-to-simplify-processes-05132004 [https://perma.cc/254Z-VHKE] (last visited Jan. 1, 2018).

79. *See* Ritesh Mehta, *The Impact of IoT in the Accounting Field*, CSO, Aug. 5, 2017, https://www.cso.com.au/blog/cso-bloggers/2017/08/25/the-impact-of-iot-in-the-accounting-field/ [https://perma.cc/EV6W-LLSP] (last visited Jan. 1, 2018).

80. *See* Elliot Jay, *The IoT and the Finance Function*, INNOVATION ENTERPRISE, Sept. 7, 2017, https://channels.theinnovationenterprise.com/articles/the-iot-and-the-finance-function [https://perma.cc/54L5-42DD] (last visited Jan. 1, 2018).

81. Elec. Power Grp., LLC v. Alstom S.A., 830 F.3d 1350, 1353 (Fed. Cir. 2013).

82. *Id.* at 1354.

83. *Id.*

84. *See id.*

85. *Id.* at 1353–54.

Federal Circuit held that the disputed claims "fall into a familiar class of claims 'directed to' a patent-ineligible concept."[86]

Content Extraction indicates that adding a step of storing collected or analyzed information cannot change the nature of abstractness. The Federal Circuit held that the disputed claims in *Content Extraction* were "drawn to the abstract idea of 1) collecting data, 2) recognizing certain data within the collected data set, and 3) storing that recognized data in a memory."[87] The court also stated that "[t]he concept of data collection, recognition, and storage is undisputedly well-known [because] humans have always performed these functions."[88]

Electric Power and *Content Extraction* together are instructive for determining whether an IoT claim is directed to an abstract idea under step one of the *Alice* standard because IoT technology also deals with information processing. IoT technology is a mixture of devices, communication technology, and data-mining technology.[89]

The main features of IoT technology include "smart devices connecting consumer objects and industrial equipment to the Internet [and software] enabling information gathering and management of these devices."[90] With those features, an invention of IoT technology may "increase efficiency, enable new services, or achieve other health, safety and environmental benefits."[91] Therefore, the nature of IoT technology could be described as a combination of collecting data, transmitting or receiving data, storing data, analyzing data, making a decision based on those data, and using devices or equipments to do so.

An IoT claim will recite steps of doing something with data or implementing something to achieve the goal of the invention. It is easy for an IoT claim to fall within any of three categories of abstract-idea claims set forth in *Electric Power* or a combination of any of these categories. In addition, *Content Extraction* indicates that an IoT claim cannot merely recite steps that have been practiced for some time by industries.[92] Thus, an IoT claim may be considered as being directed to an abstract idea.

However, *Electric Power* may indicate that an IoT claim can pass step one of the *Alice* standard if courts find any particularly-invented technology to

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86. *Id.* at 1353.

87. Content Extraction & Transmission LLC v. Wells Fargo Bank, Nat. Ass'n, 776 F.3d 1343, 1347 (Fed. Cir. 2014).

88. *Id.*

89. *See* Poudel, *supra* note 8, at 1003–08.

90. H. Michael O'Brien, *The Internet of Things*, 19 (no.12) J. INTERNET L. 1, 12 (2016).

91. *Id.*

92. *See* Content Extraction & Transmission LLC, 776 F.3d at 1347.

execute the claims steps.[93] *Electric Power* requires a finding of "computer-functionality improvements" in a claim.[94] It should be noted that adding a device limitation to an IoT claim does not help if the recitation is merely what an ordinary device or general computer can do.[95] For example, the Federal Circuit in *Electric Power* criticized the disputed claims for focusing on "certain independently abstract ideas that use computers as tools."[96] In *Content Extraction*, as a response to the patentee's assertion that "its claims require not only a computer but also an additional machine—a scanner,"[97] the Federal Circuit pointed to *Alice* and *Dealertrack, Inc. v. Huber*[98] and emphasized that although the disputed claim in *Alice* required a computer to process streams of bits, and the disputed claim in *Dealertrack, Inc.* required a clearinghouse to process information, they were found ineligible as an abstract idea.[99] In *TDE Petroleum*, the Federal Circuit held that the representative claim was directed to an abstract idea, while finding that "[t]he steps of [the representative claim] recite operations performed by any general-purpose computer."[100]

Last, *Vehicle Intelligence* implies that the inclusion of an unconventional device implementing those steps in an IoT claim may help pass step one of the *Alice* standard, but such inclusion is not helpful if no details of such an unconventional device are recited. The Federal Circuit concluded that the disputed claims were drawn to "specifically the abstract idea of testing operators of any kind of moving equipment for any kind of physical or mental impairment."[101] The court found that "[n]one of the claims at issue are limited to a particular kind of impairment, explain how to perform either screening or testing for any impairment, specify how to program the 'expert system' to perform any screening or testing, or explain the nature of control to be exercised on the vehicle in response to the test results."[102] Although the patentee asserted that the use of an expert system would improve the conventional method to

93. *See* Elec. Power Grp., LLC v. Alstom S.A., 830 F.3d 1350, 1354 (Fed. Cir. 2013) ("The advance [the disputed claims] purport to make is a process of gathering and analyzing information of a specified content, then displaying the results, and not any particular assertedly inventive technology for performing those functions.").

94. *See id.*

95. *Id.*

96. *Id.*

97. Content Extraction & Transmission LLC, 776 F.3d at 1347.

98. Dealertrack, Inc. v. Huber, 674 F.3d 1315 (Fed. Cir. 2012).

99. See Content Extraction & Transmission LLC, 776 F.3d at 1347.

100. TDE Petroleum Data Sols., Inc., v. AKM Enter., Inc., 657 F. App'x 991, 993 (Fed. Cir. 2016).

101. Vehicle Intelligence & Safety LLC v. Mercedes-Benz USA, LLC, 635 F. App'x 914, 917 (Fed. Cir. 2015).

102. *Id.*

provide "faster, more accurate and reliable impairment testing," the court responded that the disputed claims and specification failed to "provide any details as to how this 'expert system' works or how it produces faster, more accurate and reliable results."[103]

In addition, the court discussed how the specification describes syndromes for determining whether a vehicle operator is impaired and modules for making a determination and response.[104] The court criticized that "[a]t best, the [disputed] patent answers the question of how to provide faster, more accurate and reliable impairment testing by simply stating 'use an expert system.'"[105]

Vehicle Intelligence requires a claim to recite how such an unconventional device will work specifically to achieve the purposes of the invention. Taking the claimed invention as an example, the *Vehicle Intelligence* court specified what should be recited: (1) "how the existing vehicle equipment can be used to measure these characteristics";[106] (2) "assuming these measurements can be made, how the decision module determines if an operator is impaired based on these measurements";[107] (3) "assuming this determination can be made, how the decision module decides which control response to make";[108] and (4) "assuming the control response decision can be made, how the 'expert system' effectuates the chosen control response."[109] These four requirements suggest that, to pass step one of the *Alice* standard, an IoT claim must state a method of operating an unconventional device rather than a conceptual procedure of using such device.

III. IOT TECHNOLOGY AND STEP TWO ANALYSIS OF THE *ALICE* STANDARD

A. Unconventional System with Details

Among those cases involving IoT-like technology, only the disputed claims in *Amdocs* passed step two of the *Alice* standard. *Amdocs* indicates that an IoT claim with an unconventional system composed of existing devices may be patent-eligible if the specification describes how such system performs in a way that such performance does not fall within the general functions of those existing devices.

In *Amdocs*, the Federal Circuit held that the disputed claims in the 984 Patent and 797 Patent passed step two of the *Alice* standard and were patent-

103. *Id.*
104. *See id.* at 917–18.
105. *Id.* at 918.
106. *Id.*
107. *Id.*
108. *Id.*
109. *Id.*

eligible.[110] Regarding the 984 Patent, the court found that the steps of "collecting," "filtering and aggregating," and "completing" in the disputed claims were based on the invention's distributed architecture described in the specification.[111] Second, although finding "some of the components and functions [in the disputed claims] may appear generic," the court held that "several limitations are individually unconventional (e.g., completing depends upon distributed enhancing) and the overall ordered combination of all of the limitations was unconventional."[112] The court further recognized that such a combination "produced the advantage over the prior art by solving the technological problem at stake."[113]

Regarding the 797 Patent, the court found that the steps of "collecting" and "generating" and the "enhancement procedure" limitation in the disputed claims were executed through the invention's distributed architecture.[114] Second, while recognizing that "the components and functionality necessarily involved in the '797 patent (e.g., ISMs, gatherers, network devices, collection, aggregation, and enhancement) may be generic at first blush," the court found that the specification showed that "many of these components and functionalities are in fact neither generic nor conventional individually or in ordered combination."[115] The court further held that "a specific, unconventional technological solution . . . to a technological problem" has been described so narrowly that there are no preemption concerns.[116]

The key patent-eligible feature in *Amdocs* is a "distributed architecture."[117] The *Amdocs* court described the "distributed architecture" as a system including "network devices; information source modules ('ISMs'); gatherers; a central event manager ('CEM'); a central database; a user interface server; and terminals or clients," where "these components are arrayed in a distributed architecture that minimizes the impact on network and system resources."[118] The court also recognized that the specification of each disputed patent "explains that [the distributed architecture] is an advantage over prior art systems that stored information in one location, which made it difficult to keep

110. Amdocs (Israel) Ltd. v. Openet Telecom, Inc., 841 F.3d 1288, 1304–05 (Fed. Cir. 2016).

111. *Id.* at 1304 (citing U.S. Patent No. 6,947,984 col. 3 ll. 28–32, col. 3 ll. 56–57, col. 4 ll. 3–13, col. 6 ll. 45–54).

112. *Id.*

113. *Id.*

114. *Id.* at 1305-06 (citing U.S. Patent No. 6,836,797 col. 5 ll. 39–45, col. 6 ll. 1–2, col. 6 ll. 16–26, col. 8 ll. 64–67, col. 9 ll. 1–4, col. 9 ll. 36–61).

115. *Id.* at 1306.

116. *Id.*

117. *See id.* at 1291–92.

118. *Id.* at 1291.

up with massive record flows from the network devices and which required huge databases."[119]

The *Amdocs* court was looking for a specific technical problem that the invention tries to overcome. For example, the distributed architecture in *Amdocs* can "reduc[e] congestion in network bottlenecks, while still allowing data to be accessible from a central location,"[120] but in the prior art, as the specification of the 984 Patent states, "all the network information flows to one location, making it very difficult to keep up with the massive record flows from the network devices and requiring huge databases."[121] The 797 Patent also mentions the same problem.[122]

The *Amdocs* court was also looking for the connections between the claimed steps, distributed architecture, and technical problem. For example, the 984 Patent states that "[d]ata collection and management is designed for efficiency to minimize impact on the network and system resources."[123] The 797 Patent mentions that "[d]istributed filtering and aggregation eliminates system capacity bottlenecks."[124]

The distributed architecture in *Amdocs* is analogous to an IoT invention. For example, the 984 Patent describes "network devices" as "the types of sources of information that could be accessed."[125] So, the network devices are equivalent to sensors used in IoT technology. Under *Amdocs*, whether an IoT invention is patent-eligible then becomes two questions. The first question asks whether such IoT invention resolves a problem that reaches a level of the specific technical problem identified in *Amdocs*. The second asks whether the components of such IoT invention can function together to resolve the targeted problem. Therefore, *Amdocs* indicates that a patent application for an IoT invention must identify a problem and describe how sensors and other devices can work together to resolve such a problem.

B. Unconventional System without Details

Like *Amdocs*, the disputed claims in *Vehicle Intelligence* recite some unconventional systems, such as "specialized existing equipment modules" and

119. *Id.* at 1292.

120. *Id.*; *see also* U.S. Patent No. 6,947,984 col. 4 ll. 7–9.

121. U.S. Patent No. 6,947,984 col. 4 ll. 10–13.

122. *See* U.S. Patent No. 6,836,797 col. 6 ll. 22–26; *see also Amdocs (Israel) Ltd.*, 841 F.3d at 1306.

123. U.S. Patent No. 6,947,984 col. 3 ll. 30–32; *see also Amdocs (Israel) Ltd.*, 841 F.3d at 1305.

124. U.S. Patent No. 6,836,797 col. 6 ll. 1–2; *see also Amdocs (Israel) Ltd.*, 841 F.3d at 1305.

125. U.S. Patent No. 6,947,984 col. 4 ll. 49–65.

"expert systems,"[126] but the *Vehicle Intelligence* court concluded that "[n]othing in these claims—considered as individual elements or an ordered combination—disclose an inventive concept sufficient to transform the abstract idea of testing operators of any kind of moving equipment for any kind of physical or mental impairment into a patent-eligible application of that idea."[127] Although the patentee offered four arguments for the patent-eligibility of the disputed claims, the Federal Circuit denied all of them.[128] The *Vehicle Intelligence* court's responses to those arguments indicate that an IoT claim with an unconventional system may pass step two if the specification discloses how such system performs unconventional functions.

First, the patentee argued that the disputed claims "are embedded in 'specialized existing equipment modules,' as opposed to generic computers[.]"[129] The court found that the "specialized existing equipment modules" cover two groups of things: "the gas and brake pedals and the steering wheel of a car" and "stereo, navigation, anti-theft, and climate-control systems."[130] The first group was covered by "an operations module" described in the specification of the 392 Patent as part of a typical vehicle,[131] while the second group was described as existing modules.[132] However, the court criticized that the specification failed to explain "*how* the methods at issue can be embedded into these existing modules."[133] Though, the court recognized two claim limitations, "at least a portion of one or more equipment modules" recited in claims 9, 12, and 16–18[134] and "a time-sharing allocation of at least one processor executing at least one expert system" recited in claims 8, 9, and 11–15,[135] as what may implement the claimed method in those "specialized existing equipment modules," but the court criticized that "[t]he specification does not provide any more detail."[136]

Second, the patentee alleged that "executing its expert systems using existing equipment modules 'would entail hardware and software differences

126. Vehicle Intelligence & Safety LLC v. Mercedes-Benz USA, LLC, 635 F. App'x 914, 918 (Fed. Cir. 2015).

127. *Id.* at 919.

128. *Id.* at 919–20.

129. *Id.* at 919.

130. *Id.* (citing U.S. Patent No. 7,394,392 col. 6 ll. 32–49, col. 12 ll. 10–15).

131. *See* U.S. Patent No. 7,394,392 col. 6 ll. 35–39.

132. *See id.* at col. 12 ll. 28–34.

133. *Vehicle Intelligence*, 635 F. App'x at 919 (emphasis added).

134. *See* U.S. Patent No. 7,394,392 col. 15 ll. 45–46, col. 16 ll. 8–9, 57–58. Claims 17 and 18 are dependent claims of claim 16.

135. *See* U.S. Patent No. 7,394,392 col. 15 ll. 41–43. Claims 9 and 11–15 are dependent claims of claim 8.

136. *Id.*

compared to execution in a larger generic computer.'"[137] However, the court found that the specification "is completely devoid of any explanation of what these hardware and software differences are [and] *how* to implement them using the existing equipment modules."[138] The court also characterized the patentee's allegation as tying the claimed methods "to particular machines and that alone is sufficient to confer eligibility."[139] The court clarified that under the *Alice* standard, "this is no longer sufficient to render a claim patent-eligible."[140] Therefore, the court concluded that "[m]erely stating that the methods at issue are performed on already existing vehicle equipment, without more, does not save the disputed claims from abstraction."[141]

The patentee's third argument was based on "four [alleged] inventive concepts in the claims at issue: 1) screening by one or more expert systems; 2) selectively testing; 3) a time-sharing allocation of at least one processor; and 4) a screening module that includes one or more expert systems that use at least a portion of one or more equipment modules."[142] However, the court criticized that the claims fail to show "what screening should be done or *how* the expert system would perform such screening . . . how to select the tests to run or even what tests to select from . . . *how* the 'time-sharing allocation' on a processor should be done . . . [and] *how* the expert system works to screen for impairments or *how* such systems can be portioned out over one or more equipment modules."[143] Therefore, the court concluded that "[t]he claims merely state the abstract idea of testing an equipment operator for impairments using an *unspecified* 'expert system' running on equipment that already exists in various vehicles."[144]

The last argument was that the disputed "claims are necessarily rooted in computer technology in order to satisfy a need for faster, more accurate and reliable impairment testing of vehicle operators, a problem [the patentee] characterizes as 'truly life or death,'"[145] but the court criticized that "[t]he claims do not address *a problem arising in the realm of computer networks*."[146] Rather, the court found that the disputed claims "are broadly drafted to cover testing a vehicle operator for impairments, similar to a police officer field-

137. *Id.* (citing Appellant's Br. 23).
138. *Id.* (emphasis added).
139. *Id.*
140. *Id.*
141. *Id.*
142. *Id.* at 919–20.
143. *Id.* at 920 (emphasis added).
144. *Id.* (emphasis added).
145. *Id.* (citing Appellant's Br. 19).
146. *Id.* (emphasis added).

testing a driver for sobriety."[147] In addition, the court criticized that "the claims at issue do not recite faster, more accurate and reliable impairment testing than what was known in the prior art."[148] The court found that the disputed claims "merely recite using an *undefined* 'expert system' to screen and test for impairments."[149] Further, the court criticized that "[t]he specification does not explain how this 'expert system' achieves any improvements over the prior art."[150] Specifically, the court found that "the specification lists 'at least ten major advantages to using expert system screening in conjunction with already existing modules in equipment to detect impairment in an equipment operator' without explaining how the expert system achieves these advantages."[151] Therefore, the court concluded that they "do not provide an 'inventive concept' sufficient to save these claims from patent-ineligibility."[152]

The *Vehicle Intelligence* court's comments on the patentee's four arguments reflected the Federal Circuit's focus on how to implement the claimed "specialized existing equipment modules" or "expert systems." Because neither the disputed claims nor specification provided *how*, the disputed claims were held patent-ineligible.

The specification of the 392 Patent discloses three flowcharts that describe three ways to monitor an equipment operator, but the description of each flowchart actually does not mention "specialized existing equipment modules" or "expert systems."[153] The specification also discloses several embodiments of a system for screening an equipment operator, but the description of each embodiment merely uses "screening module," "navigation module" and "control module" without specifying any particular devices required to build these modules or without identifying any structures of these modules.[154] At most, only the functions of each module are illustrated.[155] Lastly, the specification illustrates some embodiments of the claimed expert system by using "expert system screening module," "expert system database module,"

147. *Id.*

148. *Id.*

149. *Id.* (emphasis added).

150. *Id.*

151. *Id.* (citing U.S. Patent No. 7,394,392 at 6:50–7:8).

152. *Id.*

153. U.S. Patent No. 7,394,392 col. 13 ll. 8–64.

154. *Id.*

155. *See, e.g., id.* at col. 10 ll. 19–27 ("The navigation module 500 in some embodiments includes speech synthesis and/or speech recognition subsystems that can be integrated with little additional cost with the screening module 104 to expand the extent of the screening to include speech communication and speech analysis of the equipment operator 102. The navigation module 500 in one embodiment also provides historical information useful for more accurately screening the equipment operator 102 for impairments.").

"expert system decision module" and "expert system interface module,"[156] but these expert system-related modules are explained without any component details, while only the functions of these modules are mentioned.[157] That is why the *Vehicle Intelligence* court called the claimed expert system an "unspecified" or "undefined" expert system.[158]

Although "specialized existing equipment modules" or "expert systems" may sound unconventional, the lack of explanation of unconventional features in the specification makes them look like a fake unconventional system. As the court found, the specification actually "explains that the processors used in the methods may be 'based on any commercially available microprocessor of any word bit width and clock speed, a control Read–Only–Memory, or a data processing equivalent.'"[159] That is, the claimed "specialized existing equipment modules" or "expert systems" are actually conventional.

The style of patent drafting in *Vehicle Intelligence* is quite different from that in *Amdocs*. In *Amdocs*, the 984 Patent, for example, specifies the components of the patent-eligible feature, "distributed architecture,"[160] such as Lightweight Directory Access Protocol ("LDAP"),[161] Remote Authentication

156. *Id.* at col. 10 l. 65–col. 13 l. 7.

157. *See, e.g.*, *id.* at col. 11 ll. 42–60 ("The expert system database module 1000 stores information useful in determining the impairment of the equipment operator (not shown). The expert system decision module 1002 makes the actual determination of whether or not the equipment operator is impaired and decides which control response to make if there is an impairment. The expert system screening module 1006 assists in screening and selectively testing the equipment operator, and assists the expert system decision module 1002 in determining whether the equipment operator has a true impairment. The expert system interface module 1004 is used to obtain information concerning the equipment operator to determine whether or not the equipment operator has a true impairment. The expert system other factors module 1008 communicates with the expert system screening module 1006 and the expert system interface module 1004, and provides additional information that is used to adapt and/or interpret the screening of the equipment operator to more accurately determine whether the equipment operator has a true impairment.").

158. Vehicle Intelligence & Safety LLC v. Mercedes-Benz USA, LLC, 635 F. App'x 914, 920 (Fed. Cir. 2015).

159. *Id.* at 919 (quoting U.S. Patent No. 7,394,392 col. 7 ll. 14–17).

160. *See* U.S. Patent No. 6,947,984 col. 4 ll. 14–45.

161. *See* IBM, Lightweight Directory Access Protocol, https://www.ibm.com/support/knowledgecenter/en/ssw_aix_71/com.ibm.aix.security/ldap_overview.htm [https://perma.cc/T3T8-PSCT] (last visited Dec. 27, 2017) ("The [LDAP] defines a standard method for accessing and updating information in a directory (a database) either locally or remotely in a client-server model.").

Dial In User Service ("RADIUS"),[162] proxy server,[163] CISCO Netflow,[164] Domain Name System ("DNS"),[165] and Information Source Module (ISM),[166] which are well-defined concepts in information technology.

Vehicle Intelligence and *Amdocs* together indicate that the specification of an IoT patent must identify the industrially-recognized components used to facilitate the IoT architecture. Merely stating undefined or unspecified components of the IoT architecture cannot help the patent-eligibility determination.

C. Conventional Use of Existing Devices

Content Extraction, *Electric Power*, and *TDE Petroleum* indicate that if step one of the *Alice* standard is not passed partially because of recitation of ordinary devices or general computers, or ordinary functions thereof, step two will not be passed either.

Content Extraction indicates that a claim merely reciting existing devices to perform an ordinary human activity cannot be patent-eligible.[167] In *Content Extraction*, the patentee conceded that "the use of a scanner or other digitizing device to extract data from a document was well-known at the time of filing, as was the ability of computers to translate the shapes on a physical page into typeface characters."[168] So, the Federal Circuit held that the disputed claims "merely recite the use of this existing scanning and processing technology to recognize and store data from specific data fields such as amounts, addresses,

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162. *See* CISCO, *How Does RADIUS Work?,* https://www.cisco.com/c/en/us/support/docs/security-vpn/remote-authentication-dial-user-service-radius/12433-32.html [https://perma.cc/S87G-RU6F] (last visited Dec. 27, 2017).

163. *See* Apple, *macOS Sierra: Enter Proxy Server Settings*, https://support.apple.com/kb/PH25424?locale=en_US [https://perma.cc/EXR4-A93X] (last visited Dec. 27, 2017) ("A proxy server is a computer on a local network that acts as an intermediary between a single computer user and the Internet so that the network can ensure security, administrative control, and caching service.").

164. *See* CISCO, *Chapter: Configuring NetFlow*, https://www.cisco.com/c/en/us/td/docs/ios/12_2/switch/configuration/guide/fswtch_c/xcfnfc.html [https://perma.cc/TYR7-AME3] (last visited Dec. 27, 2017).

165. *See* Regis Donovan, *How IT Works Domain Name System*, https://technet.microsoft.com/en-us/library/2005.01.howitworksdns.aspx [https://perma.cc/J7AR-WRHN] (last visited Dec. 27, 2017).

166. *See* MicroStrategy, *KB30064: How to Create an Information Source Module Object in MicroStrategy Narrowcast 9.x - 10.x*, https://community.microstrategy.com/s/article/KB30064-How-to-create-an-Information-Source-Module-Object-in [https://perma.cc/Y5FK-5JGB] (last visited Dec. 27, 2017).

167. Content Extraction & Transmission LLC v. Wells Fargo Bank, Nat. Ass'n, 776 F.3d 1343, 1348 (Fed. Cir. 2014).

168. *Id.*

and dates."[169] In addition, the court found "no 'inventive concept' in [the patentee's] use of a generic scanner and computer to perform well-understood, routine, and conventional activities commonly used in industry."[170] The court criticized that "[a]t most, [the disputed] claims attempt to limit the abstract idea of recognizing and storing information from hard copy documents using a scanner and a computer to a particular technological environment."[171]

The *Content Extraction* court's step-two analysis also touched some dependent claims.[172] The patentee asserted that "certain dependent claims recite additional steps, such as extracting and detecting specific data fields, repeating some steps, and storing data as images or text, rendering those claims patent-eligible."[173] For example, one dependent claim further comprised "defining a set of symbols which designate fields of information required by an application program; and detecting the presence of a particular one of said defined set of symbols on a hard copy document and extracting a field of information required by an application program based on said detecting."[174] However, the court held that "[t]his limitation merely describes generic optical character recognition technology, which [the patentee] conceded was a routine function of scanning technology at the time the claims were filed."[175] Therefore, while recognizing that those dependent claims "may have a narrower scope than the representative claims," the court concluded that nothing as an inventive concept in those dependent claims can transform such abstract idea into a patent-eligible subject matter.[176]

Electric Power indicates that data or information processing based on general computers or devices cannot add any inventive concept to the step-two analysis of the *Alice* standard. In *Electric Power*, the Federal Circuit criticized that the disputed claims "do not even require a new source or type of information, or new techniques for analyzing it."[177] The court found that nothing in the claims "require an arguably inventive set of components or methods, such as measurement devices or techniques, that would generate new data."[178] The court also found nothing that may "invoke any assertedly

169. *Id.*
170. *Id.*
171. *Id.*
172. *Id.* at 1348–49.
173. *Id.* at 1348 (referencing Appellant's Br. 40–41).
174. *Id.* at 1348–49 (quoting Appellant's Br. 40–41).
175. *Id.* at 1349.
176. Id.
177. Elec. Power. Grp., LLC v. Alstom S.A., 830 F.3d 1350, 1355 (Fed. Cir. 2013).
178. Id.

inventive programming."[179] Instead, the court found that the claims merely require "the selection and manipulation of information—to provide a 'humanly comprehensible' amount of information useful for users."[180]

In addition, the *Electric Power* court found that "[n]othing in the claims, understood in light of the specification, requires anything other than off-the-shelf, conventional computer, network, and display technology for gathering, sending, and presenting the desired information."[181] The court pointed to "the claim requirement of 'displaying concurrent visualization' of two or more types of information," but the court criticized that "even if [it is] understood to require time-synchronized display: nothing in the patent contains any suggestion that the displays needed for that purpose are *anything but readily available*."[182] Therefore, the court held that "such invocations of computers and networks that are not even arguably inventive are 'insufficient to pass the test of an inventive concept in the application' of an abstract idea."[183]

While *Content Extraction* and *Electric Power* simply echo a notion in *Alice* that "the mere recitation of a generic computer cannot transform a patent-ineligible abstract idea into a patent-eligible invention,"[184] *Electric Power* may provide insight into what can transform use of general computers or devices into an inventive concept. The *Electric Power* court was looking for "any requirements [in the disputed claims] for *how* the desired result is achieved,"[185] but the disputed claims failed to "require any nonconventional computer, network, or display components, or even a 'non-conventional and non-generic arrangement of known, conventional pieces.'"[186] Rather, the court found that the disputed claims "merely call for performance of the claimed information collection, analysis, and display functions 'on a set of generic computer components' and display devices."[187] The court also noticed that the disputed claims "specify what information in the power-grid field it is desirable to gather, analyze, and display, including in 'real time,'"[188] but the court criticized that the claims "do not include any requirement for performing the claimed

179. Id.

180. Id.

181. Id.

182. *Id.* (emphasis added) (quoting U.S. Patent No. 8,401,710 col. 31 l. 37).

183. *Id.* (quoting buySAFE, Inc. v. Google, Inc., 765 F.3d 1350, 1353, 1355 (Fed. Cir. 2014)).

184. Alice Corp. v. CLS Bank Int'l, 134 S. Ct. 2347, 2358 (2014).

185. *Elec. Power Grp., LLC*, 830 F.3d at 1355 (alteration in original).

186. *Id.* (quoting Bascom Glob. Internet Servs., Inc. v. AT&T Mobility LLC, 827 F.3d 1341, 1349–52 (Fed. Cir. 2016)).

187. *Id.*

188. *Id.* at 1356.

functions of gathering, analyzing, and displaying in real time by use of anything but entirely conventional, generic technology."[189]

TDE also searches for "the *how* that is necessary to turn the abstract idea into a patent-eligible application."[190] The *TDE* court recognized that "the specification [of the 812 Patent] arguably provides specific embodiments for the step of 'automatically selecting one of the states as the state of the well operation.'"[191] However, the court criticized that the disputed claims failed to include those details but simply recited "generic computer functions that amount to nothing more than the goal of determining the state of an oil well operation."[192]

The state-selecting step is described in the specification with references to Figures 4, 5, and 6 of the 812 Patent.[193] "FIG. 4 illustrates a method for determining the state of drilling operations for the drilling rig."[194] "FIGS. 5A–B illustrate a method for determining the drilling state of the drilling rig."[195] Finally, Figure 6 presents states of a well operation determined through the procedures illustrated in Figures 4 and 5.[196] Hence, it is possible that reciting procedural steps disclosed in Figures 4, 5, and 6 of the 812 Patent may add an inventive concept to the state-selecting step and transform the disputed claims into a patent-eligible subject matter.

Content Extraction, *Electric Power*, and *TDE Petroleum* indicate that recitation of conventional use of existing devices in an IoT claim may not transform an abstract idea into a patent-eligible subject matter.

CONCLUSION

An IoT claim is generally a method claim of exchanging information from one device to another device to achieve some industrial solution. The Federal Circuit case law indicates that an IoT claim will not easily pass the step one analysis of the *Alice* standard if the nature of the IoT claim is a combination of collecting, analyzing, storing, or presenting data or information. However, under *Electric Power*, an IoT claim may pass the step one analysis if the IoT claim recites technical features particularly invented for executing the claimed steps.

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189. *Id.*

190. TDE Petroleum Data Sols., Inc., v. AKM Enter., Inc., 657 F. App'x 991, 993 (Fed. Cir. 2016)(alteration in original).

191. *Id.*

192. *Id.*

193. U.S. Patent 6,892,812 col. 9 l. 14–col. 14 l. 8.

194. *Id.* at col. 9 ll. 14–15.

195. *Id.* at col. 10 ll. 57–58.

196. *Id.* at col. 13 ll. 35–38.

The Federal Circuit case law also suggests that an IoT claim is patent-ineligible even though it includes physical devices. However, recitation of an innovative physical system may make an IoT claim more likely to be patent-eligible. Such system has to be unconventional. Even a system composed of existing devices may be unconventional in terms of patent-eligibility. It is very important to describe a technical problem intended to be fixed in the specification. Explaining how those devices actually work to achieve the purpose of the invention is also helpful.

IoT technology deals with information, so under the *Alice* standard, the patent-eligibility of an IoT claim is questionable. While the *Alice* standard may limit the scope of patent-eligible IoT claims, the Federal Circuit case law suggests that there is room for patent-eligible IoT claims.

NOA v. DOA:

INCREASING MEDICAL DIAGNOSTIC PATENTABILITY AFTER MAYO

KAREN MCKENZIE, RN, JD*

INTRODUCTION

The medical diagnostics market is expected to reach 65 billion by 2018.[1] In March 2012, in *Mayo Collaborative Services v. Prometheus Labs, Inc.*, ("*Mayo*") the U.S. Supreme Court held that the Mayo Clinic (the "Clinic") had not infringed on Prometheus Labs' ("Prometheus") diagnostic patent because the Prometheus patent involved ineligible subject matter, and was therefore

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1. Jim Bustschli, *Diagnostic market growth expected to reach $65 billion by 2018*, HEALTHCARE PACKAGING, https://www.healthcarepackaging.com/article/trends-and-issues/vitro-diagnostics/diagnostic-market-growth-expected-reach-65-billion-2018 [https://perma.cc/RV44-3NM9]; *see also* TUFTS UNIVERSITY, CSDD IMPACT REPORT VOL. 17 NO. 6 (NOVEMBER/DECEMBER 2015).

invalid.[2] Section 101 of the Patent Act defines eligible subject matter as "any new and useful process, machine, manufacture, or composition of matter" as patentable subject matter.[3] Courts have held that Section 101 contains an implicit exception, making laws of nature, natural phenomena, and abstract ideas ineligible for patent protection.[4] Traditionally, applications to a structure or process have satisfied this exception.[5]

However, since the Court's unanimous decision in *Mayo*, the percentage of medical diagnostic patents allowed[6] by the U.S. Patent & Trademark Office (the "USPTO") has dropped to less than thirty-five percent, as compared to eighty-five percent before *Mayo*.[7] *Mayo* and its progeny[8] arguably had a significant impact on the multi-billion-dollar medical diagnostic industry—an industry focused on the laws of nature that occur within the human body. After *Mayo*, medical diagnostics developers have encountered less certainty for both issuance and in mounting a vigorous defense of infringement.

Although the topic of patentability has been avidly discussed in legal literature critiquing the Court's *Mayo* rationale, this article will analyze possible solutions to increase patentability, and the defense of medical diagnostic patents. Specifically, this article will examine: (1) how the Prometheus patent could have been altered during patent prosecution; (2) how these changes are affected by a challenge of invalidity elucidated through *Mayo* and its progeny; and (3) whether the Patent Trial and Appeal Board (the "PTAB") or subsequent Federal Circuit decisions have clarified the patentability of medical diagnostic patents. Finally, this article will draw conclusions regarding strategies to increase patentability in medical diagnostic patents and reduce the likelihood that the patent will be pronounced "Dead on Arrival" (DOA)[9] in district court.

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2. Mayo Collaborative Servs. v. Prometheus Labs., Inc., 566 U.S. 66, 70 (2012).

3. 35 U.S.C. § 101 (2012).

4. Diamond v. Diehr, 450 U.S. 175, 185 (1981).

5. *Id.* at 187.

6. NOA is a "Notice of Allowance" in which, "[i]f on examination, it appears that the applicant is entitled to a patent under the law, a notice of allowance will be [issued]." *See* 37 C.F.R. § 1.311(a); U.S. PATENT & TRADEMARK OFFICE, MANUAL OF PATENT EXAMINING PROCEDURE § 1303 (2018).

7. Gaudry, Grab & McKeon, *Trends In Subject Matter Eligibility for Biotechnology Inventions*, IPWATCHDOG.COM, http://www.ipwatchdog.com/2015/07/12/trends-in-subject-matter-eligibility-for-biotechnology-inventions/id=59738/ [https://perma.cc/Q2ML-QED6].

8. Association for Molecular Pathology v. Myriad Genetics, Inc., 569 U.S. 576 (2013); Alice Corp. Pty. Ltd. v. CLS Bank Int'l, 134 S. Ct. 2347 (2014); Ariosa Diagnostics, Inc. v. Sequenom, Inc., 788 F.3d 1371
(Fed. Cir. 2015).

9. DOA is a medical acronym commonly used in emergency room settings for a patient who was brought in by ambulance but was declared dead before receiving treatment in the emergency room; in other words, the patient was declared "Dead On Arrival."

I. PATENTABILITY OF MEDICAL DIAGNOSTICS

A. Dissecting the Prometheus Patent

The Prometheus patent assessed the proper therapeutic blood level of drugs used to treat Crohn's disease and ulcerative colitis.[10] Essentially, the patent applied principles of pharmacokinetics to customize the dosage for each individual patient, and therefore minimize toxicity while optimizing the therapeutic value of the medication.[11] The Clinic licensed the patented steps for determining these individualized dosages.[12] Eventually, the Clinic developed and used its own process; and Prometheus subsequently sued for infringement.[13] A U.S. District Court determined that the Clinic infringed on Prometheus's patents, but that Prometheus's patents were invalid. The U.S. Court of Appeals for the Federal Circuit overturned part of that decision, holding that Prometheus' diagnostic test *was valid*.[14] The Clinic subsequently appealed.[15]

The U.S. Supreme Court held that the processes in the diagnostic test were ineligible subject matter because the processes pertained to laws of nature under 35 U.S.C. § 101 of the Patent Act.[16] Although "an application of a law of nature . . . to a known structure or process may [deserve] patent protection," a law of nature cannot be transformed "into patent eligible [matter] . . . simply [by] stat[ing] the law [and] adding the words, 'apply it.'"[17] The Court therefore found that the "steps" Prometheus added to the process were not novel; instead they were merely instructions regarding a law of nature.[18] Thus, *Mayo* altered the landscape of the machine-transformation test, which up to that point, had been applied to other processes.[19] Medical diagnostics largely revolved around laws of nature played out within the human body and so long as a novel application was applied, the USPTO, the Federal Circuit, and Supreme Court did not cry foul. However, after *Mayo*, previously accepted additional requirements for process patentability to survive a law of nature invalidation

10. Mayo Collaborative Servs. v. Prometheus Labs., Inc., 566 U.S. 66, 73 (2012).
11. *Id.*at 73–74.
12. *Id.* at 74–75.
13. *Id.* at 75–76.
14. *Id*. at 76 (emphasis added).
15. *Id.*
16. *Id.* at 76.
17. *Id.* at 72.
18. *Id.* at 77.
19. Computers, software, manufacturing and credit card company transactional software, for example.

would no longer be enough. In fact, simply adding the language "apply it" would not be enough.[20]

In light of this, the U.S. Supreme Court remanded *Mayo* to the Federal Circuit to determine whether transforming a law of nature was an adequate transformation to make Prometheus' diagnostic test patentable.[21] On remand, the Federal Circuit reasoned that it "is virtually self-evident that a process for a chemical or physical transformation of *physical objects or substances* is a patent-eligible subject matter[.]"[22] However, the Supreme Court found that the administering and determining steps of the Prometheus patent were not transformative, but merely "insignificant extra-solution activity[.]"[23] Additionally, the machine-or-transformation test must transform an ineligible material into eligible material.[24]

The Court addressed this complex transformation challenge, inherent within medical diagnostics, by discussing the risk of making overly broad claims and whether a claim has presented a "substantial practical application,"[25] reinforcing that "laws of nature, natural phenomenon, and abstract ideas" cannot be granted patent protection.[26] Historically, until the mid-2000's, 35 U.S.C. § 101 was interpreted quite broadly to include many types of subject matter; however, laws of nature were never patentable except for diagnostic methods claims that were routinely granted by the USPTO. Challenges to their status as patentable subject matter were not typically raised during litigation.

Mayo marks a distinct departure from this historical treatment of diagnostics. Reciting a process "is no more than a[n] . . . instruction to [read some numbers in light of medical knowledge]."[27] Upon review of Prometheus' '632 patent claims 1-54, the following claims construction language is repeated in claims 1, 7, 15, 25, 37 and 46:

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20. *Mayo*, 566 U.S. at 76. (quoting Bilski v. Kappos, 561 U.S. 593 (2010) ("which clarified that the 'machine-or-transformation test' is not a definitive test for finding patent eligibility, but only an important and useful clue.").

21. *Mayo*, 566 U.S. at 76–77.

22. Prometheus Labs., Inc. v. Mayo Collaborative Servs., 628 F.3d 1347, 1356 (Fed. Cir. 2010), rev'd, 566 U.S. 66 (2012) (quoting In re Bilski, 545 F.3d 943, 962 (Fed. Cir. 2008) (emphasis in original).

23. *Mayo*, 566 U.S. at 78. *Compare to* Chen, Wan-Ling, *Patent-Eligibility after Bilski: Revisiting The Supreme Court's Prometheus Decision*, 1 NTUT J. OF INTELL. PROP. L. & MGMT. 94, 100 (2012) (asserting that the Grams test was found to be a merely a mathematical algorithm).

24. Diamond v. Diehr, 450 U.S. 175, 184 (1981).

25. *Id.* at 71.

26. *Id.* at 186 (holding that mathematical formulas are not patentable but when the claims are considered as a whole, and it is clear that it is an attempt to patent a process that implements or applies a mathematical formula—this is transformative and patentable). *Id.* at 191–93.

27. *Mayo*, 566 U.S. at 78.

> (1) A method of optimizing therapeutic efficacy for treatment of a . . . disorder:
> (a) administering a drug . . . to a subject having said . . . disorder; and
> (b) determining the level of [drug] in said subject having . . . disorder, wherein the level of [drug] less than about 230 pmol per $8x10^8$ red blood cells indicates a need to increase the amount . . . drug subsequently administered to said subject and wherein the level of 6-thioguanine greater than about 400 pmol per $8x10^8$ red blood cells indicates a need to decrease . . . drug subsequently administered.
> . . .
> (7) A method of reducing toxicity associated with treatment of a . . . disorder, comprising:
> (a) administering a drug providing 6-thioguanine to a subject having said . . . disorder;
> (b) determining the [amount of the drug] . . . in said subject having . . . disorder; and
> (c) determining the level of 6-methyl-mercaptopurine in said subject having said . . . disorder, wherein the level of 6-thioguanine greater than about 400 pmol per 8×10^8 red blood cells or the level of 6-methyl-mercaptopurine greater than about 7000 pmol per 8×10^8 red blood cells indicates a need to decrease the amount of . . . drug subsequently administered.[28]

The claims construction language of "administering, determining, and administering," does not describe a non-conventional or novel activity. Indeed, this activity describes what is commonly known as pharmacokinetics and pharmacodynamics.[29] Arguably, what is missing from the '623 patent claims is some form of unique step that may have enabled a more effective adjustment of the blood levels of the drug in question. This could have been supported by a unique mathematical algorithm, a more discrete lab test with a higher degree of sensitivity and specificity than other tests on the market, or a process that was more advanced in regard to the accuracy of predicting toxicity and therapeutic levels in a specific population. Such a process of determining toxicity with a higher degree of sensitivity, could in turn allow, for example,

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28. U.S. Patent No. 6,355,623 col. 20-24 l. 10-12.

29. *See* Jennifer Le, *Overview of Pharmacokinetics,* MERCK MANUAL, http://www.merckmanuals.com/professional/clinical-pharmacology/pharmacokinetics/overview-of-pharmacokinetics [https://perma.cc/4TU8-4DA7] (noting that because of individual differences, drug administration must be based on each patient's needs—traditionally, by empirically adjusting dosage until the therapeutic objective is met. This approach is frequently inadequate because it can delay optimal response or result in adverse effects. Knowledge of pharmacokinetic principles helps prescribers adjust dosage more accurately and rapidly. Application of pharmacokinetic principles to individualize pharmacotherapy is termed therapeutic drug monitoring).

less frequent blood draws, and more accurate determinations. However, this type of disclosure was absent in the '632 patent and was historically not required by the USPTO to issue a patent or the courts in the defense of diagnostic patents.

In contrast, *Classen v. Biogen Idec*, decided before *Mayo* but still relevant, claimed a method directed to immunizing a patient based on detection of markers in a screening step.[30] Although the screening step was based on a natural law, the immunization step was a non-conventional specific application of the screening principle,[31] and this claim was held as patentable.[32]

A similar diagnostic test that was based on natural law—yet, held as patentable—was the subject of litigation in *Ameritox Ltd. v. Millennium Health, LLC*.[33] The *Ameritox* invention was specifically directed "to quantify[] the metabolite concentration by adjusting the concentration for the patient's hydration status, and then statistically comparing the adjusted concentration to a set of known normative data."[34] In this way, the invention provided a method to improve medication monitoring and identify aberrant drug use. More importantly, the *Ameritox* '680 patent identified statistical analysis and normative data that increased the sensitivity and specificity of the test rendering it an inventive concept.[35]

B. Mayo and its progeny: Alice Corp, Myriad and Sequenom

Ameritox provides an excellent discussion of how *Alice Corporation v. CLS Bank International* outlines the framework for analyzing claims directed at an abstract idea.[36] *Alice Corp* provided a two-step test for patentability: (1) is the patent related to a law of nature; (2) if so, does the claim contain an inventive concept, element or combination of elements "sufficient to ensure that the patent . . . amounts to significantly more than a patent [on an] ineligible concept.[37] "Applications of concepts 'to a new and useful end' remain eligible for patent protection."[38] Undoubtedly, most diagnostic patents would satisfy step one of the *Alice Corp* framework. As the District Court noted in *Ameritox*, the "real heavy lifting" occurs in step two, which analyzes whether the process

30. Classen Immunotherapies, Inc. v. Biogen Idec, 659 F. 3d 1057, 1060 (Fed. Cir. 2011).

31. *Id.* at 1064–68.

32. *Id.*

33. Ameritox, Ltd. v. Millennium Health, LLC, 88 F. Supp. 3d 885, 917 (W.D. Wis. 2015), *reconsideration denied*, No. 13-CV-832-WMC, 2015 WL 1272280 (W.D. Wis. Mar. 19, 2015).

34. *Id.* at 909.

35. *Id.* at 911.

36. *Id.* at 903.

37. *Id.* (quoting *Alice Corp.*, 134 S. Ct. at 2355).

38. *Id.* at 911 (quoting, *Alice Corp.*, 134 S. Ct. at 2354).

sought to be patented includes an additional element or combination of elements that constitute an "inventive concept[.]"[39] For example, "*an element or combination of* elements that is sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the [ineligible concept] itself."[40]

In the *Association for Molecular Pathology v. Myriad Genetics, Inc*., the Court analyzed claims to isolated genomic deoxyribonucleic acid (the "gDNA") segments associated with the breast cancer susceptibility gene (the "BRCA") and methods of diagnosing a propensity for cancer by detecting mutations in the genetic sequences.[41] The Court held that isolating a gDNA segment was insufficient to provide patent eligibility.[42] The Court reasoned that, while *Myriad* had discovered "an important and useful gene, . . . separating that gene from its surrounding genetic material is not an act of invention."[43] However, the complimentary deoxyribonucleic acid (the "cDNA"), which lacks non-coding regions of gDNA, was held to be patentable, because it was not a naturally occurring material.[44] Essentially, the *Alice Corp* framework was inapplicable.[45] This is similar to the results described *In re BRCA1– & BRCA2–Based Hereditary Cancer Test Patent Litig*., in which diagnostic tests to determine risk of breast cancer were found to be invalid.[46]

In *Ariosa Diagnostics, Inc. v. Sequenom, Inc*., the U.S. Court of Appeals for the Federal Circuit held that even a truly revolutionary medical test was patent ineligible.[47] The test at issue was one for detecting fetal genetic conditions in early pregnancy, which allowed the expectant mother to avoid more dangerous invasive techniques that could be potentially harmful to both the mother and the fetus.[48] The Federal Circuit concluded that the discovery was a significant contribution to the medical field, but the contribution did not matter as far as *patent eligibility* was concerned.[49]

The invention was embodied in U.S. Patent No. 6,258,540, which claimed certain methods for using cell-free fetal deoxyribonucleic acid (the "cffDNA")

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39. *Id.* at 903.

40. *Id.* (quoting *Alice Corp*., 134 S. Ct. at 2355) (emphasis in original).

41. Association for Molecular Pathology v. Myriad Genetics, Inc., 569 U.S. 576, 582–83 (2013).

42. *Id.* at 596.

43. *Id.* at 591.

44. *Id.* at 594–95.

45. *Id.*

46. In re BRCA1- & BRCA2–Based Hereditary Cancer Test Patent Litig., 774 F.3d 755, 758–65 (Fed. Cir. 2014).

47. Ariosa Diagnostics, Inc. v. Sequenom, Inc., 788 F.3d 1371, 1377 (Fed. Cir. 2015).

48. *Id.* at 1373.

49. *Id.* at 1379 (emphasis added).

by teaching technicians to take maternal blood samples; keep the non-cellular portion (which was previously discarded as medical waste); amplify the genetic material so that only they had discovered what was present; and thereby identify paternally inherited sequences from fetal DNA that previously had not been known to be present in the maternal samples.[50] And it was therefore a novel discovery. In a separate concurrence, Judge Linn expressed his dissatisfaction with the "sweeping language of [the Court's decision] in *Mayo*."[51] Most notably, Judge Linn lamented on the Court's lumping together of the post-solution conventional activity as if it were qualitatively the same.[52]

In March of 2016, Sequenom, Inc. filed a Petition for Writ of Certiorari in the Supreme Court seeking to answer a single question: "[w]hether a novel method is patent-eligible where: (1) a researcher is the first to discover a natural phenomenon; (2) that unique knowledge motivates him or her to apply a new combination of known techniques to that discovery; and (3) he or she thereby achieves a previously impossible result without preempting other uses of the discovery?"[53] On June 27, 2016, the Court denied certiorari to Sequenom, Inc.[54] If the Court granted certiorari, however, it may have been forced to address the overwhelming breadth and scope of the decision in *Mayo*. At the very least, the Court may have provided more guidance to practitioners and inventors in the fields of medical diagnostics.

C. PTAB CASES & USPTO GUIDANCE

Since *Mayo*, the USPTO has taken up eligibility cases and also has offered guidance to practitioners. Under the authority of the American Invents Act (the "AIA"), the Patent Trial and Appeal Board (the "PTAB") has reviewed the validity of patents.[55] Some of these decisions may elucidate the contours of eligibility in diagnostic process patents beyond *Mayo* and its progeny. Of the sixty or more decisions from the Federal Circuit, the PTAB, or those decisions appealed to the U.S. Court of Federal Claims through May of 2016, only a small percentage involved diagnostic patents, and an even smaller amount originated at the PTAB.[56]

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50. US Patent no. 6,258,540 col. 1-3 l. 50-62.

51. Ariosa, 788 F.3d at 1380.

52. *Id.*

53. Petition for Writ of Certiorari, Sequenom, Inc. v Ariosa Diagnostics, Inc. 136 S. Ct. 2511 (2016) (No. 15–1182).

54. Sequenom, Inc. v. Ariosa Diagnostics, Inc. 136 S. Ct. 2511, 2511 (2016).

55. 35 U.S.C. § 135(b) (2012).

56. *See* U.S. PATENT & TRADEMARK OFFICE, CHART OF SUBJECT MATTER ELIGIBILITY COURT DECISIONS, https://www.uspto.gov/sites/default/files/documents/ieg-dec-2016-sme_crt_dec.xlsx [https://perma.cc/2L2M-BU6Z], (last visited March 22, 2017).

On May 4, 2016, the PTAB issued updated guidance to patent examiners on subject matter eligibility.[57] The instructions required examiners to articulate a reasoned rationale for any 35 U.S.C. § 101 rejections under both steps of the *Alice* and *Mayo* test.[58] These require the examiner to identify specific claim limitations in support of a rejection under both steps of the two-step analysis.[59] Additionally, the instructions establish that best practice for patent examiners is to cite the appropriate court decisions that support their conclusions.[60] Given that there are few cases that specifically govern diagnostic patents, the USPTO also provided subject matter eligibility guidelines for life science claims with the caveat that the examples are intended to show exemplary analysis and should not be the basis for a subject matter claim.[61]

The USPTO also issued a 2016 update to its "Index of Eligibility Examples" as well as an index of "Subject Matter Eligibility Court Decisions."[62] The USPTO guidance offers two life sciences examples provided of claims construction together with an analysis of the patent eligibility of those claims. First, a pigeon flu virus vaccine with claims construction listed as follows:

> Claims
> 1. A vaccine comprising live attenuated Pigeon flu virus.
> 2. A vaccine comprising inactivated Pigeon flu virus.
> 3. A vaccine comprising: Peptide F; and
> 4. A vaccine comprising: Peptide F; and
> a pharmaceutically acceptable carrier selected from the group consisting of a cream, emulsion, gel, liposome, nanoparticle, or ointment
> 5. A vaccine comprising: Peptide F; and
> an immuno-effective amount of an aluminum salt adjuvant.

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57. Robert W. Bahr, *Formulating a Subject Matter Eligibility Rejection and Evaluating the Applicant's Response to a Subject Matter Eligibility Rejection*, U.S. PATENT & TRADEMARK OFFICE (May 4, 2016), https://www.uspto.gov/sites/default/files/documents/ieg-may-2016-memo.pdf [https://perma.cc/352J-52TD]. *See generally* May 2016 Subject Matter Eligibility Update, 81 Fed. Reg. 27381 (May 6, 2016); July 2015 Update on Subject Matter Eligibility, 80 Fed. Reg. 45429 (July 30, 2015).

58. Bahr, *supra* note 57, at 1.

59. *Id.* at 2.

60. *Id.* at 2–3. *See* U.S. PATENT & TRADEMARK OFFICE, EXAMINATION AND TRAINING MATERIALS: BEST PRACTICES IN EXAMINATION (Jan. 3, 2017), https://www.uspto.gov/patent/laws-and-regulations/examination-policy/examination-guidance-and-training-materials (last visited March 22, 2017) [https://perma.cc/XYD3-ZKJ5].

61. *See* U.S. PATENT & TRADEMARK OFFICE, SUBJECT MATTER ELIGIBILITY EXAMPLES: LIFE SCIENCES (2016), https://www.uspto.gov/sites/default/files/documents/ieg-may-2016-ex.pdf [https://perma.cc/WAK5-Q6XZ] (last visited March 22, 2017)

62. *Id.*

> 6. A vaccine comprising: Peptide F;
> an immuno-effective amount of an aluminum salt adjuvant; and a pharmaceutically acceptable carrier.
> 7. A vaccine delivery device comprising a microneedle array that is coated with a vaccine comprising Peptide F. [63]

According to the USPTO best-practice analysis, Claims 1-2, and 4-7 were patent eligible, but Claim 3 was patent ineligible because, while there is no naturally occurring counterpart in nature, there is no indication that mixing these components changes the structure, function or other properties of the peptide or water.[64]

In contrast to Claim 3, Claim 5 was patent eligible because Peptide F and the adjuvant (e.g., aluminum phosphate) do not occur naturally together in nature, there is no naturally occurring counterpart mixture for comparison, and the mixture is different than the mere "sum" of the immunogenicity of its components.[65] When combined, the resultant mixture has an enhanced immunity of eighty percent seroprotection rate with respect to the virus.[66] The mixture's alteration in immunogenicity is a marked difference compared to the two items as they appear separately in nature (which has a poor immunogenicity of thirty percent).[67] Therefore, because the claims are not directed to a "product of nature exception," the claims qualify as patent eligible subject matter.[68]

The second example provided is a patent for Diagnosing and Treating Julitis.[69] Generally, it is diagnosed by physical observation during a medical examination.[70] However, it is commonly mistaken for other rashes caused by Rosacea; indeed, doctors often misdiagnose it as Rosacea which has a different treatment altogether.[71]

The applicant disclosed a method of detecting Jul-1 and using anti-Jul-1 antibody, which may use naturally and non-naturally occurring (porcine

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63. *Id.* at 2–3.

64. *Id.* at 3–4, 5–8.

65. *Id.* at 7.

66. *Id.*

67. *Id.*

68. *Id.* at 5–7 (quoting *Myriad Genetics*, 133 S. Ct. at 2117 (2013)) (explaining that the bacterial mixture of "Funk Brothers" was not patent eligible because the patent holder did not alter the bacteria in any way).

69. *Id.* at 9. Julitis is an auto-immune disease that affects more than 17 million people in North America and causes chronic inflammation of the skin resulting in itchy and extremely painful rash on the face, hands, and feet. *Id.*

70. *Id.*

71. *Id.*

antibodies)[72] to diagnose the disease.[73] The claims construction of the invention is as follows:

> 1. A method of detecting JUL-1 in a patient, said method comprising:
> a. obtaining a plasma sample from a human patient; and
> b. detecting whether JUL-1 is present in the plasma sample by contacting the plasma sample with an anti-JUL-1 antibody and detecting binding between JUL-1 and the antibody.
>
> 2. A method of diagnosing julitis in a patient, said method comprising:
> a. obtaining a plasma sample from a human patient;
> b. detecting whether JUL-1 is present in the plasma sample by contacting the plasma sample with a porcine anti-JUL-1 antibody and detecting binding between JUL-1 and the porcine antibody; and
> c. diagnosing the patient with julitis when the presence of JUL-1 in the plasma sample is detected.
>
> 3. A method of diagnosing julitis in a patient, said method comprising:
> a. obtaining a plasma sample from a human patient;
> b. detecting whether JUL-1 is present in the plasma sample by contacting the plasma sample with an anti-JUL-1 antibody and detecting binding between JUL-1 and the antibody; and
> c. diagnosing the patient with julitis when the presence of JUL-1 in the plasma sample is detected.
>
> 4. A method of diagnosing julitis in a patient, said method comprising:
> a. obtaining a plasma sample from a human patient;
> b. detecting whether JUL-1 is present in the plasma sample by contacting the plasma sample with antibody mAb-D33 and detecting binding between JUL-1 and antibody mAb-D33; and
> c. diagnosing the patient with julitis when the presence of JUL-1 in the plasma sample is detected.
>
> 5. A method of diagnosing and treating julitis in a patient, said method comprising:

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72. *See generally*, Corinna Lau, et al., *Chimeric Anti-CD14 IGG2/4 Hybrid Antibodies for Therapeutic Intervention in Pig and Human Models of Inflammation*, 191 THE JOURNAL OF IMMUNOLOGY 191, 4769–4777 (2013), found at http://www.jimmunol.org/content/jimmunol/191/9/4769.full.pdf (discussing how porcine anti-bodies are non-naturally occurring in humans, but are useful in the detection of an immune response to a disease, and thus the detection of various inflammatory markers of disease) [https://perma.cc/DWN2-LQFA].

73. *See* SUBJECT MATTER ELIGIBILITY EXAMPLES *supra*, note 61, at 10.

a. obtaining a plasma sample from a human patient;
b. detecting whether JUL-1 is present in the plasma sample;
c. diagnosing the patient with julitis when the presence of JUL-1 in the plasma sample is
detected; and
d. administering an effective amount of topical vitamin D to the diagnosed patient.

6. A method of diagnosing and treating julitis in a patient, said method comprising:
a. obtaining a plasma sample from a human patient;
b. detecting whether JUL-1 is present in the plasma sample;
c. diagnosing the patient with julitis when the presence of JUL-1 in the plasma sample is
detected; and
d. administering an effective amount of anti-tumor necrosis factor (TNF) antibodies to the diagnosed patient.

7. A method of treating patients with julitis, the method comprising administering an effective amount of anti-TNF anti-bodies to a patient suffering from julitis.[74]

According to the USPTO best-practice guidance, the following claims are patent eligible: claims 1 and 3-7, while claim 2 is ineligible.[75] Claim 1 is eligible because, as a drug,[76] the anti-Jul-1 anti-body does not fall under the natural law exception discussed in *Mayo* and although the plasma is present in the sample, the claim on the whole, is not focused on the plasma product.[77] Therefore, the two-step analysis set by the *Alice* and *Mayo* test need not be performed.[78] Claim 2 is ineligible because it is aimed at a process that centers on the consequence of a law of nature that is the correlation or relationship between the presence of the Jul-1 in a patient's plasma and the present of julitis in a patient.[79] Claim 2 the essence of naturally occurring process and law of nature discussed in *Mayo.*

74. *Id.* at 10–11.

75. *Id.* at 11–15.

76. Here, "drug" comprises naturally occurring and or synthetically derived chemical compounds, which when injected or digested, have an effect on the human body, but are not naturally present in the body. Cambridge Online Dictionary, found at https://dictionary.cambridge.org/dictionary/english/drug [https://perma.cc/73GU-MQ9L].

77. SUBJECT MATTER ELIGIBILITY EXAMPLES *supra,* note 61 at 11.

78. *Id.* at 11.

79. *Id.*

II. RESOLUTION

Inferences can be drawn about the patentability of medical diagnostic patents, lessons learned from Prometheus, and subsequent patent decisions after *Mayo*. Namely, patent prosecution must adequately capture a novel transformative process to enable a diagnostic patent to secure a Notice of Allowance ("NOA"). Perhaps the Prometheus patent could have been saved by use of more creatively drafted patent claims that captured the novel mathematical processes, or the sensitivity and specificity of the lab work using normative data to establish the novelty of the method as in the case of *Ameritox*.

The probability of survival of a medical diagnostic patent under the *Mayo* framework, (e.g. process patents that involve laws of nature must be transformative in a meaningful and substantial way), requires more nuanced work on the patent prosecution side to ensure a NOA. Patent prosecution of medical diagnostic patents must accurately capture the novelty of the transformative process involved.

The second issue involves patent defense during claims construction. In order to ensure that a medical patent is not Dead on Arrival ("DOA") in federal court during patent litigation, the patent must contain a detailed explanation of the novel transformative process. Subject matter eligibility and claims construction challenges cannot begin and end with laws of nature. This may require patent prosecutors to educate themselves on the unique study designs and unique methods used early in the development stages of the disclosed invention. A detailed comparative analysis using normative data can ensure the survival of the independent patent claims. Statistical analysis and treatment algorithms may also be very valuable to distinguish the novelty of the accuracy of a proposed diagnostic test.

Congress intended that novelty applied to laws of nature would result in patentability. Issues with patent prosecution of medical diagnostic patents result in the lack of clarity of the novelty and transformation of laws of nature into a patentability. *Mayo* and its progeny have not provided a bright-line rule on how to prosecute claims to ensure patentability. However, if we examine the cases carefully, they provide insight *into what not to do*, and what to do to strengthen the patents chances of a NOA during prosecution and prevent invalidity (DOA) during claims construction. Therefore, increased care during prosecution may allow these patents to survive novelty, law of nature, transformation tests that *Mayo* and its progeny have imposed.

Whether the PTAB has added any insight to the patentability of medical diagnostic patents is still open for debate. The USPTO has offered guidance in this past year that offers a checklist of sorts to avoid invalidity claims. Proper prosecution should capture the transformation of the law of nature that reflects

a novel use. A careful study of the differences between a particular diagnostic test, examining what provides novelty over other tests or processes, is key.

CONCLUSION

In conclusion, patent prosecution can no longer be a recitation of broad claims 1-57 with the term "comprising" and "applied to." Patent prosecution of medical diagnostic patents must strive to understand the whole diagnostic process and the basis for the reliability, validity, sensitivity and specificity of the particular test as compared to what is known in the art. Claims themselves cannot be centered on the naturally occurring phenomenon like plasma, BRCA genes, blood cells, or principles of pharmacokinetics. Claims construction should not begin and end with the naturally occurring phenomenon, the patient, or the patients' cellular or physical reaction to the diagnostic test, but with a description of the *non-naturally* occurring process or transformative method that is being used as the means to more accurately detect and natural reaction to that created stimulus.

Unfortunately, the USPTO guidance does not offer examples of medical machinery diagnostics but is largely focused on vaccine or immune therapies that have a non-natural impetus that avoids the stickiness of the *Mayo-Alice* two-step. As we can see in the three medical diagnostic patents discussed, a critical step to survival is patent prosecution. *Mayo* had a chilling effect on the medical diagnostic patent industry. Increased care at the level of patent prosecution, and perhaps with an eye toward increased disclosure of a procedural algorithm or mathematical formula, or indicia that captures the unique individual patent reaction to the test, should be utilized in order to prevent a declaration of DOA during invalidity litigation at the district court, PTAB or Federal Circuit level.

APPENDIX

Prometheus Patent Claims Construction

The '623 patent had the following claims… We claim:

1. A method of optimizing therapeutic efficacy for treatment of an immune-mediated gastrointestinal disorder, comprising:

(a) administering a drug providing 6-thioguanine to a subject having said immune-mediated gastrointestinal disorder; and

(b) determining the level of 6-thioguanine in said subject having said immune-mediated gastrointestinal disorder,

wherein the level of 6-thioguanine less than about 230 pmol per 8×10^8 red blood cells indicates a need to increase the amount of said drug subsequently administered to said subject and

wherein the level of 6-thioguanine greater than about 400 pmol per 8×10^8 red blood cells indicates a need to decrease the amount of said drug subsequently administered to said subject.

2. The method of claim 1, wherein said immune-mediated gastrointestinal disorder is inflammatory bowel disease (IBD).

3. The method of claim 2, wherein said subject having IBD is a pediatric subject.

4. The method of claim 1, wherein said immune-mediated gastrointestinal disorder is selected from the group consisting of lymphocytic colitis, microscopic colitis, collagenous colitis, autoimmune enteropathy, allergic gastrointestinal disease and eosinophilic gastrointestinal disease.

5. The method of claim 1, wherein said level of 6-thioguanine is determined in red blood cells.

6. The method of claim 5, wherein said level is determined using high-pressure liquid chromatography.

7. A method of reducing toxicity associated with treatment of an immune-mediated gastrointestinal disorder, comprising:

(a) administering a drug providing 6-thioguanine to a subject having said immune-mediated gastrointestinal disorder;

(b) determining the level of 6-thioguanine in said subject having said immune-mediated gastrointestinal disorder; and

(c) determining the level of 6-methyl-mercaptopurine in said subject having said immune-mediated gastrointestinal disorder,

wherein the level of 6-thioguanine greater than about 400 pmol per 8×10^8 red blood cells or the level of 6-methyl-mercaptopurine greater than about 7000 pmol per 8×10^8 red blood cells indicates a need to decrease the amount of said drug subsequently administered to said subject.

8. The method of claim 7, wherein said immune-mediated gastrointestinal disorder is IBD.

9. The method of claim 8, wherein said subject having IBD is a pediatric subject.

10. The method of claim 7, wherein said immune-mediated gastrointestinal disorder is selected from the group consisting of lymphocytic colitis, microscopic colitis, collagenous colitis, autoimmune enteropathy, allergic gastrointestinal disease and eosinophilic gastrointestinal disease.

11. The method of claim 7, wherein said toxicity associated with said drug treatment is hematologic toxicity.

12. The method of claim 7, wherein said toxicity associated with said drug treatment is hepatic toxicity.

13. The method of claim 7, wherein said level of 6-thioguanine and said level of 6-methyl-mercaptopurine each is determined in red blood cells.

14. The method of claim 13, wherein said level is determined using high-pressure liquid chromatography.

15. A method of optimizing therapeutic efficacy and reducing toxicity associated with treatment of an immune-mediated gastrointestinal disorder, comprising:

(a) administering a drug providing 6-thioguanine to a subject having said immune-mediated gastrointestinal disorder;

(b) determining the level of 6-thioguanine in said subject having said immune-mediated gastrointestinal disorder; and

(c) determining the level of 6-methyl-mercaptopurine in said subject having said immune-mediated gastrointestinal disorder,

wherein the level of 6-thioguanine less than about 230 pmol per 8×10^8 red blood cells indicates a need to increase the amount of said drug subsequently administered to said subject,

wherein the level of 6-thioguanine greater than about 400 pmol per 8×10^8 red blood cells indicates a need to decrease the amount of said drug subsequently administered to said subject, and

wherein the level of 6-methyl-mercaptopurine greater than about 7000 pmol per 8×10^8 red blood cells indicates a need to decrease the amount of said drug subsequently administered to said subject.

16. The method of claim 15, wherein said immune-mediated gastrointestinal disorder is IBD.

17. The method of claim 16, wherein said subject having IBD is a pediatric subject.

18. The method of claim 15, wherein said immune-mediated gastrointestinal disorder is selected from the group consisting of lymphocytic

colitis, microscopic colitis, collagenous colitis, autoimmune enteropathy, allergic gastrointestinal disease and eosinophilic gastrointestinal disease.

19. The method of claim 15, wherein said level of 6-thioguanine and said level of 6-methyl-mercaptopurine each is determined in red blood cells.

20. The method of claim 19, wherein said level is determined using high-pressure liquid chromatography.

21. The method of claim 15, wherein said toxicity associated with said drug treatment is selected from the group consisting of hepatic toxicity and hematologic toxicity.

22. A method of optimizing therapeutic efficacy of treatment of a non-IBD autoimmune disease, comprising:

(a) administering a drug providing 6-thioguanine to a subject having said non-IBD autoimmune disease; and

(b) determining the level of 6-thioguanine in said subject having said non-IBD autoimmune disease,

wherein the level of 6-thioguanine less than about 230 pmol per 8×10^8 red blood cells indicates a need to increase the amount of 6-mercaptopurine drug subsequently administered to said subject and

wherein the level of 6-thioguanine greater than about 400 pmol per 8×10^8 red blood cells indicates a need to decrease the amount of 6-mercaptopurine drug subsequently administered to said subject.

23. The method of claim 22, wherein said level of 6-thioguanine metabolite is determined in red blood cells.

24. The method of claim 23, wherein said level is determined using high-pressure liquid chromatography.

25. A method of optimizing therapeutic efficacy and reducing toxicity associated with treatment of an immune-mediated gastrointestinal disorder, comprising:

(a) administering a drug providing 6-thioguanine to a subject having said immune-mediated gastrointestinal disorder;

(b) determining the level of 6-thioguanine in said subject having said immune-mediated gastrointestinal disorder; and

(c) determining the level of 6-methyl-mercaptopurine in said subject having said immune-mediated gastrointestinal disorder,

wherein the level of 6-thioguanine less than about 230 pmol per 8×10^8 red blood cells indicates a need to increase the amount of said drug subsequently administered to said subject, and

wherein the level of 6-thioguanine greater than about 400 pmol per 8×10^8 red blood cells or a level of 6-methyl-mercaptopurine greater than about 7000

pmol per 8×10^8 red blood cells indicates a need to decrease the amount of said drug subsequently administered to said subject.

26. The method of claim 25, wherein said immune-mediated gastrointestinal disorder is IBD.

27. The method of claim 26, wherein said subject having IBD is a pediatric subject.

28. The method of claim 25, wherein said immune-mediated gastrointestinal disorder is selected from the group consisting of lymphocytic colitis, microscopic colitis, collagenous colitis, autoimmune enteropathy, allergic gastrointestinal disease and eosinophilic gastrointestinal disease.

29. The method of claim 25, wherein said level of 6-thioguanine and said level of 6-methyl-mercaptopurine each is determined in red blood cells.

30. The method of claim 29, wherein said level is determined using high-pressure liquid chromatography.

31. The method of claim 25, wherein said toxicity associated with said drug treatment is selected from the group consisting of hepatic toxicity and hematologic toxicity.

32. The method of claim 1, wherein said drug is selected from the group consisting of 6-mercaptopurine, azathioprine, 6-thioguanine, and 6-methylmercaptopurine riboside.

33. The method of claim 7, wherein said drug is selected from the group consisting of 6-mercaptopurine, azathioprine, 6-thioguanine, and 6-methylmercaptopurine riboside.

34. The method of claim 15, wherein said drug is selected from the group consisting of 6-mercaptopurine, azathioprine, 6-thioguanine, and 6-methylmercaptopurine riboside.

35. The method of claim 22, wherein said drug is selected from the group consisting of 6-mercaptopurine, azathioprine, 6-thioguanine, and 6-methylmercaptopurine riboside.

36. The method of claim 25, wherein said drug is selected from the group consisting of 6-mercaptopurine, azathioprine, 6-thioguanine, and 6-methylmercaptopurine riboside.

37. A method of optimizing therapeutic efficacy and reducing toxicity associated with treatment of an immune-mediated gastrointestinal disorder, comprising:

(a) administering a drug selected from the group consisting of 6-mercaptopurine, azathioprine, 6-thioguanine, and 6-methylmercaptoriboside to a subject having said immune-mediated gastrointestinal disorder; and

(b) determining the level of 6-thioguanine or 6-methyl-mercaptopurine in said subject having said immune-mediated gastrointestinal disorder;

wherein the level of 6-thioguanine less than about 230 pmol per 8×10^8 red blood cells indicates a need to increase the amount of said drug subsequently administered to said subject, and

wherein the level of 6-thioguanine greater than about 400 pmol per 8×10^8 red blood cells or a level of 6-methyl-mercaptopurine greater than about 7000 pmol per 8×10^8 red blood cells indicates a need to decrease the amount of said drug subsequently administered to said subject.

38. The method of claim 37, wherein said drug is 6-mercaptopurine.

39. The method of claim 37, wherein said drug is azathioprine.

40. The method of claim 37, wherein said immune-mediated gastrointestinal disorder is inflammatory bowel disease (IBD).

41. The method of claim 40, wherein said subject having IBD is a pediatric subject.

42. The method of claim 37, wherein said immune-mediated gastrointestinal disorder is selected from the group consisting of lymphocytic colitis, microscopic colitis, collagenous colitis, autoimmune enteropathy, allergic gastrointestinal disease and eosinophilic gastrointestinal disease.

43. The method of claim 37, wherein said level of 6-thioguanine and said level of 6-methyl-mercaptopurine each is determined in red blood cells.

44. The method of claim 43, wherein said level is determined using high-pressure liquid chromatography.

45. The method of claim 37, wherein said toxicity associated with said drug treatment is selected from the group consisting of hepatic toxicity and hematologic toxicity.

46. A method of optimizing therapeutic efficacy and reducing toxicity associated with treatment of an immune-mediated gastrointestinal disorder, comprising:

(a) determining the level of 6-thioguanine or 6-methyl-mercaptopurine in a subject administered a drug selected from the group consisting of 6-mercaptopurine, azathioprine, 6-thioguanine, and 6-methylmercaptoriboside, said subject having said immune-mediated gastrointestinal disorder;

wherein the level of 6-thioguanine less than about 230 pmol per 8×10^8 red blood cells indicates a need to increase the, amount of said drug subsequently administered to said subject, and

wherein the level of 6-thioguanine greater than about 400 pmol per 8×10^8 red blood cells or a level of 6-methyl-mercaptopurine greater than about 7000 pmol per 8×10^8 red blood cells indicates a need to decrease the amount of said drug subsequently administered to said subject.

47. The method of claim 46, wherein said drug is 6-mercaptopurine.

48. The method of claim 46, wherein said drug is azathioprine.

49. The method of claim 46, wherein said immune-mediated gastrointestinal disorder is IBD.

50. The method of claim 47, wherein said subject having IBD is a pediatric subject.

51. The method of claim 46, wherein said immune-mediated gastrointestinal disorder is selected from the group consisting of lymphocytic colitis, microscopic colitis, collagenous colitis, autoimmune enteropathy, allergic gastrointestinal disease and eosinophilic gastrointestinal disease.

52. The method of claim 46, wherein said level of 6-thioguanine and said level of 6-methyl-mercaptopurine each is determined in red blood cells.

53. The method of claim 52, wherein said level is determined using high-pressure liquid chromatography.

54. The method of claim 46, wherein said toxicity associated with said drug treatment is selected from the group consisting of hepatic toxicity and hematologic toxicity.

JOUSTING AT WINDMILLS:

CERVANTES AND THE QUIXOTIC FIGHT FOR AUTHORIAL CONTROL

H. PARKMAN BIGGS

" . . . for among the untutored poets of our day, the custom is for each to write however he wishes and steal from whomever he wishes regardless of whether or not it suits his intention, and there is no foolishness, either sung or written, that is not attributed to poetic license."[1]

Miguel de Cervantes, *Don Quixote* (Part II)

INTRODUCTION

Achieving the appropriate balance between the right of first authors to control the later use of their work and freedom for follow-on authors to further develop from that text has long been challenging. Currently, under United States law in particular, fair use stands as a nebulous buffer between the two creative camps, granting a significantly limited right to the second author to work from the first author's text.[2] While that tension excites its own debate, a less considered aspect of this tension involves the degree to which the first author might be creatively and productively affected by the follow-on author,

1. MIGUEL DE CERVANTES, DON QUIXOTE 917 (Edith Grossman trans., HarperCollins ed., 2003).

2. 17 U.S.C §§ 107(1), (4) (1992).

particularly in a context where absolutely no such mediating protection exists. If that lack of protection substantially improves and increases the original author's output, by extension it puts the foundational reasoning for U.S Copyright's limited monopoly in question.

Don Miguel de Cervantes wrote *Don Quixote* in such a copyright-less landscape. Cervantes' bitter interplay with a follow-on author, Alonso Fernández de Avellaneda—which substantially affected both the plot and general content of Cervantes' original *Don Quixote*—provides a striking insight to what such an uncontrolled universe might produce creatively.

Our focus here will first be to consider the interplay of these two authors through a close reading of their rival texts. Having provided the introduction to our topic in Part I, in Part II we will take a broader look more generally at the historical relationship of the author to his text. In Part III we will focus on Cervantes specifically, addressing his misattributions and non-attributions, which highlight the lack of authorial control for artists in his time. In Part IV we will consider Cervantes' follow-on author, Avellaneda, and his work, often termed the "false *Don Quixote*." We will conclude by considering what this bitter rivalry may suggest in terms of creative production, the core goal of the U.S. Copyright Clause.

I. UNDERSTANDING THE AUTHOR'S RELATIONSHIP TO HIS WORK

The attribution and close association of authors to their texts has not always been convention for western literature, let alone the idea of exclusive authorial control. While we understand the modern author generally as fulfilling, as Foucault has stated, "a certain functional principle by which, in our culture, one limits, excludes and chooses,"[3] Foucault also observed that historically the author did not always enjoy this control:

> There was a time when texts that we today call "literary" (narratives, stories, epics, tragedies, comedies) were accepted, put into circulation and valorized ***without any question about the identity of the author*** . . . [t]heir ancientness, whether real or imagined, was regarded as a sufficient guarantee of their status.[4]

3. FOUCAULT, WHAT IS AN AUTHOR? (1977), *reprinted in* AESTHETICS, METHOD AND EPISTEMOLOGY 221 (Robert Hurley and others trans., James D. Faubion ed., 1998).

4. *Id.* at 212; *see also* Robert J. Griffin, *Anonymity and Authorship*, 30 NEW LITERARY HISTORY 877 (1999) (emphasis added).

This idea of authorship harkens for some back to Greek and Roman precedents,[5] but Foucault's claim of author-text disassociation has particular support in the medieval period of western literature, between the 8th and 14th centuries. *The Song of Roland* for example, an epic poem recounting the heroic death of Charlemagne's nephew in battle in 778, was largely codified in the 12th century.[6] Many scholars have argued compellingly, however, that new characters were added over a period of several prior centuries—characters such as Ganelon—introduced in the 9th century—or Oliver, introduced in the 10th.[7] While the poem has been attributed to Turold, this seems primarily based on the mention of his name in the very last lines of the work—his name was not originally listed under the work's title.

The *Romance of the Rose* offers another example of group authorship over time. While most agree that the first four thousand lines of the work were written between 1225 and 1230 by Guillaume de Lorris,[8] the work was expanded in scope and given a decidedly more sexual tone under Jean de Meun's period of writing (1269-1278).[9] Under de Meun's hand, the lover gets the rose to open her bud so he can then spill "a little seed just in the center,"[10] providing an explicitness which would have been a surprise to its original author. Furthermore, a third contributor, Guy de Mori is credited with weaving the two texts to a better whole, reportedly adding, editing, and deleting portions of text.[11] If true, these three authors, if not more, all co-authored the version we recognize today—a final version quite different from its original author's vision.

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5. For Greek precedent, there is a contingent of classical scholars who believe the *Iliad* and *Odyssey* were composed by many unnamed authors, most likely oral composers, and only collected and committed later to writing; *see* BARBARA GRAZIOSI, INVENTING HOMER: THE EARLY RECEPTION OF EPIC 41 (2002). For consideration of the oral nature of these works and the notion of ring or chiastic structures in Homer, *see* ALBERT LORD, SINGER OF TALES 45 (1960); FREDERICK AHL & HANNA ROISMAN, THE ODYSSEY RE-FORMED 191 (1996). For evidence of loose authorial attribution in Roman times, *see* Harold C. Streibich, *Moral Right of Ownership to Intellectual Property - Part I: From the Beginning to the Age of Printing*, 6 MEM. ST. U. L. REV. 1, 6 (1975-1976) (quoting Martial, *Epigrams*, L. i., 30, stating: "It is said, Fidentinus, that in reciting my verses you always speak of them as your own. If you are willing to credit them to me, I will send them to you gratis. If, however, you wish to have them called your verses, you had better buy them, when they will no longer belong to me," Marshal's comments in his *Epigrams* are instructive.)

6. GERARD BRAULT, THE SONG OF ROLAND: AN ANALYTICAL EDITION 1 (1978).

7. EUGENE VANCE, READING THE SONG OF ROLAND 9 (1970).

8. FRANCES HORGAN, INTRODUCTION TO ROMANCE OF THE ROSE ix (Oxford University Press, 1999).

9. *Id*. at xv.

10. BARBARA W. TUCHMAN, A DISTANT MIRROR: THE CALAMITOUS 14TH CENTURY 212 (1987) *quoting* JEAN DE MEUN, ROMAN DE LA ROSE.

11. SYLVIA HUOT, THE ROMANCE OF THE ROSE AND ITS MEDIEVAL READERS 85–7 (1993).

Examples of a lack of authorial control persisted through the tail end of the Middle Ages as well, albeit with a closer association of author to text. Matteo Boiardo revisited the medieval Roland, giving him a considerably more romantic turn in his *Orlando Innamorato* (1483, 1495).[12] Boiardo's Orlando was taken and further developed under Ludovico Ariosto in his well-received *Orlando Furioso* (1532).[13] In the Renaissance period, Lope de Vega, a highly renowned poet of Cervantes' period,[14] wrote what many consider a further sequel to this work with his *La Hermosura de Angélica*.[15] Although the authors here are clearly more attributed to their text, their sequels—freely taking from prior authors—illustrate the lack of exclusive rights for prior authors.

All of these examples provide essential context for understanding the later intense interplay between Cervantes and Avellaneda that is our focus, particularly in terms of clarifying the then understood authorial rules of the game. Avellaneda, author of "the false *Don Quixote*", actually makes this point himself in his *Don Quixote* prologue:

> *I only say that nobody need be startled that this second part comes from a different author, for there is nothing new about a different person pursuing the same story*. How many have spoken to the love affairs of Angélica and what happened to her? Various Arcadias have been written and Diana is not all by one hand.[16]

While Avellaneda's point is worth taking, it is also noteworthy that he felt the need to make the point. If these were truly the authorial rules of the game, it would hardly seem to require comment. Avellaneda, however, clearly knew his work would excite a virulent response, and he would not be disappointed. In the next section, we turn to Miguel de Cervantes and take a closer look at his life and *Don Quixote*, his masterpiece.

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12. ENCYCLOPEDIA OF ITALIAN LITERARY STUDIES 267 (Gaetana Marrone, Paolo Puppa, & Luca Somigli et al. eds., 2006).

13. ELIZABETH HORODOWICH & LIA MARKEY, THE NEW WORLD IN EARLY MODERN ITALY, 1492-1750 271 (2017).

14. Lope de Vega has been conjectured by many as to be Avellaneda, the author of *The False Don Quixote*.

15. LOPE DE VEGA, POEMA DE LA HERMOSURA DE ANGELICA (1602).

16. ALONSO FERNANDEZ DE AVELLANEDA, DON QUIXOTE DE LA MANCHA 4 (John E. Keller & Alberta Wilson Server ed., 1980) (emphasis added).

II. CERVANTES AND THE 16TH CENTURY COPYRIGHT LANDSCAPE

A. Cervantes' Early Years

Miguel de Cervantes Saavedra was born in 1547 and initially chose a life of adventure—a choice that proved decidedly unrewarding. At twenty-four, he lost his hand fighting at the Battle of Lepanto in 1571 and a few years later suffered the further indignity of both being captured by Barbary pirates and forced into slavery in Algiers, serving a significant amount of time in prison.[17] Ransomed and returned to Spain in 1580, he turned to writing and enjoyed little success, writing at least twenty plays, all rather coolly received. His early works of fiction and poetry also found only tepid approval, and so the extraordinary success of *Don Quixote* in 1605 was rather unexpected.[18]

Fully titled *El Ingenioso Hidalgo Don Quixote de la Mancha* ("*The Ingenious Nobleman Don Quixote of la Mancha*") the work followed the wanderings of its eponymous subject's knight-errant quests, coupled with the credulous and corpulent Sancho Panza, all to win the heart of his idolized Dulcinea, who we come to learn falls decidedly short of Don Quixote's panegyrics. Don Quixote's often deluded actions, for all of their entertainment value, doubled as scathing criticisms of earlier knight-errantry works of absurdly exaggerated exploits, most notably *Amadis of Gaul*[19] and the *Song of Roland*.[20]

For all of the book's bite, it was nonetheless enthusiastically hailed by the public, immediately bringing urgent calls for a second part. Cervantes, however, had sold the rights to a printer, Franciso de Robles, who secured a ten-year license from the king banning any other works using Don Quixote.[21]

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17. Indeed, Cervantes would seem to obliquely make reference to his experiences in prison in *Don Quixote*, when he notes through one of his characters that imprisonment could be welcome in providing the necessary free time to write books: "I'll have time to finish my book, for . . . on the galleys of Spain there's more leisure than I'll need, though I don't need much for what I have to write." MIGUEL DE CERVANTES, DON QUIXOTE 169 (Edith Grossman trans., 2003). Cervantes also seems to cull from his imprisonment generally later when "the captive" relates another extended imprisonment, 34380 (*passim*).

18. With the absence of any cognizable authorial rights, Cervantes would sadly not reap the financial rewards of his success with *Don Quixote* he richly deserved. Indeed, it is likely Cervantes would have died penniless and unable to complete the second part of his most famous work if not for the sponsorship of Pedro Fernández de Castro y Andrade, who recognized the author's thorny, but undeniable genius.

19. *See generally* GARCI RODRIGUEZ DE MONTALVO, AMADIS OF GAUL (1304).

20. *See generally* UNKNOWN, SONG OF ROLAND (c. 1100). Scholars speculate that the author was possibly the poet named Turold. *See* Brault*, supra* note 6.

21. Francisco de Robles, *Personajes relacionados con la Historia del Libro*, TODO LIBRO ANTIGUO (2013), http://www.todolibroantiguo.es/personajes-historicos/francisco-de-robles.html [https://perma.cc/4XZ3-VL2Q];

It would seem that Cervantes himself took this to heart, or perhaps found himself actively forbidden by his printer, and so turned his attention to other projects over that decade.

Cervantes furthermore *seemed* to suggest in *Don Quixote* that he was done with the character, when at the end he wrote the following: "[P]erhaps a better pen will take up the cause."[22] Might a follow-on author then reasonably assume such a call was an invitation to continue? [23] Cervantes' tongue-in-cheek criticisms of the era's general lack of authorial control might also suggest a follow-on author might have at least his grudging license to further develop the character. In the next section, we take a more specific look at those tongue-in-cheek references, particularly as they relate to aspects of copyright law, and most notably, attribution.

Pero si por algo es recordado es por el Quijote. Como dice la portada: "Vendese en casa de Francisco de robles, librero del Rey nuestro señor." Los derechos para la primera parte de la obra los había comprado por 1.500 reales en 1604.

La cédula real o privilegio de Felipe III del 26 de septiembre de 1604 autoriza su publicación, concediendo a Miguel de Cervantes licencia y facultad «por tiempo y espacio de diez años, que corran y se cuenten desde el dicho día de la desta nuestra cédula. So pena que la persona o personas que sin tener nuestro poder lo imprimiere o vendiere, o hiciera imprimir o vender, por el mesmo caso pierda la impresión que hiciere, con sus moldes y aparejos della, y más incurra en pena de cincuenta mil maravedises, cada vez que lo contrario hiciera» . El por qué Cervantes eligió a Francisco de Robles puede deberse a la amistad que ambos mantenían, ya que como hemos dicho su padre editó la Galatea o bien, la fama que como editor tenía,[. . .]

Translation: (Jennifer Rengachary) *But if he is remembered for anything it's for Quixote. As it says on the cover: "Sold at the House of Francisco de Robles, bookseller of our Lord the King." The rights for the first part of the work were purchased for 1500 reales in 1604.*

The royal stamp of Felipe III on September 26, 1604 authorized its publication, giving Miguel de Cervantes a license "for a space and time of 10 years, from this stamped date. If any unauthorized person prints or sells this work or causes this work to be printed or sold, the printed materials will be seized, as well as the printing apparatus used, and a fine of 500,000 maravedises will be imposed." Whether Cervantes choose Francisco de Robles due to their friendship as his father had edited La Galatea or because of his own fame as an editor [. . .]; *see also* ROGER CHARTIER, THE AUTHORS HAND AND THE PRINTERS MIND: TRANSFORMATIONS OF THE WRITTEN WORD IN EARLY MODERN EUROPE 140 (2013).

22. Tom Lathrop, *"Don Quixote" and Its Errant Author*, NEW ENGLAND REVIEW (1990-), VOL. 31, NO. 4, 16 (2010). Original: "*forse major plecta.*"

23. While one could reasonably cite to this as a license to borrow, we should perhaps not overly read into such exhortations, as they were part of the standard ending of works, such as *Orlando Furioso*. *See* MATTEO MARIA BOIARDO, ORLANDO INNAMORATO, the first two parts published 1483, the last part, posthumously in 1495; *see also* LUDIVOCO ARIOSTO, ORLANDO FURIOSO (Guido Waldman trans., 1532).

B. Don Quixote, Part I: Cervantes and Copyright

It is perhaps helpful first to situate not only the copyright landscape of Cervantes' past, but also the timing of the laws that followed. *Don Quixote* fell just under a century before the Statute of Anne in England (1710)[24] and slightly over two centuries before Spain's Copyright Act of 1847.[25] As for the writing itself, it is perhaps Cervantes' criticisms with regard to authorial attribution that are most striking relative to basic modern copyright principles.[26]

From the very beginning we learn that Cervantes plans to embrace a loose sense of authorship. In the prologue, Cervantes wrote that others have advised him "[to] write [the poems] yourself, and then . . . baptize them with any name you want . . . ."[27] That is to say, rather than actually take the time to wait on the praise of authors and also lose control of that content, greater efficiency and control can be achieved writing the content yourself and attributing that work to those whom you admire.

As something of an aside, it is worth mentioning that Avellaneda later gave this statement a more cynical coloring, claiming that the actual reason Cervantes had to make up verses and attribute them to other poets was because he was incapable of "finding a titled person in Spain who would not be offended if his name were mentioned [in connection with Cervantes], so many having permitted their names to appear at the beginning of books by the authors he backbites."[28] We will have more to say on this later.

Cervantes' efforts at misattribution, however, do not end there. He attributes a quote to Cato that is actually from Ovid and compounds the error (intentionally?) by misquoting the reference.[29] Cervantes then states at the

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24. ISABELLA ALEXANDER & H. TOMÁS GÓMEZ-AROSTEGUI, RESEARCH HANDBOOK ON THE HISTORY OF COPYRIGHT LAW 17 (2016).

25. *Id.* at 423.

26. Cervantes was critical of many other areas of authorship as well, directing his wrath towards the obtuseness of publishers among many other targets. He might end a chapter randomly with a semi-colon for example: Cervantes, *supra* note 1, at 94. At other times, he began chapters with humorously bland and contentless titles, such as "Chapter LXX, which follows chapter LXIX," or Chapter 59 (LIX), which begins as: "[W]hich recounts the extraordinary incident that befell Don Quixote and can be considered an adventure." *Id.* at 842, 912.

27. *Id.* at 5.

28. Avellaneda, *supra* note 16, at 4.

29. Cervantes, *supra* note 1, at 6. For example, in his preface notes Cervantes stated: "[i]f it's the fickleness of friends, Cato's there, ready with his couplet:

> *Done eris felix, multos*
> *numerabis amicos,*
> *Tempora si fuerint*
> *nubila, solus eris"*

outset that the text of *Don Quixote* is actually not his, but a translation from an old Arabic text, written by a sort of omnipresent wizard-like chronicler named Cide Hamete Benengali. Cervantes, however, took this literary conceit still one step further, noting that he was not even the translator, but instead paid another to translate it.[30]

From misattribution, Cervantes moved seamlessly into non-attribution. Within the body of his work, songs were sung as if original to Cervantes' *Don Quixote*.[31] Sancho Panza cited pontifically to all sorts of famous works, sometimes also misquoting them and frequently mistaking their application.[32] Don Quixote and others also hold forth, without always revealing that wisdom proffered is not their own.[33] Given this accumulation of factors—Cervantes' non-authorship conceit, his misattribution and non-attribution, his final

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This phrase is misattributed, it actually came from Ovid's *Tristia* 1.9.5-6. *"To a Steadfast Friend,"* but there should be two lines rather than four for the elegiac couplet form. In addition, there are actual textual errors. The Oxford English Edition reads as follows:

> ***Donec** eris **sospes**, multos numerabis amicos*
> *Tempora si fuerint nubila, solus eris*
> *"When you are happy, you will have many friends*
> *If times become gray, you will be alone"* (translation by author)

['Felix' instead of 'sospes' has been accepted in other textual versions however.] Original text: http://www.thelatinlibrary.com/ovid/ovid.tristia1.shtml [https://perma.cc/J4KD-DPYG].

30. Cervantes wrote specifically *"to facilitate the arrangement and not allow such a wonderful find out of my hands, I brought him to my house, where, in a little more than a month and a half, he translated the entire history, just as it is recounted here."* Cervantes, *supra* note 1, at 68. Furthermore, in Cervantes' Second Part he again alludes to the *Don Quixote* text being found in an old hermitage, "some parchments on which, in Gothic script, Castilian verses celebrated many of the knight's exploits and described the beauty of Dulcinea of Toboso, the figure of Rocinante, the fidelity of Sancho Panza, and the tomb of Don Quixote . . . ." *Id.* at 445.

31. For example:

> And when my soul, freed of its mortal shell,
> is led across the dark infernal Styx,
> it will celebrate you still,
> and with that song it will halt the waters of oblivion.

The verse is not attributed but is from the second stanza of Lope de Vega's third eclogue. Cervantes, *supra* note 1, at 909. Cervantes even has counsel for those trying to lengthen their work, to give it an amplitude and weight it might not otherwise have. Cervantes' opening, furthermore, is filled tributes to the major characters of *Don Quixote*, misattributed to famous authors. *Id.* at 11–18.

32. *Cf.*, *e.g.*, "you are the messenger, my friend, and do not deserve the blame." *Id.* at 515. Which are actually lines from a ballad referring to Bernardo del Carpio as noted in footnote 3 of the chapter.

33. For example, Don Quixote sings a long song that is actually a translation from an Italian madrigal by Pietro Bembo. *Id.* at 905.

invitation for another to continue the writing of Don Quixote's adventures, and the fact that copyright as we know it did not exist at the time—one might think Cervantes would allow another author to borrow his character. As will become clear, this is not the case, and his anger substantially affected his own creative production of the final hundred pages of his literary masterpiece.

III. THE BATTLE FOR AUTHORIAL CONTROL

A. Cervantes' Don Quixote, Part II

While copyright as we know it did not exist at the time, as noted above, isolated exclusive licenses could be obtained from the king, and it appears Cervantes' publisher, Francisco de Robles, actively protected his ten-year grant from the king for *Don Quixote.* As it turns out, one author was watching closely, waiting for Fransico de Robles' license to expire. Writing under the pseudonym Alonso Fernández de Avellaneda, this author printed his version of the second part of *Don Quixote* almost immediately upon Fransico de Robles' license expiration in 1614. While Cervantes had also been waiting, he was clearly beaten to the punch, his version appearing a full year later. Reading Avellaneda's version, Cervantes was so incensed he wove insults to Avellaneda's person, writing ability, and plot choice in the final pages of his version, often to the exclusion of other character or plot development.[34] Avellaneda's follow-on work—understood in terms of its effect on first author output and creativity—in short dramatically affected Cervantes' subsequent creative work, changing content choice and perhaps even increasing Cervantes' creative output.

At this point it makes sense to consider this curious interplay and output in light of the functioning of modern U.S. copyright. For Cervantes' heightened productivity here offers us a compelling, perhaps repellent, example of an author whose productivity was potentially significantly enhanced through the desperation of a lack of copyright protection.

For, where the purpose of U.S. Copyright's is to "promote the Progress of the Science and the useful Arts,"[35] in this example many have rightly questioned whether Cervantes would have finished this work under a modern Copyright regime, free from the anxiety of a creative interloper. If the

34. Cervantes apparently learned of the other Don Quixote around Chapter 59 (LIX) of the second part after which allusions to the false Don Quixote increase considerably. *Id.* at 842; *see also id.* at 453, note 2. For a look at a similar fight for authorial control through Charles Dickens in a 19th century British copyright landscape, *see* H. Parkman Biggs, *Mocking their Muses: 'Fan Fiction' in the Age Dickens and Cervantes*, MÉLANGES EN L'HONNEUR DU PROFESSEUR JOËL MONÉGER, 615–17 (2017).

35. U.S. CONST. art. I § 8, cl. 8.

Copyright Clause speaks in part to a utilitarian function of productivity, where the function is solely to promote quantity, Cervantes' accelerated output suggests an uncomfortable counterpoint to the argument of increased utility. Would Cervantes have had the material, the inspiration, the spurring without Avellaneda threatening his legacy? Anyone who has read the last half of *Don Quixote Part II* will be hard-pressed to argue that Avellaneda's work did not dramatically influence Cervantes' version. And yet, it is that very lack of protection that is in part responsible for a text many consider the greatest literary fiction *of all time*. To make Avellaneda's influence more explicit, it is useful to document just how riddled the final part of Cervantes' *Don Quixote* is with allusions to Avellaneda.

Cervantes first references Avellaneda fairly gently in his prologue, sympathizing with his readers, who he imagines as longing for his angry response to Avellaneda's work:

> [H]ow impatiently you must be waiting for this prologue, illustrious . . . reader, believing you will find in it reprisals, quarrels and vituperations hurled at the author of the *second Don Quixote* . . . [b]ut the truth is [that] I will not give you that pleasure . . . you would like me to call him an ass, a fool, an insolent dolt . . . let his sin be his punishment, let him eat it with his bread, and let that be an end to it.[36]

Notice also that Cervantes refused to refer to Avellaneda by name, a discipline he stuck closely to. Cervantes then mentions a "loathing and disgust caused by another Don Quixote who has traveled the world in the disguise of a second part,"[37] Cervantes fairly pointing out that this second author would seem to implicitly recognize his inappropriateness by not revealing his identity.[38]

Still in the Prologue, Cervantes speaks to the money lost to him by Avellaneda's work, which again speaks to our modern notions of copyright, but he insists the money is not his concern:

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36. Cervantes, *supra* note 1, at 455 (Cervantes continues with what does upset him, however: "[w]hat I do mind . . . is that he accuses me of being old and one-handed, as if it had been in my power to stop time and halt its passage, or if I had been wounded in some tavern and not at the greatest event ever seen in past or present times . . . .").

37. *Id.* at 453.

38. Cervantes writes that [this other author] "hides his name and conceals his birthplace, as if he had committed some terrible act of treason against the crown." *See id.* at 456. This is indeed, the case, as the true identity of Avellaneda has never been established. *See also* Avellaneda, *supra* note 16, at vi.

> [H]is threat to deprive me of profits with his book is something I do not care about at all . . . [thanks to] the great Count of Lemnos, whose . . . liberality keeps me standing in spite of all the blows struck by my bad fortune . . . .[39]

Cervantes finishes his second prologue by explaining he decided to kill Don Quixote at the end of this second part to prevent further use of his character. Cervantes is in effect asserting authorial control through the only means available to him without copyright, but that textual decision, if we find it sublime, is linked to the copyright-less space Cervantes created in.[40]

The negative to outright scathing references to Avellaneda's work and person do not end with the prologue. They become almost the very rhythm of the final hundred pages of the work, a point at which we might reasonably guess Cervantes first became aware of his rival's publication.[41]

In the first reference within the work, Cervantes' Don Quixote hears through a thin hotel wall a person proposing to his friend "to read another chapter of *the second part of Don Quixote of La Mancha*" to which the person responds "why does your grace want us to read this nonsense? Whoever has read *the first part of the history of Don Quixote of La Mancha* cannot possibly derive any pleasure from reading this second part."[42] Not limiting the criticism to content, Cervantes' character also takes exception to Don Quixote "having fallen out of love with Dulcinea of Toboso"[43] in Avellaneda's version.

As the final hundred pages continue, Cervantes' obsession with Avellaneda's intrusive contribution becomes increasingly the focus, although Cervantes takes great pains to never mention Avellaneda by name. For example, Sancho, discovering the existence of both his and Don Quixote's counterparts, feels compelled to mark the difference:

> Believe me . . . the Sancho and the Don Quixote in that history are not the ones who appear in the history composed by Cide Hamete

39. Cervantes, *supra* note 1, at 457; *see* Avellaneda, *supra* note 16, at 3 (stating in the prologue that "[b]ut let him complain about my work because of the profits I take away from his second part.")

40. Cervantes, *supra* note 1, at 458 (stating that "I give you a somewhat expanded Don Quixote who is, at the end, dead and buried, so that no one will dare tell more tales about him . . . .")

41. *See id.* at 540 (when Don Quixote speaks of the possibility of an enchanter that appears as Don Quixote and "allowed himself to be vanquished in order to cheat [the real] Don Quixote of the fame that his high chivalric deeds have earned . . . for him throughout the known world.")

42. *Id.* at 845.

43. *Id.*

> Benengeli, the ones who are us: my master is valiant, intelligent and in love, and I'm simple, amusing, and not a glutton or a drunkard.[44]

Cervantes' reworkings do not end there as he also alters the actual plot of his work, *Don Quixote* stating he will no longer go to Zaragoza as Avellaneda's character had, but instead has Don Quixote travel to Barcelona, simply to further underscore "the lies of this modern historian to the world, and . . . that I am not the Don Quixote he says I am."[45]

Later, in the hopes of helping Don Quixote better understand who the other Don Quixote is, Cervantes' Don Quixote is then urged to read passages from Avellaneda's *Don Quixote*. He demurs, however, not wanting to give Avellaneda—again not mentioned by name—the satisfaction:

> [Don Quixote] considered that he had read it . . . that all of it was foolish, and if it happened to come to the attention of the author that he had held it in his hands, he did not want him to celebrate the idea that Don Quixote had read it, for one's thoughts must eschew obscene and indecent things, as must one's eyes.[46]

At a meta-textual level, it is worth noting that characters here are not only speaking across books, but across authors, indeed across their purported translators. Cervantes creates a further opportunity for insult by having Don Quixote spot a printing shop in his wanderings, where he finds Avellaneda's *Don Quixote* headed to press:

> He moved on and saw that they were also correcting another book, and when he asked its title, they responded that it was called the *Second Part of the Ingenious Gentleman Don Quixote of La Mancha*, written by somebody from Tordesillas.
>
> "I have already heard of this book," said Don Quixote, "and by my conscience, ***the truth is I thought it had already been burned and turned to ashes for its insolence; but its day of reckoning will come, as it does to every pig***, for feigned histories are good and enjoyable the closer they are to the truth . . . and as for true ones, the truer they are, the better."[47]

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44. *Id.* at 848.
45. *Id.* at 849.
46. *Id.* at 848.
47. *Id.* at 874–75 (emphasis added).

And the drumbeat would only intensify. Subsequently, Don Quixote's unrequited (although in actuality feigned) suitor Altisidora, describes her near-death experience to Don Quixote:

> To tell the truth . . . I probably didn't die completely because I didn't enter hell . . . I reached the gate, where about a dozen devils were playing *pelota* . . . in tights and doublets . . . and what amazed me most was that instead of balls they were using books . . . [o]ne of them, brand new and nicely bound, was hit so hard that its innards spilled out.
>
> [When it was discovered to be the "fake" second part of the history of *Don Quixote of La Mancha*, the devil says] 'Take it away from here…and throw it into the pit of hell so that my eyes never see it again . . . [For it is] [s]o bad . . . that if I myself set out to make it worse, I would fail.[48]

Don Quixote soon after then relates the incompetence of certain artists who paint:

> [w]hatever comes out. And if . . . painting a rooster, he would write . . . 'This is a rooster,' so that no one would think it was a fox And that . . . is how the . . . writer . . . must be . . . of this new Don Quixote: he painted or wrote whatever came out.[49]

Cervantes then took the extraordinary additional step of weaving Avellaneda's *characters* into Cervantes' text, setting up a lengthy passage between Avellaneda's Don Alvaro Tarfe, a close associate of Avellaneda's Don Quixote, and Cervantes' Don Quixote.[50] Don Quixote convinces Tarfe that the characters Tarfe consorted with were impostors and that the author who created him was substandard. Tarfe agrees. Not finished there, Cervantes went so far as to have Don Alvaro Tarfe sign a document with the local magistrate officially declaring it so.[51]

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48. *Id.* at 915–16.

49. *Id.* at 923 (noting that he may also have been "like a poet who was at court some years ago, whose name was Mauleón; when asked a question, he would say the first thing that came into his head, and once when asked the meaning of *Deum de Deo*, he responded 'Dim down the drummer.'")

50. Avellaneda, *supra* note 16, at 14, footnote 17.

51. Cervantes, *supra* note 1, at 924–27.

The cataloguing of this degree of reference and animosity is important again when we are considering purely the extent of the influence that Avellaneda's work had on Cervantes' productivity and content choice. For the work that we now consider one of the great literary masterpieces of all time owes unfortunately a massive debt in its final pages to Avellaneda—an by extension to the lack of copyright.[52]

The finale of *Don Quixote* further makes the point. On his deathbed, Cervantes' Don Quixote reads his last will and testament and begs his executors, should they meet the author who wrote the other *Don Quixote Part II* to ask his forgiveness for having given this false author the opportunity to write "such great absurdities . . . ."[53] Don Quixote dies three days later, and Cervantes relates that the priest drew up a document testifying to his death "to remove the possibility that any author other than Cide Hamete Benengeli would falsely resurrect him . . . ."[54]

Finally, to further assure that no other would take up the quixotic mantle, Cervantes ends this second part with the fictional Arab writer, Cide Hamete Benengeli, speaking to his pen as follows:

> Here you will remain, hanging from this rack on a copper wire . . . [l]et no one lay a hand on [this pen]; for this enterprise . . . is reserved only for me. For me alone was Don Quixote born, and I for him; he knew how to act, and I to write; the two of us alone are one, despite and regardless of the false Tordesillan who dared . . . to write . . . about the exploits of my valorous knight . . . .[55]

The final words of Cervantes' *Don Quixote* are a warning to leave his "true Don Quixote" alone.[56] It is interesting to consider again, however, the role Avellaneda's work played on the creative production of Cervantes. As we have noted, Cervantes' final hundred pages referenced Avellaneda relentlessly and seemed to give Cervantes new creative inspiration—perhaps even a solution as to how he might end his second part. What might that final text have looked like without Avellaneda's work? Might the work have been finished at all? If Avellaneda helped Cervantes finish his work, Western literature owes Avellaneda an enormous debt of gratitude, for not only did his text contribute

52. Angelique Chrisafis, *Don Quixote is the World's Best Book say the World's Top Authors*, THE GUARDIAN May 8, 2002, https://www.theguardian.com/world/2002/may/08/humanities.books [https://perma.cc/74WJ-7LG6].

53. Cervantes, *supra* note 1, at 938.

54. *Id.*

55. *Id.* at 939.

56. *Id.* at 940.

significantly to Cervantes final pages, Avellaneda's spurring on of Cervantes at that particular moment in time was crucial as Cervantes died only one year later.

An analysis of only Cervantes' text of *Don Quixote* is incomplete, however. Understanding more closely what may have caused such upset to Cervantes and affected him so deeply is warranted. Was Avellaneda's work truly so wanting that it deserved the "loathing and disgust" of Cervantes?[57] In the next section, we will take a closer look at Avellaneda's text, particularly focusing on the author's references to Cervantes and Cervantes' *Don Quixote*.

B. Avellaneda's Don Quixote de La Mancha Part II

For all of Cervantes' mockery, it is fair to question whether Avellaneda's work was indeed as substandard as Cervantes found it to be. Although not every generation agrees—indeed in the seventeenth and eighteenth centuries the French actually found Avellaneda's version superior to Cervantes'—current consensus generally finds Avellaneda's version capable but not quite to Cervantes' level of mastery.[58] We will try here to document in some measure how the difference in quality between the two works might reveal itself.

Cervantes' greater discipline reveals itself first in the maintaining of conceits; Cervantes notes that his work is from a mysterious Arab writer, Cidi Hamete Benengeli, a conceit he sustains throughout the book, mentioning the Arab author forty-two times.[59] Cervantes further improves on the conceit, as earlier noted, by stating that he also did not translate the work. In contrast, Avellaneda cites to an Arab writer, Alisolán, so seems ready to honor the tradition, but then never specifically mentions him again.

Avellaneda also seems less able to fully render the complexity to Cervantes' characters. Under Avellaneda's version, Don Quixote is mad without any moments of lucidity or redemptive behavior, also proving more quick to violence. Sancho Panza is not a wise-fool as under the hand of Cervantes but is instead an unremitting fool.[60] At the end, while Avellaneda

57. *Id.* at 453.

58. *See* Avellaneda, *supra* note 16, at Translator's Introduction ix–xi.

59. The figure of 42 times established through text search by author.

60. Addressing Sancho Panza a character of Cervantes' notes of Avellaneda's work: "this new author does not handle you with the decency that displays itself in your person; he makes you out a heavy feeder and a fool, and not in the least droll, and a very different being from the Sancho described in the First Part of your master's history." DON QUIXOTE, PART II, MIGUEL DE CERVANTES Chapter 59, 167 (Amazon Kindle, 2011). *Compare* Avellaneda, *supra* note 16, at 269 where Sancho behaves simply like a fool, *with* Cervantes, *supra* note 1, at 895 where Cervantes' Sancho, who is allowed to render judgment, and does so fairly wisely, even at the behest of Don Quixote himself who towards the end of the work says, "[you] are welcome to respond . . . Sancho, my friend; I would not be competent to do so, my judgment is so shaken and confused."

has his Don Quixote involuntarily committed to an insane asylum because there is simply no hope for him, Cervantes' Don Quixote comes to a more baleful realization of his errors, induced into a sort of anagnoresis after an inglorious confrontation at the hands of herders whose animals trample him into his changed worldview. Don Quixote, in his despondency, seems to understand what his life has been, lamenting to Sancho:

> Eat, Sancho my friend . . . sustain life, which matters to you more than to me, and let me die at the hands of my thoughts and by means of my misfortunes. I, Sancho, was born to live by dying, and you to die by eating; so you can see that I am telling you the truth in this regard, consider me, printed in histories, famous in the practice of arms, courteous in my actions, respected by princes, wooed by maidens; and ***when I expected the palms, triumphs, and crowns that were earned and deserved by my valorous deeds, I have seen myself this morning trampled and kicked and bruised by the feet of filthy and unclean animals.*** This thought dulls my teeth, blunts my molars, numbs my hands, and completely takes away my desire for food, and so I think I shall let myself die of hunger, the cruelest of all deaths.[61]

Cervantes' Don Quixote takes control of his life at the end and understands fully the absurdity of his position. That fuller complexity is not part of Avellaneda's Don Quixote who is simply deposited, still delusional, in an insane asylum.

Avellaneda's moralism is furthermore rather heavy-handed, and so for him Don Quixote deserves his misery and misfortune for after all he is committing sins against God.[62] Cervantes' lessons are less heavy-handed, more equivocal. We see a bit of ourselves in him and even find ourselves rooting for him. Not so for Avellaneda's Don Quixote.

The only area where Avellaneda and Cervantes seem to agree is on the corrupting influence of chivalric books, something Avellaneda would rail against more stridently and unsubtly than Cervantes: "we both have one aim, which is to banish the harmful lesson of the inane books of chivalry so commonplace among rustics and idle people."[63] Avellaneda echoes this sentiment again late in his story when another describes Don Quixote as "half-

61. *Id.* at 842 (emphasis added).
62. *See* Avellaneda, *supra* note 16, at 77, 153, 165, 189–91.
63. *Id.* at 3.

crazy . . . because of having taken to reading too many of the deceitful books of chivalry which are being printed, and believing them to be true . . . ."[64]

Even here, however, the complexity of the moral lessons of these two authors diverges. In the end of Avellaneda's version, in a rather heavy-handed moral fashion, Don Quixote is sent to a mad house because of these books, and he is instructed he must no longer read them:

> I trust . . . that you will return to your senses and forget the readings and wild fancies in the insane books of chivalry that have reduced you to such a state. Take care of your soul and realize God's mercy in not permitting you to die on those roads in the disastrous situations in which your madness placed you so many times.[65]

At the end of his version, Avellaneda took an approach to the continuation of the Don Quixote legacy far more consistent with his times than Cervantes, inviting others to take up the challenge and write further adventures of Don Quixote, stating on his final page that "a better pen will surely not be lacking."[66] Avellandea had indeed earlier even invited others to consider writing a separate work focusing on Sancho Panza.[67] One might argue that this was relatively easy for him to do as he was playing with house money, offering up characters that had never been his own. Regardless, as loud as Avellaneda may have invited follow-on authorship, history has for the most part favored Cervantes' plea that no one else take up their pen in Don Quixote's name.

CONCLUSION

Understanding exactly the nature and degree of interplay between Cervantes' and Avellaneda's version of Don Quixote is essential to understanding how things operated in a long forgotten literary landscape without copyright. A perhaps uncomfortable conclusion suggests itself in terms of creative production, a constitutional predicate of U.S. Copyright. As shown, the lack of any copyright protections provided in this particular case for an open market that motivated excellent additional original authorship from both the original and follow-on author. As noted earlier, Avellaneda's work, though

64. *Id.* at 275.
65. *Id*. at 344.
66. *Id.* at 346.
67. *Id*. at 334.

today not as widely hailed as Cervantes', at one time was held to actually be the superior version.[68]

Avellaneda's work also seems to have contributed greatly to Cervantes' Second Part and perhaps even to its completion. The references to Avellaneda and his work sprinkled through Cervantes' version can be seen on the one hand as a muddying a masterpiece, compromising its purity, but the opposite conclusion can also be reached. The text as written has been judged by many to be the greatest fictional work of all time,[69] perhaps that sort of muddying is an essential part of the patina that makes it so exceptional.

We would be remiss, however, not to note that a contrary conclusion is also possible. Cervantes did kill off Don Quixote in the hopes this would make him unavailable to others, and most have respected that plea. This plea to end all follow-on authorship for perpetuity diminished follow-on authorship far more than the short-term increase in productivity added. More speculatively, was Cervantes' death independent of his productive output or did his outrage have consequences for his health and so did his untimely death end the productivity of a great author?

It is also worth noting that if we are sympathetic to Cervantes' authorial challenges and protest, our reactions spring in part more from a sense of fairness than from a desire for optimal creative output. Certainly, it is a fairer world that allows authors to benefit from their creations and to have the right to control the use of that creation. Fairness, however nice, is not part of the U.S. Copyright mandate, so has no place as a constitutional argument. All in all, the case of Cervantes and Avellaneda is therefore intriguing from a copyright production standpoint, as this extraordinary creative battle made possible by its attendant, uncontrolled copyright landscape can reasonably be seen to have resulted in greater productivity for the authors than its copyright-controlled counterpart—and resulted in no less than the greatest piece of western literary fiction of all time. This serves as a somewhat unwelcome truth—and frankly not one that this author or most creatives will particularly welcome, but a truth nonetheless—that from a utilitarian perspective a lack of limited monopolies can actually lead to truly exceptional creative productivity.

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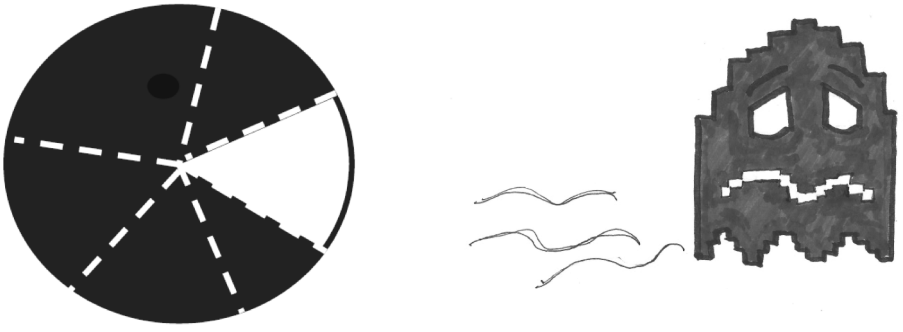
68. Avellaneda, *supra* note 16, at xi. As Server and Keller note specifically: "[w]hen Alain-René Lesage's translation into French of the spurious novel appeared in 1704, a century after the first publication of Cervantes' Part I, he printed a prologue in which he extolled Avellaneda highly and led Spaniards themselves to consider it as great or even greater than Cervantes' work . . . [e]ven as late as 1882 in France the translator A. Germond de Lavigne was still hailing Avellaneda as Cervantes' superior in the area of novel writing."

69. Chrisafis, *supra* note 52.

PATENT ELIGIBILITY'S DOCTRINAL EXCLUSIONS . . . LATELY, A SCARY MOVIE TOO DIFFICULT TO WATCH:

CONCRETE SOLUTIONS AND SUGGESTIONS



KRISTY J. DOWNING, ESQ.*

ABSTRACT

Patent eligible subject matter is defined by the legislature's 35 U.S.C. § 101 to include "any new and useful process, machine, manufacture or composition of matter." Since the nineteenth century, however, United States (U.S.) courts have considered certain otherwise eligible subject matter excludable from patent protection. The judiciary's doctrinal exclusions' purpose was to protect fundamental building blocks to science and useful arts ensuring that such information could not be monopolized by one entity. Presently, however, the judicial exclusions have been used to exclude fewer *fundamental* building blocks and more ordinary brick-and-mortar innovations after two U.S. Supreme Court decisions (*Mayo* and *Alice*). The doctrinal exclusions have been recently interpreted so loosely that many practitioners are turning their heads away from § 101 jurisprudence in fear of the erratic and inconsistent wreckage of § 101 judgments. This article discusses the history of § 101 and its doctrinal exclusions to regain a collective consciousness as to its original directives. This article parses through recent appellate decisions and illustrates common arguable derailments made by the judiciary in weighing inventions under the

Mayo-Alice framework. Finally, this article includes practical suggestions for all three branches on the U.S. government on § 101, including use of a pictorial tool in analyzing claim scope under the preemption doctrine to take the "abstractness" out of the analysis. By pie charting claims against all possible practical applications of a fundamental concept those applications foreclosed by the claims become more distinct, as should eligibility therefrom.

INTRODUCTION

I have a confession to make: while being an admirer of patent eligibility, pre-*Mayo* & *Alice,* I have had to cease "watching the show" lately due to the disquieting way the judicial exclusions of § 101 are being applied prejudicially towards invalidity.[1] The notion of an "abstract concept" being so narrowly drawn as to include almost anything or "conventional" claim language disqualifying an invention from eligibility has produced an erratic wreckage too gruesome to fixate upon.[2] Innocent, reasonably harmless innovations in hard-core sciences like data processing, digital imaging, medical diagnostics and power-grid management have gotten sucked into the vortex of what I would like to call judicial paranoia on eligibility; these deprived inventions are never to return to the intellectual-property scene again, commercially relevant ones nonetheless.[3]

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1. *See, e.g.*, Robert Sachs, *#AliceStorm: April Update and the Impact of TC Heartland on Patent Eligibility*, BILSKI BLOG, http://www.bilskiblog.com/blog/2017/06/alicestorm-april-update-and-the-impact-of-tc-heartland.html (June 01, 2017) (reporting post-*Alice* § 101 invalidity rates as high as 97.8% on covered business method patent reviews at the Patent Trial and Appeal Board and 91.7% at the Court of Appeals).

2. *See, e.g.*, BASCOM Glob. Internet Servs. v. AT&T Mobility, 827 F.3d 1341, 1353-54 (Fed. Cir. 2016) (Newman, J., concurring) (discussing how "the emphasis on eligibility has led to erratic implementation in the courts"); Brief of Amicus Curiae Paul R. Michel In Support of Neither Party at 7, Alice Corp. Pty. Ltd. v. CLS Bank International, 134 S.Ct. 2347 (2014) (No. 13-298) (referring to the vague and unpredictable nature of defining something as an "abstract concept").

3. *See, e.g.*, Robert Sachs, *The One Year Anniversary: The Aftermath of #AliceStorm*, BILSKI BLOG, (June 20, 2015) http://www.bilskiblog.com/blog/2015/06/the-one-year-anniversary-the-aftermath-of-alicestorm.html. The author provides an overview of the aftermath following the one-year anniversary of *Alice*:

> It's been one year since the Supreme Court's decision in *Alice Corp. v. CLS Bank.* On its face the opinion was relatively conservative, cautioning courts to "tread carefully" before invalidating patents, and emphasizing that the primary concern was to avoid preemption of "fundamental building blocks" of human ingenuity. The Court specifically avoided any suggestion that software or business methods were presumptively invalid. But those concerns seem to have gone unheeded. *The Court's attempt to sidestep the tricky problem of defining the boundary of an exception to patent eligibility—"we need not labor to delimit the precise contours of the "abstract ideas category in this case""—has turned into the very mechanism that is quickly "swallow[ing] all of patent law."* The federal courts, the Patent Trial and Appeal Board, and the USPTO are using the very lack of a definition to liberally expand the contours of abstract ideas to cover everything from computer animation to database architecture to digital photograph management and even to safety systems for automobiles.

Id. (emphasis added).

Historically, courts have carved out doctrinal exclusions to patent eligibility for concerns of a "patent monopoly" on fundamental building blocks interfering with the "progress of science and useful arts" more so than promoting them.[4] Yet, lately that policy has gotten lost;[5] instead eligibility has been used as grounds for invalidating issued patents where the invention is arguably sufficiently limited in practical applications of a fundamental concept.[6] Given reasons for ineligibility appear, in many ways, phantom like, depending upon arguments rather than evidence.[7] At least with §§ 102 and 103, one has the objective teachings of the prior art to justify why an invention is unpatentable;[8] with § 101, however, all reasons seem to essentially summate to a "because [an authority] said so" reply.[9]

As patent stakeholders try to piece together an understanding of what technology cannot be protected by U.S. patent laws we are constantly thrown off guard by eligibility.[10] Many types of sophisticated technologies or

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4. *See, e.g.*, Tilghman v. Proctor, 102 U.S. 707, 724–30 (1881) (providing a discussion on how allowing patents on "mere principles" unjustly monopolizes the use of essentially "every mode" of accomplishing the resulting benefit of the principle as opposed to a "particular mode."). In referring to an earlier case finding claims ineligible—O'Reilly v. Morse—Justice Bradley stated, "The eighth claim of Morse's patent was held to be invalid, because it was regarded by the court as being not for a process, but for a mere principle. . . It was not a claim of any particular machinery, nor a claim of any particular process for utilizing the power; but a claim of the power itself . . . ." *Id.* at 726–27.

5. *See infra* Section IV.

6. *See infra* Section IV(A)–(C).

7. *See, e.g.*, Wayne Sobon, *Exploring the Legal Contours of Patent Subject Matter Eligibility*, (Dec. 15, 2016), http://www.bilskiblog.com/blog/2016/12/exploring-the-legal-contours-of-patent-subject-matter-eligibility.html ("Section 101 is being used with ferocious effect, by District Courts at the pleading stage, *with little to any factual development*, and by Patent examiners, in hundreds and thousands of cases, as a new, often insurmountable hurdle to patentability."(emphasis added)).

8. *See* U.S. PATENT & TRADEMARK OFFICE, MANUAL OF PATENT EXAMINATION AND PROCEDURE, § 2131 (9th ed. Rev. 08.2017, Jan. 2018) ("A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." (quoting Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987)); *see also* Graham v. John Deere Co., 383 U.S. 1, 17 (1966). In *Graham v. John Deere Co.*, a discussion of §103 is provided:

> While the ultimate question of patent validity is one of law, . . . the § 103 condition, which is but one of three conditions, each of which must be satisfied, lends itself to several basic factual inquiries. Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved.

Id.

9. Sobon, *supra* note 7.

10. *See, e.g.*, BASCOM Glob. Internet Servs. v. AT&T Mobility, 827 F.3d 1341, 1353–54 (Fed. Cir. 2016) (Newman, J., concurring) (discussing the current "erratic" implementation of the eligibility standard); Jeffrey A. Lefstin, Peter S. Menell, and David O. Taylor, *Final Report of the Berkley Center for Law & Technology Section 101 Workshop: Addressing Patent Eligibility Challenge*, 33 BERKELEY TECH. L.J. 551, 554–56 (2017) (stating that *Alice* and *Mayo* "have sent shock waves through the

consumer products have been negatively affected by the modern anxieties of § 101 including computing, banking, and medical diagnostics and products.[11] Patents are salient to those industries, impacted stakeholders include Global 1000 companies,[12] non-practicing entities,[13] attorneys[14] and solo inventors.[15]

This horrific scene is due to a number of factors within our control and some others that are not. On the one hand, it is hard to tailor fit a standard to technology unforeseen.[16] On the other hand, today, the way the judicial exclusions are applied is too fungible for reliability.[17] One would likely have more reliable odds at a Las Vegas game than in winning eligibility.[18] These are technological areas where we *want* to "promote the progress of science and useful arts" as patents are intended to do.[19] Additionally, there is no consensus about eligibility, one man's trash is another's treasure.[20] Experts are constantly

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research, technology, business, and patent communities" and citing examples in medical devices, software innovations, and financing).

11. Lefstin et al., *supra* note 10.

12. *See, e.g.*, Apple Inc. v. Ameranth Inc., 842 F.3d 1229 (Fed. Cir. 2016) (involving Apple, a Global 1000 company, finding a computer system for taking and transmitting menu orders ineligible).

13. *See, e.g.*, Intellectual Ventures I LLC v. Capital One Bank (USA), 792 F.3d 1363 (Fed. Cir. 2015) (involving Intellectual Ventures, a non-practicing entity, finding web advertising systems ineligible).

14. *See, e.g.*, Inventor Holdings, LLC v. Bed Bath & Beyond, Inc., 876 F.3d 1372 (Fed. Cir. 2017) (finding a business-method patentee liable for attorney's fees when continuing to assert their patents post-*Bilski* and *Alice*!).

15. *See, e.g.*, *In re* Brown, 645 F. App'x (Fed. Cir. 2016) (affirming the ineligibility findings for claims to methods of cutting hair by independent inventors in a non-precedential opinion).

16. *See, e.g.*, CLS Bank Int'l v. Alice Corp., 717 F.3d 1269, 1304 (Fed. Cir. 2013) (Rader, Chief J., dissenting) (stating "It is particularly important that Section 101 not be read restrictively to exclude 'unanticipated inventions' because the most beneficial inventions are 'often unforeseeable.'") (citing Diamond v. Chakrabarty, 447 U.S. 303, 316 (1980) and J.E.M. Agric. Supply v. Pioneer Hi-Bred Int'l, Inc., 534 U.S. 124, 135 (2001)).

17. *See, e.g.*, BASCOM Glob. Internet Servs., Inc. v. AT&T Mobility LLC, 827 F.3d 1341, 1353–54 (Fed. Cir. 2016) (Newman, J., concurring) (discussing how "the emphasis on eligibility has led to erratic implementation in the courts."); Brief of Amicus Curiae Paul R. Michel In Support of Neither Party at 7, Alice Corp. Pty. Ltd. v. CLS Bank International, 134 S.Ct. 2347 (2014) (No. 13-298) (referring to the vague and unpredictable nature of defining something as an "abstract concept").

18. *Subject Matter Eligibility Court Decisions (Formerly Appendix 3)*, U.S. PATENT AND TRADEMARK OFFICE (Dec. 5, 2017), https://www.uspto.gov/patent/laws-and-regulations/examination-policy/subject-matter-eligibility (providing that post-*Alice* U.S. Court of Appeals § 101 decisions fair towards ineligibility 86% of the time).

19. U.S. CONST. art. I, § 8, cl. 8. "The Congress shall have power: . . . To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries." *Id.*

20. *See, e.g.*, Sobon, *supra* note 7 (positing an eligibility guide as broad as anything "useful" by, *inter alia*, quoting prior Judge Rich as to whether § 101 should even be considered a condition to patentability: "[a]s Judge Rich underscored in *Bergy*, Section '101 was never intended to be a "standard of patentability"'"). *Compare* Sobon, *supra* note 7 *with* Megan Throbe, *A Call to Action: Fixing the Judicially-Murkied Waters of 35 U.S.C. § 101*, 50 IND. L. REV. 1023, 1029–30 (2017) (advocating for

bickering about eligibility.[21] Courts are also pausing on defining "abstract idea" in clear and concrete terms for the patent community, while invalidating patents on that very basis.[22] The "conventional" elements prong of *Alice* is being applied more like an abbreviated § 102/103 analysis.[23]

This article kicks the can-of-solution around with respect to all three branches of the federal government. Legislative proposals being discussed at the U.S. Patent Office and bar organizations are reviewed. Also considered are the recent, frequently published guidelines by the U.S. Patent Office. Moreover, the article critically hones in on contemporary U.S. Court of Appeals decisions. Perhaps more significantly, this article focuses on the original purposes of the doctrinal exclusions: to ensure that fundamental building blocks to innovation are not significantly foreclosed by the grant of a U.S. patent.[24] It is time that we return to those basics. Next, because eligibility deals with

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a more aggressive use of § 101 so as to preserve judicial and Patent Office resources by eliminating claims preliminarily on § 101).

21. *See supra* Section IV(D).

22. *See The One Year Anniversary: The Aftermath of #AliceStorm*, *supra* note 3 ("The Court's attempt to sidestep the tricky problem of defining the boundary of an exception to patent eligibility—'we need not labor to delimit the precise contours of the "abstract ideas category in this case"'—has turned into the very mechanism that is quickly 'swallow[ing] all of patent law.'").

23. *See, e.g.*, Daniel Taylor, *Down the Rabbit Hole: Who Will Stand Up for Software Patents After Alice?*, 68 ME. L. REV. 217, 249–50 (2016) (discussing how *Alice* Has Brought Back A Test For 'Invention'). "If the court finds an 'abstract idea,' the court may then perform an obviousness analysis and search for an 'inventive concept' or 'something more' based solely on the patent claims and the court's subjective knowledge . . . ." *Id.*; Megan Throbe, *A Call to Action: Fixing the Judicially-Murkied Waters of 35 U.S.C. § 101*, 50 IND. L. REV. 1023, 1029–33 (2017) (discussing the continued blurred lines between §§ 101 and 102 et al. when courts decide eligibility).

24. *See, e.g.*, Gottschalk v. Benson, 409 U.S. 63, 67–68 (1972). In *Gottschalk v. Benson*, the court provided a discussion on the fundamental building blocks of innovation:

> The Court stated in *Mackay Co. v. Radio Corp.,* 306 U. S. 86, 94 . . . , that "[w]hile a scientific truth, or the mathematical expression of it, is not a patentable invention, a novel and useful structure created with the aid of knowledge of scientific truth may be." That statement followed the longstanding rule that "[a]n idea of itself is not patentable." *Rubber-Tip Pencil Co. v. Howard*, 20 Wall. 498, 507. . . . "A principle, in the abstract, is a fundamental truth; an original cause; a motive; these cannot be patented, *as no one can claim in either of them an exclusive right*." *Le Roy v. Tatham,* 14 How. 156, 175. . . . Phenomena of nature, though just discovered, mental processes, and abstract intellectual concepts are not patentable, *as they are the basic tools of scientific and technological work*. As we stated in *Funk Bros. Seed Co. v. Kalo Co.*, 333 U. S. 127, 130 . . . , "He who discovers a hitherto unknown phenomenon of nature *has no claim to a monopoly of it which the law recognizes. If there is to be invention from such a discovery, it must come from the application of the law of nature to a new and useful end*." We dealt there with a "product" claim, while the present case deals with a "process" claim. But we think the same principle applies.

Id. (emphasis added).

abstractness a pictorial suggestion of pie-charting any potential foreclosure of a fundamental concept is also made. By removing the inherent intangibility of abstract concepts perhaps practitioners can migrate towards a universal application and more reliability.

I. THE PURPOSES OF THE U.S. PATENT SYSTEM AND ITS RELEVANCE TO PATENT ELIGIBILITY

A. Background on U.S. Patent Law

The U.S. patent system has a specific purpose in mind and its origins are constitutional. Article I, Section 8, Clause 8 of the U.S. Constitution grants Congress the authority to make laws to "promote the Progress of Science and useful Arts . . . ."[25] Therefore, the U.S. patent system is designed simply to reward and incentivize scientific and useful progression. The Drafters reasoned upon a specific means by which the U.S. Congress could incentivize innovation in this country. Proper motivation was fashioned "by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."[26] This is commonly referred to as a "monopoly" on the patented invention because the issued patent grants the inventor authority to exclude others from making, using, offering to sell, selling or importing their invention anywhere in the United States.[27] In essence, the Framers believed that if inventors (and/or their investors) could be given exclusivity to their inventions for a limited time doing so would provide them with an ability to fiscally profit from their ingenuity.

Patent owners are not the only ones to benefit from patent laws; the fact that Congress architected a system of property rights for inventions signals that the Republic had (and has) an interest in the U.S. patent system as well. Many companies and investors are more likely to invest where intellectual property can be respected.[28] Investing makes inventions more readily available to the masses. Some examples of patent inventors whose inventions were made more publicly accessible by investor interests include Edison for his electric grid distribution system,[29] Tesla for his brushless electric motor and utility of

25. U.S. CONST. art. I, § 8, cl. 8. "To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries." *Id.*

26. *Id.*

27. 35 U.S.C. § 271(a) (2010).

28. *See, e.g.*, Jack Nicas et al., *Stronger Chinese Patent Laws Also Help U.S. Companies*, WALL ST. J., Jul. 20, 2016 (covering the recent surge in Chinese investing and patenting).

29. *Thomas Edison*, WIKIPEDIA (last visited Apr. 7, 2019), https://en.wikipedia.org/wiki/Thomas_Edison. *See also*, Jill Jonnes, *Let There Be Light*, TIME MAGAZINE ONLINE (Jun. 23, 2010),

alternating current,[30] McCoy for his locomotive lubricating system,[31] and Magie for her Monopoly board game.[32] It is difficult to argue that the U.S. patent system has not met its purpose because the U.S. remains one of the most innovative, and developed countries in the world.[33] Science and our society have certainly progressed under the 228 year tenure of the U.S. patent system.[34]

B. Historical § 101

As integral as U.S. patent rights have been to our country's development, patent rights are not without limitations. As expressed in 35 U.S.C. § 101, one limitation pertains to what types of inventions or discoveries can be protected by a U.S. patent or what inventions are eligible for U.S. patent.[35] Inventions eligible for patent are limited to "process[es], machine[s], [articles of] manufacture, or composition[s] of matter" and their improvements under the statute.[36] So, an RF wave signal would be excluded from patent protection under the Code while a method for generating the same might be eligible for patent.[37]

In addition to those codified categories of patent eligible subject matter, U.S. courts have taken it upon themselves to enumerate other limits on patent

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http://content.time.com/time/specials/packages/printout/0,29239,1999143_1999202_1999203,00.html.

30. *Nikola Tesla*, WIKIPEDIA (last visited Apr. 7, 2019), https://en.wikipedia.org/wiki/Nikola_Tesla. *See also* Jonnes, *supra* note 29.

31. *Elijah McCoy*, WIKIPEDIA (last visited Apr. 7, 2019) https://en.wikipedia.org/wiki/Elijah_McCoy. *See also Elijah McCoy Biography*, BIOGRAPHY (Jan. 19, 2018), https://www.biography.com/people/elijah-mccoy-9391300.

32. *See History of the Board Game Monopoly*, WIKIPEDIA (last visited Apr. 7, 2019), https://en.wikipedia.org/wiki/History_of_the_board_game_Monopoly. *See also* Mary Pilon, *Monopoly's Inventor: The Progressive Who Didn't Pass 'Go'*, NEW YORK TIMES ONLINE (Mar. 3, 2015), https://www.nytimes.com/2015/02/15/business/behind-monopoly-an-inventor-who-didnt-pass-go.html.

33. *See, e.g.*, Chris Weller, *The 16 most innovative countries in the world*, BUSINESS INSIDER ITALIA (Jun. 15, 2017), https://it.businessinsider.com/most-innovative-countries-in-the-world-2017-6/?refresh_ce (listing the United States as the fourth most innovative country globally for the second year in a row).

34. *The First US Patent Issued Today in 1790*, U.S. PATENT AND TRADEMARK OFFICE (July 31, 2001), https://www.uspto.gov/about-us/news-updates/first-us-patent-issued-today-1790 (celebrating the anniversary of the issued U.S. patent on a method of making potash).

35. 35 U.S.C. § 101 (1952).

36. *Id.*

37. *In re* Nuijten, 500 F.3d 1346, 1357 (Fed. Cir. 2007) (to transitory forms of signal transmission); U.S. PATENT AND TRADEMARK OFFICE, MANUAL OF PATENT EXAMINING PROCEDURE §2106 (9th ed. Rev. 08.2017, Jan. 2018) (listing examples of claims that are not directed to one of the four statutory categories of eligible subject matter).

eligibility.[38] Their doctrinal exclusions include "laws of nature, physical phenomena, and abstract ideas."[39] These doctrinal exclusions, though more than 130 years old, for some reason have not been incorporated into the United States Code.[40] However, the exclusions are just as etched in stone as any section of the U.S. Code because the patent industry universally recognizes them as exclusions to patentability.[41]

The policy behind the doctrinal exclusions is logical: courts have reasoned that if "monopolies" are granted on fundamental building blocks of scientific ingenuity then such monopolies might hinder the "Progress of Science and Useful Arts" more than they would promote it.[42] It might be too cumbersome, in so many words, for a person of ordinary skill in the art to "design around" a law of nature, such as e.g., Newton's theory on gravity, photosynthesis or pricing according to natural demand and supply. Such a broad property right would restrict all innovations for systems that depend upon, for example, the Earth's natural gravitational pull like flight or ground vehicle propulsion and even building static structures. A "patent monopoly" on photosynthesis, as another example, would limit humanity from growing crops or using the sun's

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38. *See, e.g.*, Diamond v. Chakrabarty, 447 U.S. 303, 309 (1980) (listing out the doctrinal exclusions to patent eligibility).

39. *Id.*

40. U.S. PATENT AND TRADEMARK OFFICE, MANUAL OF PATENT EXAMINING PROCEDURE § 2106.04 (9th ed. Rev. 08.2017, Jan. 2018) *see also* Tilghman v. Proctor, 102 U.S. 707 (1881) (a nineteenth century case on exclusions to patent eligibility).

41. *See, e.g.*, MANUAL OF PATENT EXAMINING PROCEDURE §2106, *supra* note 37 (listing judicial exceptions to the four categories of patentable subject matter).

42. *See, e.g.*, Gottschalk v. Benson, 409 U.S. 63, 67–68 (1972). In *Gottschalk v. Benson*, the court provided a discussion on the fundamental building blocks of innovation:

> The Court stated in *Mackay Co. v. Radio Corp.,* 306 U. S. 86, 94 . . . , that "[w]hile a scientific truth, or the mathematical expression of it, is not a patentable invention, a novel and useful structure created with the aid of knowledge of scientific truth may be." That statement followed the longstanding rule that "[a]n idea of itself is not patentable." *Rubber-Tip Pencil Co. v. Howard*, 20 Wall. 498, 507. . . . "A principle, in the abstract, is a fundamental truth; an original cause; a motive; these cannot be patented, *as no one can claim in either of them an exclusive right*." *Le Roy v. Tatham,* 14 How. 156, 175. . . . Phenomena of nature, though just discovered, mental processes, and abstract intellectual concepts are not patentable, *as they are the basic tools of scientific and technological work*. As we stated in *Funk Bros. Seed Co. v. Kalo Co.*, 333 U. S. 127, 130 . . . , "He who discovers a hitherto unknown phenomenon of nature *has no claim to a monopoly of it which the law recognizes. If there is to be invention from such a discovery, it must come from the application of the law of nature to a new and useful end*." We dealt there with a "product" claim, while the present case deals with a "process" claim. But we think the same principle applies.

Id. (emphasis added).

energy for the same, leading potentially to massive starvation or significant financial burden for a basic need. As another example, the inability to price according to supply-and-demand might stifle financial transactions as diverse as those in retail stores, regarding residential/commercial real estate sales and even those in professional service industries like law, engineering and medicine. It is not believed that "the Matrix" could handle it in sum; now . . . how is that for a conspiracy theory?

There is another caveat to patent rights that similarly limits these global-domination-conspiracy concerns expressed with the doctrinal exclusions. Patent owners quite arguably cannot limit others from engaging in experimental work related to their patented inventions.[43] So, persons of skill in the art would theoretically still be able to test the patented invention without liability if they did not seek to commercialize it. For this reason, recent patent scholars have opined that perhaps the doctrinal exclusions are less necessary.[44] Being able to test a discovery as ubiquitous as photosynthesis, for example, through the experimental exception may not be enough to deter patent-monopolistic chaos

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43. *See, e.g.*, CLS Bank Int'l v. Alice, Corp., 717 F.3d 1269, 1323–24 (Fed. Cir. 2013) (en banc) (Newman, J., dissenting). In *CLS Bank Int'l v. Alice Corp*., the court provided a discussion on the experimental use of patented information:

> The Federal Circuit has reaffirmed that "patenting does not deprive the public of the right to experiment with and improve upon the patented subject matter." *In re Rosuvastatin Calcium Patent Litig.,* 703 F.3d 511, 527 (Fed. Cir. 2012). However, in *Embrex, Inc. v. Service Engineering Corp.,* 216 F.3d 1343, 1349 (Fed. Cir. 2000), the court stated that the experimental use defense was "very narrow" and unavailable when "the inquiry has definite, cognizable, and not insubstantial commercial purpose," the concurrence adding that "neither the statute nor any past Supreme Court precedent gives any reason to excuse infringement because it was committed with a particular purpose or intent, such as for scientific experimentation." *Id.* at 1353. Precedent does not support this theory. The right to study and experiment, to evaluate and improve upon the information in patents was discussed by our predecessor Court of Claims in *Ordnance Engineering Corp. v. United States,* 84 Ct. Cl. 1 (1936) and in *Chesterfield v. United States,* 159 F.Supp. 371 (Ct.Cl.1958), the court explaining that experimentation does not infringe the patent. Factual distinctions may arise, as in *Pitcairn v. United States,* 212 Ct. Cl. 168, 547 F.2d 1106 (1976), where the Court of Claims held that of 2200 infringing helicopters, the use of 93 helicopters for testing or demonstration was not an "experimental use," as compared with the truly "experimental helicopters" that the patentee did not accuse of infringement.

Id. See also 35 U.S.C. § 271(e)(1) (2010). "It shall not be an act of infringement to make, use, offer to sell, or sell . . . a patented invention . . . solely for uses reasonably related to the development and submission of information under a Federal law which regulates the manufacture, use or sale of drugs or veterinary biological products." *Id.*

44. CLS Bank Int'l v. Alice, Corp., 717 F.3d 1269, 1321–22 (2013) (en banc) (Newman, J., dissenting) ("Judicial clarification is urgently needed to restore the understanding that patented knowledge is not barred from investigation and research. The debate involving §101 would fade away, on clarification of the right to study and experiment with the knowledge disclosed in patents.").

because "the [p]eople" (and many animals) would still need to be nourished for the term of the patent, not just experiment with crops.

In addition to the experimental use exception, there are other restrictions on patent rights that would limit the "monopoly" ordinarily granted with a U.S. patent. For example, for decades the right to exclude others from practicing the patented invention included a right to a permanent injunction once a finding of infringement had been made.[45] In recent years, however, the U.S. Supreme Court decided that patent injunctive relief must satisfy the traditional principles of equity used in other civil disputes.[46] In Justice Kennedy's Concurrence to the *eBay* Opinion, Justice Kennedy suggested that the "economic function" (or practicing status) of a patentee should be relevant, if not outcome determinative, in analyzing whether an injunction should issue.[47] The industry gravitated towards this paragraph in the Kennedy Concurrence and since then patent injunctions have almost exclusively been limited to those that have a reputational interest in the patent, meaning either the patentee or one of their licensees is practicing the invention.[48]

With respect to subject-matter eligibility, one might argue that bearing *eBay* in mind, even if patents on fundamental concepts were allowed the benefits of

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45. *See* MercExchange LLC v. eBay, Inc., 401 F.3d 1323, 1338 (2005) (overruled by eBay v. MercExchange, 547 U.S. 388 (2006)) ("Because the 'right to exclude recognized in a patent is but the essence of the concept of property,' the general rule is that a permanent injunction will issue once infringement and validity have been adjudged." (citation omitted)).

46. eBay, Inc. v. MercExchange LLC, 547 U.S. 388, 391–94 (2006).

47. In his concurrence in eBay, Inc. v. MercExchange LLC, Justice Kennedy stated:

> In cases now arising trial courts should bear in mind that in many instances the nature of the patent being enforced and the economic function of the patent holder present considerations quite unlike earlier cases. An industry has developed in which firms use patents not as a basis for producing and selling goods but, instead, primarily for obtaining licensing fees. . . . For these firms, an injunction, and the potentially serious sanctions arising from its violation, can be employed as a bargaining tool to charge exorbitant fees to companies that seek to buy licenses to practice the patent.

Id. at 395–97 (Kennedy, J., concurring). There are also limitations on injunctive relief if the invention relates to medical innovations used for the benefit of saving lives:

> [W]ith respect to both Abbott's cancer test kits and Abbott's hepatitis test kits, the district court determined that the public interest is served best by the availability of these kits. On this basis, the district court did not enjoin Abbott from producing these products. We cannot hold that the district court's public interest analysis provides a basis for us to disturb its grant to Hybritech of preliminary relief.

Hybritech Inc v. Abbott Laboratories, 849 F.2d 1446, 1458 (Fed. Cir. 1988)

48. Downing, *Injunctive Relief after eBay*, American Intellectual Property Law Association Patent Law Committee (Washington D.C., 2007).

the invention would not be kept from the public because the patent owner would only be able to enjoin others from practicing the invention if the patentee or a licensee were practicing it. The public would not be completely deprived of a patented invention because either the patentee or an infringer would be providing it to the public. Returning to a prior example, the country would not run out of food from plants if photosynthesis were to be considered patent-eligible, food would likely just be more expensive. Considering *eBay* (and the experimental exception to infringement), one might ask whether the doctrinal exclusions are as necessary as they once were?

C. Modern Patent Law & § 101

Despite this curiosity as to the necessity of the exclusions given recent curtailments of patent rights, the doctrinal exclusions are applied with evermore brutish confidence.[49] The exclusion most responsible for what some would refer to as a "storming attack" on issued patents, is the "abstract idea" exclusion to eligibility.[50] Like most things considered in the abstract, inventions considered to be "abstract" can result in much confusion, dissent, and mystique. E.g., death and the afterlife are said to be abstract concepts and some of the most contentious and frightening topics in human history. Other examples are the Universe in its full scope or large numbers incalculable by hand. These concepts stump the brightest of minds as do "abstract concepts" excluded from eligibility.

Imagine: spending hundreds of thousands of dollars on a property right, e.g., for a yacht or piece of land, closing on the property and being given title from the government. Imagine further paying periodic property taxes called "maintenance fees" and "annuities." However, when noticing others using the property without proper permission one consults an attorney who agrees with your position and sends the offending party a cease-and-desist letter. When trying to collect rent from the offender, unluckily, the trespasser claims that no one can own this type of property, it is like a preserved wetland or a national park. Only, this "[t]aking" would not be with just compensation, the courts and the patent system would just rescind it.[51] An investment nightmare, this extremely unsettling practice leaves patent stakeholders unsure of what

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49. *See* Sections IV(A)–(C).

50. *See The One Year Anniversary: The Aftermath of #AliceStorm*, *supra* note 3 ("The Court's attempt to sidestep the tricky problem of defining the boundary of an exception to patent eligibility—'we need not labor to delimit the precise contours of the "abstract ideas category in this case"'—has turned into the very mechanism that is quickly 'swallow[ing] all of patent law.").

51. *Compare* U.S. CONST. amend. IV *with* Mayo Collaborative Svcs v. Prometheus Labs, 132 S.Ct. 1289 (2012) (federal court rendered claims patent ineligible after issuance by the Patent Office and provides no compensation for relinquishing the right).

inventions can reliably be protected by U.S. patent laws.[52] Moreover, the average attorney cannot even provide investors with comfort on modern eligibility because the law is often confusing, self-contradictory or still being formed on a case-by-case basis thus opening up inventors to liability for merely asserting their patents.[53] Many investors have assets comparable to a coastline of land or fleet of luxury yachts devoted to patents.

Intellectual property—an intangible asset—has not lived without some mystique in the past. To some degree it goes with the territory of owning an intangible asset. For example, the scope of ownership often changes from the time of authorship of a patent application, through its prosecution and then when enforcement occurs because different people are interpreting the claims for different reasons on each occasion.[54] Some small variances in claim construction, however, are much more tolerable than the eradication of the patent right altogether. After the sting of so many recent ineligibility decisions under § 101, some have opined that the presumption of validity is not even considered in § 101 decisions;[55] courts are so patent-phobic that they are arguably invalidating nearly any patent where there is commercial breadth.[56]

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52. *See, e.g.*, Michael Clancy, *Intellectual Property Law—The Future of Patent Eligibility Analysis On Medical Diagnostics and its Effects on Healthcare Innovation—Ariosa Diagnostics, Inc. v. Sequenom, Inc.*[], 12 J. HEALTH & BIOMED. L. 319, 330–34 (2017) (discussing how the application of *Alice-Mayo* in *Ariosa* left ambiguity as to whether an inventive concept is needed for claims that involve a law of nature to be eligible and reduced patenting: "[t]his heightened standard forces medical diagnostic companies, which cannot obtain patents, to protect their intellectual property rights by trademark and trade secret law.").

53. *See, e.g.*, Inventor Holdings v. Bed Bath & Beyond, 876 F.3d 1372, 1374 (Fed. Cir. 2017) (finding a business-method patentee liable for attorney's fees when continuing to assert their patents post-*Bilski* and *Alice*!).

54. *See, e.g.*, Cuozzo Speed Technologies v. Lee, 136 S.Ct. 2131, 2142 (2016) (endorsing use of the broadest reasonable interpretation standard for claim construction at the Patent Office, while courts use a plain and ordinary construction for litigation).

55. *See, e.g.*, Robert Sachs, *Twenty-Two Ways Congress Can Save Section 101*, BILSKI BLOG (Feb. 12, 2015), http://www.bilskiblog.com/blog/2015/02/twenty-two-ways-congress-can-save-section-101.html. The author provided a discussion on the presumption of validity:

> While every court decision states that the presumption of validity applies to Section 101, *the behavior of the district courts suggests that the presumption in practice has no weight*. This is evidenced by the growing numbers of district court decisions that find a patent invalid on motion to dismiss, in which the court [must] find that there is no plausible interpretation of the claim as eligible subject matter, giving no weight to the inherent fact that the patent examiner found it plausible that the claims were eligible by allowing the patent.

Id. (emphasis added).

56. *See* Section IV(A)–(C).

The need for a more transparent litmus for patent eligibility intensifies. Eligibility remains one of the most controversial topics in patent law, especially since the adoption of post-grant reevaluation of business method patents under § 101 with the historic passage of the America Invents Act.[57] For computing technologies, business methods, and health care technologies the instability of § 101's exclusions has caused great angst.[58] Moreover, as computers continue to infiltrate everything, § 101 is affecting industries where one might not have fathomed patent rights being questionable years ago, like vehicular technologies, image processors, networking, and power-grid management.[59]

In order to understand where we are going with §101's judicial exclusions we need to be reminded of where we have been.[60]

II. THE HISTORY OF ELIGIBILITY'S DOCTRINAL EXCLUSIONS

As science evolved so did subject-matter eligibility. Early on, courts considered what types of inventions should be eligible for patent protection. At that time, many debated innovations related to chemistry and radio communications.[61] These early decisions highlight the original policy behind the judicial exclusions.

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57. 35 U.S.C. §§ 321–329 (2011); AIA § 18 (2011); 37 CFR §§ 42.300 *et seq*. (2011).

58. *See The One Year Anniversary: The Aftermath of #AliceStorm*, *supra* note 3 ("The Court's attempt to sidestep the tricky problem of defining the boundary of an exception to patent eligibility—'we need not labor to delimit the precise contours of the "abstract ideas category in this case"'—has turned into the very mechanism that is quickly 'swallow[ing] all of patent law.").

59. *See, e.g.*, Vehicle Intelligence & Safety LLC v. Mercedes-Benz USA, LLC, 635 F. Appx. 914 (Fed. Cir. 2015) (non-precedential); In re: TLI Communications LLC, TLI Communications, LLC v. AV Automotive, LLC, 823 F.3d 607 (Fed. Cir. 2016); Content Extraction and Transmission, LLC v. Wells Fargo Bank, 776 F.3d 1343 (Fed. Cir. 2014); Intellectual Ventures I LLC v. Erie Indemnity Co., 850 F.3d 1315 (Fed. Cir. 2017); Electric Power Group v. Alstrom, 830 F.3d 1350 (Fed. Cir. 2016).

60. *See, e.g.*, Department of History*, History is* _____, UNIVERSITY OF MEMPHIS (Nov. 6, 2017) http://www.memphis.edu/history/about/history_is.php. Machiavelli stated:

> Whoever wishes to foresee the future must consult the past; for human events ever resemble those of preceding times. This arises from the fact that they are produced by men who ever have been, and ever shall be, animated by the same passions, and thus they necessarily have the same results.

Id.

61. *See, e.g.*, Tilghman v. Proctor, 102 U.S. 707, 724–30 (1881) (process for treating fats and oils); Mackay Radio & Telegraph Co. v. Radio Corp. of America, 306 U.S. 86 (1939) (antennae structures).

Later on, technology migrated towards vast improvements in computing,[62] moreover business method patents starkly grew in popularity.[63] These inventions have been the subject of recent controversy. Since § 101 does not acknowledge any of the three judicial exclusions nor does it provide an assessment standard, practitioners have relied upon appellate decisions for instruction, the most recent from the U.S. Supreme Court are *Mayo* and *Alice* articulating a two-part test for eligibility.[64]

A. Early § 101 precedent

One of the earliest U.S. appellate cases discussing patent eligibility is *Tilghman v. Proctor*.[65] *Tilghman* regarded a *process* patent for separating certain fats from oils with the use of a novel technique employing high-temperature or pressurized water.[66] The eligibility of the patent was contested because it allegedly attempted to monopolize a mere principle or *law of nature*: "that the elements of neutral fat require to be severally united with an atomic equivalent of water in order to separate from each other and become free."[67] The Court reasoned, however, that the patentee did not wish to cover the principle of nature but "a particular mode of bringing about the desired chemical union between the fatty elements and water" or in other words a particular mode of employing the scientific principle.[68] Central to the Court's analysis was how there remained many other avenues of obtaining a similar result—the separation of fats from oils—outside of the claims.[69] "He does not claim every mode of accomplishing this result. He does not claim the lime saponification process, nor the sulphuric-acid distillation process, and if, as contended, []by means of steam distillation, he does not claim that process."[70] The Court ultimately found the claimed process eligible.[71] Most pertinently, the Opinion shows the original policy behind the Court's doctrinal exclusion to

62. C. N. Trueman, *The Personal Computer*, The History Learning Site (Jul. 28, 2018), https://www.historylearningsite.co.uk/inventions-and-discoveries-of-the-twentieth-century/the-personal-computer/.

63. *See* Martinez et al., *Overview of Recent Changes and Comparison of Patent Regimes in the United States, Japan and Europe*, RESEARCH GATE, 16–17 (Jan. 2004), https://www.researchgate.net/publication/250615452_Overview_of_recent_changes_and_comparison_of_patent_regimes_in_the_United_States_Japan_and_Europe.

64. Mayo Collaborative Services v. Prometheus Labs., Inc., 566 U.S. 66 (2012); Alice Corp. Pty. Ltd. v. CLS Bank Int'l, 134 S.Ct. 2347 (2014).

65. Tilghman v. Proctor, 102 U.S. 707 (1881).

66. *Id.* at 729.

67. *Id.*

68. *Id.*

69. *Id.*

70. *Id.*

71. *Id.* at 734.

eligibility—that "not *every* mode of accomplishing" the benefits of a scientific principle be foreclosed by the grant of a U.S. patent.[72]

Nearly sixty years later the U.S. Supreme Court heard an ineligibility claim against an *article of manufacture*.[73] The product claims of the *Mackay Radio* patent relate to a radio antenna system with conductors angularly disposed according to a *mathematical formula* in order to optimize reception.[74] In *Mackay Radio* the Court recognized the difference between seeking to patent an "unpatentable" "scientific truth, or the mathematical expression of it" versus a patentable "useful structure created with the aid of knowledge of scientific truth."[75] The Court found the structure eligible for patent, however, the Court provided little analysis on why, other than to express appreciation for the fact that the claims related to a tangible structure or apparatus.[76] This might suggest that the courts' earlier concerns with the doctrinal exclusions were limited to processes until considering the next case.

Though the U.S. Supreme Court upheld the eligibility of the *product* claims in *Mackay*,[77] a decade later the Court illustrated its willingness to find at least what one might term a *composition-of-matter*[78] claim on an issued patent ineligible in *Funk Brothers Seed Co. v. Kalo Inoculant Co*.[79] *Funk Brothers* involved a productivity-promoting bacteria combination useful in agriculture.[80] Prior discovered versions of the bacteria proved useful with certain types of crops but when combined—like barreled crabs—nullified their efficacy.[81] The inventor in *Funk Brothers* conceived of combinations of varying strands of the

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72. *See id*. at 729. (emphasis added); *see also* Andrei Iancu and Peter Gratzinger, *Machines and Transformations: The Past, Present, and Future Patentability of Software*, 8 NW. J. TECH. & INTELL. PROP. 247, 274 (2010). The authors provided a discussion on the scope of algorithms:

> [R]ather than focusing on whether algorithms are "mathematical" or not, it may be more feasible to focus on separating computational processes that are mere statements of mathematical truths, from computational processes (whether or not they include math) that have a "practical application.". . . So long as a principle of nature or a scientific truth is not preempted, why should these processes be treated differently than any other process. . . ?

Id.

73. Mackay Radio & Telegraph Co. v. Radio Corp. of America, 306 U.S. 86 (1939).

74. *Id.* at 94.

75. *Id*. at 94–95.

76. *Id*.

77. *Id.*

78. Though *Funk Brothers* does not refer to the subject invention as a "composition of matter," the claimed bacteria composition would likely be referred to as such today.

79. Funk Brothers Seed Co. v. Kalo Inoculant Co., 333 U.S. 127 (1948).

80. *Id*. at 128–30.

81. *Id.*

bacteria that would promote productivity in multiple types of crops but not attack each other when combined; so, the combined bacteria could be used across a vast array of plants.[82]

The 6:3 majority in *Funk Brothers* found the bacteria cocktail ineligible for patent because it was perceived to be a "work of nature" or "*natural phenomenon*."[83] The Court explained that inventions or discoveries of natural phenomenon should not be eligible for patent "monopoly" because they are a "part of the storehouse of knowledge of all men. They are manifestations of laws of nature, free to all men and reserved exclusively to none."[84] As a matter of policy, such information was considered in the public domain, presumably so that patent rights would not significantly impede scientific development in that area. So, there was some concern by the Court (again) in *Funk Brothers*, for not foreclosing all practical applications of a doctrinal exclusion.[85]

The majority in *Funk Brothers* also seemed to be concerned with the value added to the product of nature (or lack thereof) by the patentee, reasoning that the inventor's "application of [the natural principle] is hardly more than an advance in the packaging of the inoculants . . . . Their use in combination does not improve in any way their natural functioning . . . ."[86] However, one could argue that the selection of specific strands over others "improves" their natural functioning because the collected strands do not destroy each other's utility in agriculture.[87] "[The inventor's] mixture does in fact have the new property of multi-service applicability."[88] This was the view of Justice Frankfurter's concurrence.[89] Justice Frankfurter would have found the subject claims eligible notwithstanding disclosure issues, acknowledging that every patented invention employs some sort of work or law of nature and then reasoning that the subject invention provided a "new property" (or value) when selectively combined as the inventor discovered.[90]

Justice Frankfurter's acknowledgment of a law of nature in every patented invention[91] reoccurs in subsequent § 101 precedent.[92] Thus suggesting that

82. *Id.*
83. *Id.* at 130–32 (emphasis added).
84. *Id.* at 130–31.
85. *Id.*
86. *Id.* at 131.
87. *Id.* at 132–36 (Frankfurter, J., concurring).
88. *Id.* at 135 (Frankfurter, J., concurring).
89. *Id.* 132–36.
90. *Id.* at 133–35 (finding the subject claims invalid for issues with description, not eligibility).
91. *Id.* at 135.
92. *See, e.g.*, Smart Sys. Innovations, LLC v. Chi. Transit Auth., 873 F.3d 1364, 1378 (Fed. Cir. 2017) (Jinn, J., dissenting).

assessing eligibility according to the inclusion of a doctrinal exclusion is a matter of extent.

Gottschalk v. Benson, related to an application for patent on a data conversion *method*.[93] In *Gottschalk*, binary-coded decimals were converted into digital-computer-friendly values or pure binary numbers using a conversion table.[94] The Court reasoned that the claimed method was so broad that it was drawn to a *mathematical formula* that could be performed mentally.[95]

> Here the 'process' claim is so abstract and sweeping as to cover both known and unknown uses of the []conversion. The end use may (1) vary from the operation of a train to verification of drivers' licenses to researching the law books for precedents and (2) be performed through any existing machinery or future-devised machinery without any apparatus.[96]

At that time, the Court provided no clear definition of what an "abstract concept" is but only referred to it in terms of breadth of the patent claim's practical utility. In determining that the claimed process was too broad (or "sweeping") to be eligible for patent in *Gottschalk* the Court focused on the practical uses for the conversion method that would be foreclosed by the grant of the patent.[97] Next, the Court compared the claimed method with other processes the Court previously found eligible or ineligible.[98] The Court concentrated primarily on the lack of practical uses for the fundamental concepts *outside* of the claim scope.[99] E.g., as to an ineligible printing process the claim breadth had an effect such that "some future inventor . . . could not use" a printing method undisclosed in the specification due to the fundamental concept of electromagnetic printing (or telegraphy) being impeded by the claim.[100] The arguable focus in assessing eligibility was to sort overly broad claims from those that were properly tailored to "confine the patent monopoly" to "rather definite bounds" or practical applications.[101]

The Court used an early version of the machine-or-transformation test as a clue to eligibility arguing that if the claimed invention did not have to be

93. Gottschalk v. Benson, 409 U.S. 63 (1972).
94. *Id.* at 64–67.
95. *Id.* at 67–68, 71–72.
96. *Id.* at 68.
97. *Id.*
98. *Id.* at 68–71.
99. *Id.* at 68, 71–72.
100. *Id.* at 68.
101. *Id.* at 68–72.

executed using a specific kind of machine or if the invention did not result in a physical transformation it was likely claimed too broadly or in the "abstract."[102] However, the Court expressly stated that the M/T test should not be used as the only mode by which a process may be found eligible.[103] Instead, the Court reiterated the modern preemption analysis:

> What we come down to in a nutshell is the following.
>
> It is conceded that one may not patent an idea. But in practical effect that would be the result if the formula for converting BCD numerals to pure binary numerals were patented in this case. The mathematical formula involved here has *no substantial practical application except in connection with a digital computer*, which means that if the judgment below is affirmed, the patent would *wholly pre-empt the mathematical formula* and in practical effect would be a patent on the algorithm itself.[104]

Notice (again) that the lack of remaining practical applications for the fundamental concept was highly relevant to the Court's finding of ineligibility in *Gottschalk*.

For this reason, *Parker v. Flook*, stands out from other U.S. Supreme Court precedent on § 101 because plenty of alternative practical applications of the fundamental concept in *Parker* remained outside of the claim scope, but the Court still found the claims ineligible.[105] *Parker v. Flook* regards an application for patent to a *method* of updating alarm limits or performance thresholds for the catalytic chemical conversion of hydrocarbons.[106] As the performance characteristic, e.g., temperature or pressure, operated at higher values the threshold or "alarm limit" increased.[107] While the claims were specifically written to calibrating the alarm limits in the "catalytic chemical conversion of hydrocarbons" the Court arguably treated the claimed process as one for updating alarm limits in any process.[108]

First, the Court parsed novel claim features from preexisting concepts and reasoned that the "only novel feature of the method [was] a mathematical

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102. *Id.* at 70–71.
103. *Id.* at 71–72.
104. *Id.* (emphasis added).
105. Parker v. Flook, 437 U.S. 584, 596 (1978).
106. *Id.* at 585–86.
107. *Id.* at 596–97 (reciting claim 1).
108. *Id.*

formula."[109] The fundamental concept in *Parker* was a *mathematical formula* used to calibrate an alarm limit based on a present value of a device in operation, such as its temperature, flow rate or pressure.[110] The Court arguably gave very little weight to the preamble limitation on context—for the conversion of hydrocarbons—because the process was so often used in the oil refining business.[111] "Since there are numerous processes of that kind in the petrochemical and oil-refining industries [namely, the catalytic chemical conversion of hydrocarbons], the claims cover a broad range of potential uses of the method. They do not, however, cover every conceivable application of the formula."[112] The Court considered the ubiquitous nature of catalytic chemical conversions in the oil industry but it is arguable that the Court did not fully examine alternative industries where the alarm limit updating formula—or the fundamental concept—could have been employed like, for example, most other manufacturing processes, powertrains, or thermal management.[113]

> The Court adhered to this perspective in *Diamond v. Diehr*[] when holding that, in assessing eligibility under Section 101 of the Patent Act, claims are not to be dissected, as occurred in *Parker v. Flook*[] but to be evaluated "as a whole." *Flook* was in that regard an aberration, for the Court had long assessed compliance with all requirements of the Act by analyzing the claims in view of all their limitations together.[114]

The appropriate comparison should have been between the fundamental concept used in the claimed context and its utility outside the claims, not the claimed context (in this case hydrocarbon conversion) and its given industry (here, oil refinement). Utility of a fundamental concept might theoretically dominate an industry without overly burdening progress in science for humanity at large.

Had the Court in *Parker* compared the fundamental concept, as claimed, with its remaining uses, it might have decided the case differently. This was the logic adopted by the Court of Customs and Patent Appeals.[115]

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109. *Id.* at 585–86.

110. *Id.*

111. *Id.* at 586.

112. *Id.*

113. *See* Brief Of Amicus Curiae Paul R. Michel In Support of Neither Party at 4–6, Alice Corp. Pty. Ltd. v. CLS Bank International, 134 S.Ct. 2347 (2014) (No. 13-298).

114. *Id.* at 4.

115. *Id.* at 587.

> The Court of Customs and Patent Appeals reversed [the PTO]. It read *Benson* as applying only to claims that entirely pre-empt a mathematical formula or algorithm, and noted that *respondent was only claiming on the use of his method to updated alarm limits in a process comprising the catalytic chemical conversion of hydrocarbons*. The court reasoned that *since the mere solution of the algorithm would not constitute infringement of the claims, a patent on the method would not pre-empt the formula* [or the fundamental concept].[116]

In its analysis, the Court in *Parker* first rebuked reliance on claimed features outside of the fundamental concept for determining eligibility.[117] Making the use of a fundamental principle eligible for patent because its claimed use was in a "specific fashion," the Court reasoned, placed too much emphasis on a patent attorney's art (or "draftsman's art").[118] However, practically speaking nearly all tenants of patentability in 35 U.S.C. depend on a patent attorney's/agent's art. For example, novelty, obviousness, and adequacy of description/disclosure under § 112 all depend upon how a claim is drafted or what is included and excluded in the claim language. Reliance on attorney drafting is not inherently inappropriate; patent attorneys are considering legal requirements when drafting claims – that is their skill. It stands to reason therefore that a patent practitioner's "art" would influence an inventor's legal rights just as a contract attorney's composition would affect rights under an agreement.[119]

Secondly, the Court focused on "inventiveness" or novelty when evaluating the *Parker* claims, which is essentially flawed with respect to eligibility.[120] In § 101, one is not asking if the invention is new, but whether it is the right type of invention and not too domineering.[121] Section 101 is asking whether one is

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116. *Id.* (emphasis added).

117. *Id.* at 593–95.

118. *Id.*; Diamond v. Diehr, 450 U.S. 175, 191–92 (1981). With respect to not relying upon "post-solution" activity, the Court wrote "[t]o hold otherwise would allow a competent draftsman to evade the recognized limitations on the type of subject matter eligible for patent protection." *Id.*

119. *See, e.g.*, Phillips v. AWH, Corp., 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) ("It is a 'bedrock principle' of patent law that 'the claims of a patent define the invention to which the patentee is entitled the right to exclude.'"); 42 CFR §11.7(a)(2)(iii) (providing that the Patent Office requires a special examination of attorneys and professionals to be authorized to assist others in filing U.S. patent applications). "No individual will be registered to practice before the Office unless he or she has: . . . (2) [e]stablished to the satisfaction of the OED Director that he or she: . . . (iii) [i]s competent to advise and assist patent applicants in the presentation and prosecution of their applications before the Office." *Id.*

120. Parker v. Flook, 437 U.S. 584, 594 (1978) ("[T]he discovery of such a phenomenon cannot support a patent unless there is some other inventive concept in its application.").

121. 35 U.S.C. § 101 (1952); Gottschalk v. Benson, 409 U.S. 63, 67–68 (1972).

being too greedy, trying to consume all the pie, to take over the universe, or monopolize an intellectual building block. The Court in *Parker v. Flook* rightly considered the application of the fundamental concept but only to the extent that it spoke to novelty versus other practical uses remaining outside of the claimed use; said application was not required to be novel/inventive under § 101.[122]

The bad habits of *Parker* (1) comparing use of a fundamental concept in the invention's context to its use in the invention's industry (as opposed to humanity at large), and (2) the search for inventive elements separate from a fundamental concept, have plagued patent law for the last forty years.[123]

Diamond v. Chakrabarty involved a different category of invention than the method claims of *Parker* and *Benson*.[124] *Chakrabarty* involved the appealed rejection of claims in a patent application for an *article of manufacture*, genetically engineered bacteria used to break down crude oil.[125] The Patent Office and Court of Appeals found the claims to the bacteria unpatentable because they pertained to a living thing, which was not intended to be covered by the Patent Code.[126] The posited "fundamental concept" in *Chakrabarty* was then that the claims were directed to a derivative of a *natural phenomenon*.[127]

The U.S. Supreme Court reversed the Court of Appeals decision by a margin of one justice, finding that because the claimed bacteria was not actually a product of nature, but of human ingenuity, the claims should issue.[128] In so many words, the Court stated that the genetically engineered bacteria did not fall under the natural-phenomenon judicial exclusion at all since it was

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122. *Parker*, 437 U.S. at 594.

123. Mayo Collaborative Servs. v. Prometheus Labs., Inc., 566 U.S. 66, 77 (2012) (providing a narrow construction of the "law of nature" as using a specific drug to treat a specific disorder as opposed to determining drug efficacy in general); *see also Diehr*, 450 U.S. at 188–89. In *Diamond v. Diehr*, the Court discussed the analysis under section 101:

> In determining the eligibility of respondents' claimed process for patent protection under § 101, their claims must be considered as a whole. It is inappropriate to dissect the claims into old and new elements and then to ignore the presence of the old elements in the analysis . . . . The "novelty" of any element or steps in a process . . . is of no relevance in determining whether the subject matter of a claim falls within the § 101 categories of possibly patentable subject matter.

124. Diamond v. Chakrabarty, 447 U.S. 303 (1980).

125. *Id.* at 305–06.

126. *Id.* at 306.

127. *Id.*

128. *Id.* at 308–10.

manmade.[129] The Court distinguished the composition of naturally occurring bacteria claimed in *Funk Brothers* on these grounds.[130]

Arguably, a comparison should have been made between the naturally occurring bacteria and those engineered to ensure that all practical uses of the naturally occurring bacteria would not be foreclosed by the claims. The Court in *Chakrabarty*, however, really did not discuss the practical applications of the bacteria in its natural form as compared to the engineered version. Thirty years later, furthermore, the Court found some genetically engineered DNA that was identical to that naturally occurring ineligible for patent, in *Myriad*, thus somewhat contradicting the notion that manmade organisms automatically fall outside of the doctrinal-exclusion analysis.[131]

Returning now to *process* claims, *Diamond v. Diehr*, involved *method* claims for curing rubber products using a known *mathematical formula* – the Arrhenius equation.[132] The equation was used with a computer-controlled mold that took real-time temperature readings of the mold to calibrate curing time using the Arrhenius equation.[133] The fundamental concept in *Diehr* was an abstract concept or mathematical equation: the Arrhenius equation on the energy transfer needed for chemical reactions.[134] Since the claimed method applied the equation as opposed to attempt to completely foreclose its use by others, the U.S. Supreme Court found the subject claims eligible.[135]

> Their process admittedly employs a well-known mathematical equation, but they do not seek to pre-empt the use of that equation. Rather, they seek only to foreclose from others the use of that equation in conjunction with all of the other steps in their claimed process. These include installing rubber in a press, closing the mold, constantly determining the temperature of the mold, constantly recalculating the appropriate cure time through the use of the formula and a digital computer, and automatically opening the press at the proper time.[136]

By listing the steps of the method that did *not* involve the mathematical formula the Court showcased how much narrower the claimed method was in comparison to the formula, thereby also demonstrating other practical uses for

129. *Id.*
130. *Id.* at 308–10.
131. Ass'n for Molecular Pathology v. Myriad Genetics, Inc., 133 S.Ct. 2107, 2111 (2013).
132. Diamond v. Diehr, 450 U.S. 175, 177–80 (1981).
133. *Id.*
134. *Id.*
135. *Id.* at 187–93.
136. *Id.* at 187.

the equation left outside of the claim scope.[137] Processes that do not include "installing rubber in a press," e.g., where other materials are being cured would not have been foreclosed by the *Diehr* claims.[138] The other side of the narrower-than formula-claim-scope coin is that there will be available a litany of other practical uses for the Arrhenius equation left open by the claims. Therefore, it was essentially determined based upon claim breadth, that the patentee was not seeking to be overly greedy with respect to the fundamental concept or mathematical equation.

B. Recent § 101 precedent

State Street Bank is another more recent seminal case on § 101, where a Court of Appeals panel indicated that there was no business method exclusion to patent eligibility and that the subject *system* claims employing various *mathematical concepts* were eligible under § 101.[139] The issued claims in *State Street* were to a system for pooling investor assets and calculating investment value after a day of transactions.[140] The fundamental concepts were the math equations used to calculate investment value.[141] The district court granted summary judgment for invalidity under § 101, erroneously interpreting the means-plus-function system claims to regard a method instead of *structure*.[142] The panel reasoned that the claimed use of the equations were "practical application[s]" because they "produce[d] 'a useful, concrete and tangible result' " – a final share price used for reporting.[143]

The *State Street* analysis was arguably unclear or too broadly interpreted in future cases. The panel did not use a preemption analysis, for example, in finding the subject claims eligible. It arguably rebuked such considerations when indicating the nonexistence of a business method exception to eligibility:[144]

> [Quoting the district court] "If Signature's invention were patentable, any financial institution desirous of implementing a multi-tiered funding complex modelled (sic) on a Hub and Spoke configuration

137. *Id.*

138. *Id.*

139. State Street Bank & Trust Co. v. Signature Financial Group, Inc., 149 F.3d 1368, 1375–77 (1998).

140. *Id.* at 1370–71.

141. *Id.* at 1373–75.

142. *Id.* at 1371–72.

143. *Id.* at 1373.

144. *Id.* at 1374–77.

> would be required to seek Signature's permission before embarking on such a project." . . .
>
> *Whether the patent's claims are too broad to be patentable is not to be judged under section 101, but rather under sections 102, 103 and 112*.[145]

At that time, the Supreme Court had already adopted the preemption analysis which compares the scope of the claims to the breadth of practical applications for a fundamental concept.[146] Instead of using the preemption analysis, the panel used a useful-concrete-tangible results test from *State Street* which is arguably vaguer.[147] The useful results test opened the door for some of today's most questionable business method and computer-based patents.[148]

In re Comiskey followed the *State Street* decision.[149] *Comiskey* involved a patent application for a business *method* of requiring arbitration between parties having a dispute.[150] The steps of the method were purported to be carried out "*mentally*" by a human as opposed to computer software and for that aim the claims were reasoned to be drawn to an *abstract concept*.[151] The Court found this especially relevant to determining whether the claimed process was eligible for patent.[152]

Comiskey left a great deal of questions open for the patent community as to the eligibility line for business method patents. First, it was unclear why the claims in *Comiskey* were determined to have been drawn solely to the use of human intelligence? The claims included steps like (1) enrolling a person, (2) incorporating arbitration language, (3) requiring a complainant to submit a request, and (4) conducting arbitration and determining an award.[153] Though these steps can be carried out by a human, they are not solely mental steps. To enroll a person, for example, one would have to take pen to paper, if not type

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145. *Id.* (emphasis added).

146. *See, e.g.*, Tilghman v. Proctor, 102 U.S. 707 (1881); Gottschalk v. Benson, 409 U.S. 63 (1972).

147. *State Street Bank*, 149 F.3d at 1373.

148. *See Transitional Program for Covered Business Method Patent Reviews*, U.S. PATENT AND TRADEMARK OFFICE (last visited Apr. 7, 2019), https://www.uspto.gov/patents-application-process/appealing-patent-decisions/trials/transitional-program-covered-business; 35 U.S.C. §§ 321-29 (2011); AIA § 18 (2011); 42 CFR §§ 42.300 *et seq*. (2011).

149. In re Stephen W. Comiskey, 554 F.3d 967 (2009) (en banc).

150. *Id*. at 969–71.

151. *Id*. at 980–81.

152. *Id*. at 981 ("[L]ike the claims that the Supreme Court found unpatentable in *Benson* and *Flook* and the claims found unpatentable in our own cases, Comiskey's independent claims 1 and 32 seek to patent the use of human intelligence in and of itself.").

153. *Id.*

information into a register. Similarly, to require another like a "complainant" to do something implies a verbal instruction be issued by the actor and so forth. Second, every human-executed process, whether it be for baking bread, smelting iron, or performing surgery would begin with "mental" instructions because the brain instructs the body to perform. Perhaps because no apparatus results from the *Comiskey* claims the court was reluctant to find the claims eligible. This is not, however, expressed in the opinion, precedent nor the plain language of § 101. So, it is difficult to ascertain exactly why the *en banc* sitting court nonetheless believed the subject claims in *Comiskey* to be ineligible for patent. It could have been that the *Comiskey* claims would unduly preempt something we consider to be a fundamental building block to science or business-related arts. Perhaps if dispute resolution can be considered a useful art then arbitration clauses are something basic to dispute resolution in the same way as would be converting numbers into a digital format for computer processing.[154]

The court deviated from the preemption analysis in *Comiskey*, not really examining which practical uses remained for the alleged "abstract concept," if any, outside of that claimed. Moreover, to the extent that a method of arbitration is a fundamental concept, the court was unclear as to why exactly. Most business methods are not going to employ tools or machines other than computers; so *Comiskey* left us questioning whether many non-computer-implemented business methods could be considered "abstract concepts" excluded from eligibility?

Bilski v. Kappos was the next major case on that issue and it provided a bit more clarity as to eligibility concerns regarding business methods.[155] *Bilski* involved a patent application for a *method* of reducing or "hedging" risk and was considered a method of conducting business.[156] The Court ultimately found the subject claims ineligible,[157] but the majority embraced the potential eligibility of business method claims which was in question at the time.[158] The Court started by reasoning that the claimed process was to a method of hedging which was considered to be a *fundamental concept* in *economics*, it was therefore drawn to an abstract concept.[159] Because the method of hedging was not restricted to a particular field of use, like natural ore pricing as the Applicant intended to use the concept, it was determined to preempt nearly all practical

154. *See* Gottschalk v. Benson, 409 U.S. 63, 71–73 (1972).
155. Bilski v. Kappos, 130 S.Ct. 3218 (2010).
156. *Id.* at 3223–24.
157. *Id.* at 3231.
158. *Id.* at 3228–29.
159. *Id.* at 3231.

uses of the concept as claimed.[160] In other words, the Applicant was being too greedy with respect to the fundamental concept.

Bilski was a two-sided coin on eligibility. While the case generally cemented the eligibility of business method patents[161]—even those that solely rely on human activity and are not tied to a machine or physical transformation—it also opened the door for loose characterizations of claims as reading upon fundamental concepts.[162] After *Bilski* it arguably became much easier to characterize nearly any successful economic practice as "fundamental," especially to doing business, for the purposes of arguing abstractness and ineligibility.[163] Moreover, after *Bilski*, courts took less care in viewing the claims as a whole, not really taking *every* limitation into consideration when evaluating eligibility.[164] This vague application of the exclusions doctrine resulted in courts arguably inadequately measuring the breadth of a claim before deducing that the claim would preempt a substantial number of practical uses of the "fundamental concept" or should thus be found ineligible for patent.[165]

Mayo Collaborative Svcs v. Prometheus Labs involved another method of human activity, this time in the context of a medical application.[166] The claims in *Mayo* involved an issued patent on a *method* of treating autoimmune disorders.[167] The method incorporated the use of a *law of nature*, namely, relationships between concentrations of certain chemicals in the blood and based upon that concentration determining a likelihood that a dosage of the drug would prove ineffective or cause harm.[168] The Court found the subject claims ineligible for patent, articulating a now seminal two-step test for eligibility to: 1) identify whether a judicial exclusion is included in the claims; and 2) to determine if what remains outside of the exclusion adds enough to qualify it for eligibility or is it well-understood, routine and conventional activity.[169] The opinion is littered with references to the "conventional" nature

160. *Id.* ("Allowing petitioners to patent risk hedging would preempt use of this approach in all fields, and would effectively grant a monopoly over an abstract idea.").

161. Bilski at 3229 ("[T]he Patent Act leaves open the possibility that there are at least some processes that can be fairly described as business methods that are within patentable subject matter under § 101.").

162. *See infra* Section IV(B).

163. *Id.*

164. *See infra* Section IV(C).

165. *Id.*

166. Mayo Collaborative Servs. v. Prometheus Labs. Inc., 132 S.Ct. 1289, 1294–95 (2012).

167. *Id.*

168. *Id.* at 1296–97.

169. *Id.* at 1296–98.

of steps determined to be outside of the fundamental concept in a manner that quite arguable confuses some of the purposes of § 102 with those of § 101.[170]

The Court also considered practical applications for the fundamental concept outside of the claims reasoning that the claims in *Mayo* did not adequately confine their reach to a particular application.[171] In coming to this conclusion, the Court reasoned that the steps of the method added nothing of significance to the natural law;[172] however, it is arguable that the Court too narrowly construed the law of nature in the first instance, thus failing to appreciate other practical applications for determining drug efficacy outside of the claims. For example, the claims were not drawn to determining drug efficacy in general but to treatment of a *specific* disorder, "immune-mediated gastrointestinal disorder" and the use of a *specific* drug, "6-thioguanine."[173] If the relevant natural law can be construed as determining drug efficacy by measuring the presence of a drug in the blood system in general than a ton of other practical uses lie outside of that which was claimed in *Mayo*, e.g., determining the efficacy of insulin in treating a diabetic, dialysis in treating kidney failure or an anesthetic in preparing for surgery. When stripping the natural law down to its bare bones it appears that the *Mayo* method could have been sufficiently narrow to *not* preempt all significant practical uses of the natural law.

Moreover, the "novel" or "inventive" quality of claim limitations apart from the fundamental concept is a distraction in determining eligibility; it could very well be the case that conventional components limit the practical application of a fundamental concept in a way that narrowly tailors the claim to a reasonably specific practical use.[174] Yet, this language on inventiveness conjured up in *Mayo* has led to the ineligibility of many a reasonably drafted patent claim as discussed hereinbelow in Section IV.

Association for Molecular Pathology v. Myriad Genetics, Inc., involved a *natural phenomenon* or claims directed to isolated and synthetically generated DNA.[175] Specifically, the patentee (Myriad Genetics) held claims to DNA useful in the prediction of a likelihood of developing breast and ovarian

170. *Id.* 1298–1300.

171. *Id.* at 1301–02.

172. *Id.* at 1303 ("[T]he underlying functional concern here is a *relative* one: how much future innovation is a foreclosed relative to the contribution of the inventor.").

173. *Id.* at 1295.

174. *See, e.g.*, Mackay Radio & Telegraph Co. v. Radio Corp. of America, 306 U.S. 86, 95 (1939) (finding the claimed angular ratio was simply double an angle resulting from the mathematical formula); Diamond v. Diehr, 50 U.S. 175, 187 (1981) (finding the steps in the claimed process outside of the equation were not novel).

175. Association for Molecular Pathology v. Myriad Genetics, Inc., 133 S.Ct. 2107, 2111–13 (2013).

cancers.[176] While the DNA naturally occurred, Myriad was responsible for locating the specific strands related to cancer and isolating them from the rest of the human genome as well as recreating the DNA synthetically.[177] The claimed DNA was then a *composition of matter*. The Court found the isolated DNA ineligible for patent while the reconstructed DNA was found to be eligible.[178]

In finding the isolated DNA ineligible, the Court reasoned that the separation from other genome did not require Myriad to create anything new.[179] Drawing an analogy to the bacteria cocktail found ineligible in *Funk Brothers*, the Court considered that Myriad had not altered the composition of the DNA.[180] There was a suggestion, however, that had the claims been drafted to reflect nonnaturally occurring structure with the naturally occurring structure they may have been eligible.[181]

As to the allowable synthetic DNA it was determined to be eligible for patent solely based on its distinctiveness from the naturally occurring DNA.

> cDNA retains the naturally occurring exons of DNA, but it is distinct from the DNA from which it was derived. As a result, cDNA is not a 'product of nature' and is patent eligible under § 101, except insofar as very short series of DNA may have no intervening introns to remove when creating cDNA.[182]

The Court in *Myriad Genetics* did not employ the preemption analysis in determining the eligibility (or ineligibility) of either type of claim.[183] Instead, the Court appeared to do a straight-forward assessment of whether the claimed DNA was identical to naturally occurring DNA.[184] In the past, however, where a fundamental concept has been identified its claimed distinctions were usually not enough to *automatically* render the claimed invention eligible.[185] Said

176. *Id.*

177. *Id.*

178. *Id.* at 2116–19.

179. *Id.*

180. *Id.* at 2117–19.

181. *Id.* at 2118. ("Myriad's claims are simply not expressed in terms of chemical composition, nor do they rely in any way on the chemical changes that result from the isolation of a particular section of DNA. Instead, the claims understandably focus on the genetic information encoded in the BRCA1 and BRCA2 genes.").

182. *Id.* at 2119.

183. *Id.* at 2116–19.

184. *Id.*

185. *See, e.g.*, Tilghman v. Proctor, 102 U.S. 707 (1881); Mackay Radio & Telegraph Co. v. Radio Corp. of America, 306 U.S. 86, (1939); Diamond v. Diehr, 50 U.S. 175, 187 (1981)

distinctions were scrutinized with a fine-toothed comb.[186] Regardless of whether *Myriad* was "rightly" or "wrongly" decided as to eligibility, because the preemption analysis was not made explicit, the case provides less instruction (and more apprehension) for inventions employing composition-of-naturally-occurring-matter claims.

Alice Corp. Pty. Ltd. v. CLS Bank International provides a current book end to U.S. Supreme Court jurisprudence on eligibility.[187] *Alice* pertains to issued claims to a computer-implemented *method* (and *systems*) for mitigating settlement risk for a financial transaction through the use of a third-party intermediary.[188] The fundamental concept in *Alice*, was determined to be one related to *fundamental economics* and thus was an *abstract concept*: intermediated settlement, i.e., the use of a third party to mitigate settlement risk.[189] The use of an intermediary in settlement (or clearing house) was determined to be a building block of modern economics citing expert references on settlements and economics.[190]

The additional features outside of the abstract idea were found to be insufficient to transform the fundamental concept into eligible subject matter.[191] The Court noted that the use of a computer alone was insufficient to render otherwise ineligible claims eligible.[192] Then, because the remaining steps were seen as conventional or generic they were deduced to not substantially transform the claims into eligible subject matter, rather they were said to simply instruct one to apply the fundamental concept.[193]

The Court did not make explicit the preemption analysis in *Alice*, which is unfortunate because the conventional-generic language is simply not sufficiently instructive on eligibility. This is especially true given the rampant use of existing technology on any given novel computer algorithm. It is arguable that there remained little practical applications for intermediated settlement outside of the claim scope.[194] However, without this portion of the preemption analysis being made explicit in *Alice* following courts have been able to render "innocent" claims ineligible just for incorporating known features in a previously unknown way.

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186. *Id.*
187. Alice Corp. Pty. Ltd. v. CLS Bank International, 134 S. Ct. 2347 (2014).
188. *Id.* at 2351–52.
189. *Id.* at 2355–56.
190. *Id.*
191. *Id.* at 2357–60.
192. *Id.* at 2357–58.
193. *Id.* at 2359–60.
194. *See, e.g.*, claim 33 of the '479 patent as reproduced in *Alice*.

III. THE EMPEROR IS UNCLOTHED – MODERN HORRORS TO APPLYING THE DOCTRINAL EXCLUSIONS

Applying the doctrinal exclusions under *Mayo-Alice* reminds one of the popular children's story about an emperor who loved his clothes and in vanity one day spared no expense to have a garment made for him by two swift-talking tailors.[195] The tailors claimed that the robe's material was magical such that only wise people could perceive it.[196] Given this backdrop everyone who was presented the robe hailed its praises.[197] That is, until the Emperor nearly finished the parade in his honor and a child stated the obvious: "the Emperor has no clothes on!"[198] After a few whispered conferences, adults began to acknowledge the truth . . . that the Emperor stood barren in his thermal onesie in the middle of town.[199] Sometimes custom inhibits us, such that offbeat answers add more value than what is "trending."

While the majority of deciding officials are still in denial as to *Mayo-Alice's* inadequate coverage, many childlike practitioners and judges are seeing the non-cloak of *Mayo-Alice* for what it is worth. For example, we are nearly four years into the parade and most patent practitioners could not describe the color, hemline or cuff of the doctrinal exclusions as applied to a newly reviewed innovation.[200]

> [T]he emphasis on eligibility has led to erratic implementation in the courts.
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> I have come upon no guide to when a claim crosses the boundary between unacceptable abstractness and acceptable specificity.

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195. H.C. ANDERSEN retold by MARCUS SEDGWICK, THE EMPEROR'S NEW CLOTHES, (Chronicle Books 2004); H.C. ANDERSEN retold by RIKI LEVINSON, THE EMPEROR'S NEW CLOTHES, (Dutton Children's Books 1991).

196. SEDGWICK *supra* note 195, at 3–6; LEVINSON *supra* note 195, at 5–10.

197. SEDGWICK *supra* note 195, at 13–22; LEVINSON *supra* note 195, at 13–34.

198. SEDGWICK, *supra* note 195, at 23–24; LEVINSON, *supra* note 195, at 35–37.

199. SEDGWICK, *supra* note 195, at 23–24; LEVINSON, *supra* note 195, at 35–37.

200. BASCOM Glob. Internet Servs., Inc. v. AT&T Mobility, LLC, 827 F.3d 1341, 1353–54 (Fed. Cir. 2016) (Newman, J., concurring); s*ee also* Mark Nowotarski, *Surviving Alice in the e-Commerce Arts*, BILSKI BLOG (May 17, 2017), http://www.bilskiblog.com/blog/2017/05/surviving-alice-in-the-e-commerce-arts.html#_edn1; *#AliceStorm: April Update and the Impact of TC Heartland on Patent Eligibility*, *supra* note 1 (reporting post-*Alice* § 101 invalidity rates as high as 97.8% on covered business method patent reviews at the Patent Trial and Appeal Board and 91.7% at the Court of Appeals); Lefstin et al., *supra* note 10, at 555 (stating that *Alice* and *Mayo* "have sent shock waves through the research, technology, business, and patent communities" and citing examples in medical devices, software innovations, and financing).

> Experience with this aspect demonstrates its imprecision. This conundrum is resolved on application of the criteria of patentability.[201]

The term "abstract concept" is inherently vague.[202]

> The reference in *Bilski*[] to "abstractness" as a ground of ineligibility for computer-related claims amplifies this problem and sets out a dangerous road to travel. "Abstractness" is a vague and subjective notion that has proven entirely unworkable, and unavoidably yields inconsistent and unpredictable results in the hands of 7,000 examiners and some 1,000 district judges, not to mention the countless thousands of patent attorneys, inventors, business leaders, and investors who need to interpret the law when making decisions about investing in patents, licensing, and funding or settling litigation.
>
> Clearer lines are urgently needed and can only be provided by this Court as the creator and arbiter of the judicially-created "exceptions" to statutory patent eligibility, including "abstract ideas," whatever that means.[203]

Mayo-Alice is not clear enough to transform the abstractness of "abstract concept" into something practical.

> The United States Court of Appeals for the Federal Circuit and the United States Patent and Trademark Office (USPTO) have worked to understand and apply the Supreme Court's test. But the impact of that test and its application by the Federal Circuit and the USPTO have sparked considerable discussion in the patent community, both critical and favorable, of the Supreme Court's jurisprudence. [204]

Nearly every invention involves some fundamental concept which could be characterized as "abstract."

> Step one cannot be a hunt for the abstract idea underlying the claim, because underlying virtually every claim is an abstract idea. And if the

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201. *BASCOM Glob. Internet Servs., Inc.*, 827 F.3d at 1353–54 (Newman, J., concurring).

202. Brief of Amicus Curiae Paul R. Michel In Support of Neither Party at 7, Alice Corp. Pty. Ltd. v. CLS Bank Int'l, 134 S.Ct. 2347 (2014) (No. 13-298).

203. *Id.*

204. *Patent Eligible Subject Matter: Report on Views and Recommendations from the Public,* U.S. PATENT AND TRADEMARK OFFICE, 1 (July 2017), https://www.uspto.gov/sites/default/files/documents/101-Report_FINAL.pdf.

> task under step one is to assess whether the claim is directed to no more than an abstract idea, what is left for determination under step two? . . . Despite the number of cases that have faced these questions and attempted to provide practical guidance, great uncertainty yet remains. And the danger of getting the answers to these questions wrong is greatest for some of today's most important inventions in computing, medical diagnostics, artificial intelligence, the Internet of Things, and robotics, among other things. [205]

It is believed that due at least in-part to this phenomenon modern application of the § 101 exclusions has been termed to have an "ferocious" effect, invalidity requiring "little to any factual development;" [206] in theory, nearly *any* claim in a modern popular technology field like computing, business methods and medicine employing a "fundamental concept" could be subject to a non-descript § 101 rejection or ineligibility finding.

Courts further need to remind themselves that the doctrinal exclusions are judge-made exceptions to § 101 and should be narrowly construed, not liberally applied.[207]

> Indeed, the Supreme Court has cautioned that, to avoid improper narrowing by courts of congressional enactments, resort to judge-made exceptions to statutory grants must be rare . . . .
> As the Supreme Court has made clear, too broad an interpretation of these exclusions from the statutory grant of Section 101 "could eviscerate patent law."[208]

It is time the "adults" start listening; as the following several horrors to applying the *Mayo-Alice* standard demonstrate, a more transparent and practical standard is desperately needed.

A. There is Judicial Paranoia About Whether Claims are Actually Directed to

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205. Smart Sys. Innovations, LLC v. Chi. Transit Auth., 873 F.3d 1364, 1378 (Fed. Cir. 2017) (Linn, J. dissenting).

206. *See* Sobon, *supra* note 7 ("Section 101 is being used with ferocious effect, by District Courts at the pleading stage, *with little to any factual development*, and by Patent examiners, in hundreds and thousands of cases, as a new, often insurmountable hurdle to patentability." (emphasis added)).

207. CLS Bank Int'l v. Alice Corp. Pty. Ltd., 717 F.3d 1269, 1303–04 (Fed. Cir. 2013) (Rader, C.J., dissenting in part).

208. *Id.*

Fundamental Concepts

As discussed, the policies behind the doctrinal exclusions to eligibility rest with concerns about foreclosing use of fundamental building blocks to science or useful arts.[209] Rightly at the forefront of many judicial analyses is a consideration of claim breadth under § 101. However, sometimes this consideration plays too big of a role in a courts' analysis and patentees are not given appropriate credit for being reasonably disciplined about claim scope. Courts are being too empathetic to accused infringers and their difficulties designing around an invention. Instead, claim breadth should be measured from the perspective of all humanity that might find utility in a fundamental concept under § 101.[210]

Take for example *Electric Power Group, LLC v. Alstom*, where the representative claim pertained to a power-grid management *system*.[211] The Court of Appeals panel affirmed the ineligibility findings of the district court first reasoning that the claims were directed to the *abstract concept* of collecting information, analyzing it and displaying certain related results.[212] While the "abstract concept" in *Electric Power Group* seems to have been reasonably defined, given that process improvement often requires the review of system performance data, the panel gave little to no credit to the patentee for limitations distinct from that abstract concept in assessing eligibility.[213] "Most obviously, limiting the claims to the particular technological environment of power-grid monitoring is, without more, insufficient to transform them into patent-eligible applications of the abstract idea at their core."[214] The claims in *Electric Power Group* showed more than just limitations to power-grid monitoring, like giving the data a time stamp and geographic-location notation, receiving data from multiple sources including "non-grid data sources," detecting particular types of performance characteristics (as opposed to others), displaying measurements concurrently with the results, updating results in real time and deriving what was called a "reliability indicator" of power-grid vulnerability.[215] These limitations were given no weight in assessing whether the claims were directed to an abstract concept and under step two of *Alice* only the power-grid environment limitation was given consideration.[216] A limitation is, as its name

209. *See supra* Section III(A).
210. *Id.*
211. Electric Power Group, LLC, v. Alstom S.A., 830 F.3d 1350, 1351 (Fed. Cir. 2016).
212. *Id.* at 1353–54.
213. *Id.* at 1354–56.
214. *Id.* at 1354.
215. *Id.* at 1351–53.
216. *Id.* at 1353–56.

suggests, a limit on claim scope and should be given due consideration on eligibility.

The Court of Appeals panel did consider the district court's use of the pre-emption analysis in *Electric Power Group* as a "double-check" to its own work but the panel was arguably paranoid about how widespread the claimed invention would be with respect to the fundamental concept of collecting information, analyzing it and displaying certain related results:[217]

> The district court in this case wrapped up its application of the Supreme Court's framework by invoking an important common-sense distinction between ends sought and particular means of achieving them, between desired results (functions) and particular ways of achieving (performing) them. The court identified the problem addressed by the patents: "Here, the problem is the need to monitor and analyze data from multiple distinct parts of a power grid." J.A. 30. *But, the court reasoned, "there is a critical difference between patenting a particular concrete solution to a problem and attempting to patent the abstract idea of a solution to the problem in general." Id. Electric Power Group's asserted claims, the court observed, do the latter: rather than claiming "some specific way of enabling a computer to monitor data from multiple sources across an electric power grid," some "particular implementation," they "purport to monopolize every potential solution to the problem" — any way of effectively monitoring multiple sources on a power grid. Id.* Whereas patenting a particular solution "would incentivize further innovation in the form of alternative methods for achieving the same result," the court concluded, allowing claims like Electric Power Group's claims here would "inhibit[] innovation by prohibiting other inventors from developing their own solutions to the problem without first licensing the abstract idea." *Id.*
>
> The district court did not set forth that description as a freestanding basis for its ineligibility holding, independent of the framework for analysis established under the Supreme Court's authority. Moreover, the district court phrased its point only by reference to *claims so result-focused, so functional, as to effectively cover any solution to an identified problem*. The court's description is one helpful way of double-checking the application of the Supreme Court's framework to particular claims — specifically, when determining whether the claims meet the requirement of an inventive concept *in application*. Indeed, the essentially result-focused, functional character of claim language has been a frequent feature of claims held ineligible under § 101,

217. *Id*. at 1356 (emphasis added).

> especially in the area of using generic computer and network technology to carry out economic transactions. *See Loyalty Conversion Sys. Corp. v. American Airlines, Inc.*, 66 F.Supp.3d 829, 837-38, 840, 843, 845 (E.D. Tex. 2014). In this case, the district court's wrap-up description confirms its, and our, conclusion that the claims at issue fail to meet the standard for patent eligibility under § 101.[218]

Respectfully, it does not appear that the subject claims in *Electric Power Group* sought to "monopolize" *every* way of utilizing the stated abstract concept: monitoring data from multiple sources, which remember should not even be limited to power-grid management in assessing its elementariness.[219] As discussed, representative claim 12 was limited in at least five additional ways beyond use of the abstract concept in power-grid management such that the claimed practical application required specificity as meticulous as deriving a "reliability indicator" of power-grid vulnerability.[220] The court arguably overreacted to claim scope, assessing breadth with perhaps too much empathy for the perspective of the accused infringer when claim scope should be drawn against humanity's plausible utility of the fundamental concept.

B. The Slithery Serpent-Like Idea of an "Abstract Concept" is Way Too Ambiguous and Flexible to be a Standard for Patentability

Characterizing an invention as directed to versus involving the doctrinal exclusion of an "abstract concept" has become a sort of "catch-all" exclusion to eligibility. Under *Mayo-Alice*, the list of what is considered an "abstract concept" continues to grow. "Abstract concept" is by its own name vague.[221] Moreover, in determining whether a concept is truly "abstract" courts are not

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218. *Id.*

219. *Id.* at 1351–53.

220. *Id.*

221. *See Alice Doesn't Live Here Anymore: A Critique of the Supreme Court's "Abstract Ideas" Test*, BOS. PAT. LAW ASS'NS NEWSL., Vol. 45, Issue 3 (2015) at 4–6. "In any event, this '*Bilski* comparison' method for determining whether a claim is drawn to an abstract idea is itself abstract and thus unsatisfying." *Id.* at 4; *see also* Funk Bros. Seed Co. v. Kalo Inoculant Co., 333 U.S. 127, 135 (1948) (Frankfurter, J., concurring) (discussing the natural phenomenon exclusion). In *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, J. Frankfurter wrote:

> For these are vague and malleable terms infected with too much ambiguity and equivocation. Everything that happens may be deemed 'the work of nature,' and any patentable composite exemplifies in its properties 'the laws of nature.' Arguments drawn from such terms for ascertaining patentability could fairly be employed to challenge almost every patent.

Id.

distinguishing between fundamental (i.e., foundational) building blocks and ordinary bricks and mortar.[222] More description as to *why* an abstract concept is considered fundamental to science and useful arts is needed in recent judicial opinions on eligibility.

As discussed below, some panels are arguably too narrowly construing abstract concepts, making it seem as if all practical uses of the same will be foreclosed by the patent, thereby providing support for the proposition that the patent should not be eligible. Other panelists are completely shying away from recognizing a fundamental concept even being involved in the claims (as opposed to directed to one) for fear that the claims will fail under the defeating *Alice-Mayo* framework.

Frankly, sometimes courts rush into defining something as an abstract concept. *Secured Mail Solutions* is a recent case out of the Court of Appeals where the abstract concept was arguably drawn too narrowly such that it appeared that the claims foreclosed a concept that was not actually fundamental to mailing.[223] The invention in *Secured Mail* regarded a *method* of tracking mail involving generating a unique code to affix to the mailed object that included sender information, recipient data and shipping method.[224] The panel determined that "*communicating information about a mail object using a personalized marking*" was an *abstract concept*.[225] However, while displaying sender and recipient data on a piece of mail may be fundamental to the mail system, since multiple third parties sort and deliver mail, "using a personal marking" to accomplish the same does not appear to be a necessary building block to mailing. For example, mail can be delivered in the same way that the Pony Express did it: by reading the recipient's and sender's information from the front of the envelope. Other limitations in the representative claim like authenticating the generated code or "marking" also would not foreclose the general addressing of a letter. Further, there is no reason that optical scanners might not be employed to digitize this information without generating an intermediate marking to affix on the envelope. When the core "abstract concept" of *Secured Mail Solutions* is adjusted, it seems more likely that the

222. *See, e.g.*, Secured Mail Solutions LLC v. Universal Wilde, Inc., 873 F.3d 905, 911 (Fed. Cir. 2017) (discussing that since the panel defined the fundamental concept so narrowly as "communicating information about a mail object *using a personalized marking*," it was treated more like a concrete slab that would foreclose building many different types of structures rather than an ordinary clay brick (emphasis added)); Sobon, *supra* note 7 ("We need to somehow stop the [c]ourts and the USPTO from importing their own often hazy, subjective view of 'abstractness' ([which is] often really just *unbound, personal views of novelty, obviousness or distinctiveness) into the purposefully low Section 101 patentability threshold.*" (emphasis added)).

223. *Secured Mail Solutions*, 873 F.3d at 905.

224. *Id.* at 906–08.

225. *Id.* at 911 (emphasis added).

claims were arguably narrowly tailored, under § 101, leaving many other practical uses for the fundamental concept of communicating information about a mail object in the free domain. Under the *Mayo-Alice* standard, however, there is little accountability in what a court finds "abstract," we are essentially left with a "swallow-it-because-I-said-so" answer.

Another example of where a Court of Appeals panel arguably drew the *abstract concept* too narrowly includes *Intellectual Ventures I v. Erie Indemnity Co*.[226] In this case the panel reviewed the eligibility of issued claims to a *manufacture* or system for transferring user-preference data between computers like a home computer and mobile device such that bookmarks and browser settings would be consistent between devices.[227] Under *Alice*, the panel agreed with the district court in finding "*remotely accessing user-specific information*" to be an abstract concept.[228] However, remotely accessing specific *user interface* information does not seem to be a fundamental concept to computing. Indeed, users can self-program and update each device over time while still allowing the devices to "network" or access the same websites, directories and hard drives. Automatically changing user settings across devices does not appear to be *fundamental* to computer networking. In finding the concept "abstract" the panel pointed to what seems to be more § 112 ¶(a)/(b) concerns like reciting "any particular unique delivery of information" or "how the mobile interface communicates."[229] The panel reasoned that because the claims merely provided "generic technological environment" for what it deemed to be an "abstract concept" this field-of-use limitation left the claims directed towards an abstract concept.[230] It is arguable that if a claim involves a concept that is truly fundamental/abstract the concept's abstractness should stand separate from claim description on implementation of the concept. E.g., if one were to claim an invention involving Newton's law on gravity (F=ma) additional usage descriptions in the claim would not change the core concept—the formula will

226. Intellectual Ventures I LLC v. Erie Indemnity Co., 850 F.3d 1315 (Fed. Cir. 2017); *see also* Two-Way Media Ltd. v. Comcast Cable Commc'ns, LLC, 874 F.3d 1329 (Fed. Cir. 2017) (stating that the abstract concept was arguably too narrowly drawn with respect to the '187 patent's claim 1). The Court of Appeals panel affirmed the § 101 invalidity findings of the lower court finding the claims directed to an abstract concept and no inventive concept outside of the abstract concept transformed the claims under *Alice*. *Id*. at 1341. The panel found claim 1 directed to a four-part abstract concept of "(1) sending information, (2) directing the sent information, (3) monitoring the receipt of the sent information, and (4) accumulating records about receipt of the sent information." *Id*. at 1337. Arguably, the monitoring and recording steps are not *fundamental* to streaming TV. Alternatively, streaming TV when requested could have been the abstract concept and systems without record keeping or recordation of transmission time would be outside of the claim scope.

227. *Intellectual Ventures I LLC*, 850 F.3d at 1329–30.

228. *Id*. at 1330.

229. *Id.*

230. *Id.*

be as it has always been. In this way, courts seem to be muddling step one and two of *Mayo-Alice* in its analysis.[231] Limitations outside of the abstract concept are to be reviewed under step two of *Mayo-Alice*.

Ironically, courts also tend to shy away from acknowledging any kind of abstract or fundamental concept in the claims. Who can blame them? Eligibility will be a near impossible uphill battle under step 2 of *Mayo-Alice* for almost any invention. Yet, any claim likely incorporates the use of some fundamental concept on some level.[232] In *Visual Memory, LLC v. NVIDIA Corp.* the majority found the subject claims to memory *systems* tailored to processor type eligible for patent.[233] The majority in *Visual Memory* reasoned that the claims were not drawn to, nor did they involve, an *abstract concept* at

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231. *See* FairWarning IP, LLC v. Iatric Sys., Inc., 839 F.3d 1089 (Fed. Cir. 2016). The Court of Appeals panel under step one of *Alice*, found the claims directed towards the abstract concept of essentially detecting CPU system misuse by focusing on the lack of novelty in claim features. *Id.* at 1094–95. The invention in *FairWarning* regarded systems and methods for detecting fraudulent user activity in health-care databases. *Id.* at 1091–92. The court rebuked the claims using phraseology like "implement[ing] an old practice in a new environment" and pointing to the benefit of the invention coming from the invention's use of a "general-purpose computer" rather than the "patented method itself" as if an invention's benefit need be tied to novel claim features to be non-abstract or eligible. *Id.* at 1094–95. The panel ignored, disappointingly, the other practical uses for the fundamental concept not foreclosed by the claims such as non-health-care systems and systems that used different rules than those claimed to detect misuse. *Id.* at 1092–95. The court again summarily dismissed the preemption analysis simply stating that the lack of preemption will not necessarily "save" the claims on eligibility in a somewhat conclusory fashion. *Id.* at 1098. *See also* McRO, Inc. v. Bandai Namco Games Am., Inc., 837 F.3d 1299 (Fed. Cir. 2016). The Court of Appeals panel partially relied upon novelty in finding the subject claims *not* drawn to an abstract concept. *Id.* at 1314–15. The panel assessed whether the claimed processes were the same as the prior art or distinct and whether the "novel" claimed features generated the benefit of the invention rather than the use of a generic computer. *Id.* Later, however, the panel also detailed a preemption analysis finding the claimed automated animation calibration method eligible for patent because there remained different modes of achieving the same effect—automated animation—available. *Id.* at 1315–16.

232. *See, e.g.*, Smart Sys. Innovations, LLC v. Chi. Transit Auth., 873 F.3d 1364, 1378 (Fed. Cir. 2017) (Linn, J., dissenting) (stating that "[s]tep one cannot be a hunt for the abstract idea underlying the claim, because underlying virtually every claim is an abstract idea."); *see also* Visual Memory LLC v. NVIDIA Corp., 867 F.3d 1253, 1259 (Fed. Cir. 2017) (acknowledging "the difficulty inherent in delineating the contours of an abstract idea."); *see also* Rapid Litig. Mgmt. v. CellzDirect, 827 F.3d 1042, 1044–47 (Fed. Cir. 2016) (reversing the district court's finding of ineligibility of claims towards cryogenically preserving cells). In *Rapid Litigation Management*, the panel found that claims were not "directed to" an abstract concept or law of nature but the panel arguably shied away from acknowledging that the claims involved a law of nature. *Id.* 1047–48. "The district court identified in these claims what it called a 'natural law' . . . [w]e need not decide in this case whether the court's labeling is correct. It is enough in this case to recognize that the claims are simply not directed to the [abstract concept or natural law]." *Id.* at 1047–48. It is difficult to assess foreclosure or preemption of an unacknowledged concept, to the extent comparisons are made between what is claimed and a fundamental concept—in this case the survivability of multiple freeze cycles by these cells—the fundamental concept must be identified. The panel did still acknowledge that the mere involvement of a fundamental concept is not enough to render the claims ineligible. *Id.* at 1049–50.

233. Rapid Litig. Mgmt. v. CellzDirect, 867 F.3d 1253, 1262 (Fed. Cir. 2017).

all, rather the claims were drawn to an improvement to a computer.[234] Hon. J. Hughes in dissent, however, indicated that the claims did involve the use of an abstract concept: "categorical data storage."[235] Judge Hughes was probably right in identifying that storing data by category is a fundamental building block to memory systems because different data will often need to be stored differently either due to its size, type or for other organizational reasons. Also, it is without question that the claims were drawn to a memory system that stored data categorically or in this case according to the processor type. Though the claims arguably were more limited to practical applications where the memory is tailored to the processor type, in other words the invention was not *directed to* all categorical data storage, the majority likely overlooked acknowledging that the claims *did* incorporate a fundamental concept—categorical data storage. Even when eligibility is affirmed there is ambiguity as to what is or is not an "abstract concept" probably subconsciously because judges have a sense that the claims should be eligible but know that acknowledgement of an invention being "directed to," or involving, an "abstract concept" is often a death nail to eligibility.

C. The Shape-Changing Second Prong of the Alice Test Regarding Conventionality is Improperly Applied as an Anticipation Standard Instead of Being Instructive as to What Substantially Forecloses Uses of a Fundamental Concept

The second prong of *Alice-Mayo* asks courts to assess whether the claim limitations outside of the fundamental concept substantially "transform" the invention from being directed to the fundamental concept.[236] While the opinions in *Alice* and *Mayo* invoke claim language like "conventional" or "generic" it is difficult to believe that the Court was of the conviction that the use of conventional and generic features alone would be enough to render a claim involving a fundamental concept ineligible.[237] It is par for the course to use generic features in claims, moreover even generic or conventional elements still limit the practical applications covered by the claims. Thus, by itself, conventionality cannot be a true *indicium* of eligibility.

The consideration of whether claim elements outside of the fundamental concept are conventional has grown to be a *de facto* exercise of searching for

234. *Id.*

235. *Id.* at 1262–64.

236. Alice Corp. Pty. Ltd. v. CLS Bank Int'l, 134 S.Ct. 2347, 2357 (2014).

237. *See, e.g.*, Diamond v. Diehr, 50 U.S. 175 (1981) (finding eligible a method for curing rubber using conventional equations, equipment, and techniques arranged in an unconventional manner).

novelty, or non-obviousness in a subset of the claims.[238] For example, the Court of Appeals panel in *Secured Mail Solutions* discussed conventionality such that it held the patentee to a standard of novelty to defend eligibility.[239] Claims need not, however, be held to the standard of novelty to be eligible under §101.[240]

> That is not to say,[] that all process claims that employ only independently known steps will be unpatentable. To the contrary, in examining claims under step two [of *Alice*], we must view them as a whole, considering their elements "both individually and 'as an ordered combination.'" [*citing Alice* and *Mayo*] Thus, "a new combination of steps in a process may be patentable even though all the constituents of the combination were well known and in common use before the combination was made [*citing Diehr*].[241]

The panel in *Secured Mail Solutions* disparaged the use of the unique identifier in snail mail citing references to uses of "barcodes" earlier in time and reply

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238. *See, e.g.*, Taylor, *supra* note 23, at 249–50 (discussing how "*Alice* Has Brought Back A Test For 'Invention'). "If the court finds an 'abstract idea,' the court may then perform an obviousness analysis and search for an 'inventive concept' or 'something more' based solely on the patent claims and the court's subjective knowledge . . . ." *Id. See also* Megan Throbe, *A Call to Action: Fixing the Judicially-Murkied Waters of 35 U.S.C. §101*, 50 IND. L. REV. 1023, 1029–34 (2017) (discussing the continued blurred lines between § 101 and § 102 when courts decide eligibility).

239. Secured Mail Solutions LLC v. Universal Wilde, Inc., 873 F.3d 905, 911–12 (Fed. Cir. 2017).

240. Rapid Litig. Mgmt. v. CellzDirect, 827 F.3d 1042, 1051 (Fed. Cir. 2016); *see also* BASCOM Glob. Internet Servs. v. AT&T Mobility, 827 F.3d 1341, 1349–50 (Fed. Cir. 2016) (reversing an ineligibility dismissal and instructing the district court on remand to not treat step two of *Alice* like an obviousness analysis.) "The inventive concept inquiry requires more than recognizing that each claim element, by itself, was known in the art. As is the case here, an inventive concept can be found in the non-conventional and non-generic arrangement of known, conventional pieces." *Id.* at 1349–50, 1353–55. *See also* Diamond v. Diehr, 450 U.S. 175, 188–89 ("The 'novelty' of any element or steps in a process, or even of the process itself, is of no relevance in determining whether the subject matter of a claim falls within the §101 categories of possibly patentable subject matter." (quoting Brief of Amicus Curiae Paul R. Michel In Support of Neither Party at 4–6, Alice Corp. Pty. Ltd. v. CLS Bank International, 134 S.Ct. 2347 (2014) (No. 13-298))); *Alice Doesn't Live Here Anymore: A Critique of the Supreme Court's "Abstract Ideas" Test*, *supra* note 221, at 6–8 ("[W]hat the Court [in *Alice*] really means by 'abstract' is . . . that the core concept of the claim is not novel or obvious. Indeed, the opinion is rife with words like 'well known' and 'convention.' Thus, the Court is really applying a stealth § 102 or 103 anticipation or obviousness test.'"); Taylor, *supra* note 23, at 249–50 (discussing how "*Alice* Has Brought Back A Test For 'Invention'). "If the court finds an 'abstract idea,' the court may then perform an obviousness analysis and search for an 'inventive concept' or 'something more' based solely on the patent claims and the court's subjective knowledge . . . ." *Id.*; Megan Throbe, *A Call to Action: Fixing the Judicially-Murkied Waters of 35 U.S.C. § 101*, 50 IND. L. REV. 1023, 1029–34 (2017) (discussing the continued blurred lines between § 101 and §§ 102 et al. when courts decide eligibility).

241. *Rapid Litig. Mgmt.*, 827 F.3d at 1051.

routing URLs in email.[242] This comparison to the prior art on assessing conventionality is first extremely light when cast against a traditional § 102 assessment.[243] Second, the unique-identifier steps related to the fundamental concept of "communicating information about a mail object using a personalized marking" not the added limitations that required assessment for transformation.[244] Said additional steps included at least for some claim(s) an authentication process that may have very well been unconventional as compared to other barcodes and email reply URLs.[245] In any event the analysis is absent. In this way, courts seem to be skipping over cornerstone tenants of novelty through the "backdoor" of § 101 created by *Mayo-Alice*.[246]

A court's finding of conventionality under prong two of *Mayo-Alice* can further be called into question by other findings on novelty that are arguably in opposition to the court's findings on eligibility. For example, in *Intellectual Ventures I v. Symantec Corp.* the Court of Appeals panel was split as to eligibility on one of three claim sets.[247] Hon. J. Stoll, dissenting in part as to the judgment, would have found the subject claim to computer virus screening on Internet-based telephonic networks eligible for patent because it merely *involved* an abstract concept but was not solely directed to one.[248] Specifically, the invention transferred screening from individual users to a pre-communication network administrator, thus other practical applications not foreclosed by the claim arguably included non-telephonic computer screening and screening applications at the recipient site.[249] More interestingly, J. Stoll commented on the contradiction between the majority finding the claim limitations conventional/generic and in this case the jury finding the same claims valid under §§ 102 and 103.[250] "While I recognize that validity under §§ 102 and 103 is a distinct inquiry from eligibility under § 101, and may not be dispositive of § 101, the jury verdict nonetheless supports the notion that this particular ordering of the components in claim 7 was not conventional at the time."[251] Judge Stoll's dissent brings up a valid question: how can § 102

242. *Secured Mail Solutions LLC*, 873 F.3d at 912 ("The use of barcodes was commonplace and conventional in 2001.").

243. *Id.* at 911–12; *see also Alice Doesn't Live Here Anymore: A Critique of the Supreme Court's "Abstract Ideas" Test*, *supra* note 221.

244. *Secured Mail Solutions LLC*, 873 F.3d at 908–11.

245. *Id.* at 907–08.

246. *Alice Doesn't Live Here Anymore: A Critique of the Supreme Court's "Abstract Ideas" Test*, *supra* note 221, at 6–8.

247. Intellectual Ventures I LLC v. Symantec Corp., 838 F.3d 1307 (Fed. Cir. 2016).

248. *Id.* at 1329–31.

249. *Id.* at 1319.

250. *Id.* at 1330.

251. *Id.* at 1330.

findings of novelty comport with § 101 findings of conventionality? The two would appear to be mutually exclusive concepts. Do courts need to find claim language anticipated to also find the non-abstract limitations conventional? If not, in what way do the tests differ?

By focusing too heavily on novelty under prong two of *Mayo-Alice*, courts are almost completely skipping over evaluating whether other practical applications remain outside of the claims. Another Court of Appeals panel affirmed the U.S. District Court for the Northern District of Illinois' grant of a Rule 12 dismissal due to the ineligibility of a series of patents.[252] The *Smart Systems* patents in-suit related to payment processing for access to a transit system.[253] Representative claim 14 of the '003 patent regarded using a pre-registered credit card as an identifier for payment at the turnstiles rather than running the credit card for each transaction in real-time.[254] The majority found the subject claims ineligible applying the *Mayo-Alice* standard.[255] Specifically, the court found the claims directed to one of two abstract concepts, either *conducting financial transactions in a particular field or collecting, analyzing and classifying information*.[256] Under step 2 of *Alice*, the majority found that the claim limitations outside of these abstract concepts did not recite inventive concepts, the majority mainly referring to the generic nature of those limitations in computing and financial transactions.[257] However, a thorough §§ 102/103 analysis was clearly not performed.

Moreover, when the preemption analysis is applied to the *Smart Systems* claims it is clear that many of the claims would pass the preemption test since other practical applications for the fundamental concepts existed outside of the claims. For example, other practical applications for the "collection, analysis and classification of information" include doing so for non-transit applications (like entertainment venues or refueling stations), online stores or library catalogues that do not even require payment. Also, other practical applications for conducting financial transactions in mass transit include prepaid cards, tokens or payment by cash. Thus, it was not the case that the use of the abstract (or fundamental) concept would be substantially foreclosed by the claims.[258]

252. Smart Sys. Innovations, LLC v. Chi. Transit Auth., 873 F.3d 1364 (Fed. Cir. 2017).

253. *Id.* at 1368–71.

254. *Id.* at 1368–69.

255. *Id.* at 1371–75.

256. *Id.* at 1371–73.

257. *Id.* at 1373–75.

258. *See* Apple v. Ameranth, 842 F.3d 1229, 1240 (Fed. Cir. 2016). The claimed computer system involved the abstract concept of taking and transmitting menu orders (or "generating a second menu from a first menu and sending the second menu to another location") but several other practical applications for the fundamental concept remained outside of the claims. *Id.* Based upon a dictionary interpretation of the claim terms, other practical applications for the abstract concept included manual

order taking, computer-assisted order taking where the ticket is manually delivered to the chef and computer-assisted systems where a separate modification menu is not generated, i.e., where waitstaff notes are used for special requests. *Id.* at 1234. These additional requirements imposed by the claim's limitations were seen as insignificant post-solution activity because their implementations, as claimed, were seen as relying upon "conventional" computing techniques. *Id*. at 1242–43. *See also* Return Mail, Inc. v. U.S. Postal Service, 868 F.3d 1350, 1368–71 (Fed. Cir. 2017). The claimed return mailing method involved the abstract concept of "relaying mailing address data" but several other practical applications for the fundamental concept remained outside of the claims. *Id.* Based upon a dictionary interpretation of the claim terms, other practical applications for the abstract concept included use in deliverable mail, systems that do not encode data or mailing systems that do not allow a sender to update a mailing address when the mail is still in route. *Id. See also* Intellectual Ventures I LLC v. Capital One Bank (USA), 792 F.3d 1363, 1369–71 (Fed. Cir. 2015). One of the claimed web advertisement systems involved the abstract concept of customizing website content based upon user personal characteristics or navigation history; however, several other practical applications for the fundamental concept of essentially advertising supply based upon forecasted demand remained outside of the claims. *Id.* Based upon a dictionary interpretation of the claim terms, other practical applications for the abstract concept include non-web-based advertising like traditional newspaper and television advertisements or websites where portions of prior sites visited are not displayed while browsing other webpages. *Id.* These other practical applications, outside of the claimed use of the fundamental concept, likely occupied most of the utility of the fundamental concept of advertising supply according to projected demand (i.e., the fundamental concept was not substantially foreclosed or preempted by the claims. *Id. See also* Intellectual Ventures I LLC v. Capital One Bank (USA), 850 F.3d 1332, 1338–39 (Fed. Cir. 2017). The subject claims pertained to an XML code modification system that could be used by coders and non-coders. *Id.* The claims involved the abstract concept of "collecting, displaying and manipulating data." *Id*. at 1340. Yet, based upon a dictionary interpretation of the claim terms, several other practical applications for the fundamental concept remained outside of the claims, arguably, such as data manipulation that is either not computer based or regarding XML code, data sorting that does not perform a hierarchical function (as claimed) or data manipulators that do not use a dynamic modification intermediate that enables non-coders to use the system. *Id.* The fundamental concept was not substantially foreclosed or preempted by the claims, in fact, the claims were so specific that it is difficult to image the claimed use preempting more than a small sliver of the practical-applications "pie" for the abstract concept. *Id. See also* Intellectual Ventures I LLC v. Erie Indemnity Co., 850 F.3d 1315, 1325–27 (Fed. Cir. 2017). The subject claims pertained to indexing information for computer searching; the XML index "tags" included two types of tags for different sorts of search criteria. *Id.* The claims involved the abstract concept of "creating an index and using that index to search for and retrieve data." *Id*. at 1327. The breadth of the abstract concept seems appropriate given that indexing assists with searching large information, especially between multiple searchers like those used by large organizations or public libraries. *Id.* Yet, when assessing the limitations outside of the abstract concept under step two of *Alice* the panel did not pay attention to other practical uses for the fundamental concept outside of the claim. *Id*. at 1328–29. Instead, the panel dismissed the XML limitations that would have limited the indexing to computer searching because it was considered "generic computer implementation." *Id.* One would think that a significant portion of indexing must still be done in hard copy like with individual references such as legal treatises or in a book store which have references grouped by subject. *Id.* Other practical applications for the fundamental concept arguably included those that did not involve index tags having two sorts of tags, in this case, "domain tags" and "category tags" as required by the claims. *See id*. at 1325–27. The fundamental concept of indexing was likely not substantially foreclosed by the claims at least because manual searching systems and those not having two types of index tags for one reference could still be used even if the claims were eligible. *Id. See also* Electric Power Group v. Alstom, 830 F.3d 1350, 1351 (Fed. Cir. 2016). The subject claims pertained to a power grid management system. Under step two of *Alice* (and arguably under step one as well), the court considered whether conventional computing was employed or if the invention newly improved existing computing technology. *Id*. at

The panel did not undergo the preemption analysis instead stating that "preemption concerns are fully addressed and made moot" when eligibility determinations have already been made.[259] However, the statement of the Court of Appeals panel in *Ariosa* lacked reference to statutory support and was prefaced by U.S. Supreme Court acknowledgement in *Alice* of how the principle of the preemption analysis "is the basis for the judicial exceptions to patentability."[260] Accordingly, it is not apparent that the federal judiciary agrees that the preemption analysis can or should rightly be abandoned when any (arguably diluted) version of the *Mayo-Alice* standard indicates ineligibility.

The Court of Appeals panel in *Return Mail, Inc. v. US Postal Service* took a similar position as to the determinativeness of the preemption analysis.[261]

> [W]e have consistently held that claims that are otherwise directed to patent-ineligible subject matter cannot be saved by arguing the absence of complete preemption. *See, e.g.*, *Synopsys*, 839 F.3d at 1150 (holding that an argument about the absence of complete preemption "misses the mark"); *FairWarning*, 839 F.3d at 1098 ("But even assuming that the . . . patent does not preempt the field, its lack of preemption does not save these claims."); *Intellectual Ventures I LLC v. Symantec Corp.*, 838 F.3d 1307, 1320–31 (Fed. Cir. 2016) (same); *OIP Techs., Inc. v. Amazon.com, Inc.*, 788 F.3d 1359, 1362–63 (Fed. Cir. 2015), *cert. denied*, 136 S. Ct. 701 (2015) ("[T]hat the claims do not preempt all price optimization or may be limited to [a particular] setting do not make them any less abstract."). As we have explained, "questions on preemption are inherent in and resolved by the § 101 analysis." *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371, 1379 (Fed. Cir. 2015), *cert. denied*, 136 S. Ct. 2511 (2016). []"While preemption may signal patent ineligible subject matter, the absence of complete preemption does not demonstrate patent eligibility." *Id.* Arguments about the lack of preemption risk cannot save claims that are deemed to only be directed to patent ineligible subject matter.[262]

1353–56. The court pointed to the lack of "inventive device" or "inventive distribution of functionality" as reason to distinguish the claimed invention from inventions in caselaw finding other inventions eligible. *Id.* at 1355.

259. *Smart Sys. Innovations, LLC*, 873 F.3d at 1375 (citing Ariosa Diagnostics v. Sequeonom, 788 F.3d 1371, 1379 (Fed Cir 2015)).

260. *Ariosa Diagnostics*, 788 F.3d at 1379 (quoting Alice Corp. Pty. Ltd. v. CLS Bank International, 134 S.Ct. 2347, 2354 (2014)) ("We have described the concern that drives this exclusionary principal as one of pre-emption.").

261. Return Mail, Inc. v. U.S. Postal Service, 868 F.3d 1350, 1370 (Fed. Cir. 2017).

262. *Id.*

This post-*Mayo-Alice* precedent is arguably the court's self-serving attempt to bolster its enigmatic application of the *Mayo-Alice* framework. The federal judiciary has routinely relied on the preemption analysis in assessing whether an abstract concept is transformed by other claim elements.[263] Furthermore, because the policy reasons for the doctrinal exclusions are so co-extensive with the preemption analysis it is difficult to image a scenario where claims do not substantially foreclose use of a fundamental concept but should still be considered ineligible if the invention is drawn to one of the four categories of patentable subject matter under § 101. Moreover, the courts' ability to remove otherwise eligible subject matter based upon doctrine is not unbridled and should be conservatively implemented.[264] Courts' implementation of the doctrine should serve *established* policy reasons supporting the exclusions as articulated by courts. If satisfying the preemption test is not enough to prove eligibility—being that preemption is directly focused on preventing monopolies of fundamental concepts—it is mysterious as to what other policy reasons are being served by finding its litmus unsatisfactory?

D. Industry "Mommies" and "Daddies" Keep Fighting! Most Decisionmakers Do Not Even Agree on Eligibility

It is frightening to witness the battles over eligibility these days occurring both inside and outside of the courtroom. Industry "parents" or decisionmakers constantly bicker over what subject matter should be considered eligible.[265] Moreover, "brother and sister counsel" often have notions of eligibility as vastly differing as anything "useful" under *State Street* to an endorsement of a flexible interpretation of *Alice* calling nearly anything "abstract" and

263. *See, e.g.*, BASCOM Glob. Internet Servs. v. AT&T Mobility, 827 F.3d 1341, 1350–52 (Fed. Cir. 2016) (implementing the preemption analysis under step 2 of *Alice* and finding the subject claims eligible).

264. CLS Bank Int'l v. Alice Corp., 717 F.3d 1269, 1303–04 (Fed. Cir. 2013) (Rader, C.J., dissenting in part) (citing precedent) (as quoted above).

265. *See, e.g.*, *CLS Bank Int'l*, 717 F.3d at 1269 (including four separate dissents (at least in part)); Amdocs Ltd. v. Openet Telecom, Inc., 841 F.3d 1288 (Fed. Cir. 2016) (Reyna, J., dissenting); Smart Sys. Innovations v. Chi. Transit Auth., 873 F.3d 1364 (Fed. Cir. 2017) (Linn, J., dissenting); Intellectual Ventures I LLC v. Symantec Corp., 838 F.3d 1307 (Fed. Cir. 2016) (Stoll, J., dissenting); DDR Holdings v. Hotels.com, 773 F.3d 1245 (Fed. Cir. 2014) (Mayer, J., dissenting); Visual Memory LLC v. NVIDIA, 867 F.3d 1253 (Fed. Cir. 2017) (Hughes, J., dissenting).

ineligible.[266] Some prefer § 101 as a prelude to patentability[267] others believe § 101 should be considered after the requirements of novelty and nonobviousness are met.[268] Even symposiums on proposed legislative changes result in as varied suggested amendments to the Code as: an exclusion of only completely mental processes and natural phenomenon, or codification of the preemption analysis, to restrictions as extensive as statements of a direct-natural-cause-and-effect relationship, processes involving animal cruelty or surgical procedures all together.[269] While many discuss the need for change post-*Alice*, there is arguably little consensus on *exactly what* change is needed because practitioners often disagree about the eligibility of a single invention, what types of inventions should be eligible or what specific standard to use. Therefore, even if a new standard were put in place it may be difficult to secure majority endorsement.

E. The Mysterious Future of Human Innovation Requires Eligibility to be Unforeseeably Adaptable While the Law Needs Predictability

Another difficulty with obtaining a uniform standard on eligibility is that there is no practitioner crystal ball with which one can glaze into to see and consider all future human innovation in the States. There is significant mystery about what the future of innovation holds.[270] Making a standard that will apply to all future innovation is difficult in terms of eligibility because, unlike §§ 102 and 103, there is no objective accounting for elements in the prior art on § 101 that guides an assessment on eligibility. Instead, one is asking what types of inventions should be eligible for patent without knowing the full gamut of what types of inventions will attempt to be patented or how they will compare to

266. *See, e.g.*, Sobon, *supra* note 7. *Compare* Sobon, *supra* note 7 *with* Throbe, *supra* note 20, at 1029–30 (advocating for a broader use of §101 so as to preserve judicial and patent office resources by eliminating claims preliminarily on §101); *see also Patent Eligible Subject Matter: Report on Views and Recommendations from the Public*, *supra* note 204, at 59–63 (presenting eight different legislative proposals by patent stakeholders).

267. Throbe, *supra* note 20 (advocating for a broader use of §101 to preserve judicial and patent office resources by eliminating claims preliminarily on §101).

268. Lemley et al., *Life After Bilski*, 63 STAN. L. REV. 1315, 1342 (2011) ("We think a subject-matter-first approach is backwards. Our claim overbreadth approach requires careful attention to what the patentee invented, what came before, and what might come after. It can't logically be applied in advance of thinking about the other issues in a patent case.").

269. *Patent Eligible Subject Matter: Report on Views and Recommendations from the Public*, *supra* note 204, at 59–63 (presenting eight different legislative proposals by patent stakeholders).

270. CLS Bank Int'l v. Alice Corp., 717 F.3d 1269, 1304 (Fed. Cir. 2013) (Rader, C.J., dissenting in part) ("It is particularly important that Section 101 not be read restrictively to exclude 'unanticipated inventions' because the most beneficial inventions are 'often unforeseeable.'" (citing Diamond v. Chakrabarty, 447 U.S. 303, 316 (1980) and J.E.M. Agric. Supply v. Pioneer Hi-Bred Int'l, Inc., 534 U.S. 124, 135 (2001))).

inventions in the courts' precedent.[271] This is why it is believed that the policy behind the judicial exclusions is our most prospective guide as to eligibility.

IV. PROPOSED SOLUTIONS

The policy behind the judicial exclusions needs to take centerstage and become the focus of any decision regarding eligibility so that practitioners have confidence in the doctrine. Moreover, because the inherent nature of abstract concepts is vague and abstract, claims that involve fundamental concepts can be pictorially represented against other practical uses of the fundamental concepts outside of what is claimed. Visual and objective representation of the foreclosed (or claimed) uses should facilitate agreement on that much and possibly quell much of the typical disagreements practitioners have about eligibility.

Finally, all three branches of the U.S. government have recently given attention to eligibility and suggestions on how each can further be utilized are detailed herein.

A. "Beginning With The End in Mind": Focusing on the Policy Reasons Behind the Doctrinal Exclusions

It may be beneficial to take the advice of a popular modern life coach in altering § 101 to "begin with the end in mind."[272] Often times, with life events it is easy to fall into the trap of being derailed when life's circumstances throw us a curveball. Section 101 and the *Alice-Mayo* standard has thrown more than its fair share of curveballs our way. Rather than sulk over one case or another it may be a good idea for practitioners to take a step back and ask ourselves, "okay, what is it that we should really care about on the judicial exclusions to eligibility again?" What is it that our "founding" judiciaries were seeking to weed out in the first instance when going rouge creating these exclusions? It was not technology-specific exclusions to patenting, nor was it for fear of (arguably) justly enriching non-practicing entities that usurp relatively broad patents after paying for them on the white market. Rather, the genesis of the doctrinal exclusions—as expressed in the relevant opinions—was in the courts' concerns about taking a fundamental building block to human ingenuity out of the sphere of tools others might use to solve problems.[273] That should also be our focus today. Focusing on the origins of § 101's exclusions will hopefully

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271. *Id.*

272. Stephen R. Covey, *The 7 Habits of Highly Effective People, Habit 2: Begin with the End in Mind*, FRANKLINCOVEY (2017), https://www.stephencovey.com/7habits/7habits-habit2.php.

273. *See, e.g.*, Gottschalk v. Benson, 409 U.S. 63, 67–68 (1972) (as quoted above).

quell many of the conflicts that arise from having an interest in a specific patent or technology.

A bright-line rule, which courts have shied away from,[274] is not necessarily the answer. Preemption could be applied under a totality of the circumstances. However, despite its recent criticism from the Court of Appeals, the preemption doctrine continues to be the standard most aligned with the original policy considerations expressed by early courts. Respectfully, preemption of a fundamental concept is believed to the reason for the season, so to speak.

B. Removing Abstractness by Pie Charting

Nearly all technical solutions will involve a fundamental concept.[275] The concern on § 101 is not the involvement of a fundamental concept but a substantial foreclosure of said concept.[276] One way to reduce the abstractness of assessing an abstract concept is by representing it visually. Like a Venn diagram for large numbers or intangible concepts, the foreclosure of a fundamental concept can be represented pictorially.

My proposed method for pie charting claims that involve a fundamental concept calls for first identifying the fundamental concept. After the concept is identified, one should challenge ones labeling of the concept as "fundamental." Broadly claimed inventions can appear to be drawn to a fundamental concept on first blush. As a check one might ask, "why is the concept fundamental in the first place" or "why would industry participants need to use this portion of the invention to function in the relevant market?" Once the fundamental concept is accurately identified, a circle can be drawn to represent the entire universe of practical applications for the fundamental concept (as shown below with respect to Figures 1-4). The circle represents every known way in which a fundamental concept can be employed. Though the illustrated examples below guesstimate plausible uses, expert testimony can be used to determine the plausible uses for a fundamental concept.

Next, the practical uses that the claim does *not* foreclose others from using are to be represented on the pie chart. Unclaimed practical applications can be identified by referring to claim limitations in the negative—utility in the free

274. Enfish v. Microsoft, 822 F.3d 1327, 1339 (Fed. Cir. 2016) (quoting Bilski v. Kappos, 130 S.Ct. 3218 (2010) against the use of the machine-or-transformation test as a sole determinant of eligibility); CLS Bank v. Alice, 717 F.3d 1269, 1281 (Fed. Cir. 2013) (en banc) ("Finally, the cases urge a flexible, claim-by-claim approach to subject-matter eligibility that avoids rigid line drawing. Bright-line rules may be simple to apply, but they are often impractical and counterproductive when applied to § 101.").

275. *See* Smart Sys. Innovations, LLC v. Chi. Transit Auth., 873 F.3d 1364, 1378 (Fed. Cir. 2017) (Linn, J., dissenting) (as quoted above).

276. *See, e.g.*, *Gottschalk*, 409 U.S. at 67–68 (as quoted above).

domain is inapposite to what is claimed. Like an infringement analysis, where practical applications that do not incorporate claim limitation(s) are generally outside of the scope of the claims, utility for the fundamental concept not claimed remains available to the public. Each practical application should be represented as a percentage of the overall plausible uses for the fundamental concept. The percentages can be guesstimated or derived with the assistance of an industry expert who, based upon experience, opines as to how often the fundamental concept can be used in any given practical application. By visually illustrating the percentage of uses outside of the claim scope, it becomes objectively clear how miserly, or conversely greedy, a patentee is being with respect to "the pie": practical implementations of a fundamental concept.

Assessing how much is too much can be quantitatively determined or qualitatively assessed. For example, one might say that anytime a patent applicant seeks to foreclose seventy percent or more of the practical utility of a fundamental concept, the patentee is really seeking to monopolize use of the fundamental concept and that is excessive, thus the claims should not be eligible for patent. Or, one might compare an invention to pie-charts for the inventions in precedential cases and thereby gauge whether the claims are analogous to prior eligible or ineligible cases.

Pie charting is applied to some familiar precedent hereinbelow. In the following examples the practical applications covered by the claims are shaded in. Moreover, while pie-charting is believed to be one of the more helpful ways of depicting the universe of practical applications for a fundamental concept, it is possible that other graphic representations may be used as well like bars for a fuel gauge or floors to a building or structure. The "percentage" of practical uses foreclosed by the claims are to be represented against the full measure of known practical uses for the fundamental concept.

Pie-charting is applied below with respect to the following few hallmark eligibility cases: *Mackay Radio & Telegraph*, *Gottschalk v. Benson*, *Diamond v. Diehr* and *Bilski v. Kappos*. This test admittedly does not align with some precedent, however, like *Parker v. Flook*, which arguably does not respect the preemption analysis, and *Funk Brothers*. *Mayo*'s diagnostic method also fairs inconsistent with this pie-charting method and arguably the preemption analysis if the fundamental concept, or law of nature, in *Mayo* can be fairly characterized as determining drug efficacy in general, not with respect to a specific drug.[277] This pie-charting method is believed to be applicable to inventions in modern U.S. Court of Appeals cases on eligibility as well, however, the results of pie charting often do not comport with recent precedent applying *Mayo-Alice* which this article posits is further evidence of the need for change

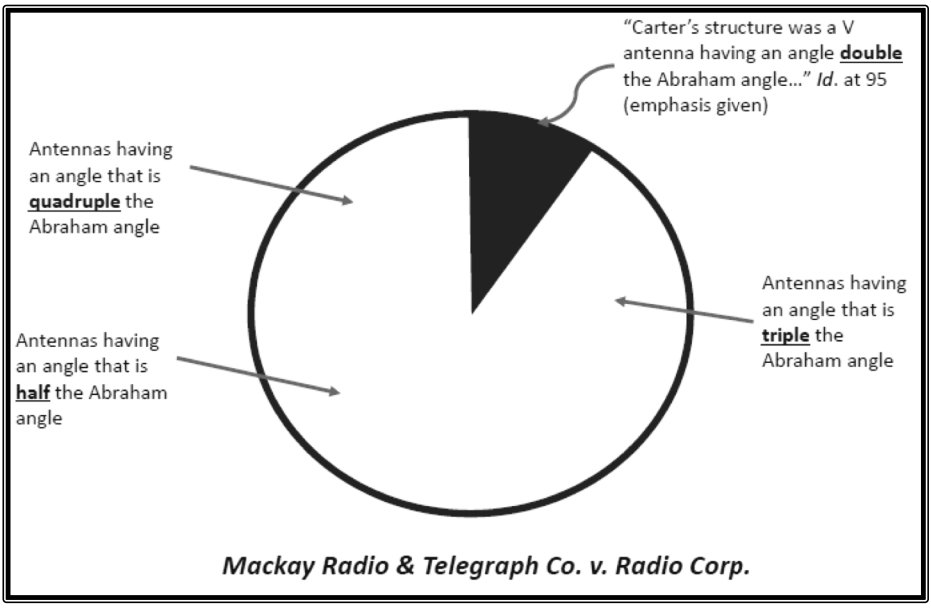

FIGURE 1: PIE CHART FOR *MACKAY RADIO & TELEGRAPH*

Figure 1 relates to a pie chart drawn for *MacKay Radio & Telegraph Co. v. Radio Corp*. One will recall that the invention in *MacKay Radio* involved product claims that related to a radio antenna system with conductors angularly disposed according to a mathematical formula to optimize reception. The fundamental concept in *MacKay Radio* was the Abraham angle for the angular disposition of two antenna prongs with respect to each other. The claims

277. *See supra* Section III(B).

covered antennas where the angular disposition of antenna prongs was twice the Abraham angle but not arrangements with either a 3:1, 4:1 or 0.5:1 relationship to the Abraham angle.[278] If we can assume that each ratio is similarly practical in utility (i.e., potential frequency of use) then with more than two options, we can guesstimate that claims to a 2:1 ratio (as in *MacKay Radio*) are likely a relatively small minority of possible practical uses for the Abraham angle in antenna construction. Figure 1 is a pictorial representation of the preemption analysis; it suggests that the patentee did not intend to monopolize substantially all uses of the fundamental concept. The U.S. Supreme Court found the *MacKay Radio* claims eligible for patent employing the preemption analysis.

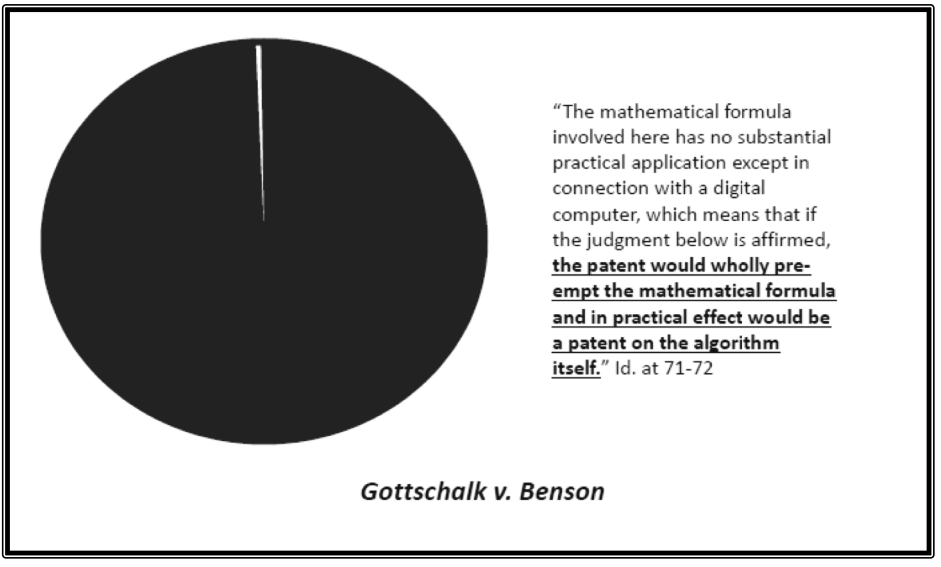

FIGURE 2: PIE CHART FOR *GOTTSCHALK V. BENSON*

Figure 2 relates to a pie chart drawn for *Gottschalk v. Benson*, a case where the U.S. Supreme court found the claimed invention ineligible for patent.[279] One will recall that the invention in *Gottschalk* involved a data conversion method that converted binary-coded decimals to digital values. The Court reasoned that the claimed method was so broad that it was drawn to a mathematical formula or algorithm itself.[280] The concept was considered fundamental because for digital processing—a popular form of computing—

278. Mackay Radio & Telegraph Co. v. Radio Corp. of America, 306 U.S. 86 (1939) (reciting claim 15).

279. Gottschalk v. Benson, 409 U.S. 63 (1972).

280. *Id*. at 68, 71–72.

most if not all types of numbers would require conversion.[281] The Court in *Gottschalk* concentrated primarily on the lack of practical uses for the fundamental concepts *outside* of the claim scope. Indeed, because the claims were so broadly written to the conversion method it is difficult to imagine even one practical application for conversion that would not employ the claimed algorithm. Thus, the graph in Figure 2 is nearly entirely shaded in by what the patent applicant sought to cover in *Gottschalk*. This pictorial representation of the preemption analysis would suggest that the patentee did intend to monopolize substantially all uses of the fundamental concept.

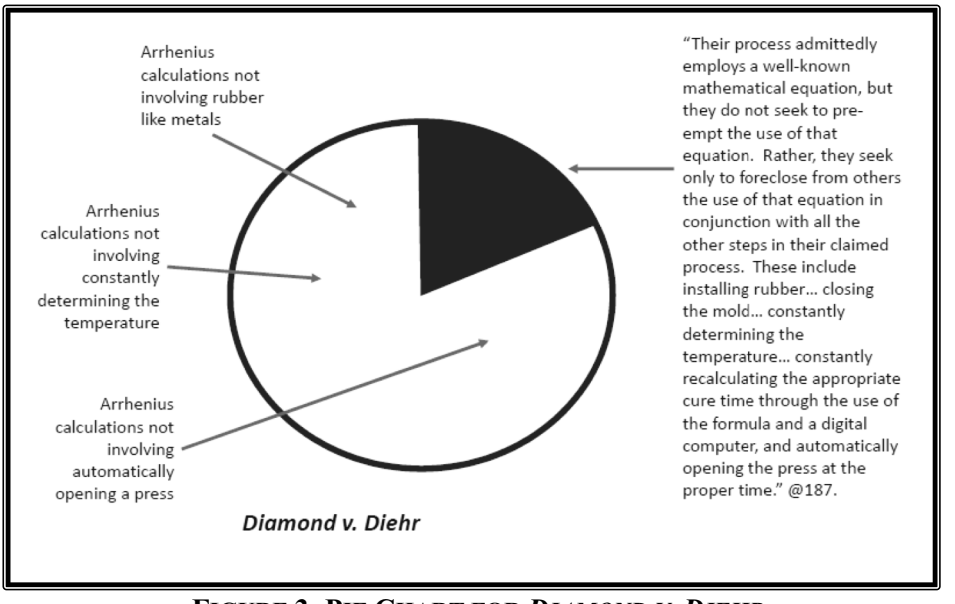

FIGURE 3: PIE CHART FOR *DIAMOND V. DIEHR*

Figure 3 relates to a pie chart drawn for *Diamond v. Diehr*, a case where the U.S. Supreme Court found the claimed invention eligible for patent.[282] The invention in *Diamond v. Diehr* involved method claims for curing rubber products using a known mathematical formula – the Arrhenius equation. The equation was fundamental because it expressed a relationship for heat transfer in chemical reactions. In its analysis, the Court expressly listed the steps of the method that did *not* involve the mathematical formula thereby showcasing other practical uses for the Arrhenius equation left outside of the claim scope. Processes that do not include "installing rubber in a press," e.g., where other

281. *Id.* at 71–72.
282. Diamond v. Diehr, 50 U.S. 175, 187–93 (1981).

materials are being cured, that do not constantly check the temperature or automatically open the mold when it is estimated that curing is complete would not have been foreclosed by the *Diehr* claims.[283] If we can assume that each embodiment of a claim limitation has relatively similar practical utility then with more than two options, we can guesstimate that the claimed method likely represented a minority of possible practical uses for the Arrhenius equation. The pictorial representation in Figure 3 of the preemption analysis would suggest that the patentee did *not* intend to monopolize substantially all uses of the fundamental concept in *Diamond v. Diehr*, where the claimed invention was ultimately found eligible for patent.

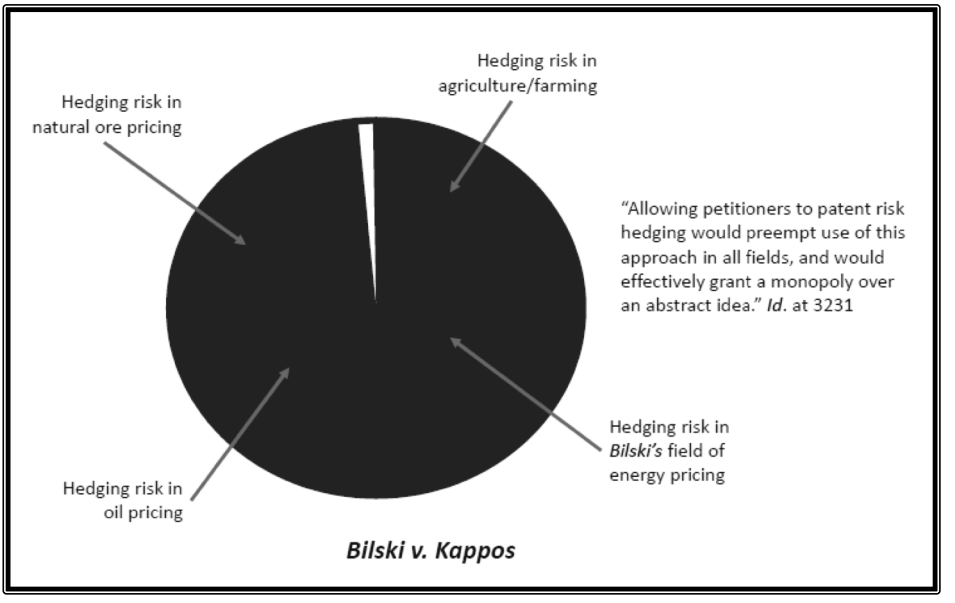

FIGURE 4: PIE CHART FOR *BILSKI V. KAPPOS*

Finally, Figure 4 relates to a pie chart drawn for *Bilski v. Kappos* a case where the U.S. Supreme court found the claimed invention ineligible for patent.[284] The invention in *Bilski* involved a patent application for a method of reducing or "hedging" risk in commodity purchasing. The concept of hedging risk was considered fundamental to economics because it allows for alternative pricing in commodity purchasing, thus diversifying risks.[285] Since the method

283. *Id.* at 187 (quoting language in Figure 3).
284. Bilski v. Kappos, 130 S.Ct. 3218, 3229–31 (2010).
285. *Id.*

of hedging was not restricted to a particular field of use, like natural ore pricing as the Applicant intended to use the concept, or anything more specific than hedging by providing alternative pricing it was determined to preempt nearly all practical uses of the concept as claimed.[286] Indeed, because the claims were so broadly written it is difficult to imagine an industry where the *Bilski* claims would not be infringed when risk is hedged through alternative pricing. Thus, the graph in Figure 4 is nearly entirely shaded in by what the patent applicant sought to cover in *Bilski*. This pictorial representation of the preemption analysis would suggest that the patentee did intend to monopolize substantially all uses of hedging risk with alternative commodity pricing.

C. Legislative Remedies

Many patent practitioners have proposed legislative renovations as a remedy to the dysfunction of eligibility post-*Mayo* & *Alice*. It would seem logical to alter the Code where there is ambiguity in the industry about the standard, however, while practitioners continue to disagree about eligible subject matter a meaningful legislative solution seems distant. Indeed, some acclaimed practitioners believe that §101 should be liberally applied and interpreted to allow nearly every machine, process, article of manufacture and composition of matter.[287] While other equally esteemed practitioners interpret the doctrinal exclusions so narrowly that only considerably inventive innovations are considered eligible for patenting.[288]

There has also been a myriad of legislative proposals on § 101's exclusions.[289] One practitioner proposal suggests placing more accountability on courts to cite *Daubert* like evidence when stating that the invention either involves or is directed to a fundamental concept.[290]

Narrowing Definitions

100(k) A "law of nature" means an express statement of a physical, causal relationship governing the natural properties or behaviors of

286. *Id.*

287. *See, e.g.*, Sobon, *supra* note 7 (positing an eligibility guide as broad as anything "useful" by, *inter alia*, quoting prior Judge Rich as to whether §101 should even be considered a condition to patentability: "[a]s Judge Rich underscored in *Bergy*, Section '101 was never intended to be a "standard of patentability").

288. *See supra* Section IV(C).

289. *See, e.g.*, *Twenty-Two Ways Congress Can Save Section 101*, *supra* note 55; *Patent Eligible Subject Matter: Report on Views and Recommendations from the Public*, *supra* note 204, at 59–63 (presenting eight different legislative proposals by patent stakeholders); Lefstin et al., *supra* note 10, at 11–15; Sobon, *supra* note 7.

290. *See, e.g.*, *Twenty-Two Ways Congress Can Save Section 101*, *supra* note 55, at 2 (emphasis added).

> physical objects, and that is recognized by the relevant scientific community.
>
> 100(l) A "natural product" means a material, substance, composition as entirely as it appears in nature without any processing by human agency, and excludes any purified, simulated, copied, isolated, replicated product.
>
> 100(m) An "abstract idea" means a purely mental concept that is incapable of any physical embodiment and excludes any process performed by a computer program.
>
> This approach cabins in the judicial exceptions directly, to prevent the courts from expanding them in haphazard and often scientifically incorrect ways. As to "laws of nature," the proposed definition is consistent with how many scientists regard "scientific" or "physical laws." *Grounding the definition in being "recognized by the relevant scientific community," requires a court to receive scientific evidence under the Daubert standard before finding a claim directed to a law of nature, and not to rely on its own lay belief of what constitutes a law of nature*.[291]

Currently, it seems too easy to coin a concept "fundamental;" even if the Code is not changed it makes sense for courts to rely on *Daubert* experts in deciding whether a concept is fundamental in determining how many practical applications are foreclosed by a claimed invention.

Another proposal suggests explicitly indicating the irrelevance of other sections of the Code in § 101.[292] This might reduce treatment of conventionality under step two of *Mayo-Alice* as a novelty or nonobviousness standard.

Other proposals suggest including language in the Code on the preemption doctrine and foreclosure of "all practical applications of the [fundamental concept]."[293] My recommendation would be to consider whether the claims substantially or "chiefly preempt the utility of an informational cornerstone."

> 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

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291. *Id.*

292. Sobon, *supra* note 7 (suggesting that "[f]or the purposes of this section, it is irrelevant whether the invention or any of its claimed elements, is otherwise unpatentable under section 102, 103 or 112").

293. *Twenty-Two Ways Congress Can Save Section 101*, *supra* note 55.

> conditions and requirements of this title. *A patent, however, shall not be available for inventions or discoveries that would, if granted, chiefly preempt the utility of an informational cornerstone*.
>
> "*Informational cornerstones" are: laws of nature, natural phenomena, fundamental economic principles, human activity and mathematical relationships.*
>
> *Whether an invention or discovery would "chiefly preempt" the utility of an informational cornerstone involves an assessment of what uses remain for the informational cornerstone outside of the claimed invention or discovery. That_which is claimed in addition to the informational cornerstone is relevant to the consideration of what uses remain for the informational cornerstone outside of the claimed invention or discovery. However, the generic nature of claim elements is irrelevant to eligibility*.

Since the novelty requirement is addressed in § 102, I would remove "new" from § 101. The removal of "new" will assist practitioners in not employing other sections of the Code when analyzing claims under § 101. The "informational cornerstones" language speaks to existing doctrinal exceptions. "Abstract concepts" will be treated as any other informational cornerstone and the informational cornerstones will naturally be identified with the initial preemption inquiry. However, it is believed that calling something an "abstract idea" is too undefined and so doctrinal examples of "abstract idea" are spelled out in the proposed code.

The "idea itself" exception to eligibility under the abstract-idea doctrine can perhaps be addressed by existing § 112, (a) or ¶1, written description and enablement requirements. The theory is that if a concept meets the written description and enablement requirements it may not be merely an "idea itself." Perhaps an "idea itself" will be claimed using functional claim language that may be interpreted under § 112, (f) or ¶6 and its scope then limited to the structure and equivalents in the specification.

The third paragraph of my proposed legislation on "uses [that] remain for the informational cornerstone outside of the claimed invention or discovery" speaks to the preemption doctrine. The what is "claimed in addition to the informational cornerstone" language speaks to the second step in *Mayo-Alice*. Since "generic" is too similar to novelty or nonobviousness perhaps the same needs to be "overruled" by the Code.

D. Patent Office Remedies

Getting cases allowed over § 101 rejections remains a puzzle for many practitioners writing patent applications in certain art areas like e-commerce.[294] The Office has published a series of exemplary cases and guidelines on § 101 on its website related to *Mayo-Alice* and recent Court of Appeals decisions which has been helpful.[295] Still, as the two-part test of *Alice* continues to be "erratically" applied by the courts there is only so much that the Office can do.[296]

One practitioner suggests providing detailed reasons for allowance in PTO office actions.[297]

> One of the major challenges of figuring out why some cases are being allowed and some are not is that only a few examiners give a detailed reason for why a 101 rejection was overcome in their notices of allowance. Most examiners either give a cursory reason (e.g. "the applicant's arguments are persuasive") or no reason at all.[298]

This seems like a reasonable accommodation. Detailed reasons for allowance on § 101—at least until there is more industry consistency—can bring us towards a more notorious standard.

E. Judicial Remedies Are, No Offense, The Least Likely Candidate

More consistency on § 101 will require collaboration between all three branches of the U.S. government. However, our historical reliance on the courts to provide practical guidance on the judicial exclusions has not served the public well recently. It is not entirely the judiciary's fault, courts by design are not able to "legislate" change through advisory opinions but must decide specific "cases and controversies."[299] Each case before the courts regards a particular invention, claimed in its own unique way.[300]

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294. *See, e.g.*, Nowotarski, *supra* note 200.

295. *Subject Matter Eligibility*, U.S. PATENT AND TRADEMARK OFFICE, (last modified Feb. 1, 2019), https://www.uspto.gov/patent/laws-and-regulations/examination-policy/subject-matter-eligibility.

296. BASCOM Glob. Internet Servs. v. AT&T Mobility, 827 F.3d 1341, 1353-54 (Fed. Cir. 2016) (Newman, J., concurring) (as quoted above).

297. *See, e.g.*, Nowotarski, *supra* note 200.

298. *Id.*

299. U.S. CONST. art. III, § 2.

300. Denise Crouch, *Judge Lourie and Newman: Call for Congress to Act*, PATENTLY-O (June 1, 2018), https://patentlyo.com/patent/2018/06/lourie-newman-congress.html (emphasis added).

> As part of the court's *en banc* denial in *Berkheimer v. HP Inc.*, [Case No.: 2017-1437 (Fed. Cir. May 31, 2018)], Judges Lourie and Newman joined together in an interesting concurring opinion that argues for some higher power to revisit the doctrine of patent eligibility to provide clarification and policy guidance. The opinion is republished below:…
>
> > I believe the law needs clarification by higher authority, perhaps by Congress, to work its way out of what so many in the innovation field consider are § 101 problems. **Individual cases, whether heard by this court or the Supreme Court, are imperfect vehicles for enunciating broad principles because they are limited to the facts presented. Section 101 issues certainly require attention beyond the power of the court.**[301]

Since courts are literally tasked with deciding the eligibility of a specific claimed invention (and not others) it is doubtful that a single judicial opinion will generate a sufficient eligibility litmus for all future human ingenuity.[302]

At least with respect to the Court of Appeals and Patent Trial and Appeal Board, cases are typically staffed in three-judge panels unless the case is reviewed *en banc* or the panel is otherwise expanded. Sitting judiciaries vary widely on eligibility such that the composition of a panel could change the determination of eligibility.[303] Thus, essentially the same invention could be reviewed by one set of judges and found eligible and another set of judges and be found ineligible.

Courts can, however, continue to dispel rumors about what types of inventions might categorically be ineligible for patent. Historically, court opinions have identified general categories of inventions that should not necessarily be found ineligible like in *Bilski* (with business methods) and *Gottschalk* (with software). Said cases, however, have done little to let the public know what types of business methods or computer software courts should consider eligible.

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301. *Id.*

302. *Id.*

303. *See, e.g.*, CLS Bank Int'l v. Alice Corp., 717 F.3d 1269, 1321 (Fed. Cir. 2013) (including four dissents (at least in part)). Hon. J. Newman predicted that the Alice standard increase "opportunistic litigation, whose result [would] depend on the random selection of the panel." *Id.* See *also*, Amdocs Ltd. v. Openet Telecom, Inc., 841 F.3d 1288 (Fed. Cir. 2016) (Reyna, J., dissenting); Smart Sys. Innovations v. Chi. Transit Auth., 873 F.3d 1364 (Fed. Cir. 2017) (Linn, J., dissenting); Intellectual Ventures I LLC v. Symantec Corp., 838 F.3d 1307 (Fed. Cir. 2016) (Stoll, J., dissenting); DDR Holdings v. Hotels.com, 773 F.3d 1245 (Fed. Cir. 2014) (Mayer, J., dissenting); and Visual Memory LLC v. NVIDIA, 867 F.3d 1253 (Fed. Cir. 2017) (Hughes, J., dissenting).

Courts have also in some instances been helpful in identifying the policy concerns behind the judicial exclusions. Continuing to do the same in alignment with the original aim of the exclusions is imperative. Moreover, courts can insist that litigants provide expert testimony on issues like: (i) whether a concept is fundamental, or (ii) what practical applications there are for a fundamental concept.

Some Court of Appeals panels have indicated that the preemption analysis is not necessary where a court has already come to a determination of eligibility.[304] However, it is difficult to see what policy concerns a non-preemption-type analysis on § 101's exclusions would serve. It is likely that courts need to return the preemption doctrine to centerstage.

304. *See, e.g.*, Return Mail, Inc. v. U.S. Postal Serv., 868 F.3d 1350, 1369–71 (Fed. Cir. 2017).

DETERMINING ENHANCED DAMAGES AFTER *HALO ELECTRONICS:*

STILL A STRUGGLE?

VERONICA CORCORAN*

INTRODUCTION

35 U.S.C. § 284 of the Patent Act allows district courts to use their discretion to award enhanced damages up to three times the amount found or assessed in the case of patent infringement.[1] This Comment will consider how the Supreme Court of the United States' holding in *Halo Electronics, Inc. v. Pulse Electronics, Inc.* changed the landscape of enhanced damages awards in light of willful infringement.

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1. 35 U.S.C. § 284 (2012) ("[T]he court may increase the damages up to three times the amount found or assessed.").

Previously, in 2007, the Court of Appeals for the Federal Circuit, in *In re Seagate,*[2] rejected a subjective standard, and moved towards an objective standard, which introduced a two-part test used to establish willful infringement and thus subject an infringer to a claim of enhanced damages.[3] First, a patent owner had to "show by clear and convincing evidence that the infringer acted despite an objectively high likelihood that its actions constituted infringement of a valid patent."[4] This is the part of the test that establishes willful infringement. Second, a patent owner must establish by clear and convincing evidence that the risk of infringement "was either known or so obvious that it should have been known to the accused infringer."[5]

The *Seagate* test had one significant limit:[6] a patentee could only recover enhanced damages when an infringer acted with objective recklessness, shown by clear and convincing evidence, and such recklessness was "despite an objectively high likelihood that [the infringer's] actions constituted infringement of a patent."[7] Consequently, in determining objective recklessness, the infringer was protected from enhanced damages if they could raise any valid defense at trial,[8] even if the infringer did not act on the basis of the defense or was even aware of it at the time of their infringement.[9] The mere

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2. In re Seagate Tech, 497 F.3d 1365 (Fed. Cir. 2007). *See also* Randy R. Micheletti, *Willful Patent Infringement After In Re Seagate: Just What is "Objectively Reckless" Infringement?*" 84 CHI-KENT L. REV. 975, 977 (2010).

3. In re Seagate Tech., 497 F.3d at 1371.

4. *Id.*

5. *Id.*

6. Halo Elecs., Inc. v. Pulse Elecs., Inc., 136 S.Ct. 1923, 1933 (2016). In *Halo*, the Court explained:

> The *Seagate* test aggravates the problem by making dispositive the ability of the infringer to muster a reasonable (even though unsuccessful) defense at the infringement trial. The existence of such a defense insulates the infringer from enhanced damages, even if he did not act on the basis of the defense or was even aware of it. Under that standard, someone who plunders a patent—infringing it without any reason to suppose his conduct is arguably defensible—can nevertheless escape any comeuppance under § 284 solely on the strength of his attorney's ingenuity.

Id.

7. Chase Means, *Has the Supreme Court Breathed New Life into Patent Trolls in Halo and Stryker?*, IPWATCHDOG (June 15, 2016), http://www.ipwatchdog.com/2016/06/15/supreme-court-patent-trolls-halo-stryker/id=70050/ [https://perma.cc/2T6E-6ZZL].

8. *Halo*, 136 S. Ct. at 1933.

9. *Id.*

fact that a "reasonable (even though unsuccessful) defense" for infringement existed protected the infringer from enhanced damages.[10]

However, in *Halo*, the Supreme Court reconsidered the *Seagate* analysis.[11] The facts of *Halo* are straightforward. In 2014, Halo Electronics sued Pulse Electronics for infringing its patents for electric packages containing transformers designed to be mounted to the surface of circuit boards.[12] A jury found that Pulse Electronics had committed infringement and further determined it was likely that Pulse willfully infringed Halo's patents.[13] The district court judge, however, declined to award enhanced damages under § 284 after determining that Halo had failed to demonstrate objective recklessness under the first step of *Seagate* and the Federal Circuit affirmed.[14]

The question before the Supreme Court, then, was whether the *Seagate* test was consistent with § 284.[15] The Supreme Court held that § 284 gives district courts the discretion to award enhanced damages against those guilty of patent infringement free of a strict test, and that district courts are "'to be guided by [the] sound legal principles' developed over nearly two centuries."[16] In its reasoning, the Court noted that awards of enhanced damages under the Patent Act are designed as "punitive" or "vindictive" sanctions for "egregious infringement behavior."[17] The Court also specified that "egregious infringement behavior" is often described as "willful, wanton, malicious, bad-faith, deliberate, consciously wrongful, flagrant, or—indeed—characteristic of a pirate."[18]

Therefore, the Supreme Court held that the requirements of *Seagate*'s test were "unduly rigid" and "encumber[ed] the statutory grant of discretion to the district courts" to determine enhanced damages.[19] Moreover, the Court noted such a high threshold would exclude from discretionary punishment many of the most guilty offenders, "such as the 'wanton and malicious pirate' who intentionally infringes on another's patent . . . for no purpose other than to steal the patentee's business."[20] Further, the Court held that "[s]ection 284 gives

10. *Id.*
11. *Id.*
12. *Id.* at 1930.
13. *Id.* at 1931.
14. *Id.*
15. *Id.* at 1928.
16. *Id.* at 1935 (quoting Martin v. Franklin Cap. Corp., 546 U.S. 132, 136 (2005)).
17. *Id.* at 1932.
18. *Id.*
19. *Id.* (quoting Octane Fitness, LLC v. Icon Health & Fitness, Inc., 134 S.Ct. 1749, 1755 (2014)).
20. *Id.*

district courts the discretion to award enhanced damages against those guilty of patent infringement" free of a strict test.[21] Although the Supreme Court suggested a flexible inquiry, the Court concluded that there were three important guideposts for such an inquiry: (1) that the district court have discretion in awarding enhanced damages; (2) that the district courts were "to be guided by [the] sound legal principles developed over nearly two centuries" concerning application and interpretation of the Patent Act; and (3) enhanced damages were only to be reserved for egregious infringement behavior.[22]

First, this Comment will examine the Federal Circuit's approach that now embraces both an objective and subjective inquiry in determining enhanced damages, which may resolve the concern over the rigidity in the *Seagate* test that the Supreme Court expressed in *Halo*. Second, this Comment will examine how district courts address the question that remains after *Halo*: what conduct warrants enhanced damages. A split appears to be developing between district courts that have adopted *Read Corporation v. Portec, Inc.* (the "*Read* factors")[23] and those rejecting *Read* that are consistent with the Supreme Court's *Halo* decision. Finally, this Comment will end with an assessment of what is the appropriate test to discuss enhanced damages going forward.

I. THE FEDERAL CIRCUIT'S APPROACH TO *HALO*

In *WBIP, LLC v. Kohler, Co.*,[24] the Federal Circuit held that enhanced damages were warranted because, first, "there was substantial evidence for the jury's finding that Kohler had knowledge of the patents in suit at the time of the infringement," and second, an objectively reasonable defense, created at the time of litigation, will not protect a defendant from enhanced damages.[25] "Subjective bad faith alone may support an award of enhanced damages"[26] and "the appropriate timeframe for considering culpability is by assessing the infringer's knowledge at the time of the challenged conduct."[27]

The district court applied the *Seagate* test framework and the jury found that WBIP proved by clear and convincing evidence that Kohler's infringement was willful.[28] Kohler appealed the district court's finding that it willfully infringed on WBIP's patents on three grounds.[29] Kohler's first two objections

21. *Id.* at 1935.
22. *Id.*
23. Read Corp. v. Portec, Inc., 970 F.2d 816, 827 (Fed. Cir. 1992).
24. The Supreme Court decided Halo after this case was argued on appeal.
25. WBIP, LLC v. Kohler Co., 829 F.3d 1317, 1341–42 (Fed. Cir. 2016).
26. *Id.* at 1340.
27. *Id.*
28. *See id.* at 1339.
29. *See id.* at 1325–42.

on appeal were based on obviousness (that the claims in the patent were obvious and known to a person of ordinary skill in the art) and written description (the claims lack written description for the claimed "compound control scheme").[30] The court found that Kohler failed to prove the claims were obvious or that the asserted claims lacked written description.[31]

The third objection was based on willful infringement.[32] Kohler argued that the judgment of willful infringement should be reversed because: (1) per the Federal Circuit's decision in *Halo*, Kohler's "obviousness and written description defenses are objectively reasonable," and (2) no evidence was presented that Kohler knew of the patents, which is a requirement of *Seagate*.[33] Under *Seagate*, if the Federal Circuit had found Kohler's defenses to be objectively reasonable, Kohler could have escaped enhanced damages despite the fact that Kohler's defenses were created during litigation and the original infringement was not based on a good faith belief that the patents in suit were obvious and lacked written description.[34]

Relying on *Halo*, the Federal Circuit rejected Kohler's argument that its defenses (obviousness and written description) were objectively reasonable.[35] In *Halo*, the Supreme Court held that the principal problem with *Seagate* was the objective recklessness requirement, which allowed offenders to create some defense later during litigation to escape enhanced damages after willfully infringing on a patent.[36] The Federal Circuit reasoned this is exactly what Kohler was attempting to do; Kohler, in fact, had never disputed that its defense was created during litigation after years of engaging in patent infringement.[37] By looking at the accused infringer's knowledge of a patent "at the time of the challenged conduct"[38] infringers can no longer protect themselves from enhanced damages by creating some sort of defense at trial after the infringement has already taken place.[39]

The Federal Circuit also "conclude[ed] that there was substantial evidence for the jury's finding that Kohler had knowledge of the patents in suit."[40] The

30. *Id.* at 1325–39.
31. *Id.* at 1326, 1339.
32. *Id.* at 1339.
33. *Id.*
34. *Id.* at 1340. The court would have also needed to find that there was not sufficient evidence presented by WBIP to show that Kohler had knowledge of the patents because knowledge of a patent being infringed is still a prerequisite to enhanced damages. *See id.*
35. *Id.* at 1340.
36. *Id.*
37. *Id.*
38. *Id.*
39. *Id.* at 1340–41.
40. *Id.* at 1341.

evidence presented at the trial by WBIP to the jury included: (1) testimony that the "low-carbon monoxide gen-sets were marked with the patents;" (2) "testimony that Westerbeke and Kohler were the only two companies in the market that provide low-carbon monoxide gen-sets;" and (3) Kohler's admission that it had pre-suit knowledge of the patents in suit.[41]

Kohler demonstrates that "[p]roof of an objectively reasonable *litigation inspired* defense to infringement is no longer a defense to willful infringement"[42] and helps to highlight some of the changes *Halo* brings to willful infringement and enhanced damages. In the *Kohler* opinion it is further explained that "timing does matter" and that subjective willfulness at the time of infringement will subject an infringer to enhanced damages.[43]

Before *Seagate*, an infringer had to exercise a duty of care if an infringer had knowledge of a patent.[44] This duty of care usually required that an accused infringer had to seek opinion of counsel before engaging in infringing activity.[45] *Seagate* upended this practice by instead requiring the patentee to demonstrate that the accused infringer was objectively reckless in its infringement and accused infringers "were no longer obligated to obtain an opinion of counsel."[46] Some observers felt that the new standard under *Seagate* would increase the difficulty in proving willful infringement and would result in fewer willfulness findings, thus fewer awards of enhanced damages.[47] However, those fears appear to have been unwarranted as a study done three years after the implementation of *Seagate* found that willfulness was found only about 10% less often.[48] The study, however, did confirm the fears that the court in *Halo* expressed; that is, a simple finding of a "substantial" or "legitimate" defense at the time of litigation was the "most significant predictor of a finding of no willfulness."[49]

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41. *Id.* at 1342.

42. *Id.* at 1341 (emphasis added).

43. *Id.* at 1340 ("[T]iming *does* matter. Kohler cannot insulate itself from liability for enhanced damages by creating an (ultimately unsuccessful) invalidity defense for trial after engaging in the culpable conduct of copying, or 'plundering,' WBIP's patented technology prior to litigation. Proof of an objectively reasonable litigation-inspired defense to infringement is no long a defense to willful infringement.") (internal citation omitted).

44. Christopher B. Seaman, *Willful Patent Infringement and Enhanced Damages After In re Seagate: An Empirical Study*, 97 IOWA L. REV. 417, 419 (2012).

45. *Id.*

46. *Id.*

47. *Id.*

48. *Id.* at 420.

49. *Id.*

II. DISTRICT COURT DETERMINATIONS UNDER THE *HALO* INQUIRY

The flexible inquiry suggested by *Halo* empowers district courts in their assessment of enhance damages under § 284, but the case itself has not offered many concrete ways for the district court to conduct this inquiry. The Supreme Court in *Halo* stated generally that district courts were to be guided by past legal cases where enhanced damages were either awarded or not awarded.[50] The Court further cautioned that district courts should remember to "take into account the particular circumstances of each case in deciding whether to award damages, and in what amount."[51] This means that, rather than using tests and factors from older cases in their determinations, it is more important to look at the circumstances surrounding those cases of infringement and look for similarities in the cases at hand.[52] These circumstances will point to what the courts can define as "egregious misconduct."[53]

Given these broad guidelines, the Supreme Court has not offered much guidance as to how a district court should assess enhanced damages for willful infringement under 35 U.S.C. § 298. This section will address the primary approaches that district courts have used in their respective *Halo* inquiries. Section A will address courts that have adopted the pre-existing *Read* factors. Section B will consider how district courts that reject the *Read* factor*s* have undertaken the *Halo* inquiry.

A. District Court Determinations That Have Adopted the Read Inquiry

A number of district courts have adopted the standards outlined in *Read Corporation v. Portec, Inc*.[54] First, *Read* and its factors will be evaluated to determine if they are still good law post-*Halo*. Next, the district court decisions utilizing *Read* will be evaluated to determine if their use is consistent with the holding of *Halo*.

1. *Read* and an evaluation of its factors.

The *Read* factors were "developed under a subjective willfulness standard,"[55] while the *Seagate* test was developed as an objective standard.[56]

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50. *See* Halo Elecs., Inc. v. Pulse Elecs., Inc., 136 S.Ct. 1923, 1933–34 (2016).

51. *Id.* at 1933.

52. *See id.* at 1934.

53. *Id.*

54. Read Corp. v. Portec, Inc., 970 F.2d 816, 827 (Fed. Cir. 1992). *See* Finjan, Inc. v. Blue Coat Sys., Inc., No. 13-CV-03999-BLF, 2016 WL 3880774, at *16 (N.D. Cal. July 18, 2016); Radware, Ltd. v. F5 Networks, Inc., No. 5:13-CV-02024-RMW, 2016 WL 4427490, at *6 (N.D. Cal. Aug. 22, 2016).

55. Micheletti, *supra* note 2, at 998.

56. *See Halo*, 136 S.Ct. at 1930.

While the Federal Circuit in *Seagate* never explicitly repealed the *Read* factors, some authorities feel it did imply as much.[57] However, the Supreme Court has now overruled *Seagate*.[58] Therefore, Halo's invalidation of Seagate effectively nullified the industries past acceptance that the Read factors were unnecessary.[59] This presents an unanswered question: have the *Read* factors become relevant once again?

There are nine primary factors from *Read*.[60] These factors include: (1) "whether the infringer deliberately copied the ideas or designs of another;" (2) "whether the infringer . . . investigated the scope of the patent and formed a good-faith belief that it was invalid or that it was not infringed;" (3) "the infringer's behavior as party to the litigation;" (4) the defendant's "size and financial condition;" (5) the "[c]loseness of the case;" (6) the "[d]uration of the defendant's misconduct;" (7) "[r]emedial action by the defendant;" (8) the "[d]efendant's motivation for harm;" and (9) "[w]hether the defendant attempted to conceal its misconduct."[61]

The first three factors are taken from a previous case, *Bott v. Four Star*,[62] and were used to determine if an infringer's conduct was willful under all circumstances.[63] Six years later the other six factors were added in *Read*.[64] In *Read*, the Federal Circuit held that the *Bott* factors were not enough on their own to "satisfy the 'totality of the circumstances' standard."[65] Of the three *Bott* factors, the first two "consider[ed] the infringer's subjective state of mind" and the third factor "consider[ed] the infringer's conduct during litigation."[66]

The *Bott* factors as they exist in *Read* are understood as follows: the first factor, "whether the infringer deliberately copied the ideas or design of another"[67] has been long used as strong evidence of willful infringement of a patent, and thus requires a finding of enhanced damages.[68] *Read*, as to this

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57. Micheletti, *supra* note 2, at 998 (stating that the validity of the *Read* factors is suspect after *Seagate*, which strongly suggested repeal by inviting courts to "'further develop the application of [the *Seagate*] standard' implying that the willfulness analysis should not include the *Bott* and *Read* Factors." (quoting In re Seagate Tech., 497 F.3d 1365, 1371 (Fed. Cir. 2007))).

58. *Halo*, 136 S.Ct. at 1935.

59. *See id*; Micheletti, *supra* note 2, at 998.

60. Read Corp. v. Portec, Inc., 970 F.2d 816, 827 (Fed. Cir. 1992).

61. *Id.*

62. Bott v. Four Star Corp., 807 F.2d 1567, 1572 (Fed. Cir. 1986).

63. *Read Corp*., 970 F.2d at 826.

64. *Id.* at 827.

65. Micheletti, *supra* note 2, at 998 (citing Read Corp. v. Portec, Inc., 970 F.2d 816, 827 (Fed. Cir. 1992)).

66. Micheletti, *supra* note 2, at 998; *Bott*, 807 F.2d at 1572.

67. *Read Corp*, 970 F.2d at 827.

68. Kenneth R. Adamo et al., *The Curse of "Copying"*, 7 J. MARSHALL REV. INTELL. PROP. L. 296, 302 (2008).

element, was crucial in shifting how copying was understood in patent infringement.[69] Before *Read*, the patent owner had to demonstrate that "whatever was 'copied' had to fall literally within the claims" to be infringing; after *Read*, the patentee could demonstrate that the infringer deliberately took the patented idea and placed it into a similar design.[70] This element of *Read* was adopted within the *Seagate* test in the second prong because whether the patent had been copied remained relevant in evaluating the mental state of the infringer.[71] Therefore, "copying remains an important consideration for willfulness after *Seagate*."[72]

As mentioned before, some post-*Halo* district court decisions have been using the *Read* factors to evaluate whether enhanced damages should be awarded, and those cases are still using "copying" as part of the evaluation.[73] For example, in *Trustees of Boston University v. Everlight Electronics Co., Ltd.*, the court compared the copying that took place in *Halo* to the copying that took place in the case at hand.[74] Additionally, under 35 U.S.C. § 271(a)—to establish infringement of a patent—a patent owner must show the presence of every element of a patent or its substantial equivalent is in the accused device; or in other words they must show the device was copied.[75] Therefore, the first factor of *Read,* and an evaluation of the degree of copying, continues to be a pivotal factor for the awarding of enhanced damages.

The second factor, "whether the infringer . . . investigated the scope of the patent and formed a good-faith belief that it was invalid or that it was not infringed"[76] was an integral part of patent infringement cases extending back to *Underwater Devices*, which created the requirement that potential infringers

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69. *See id.* at 302 n.39.

70. *Id.*

71. Seaman, *supra* note 44, at 458.

72. *Id.*

73. *See* Radware, Ltd. v. F5 Networks, Inc., No. 5:13-CV-02024-RMW, 2016 WL 4427490, at *6 (N.D. Cal. Aug. 22, 2016); Finjan, Inc. v. Blue Coat Systems, Inc., No. 13-CV-03999-BLF, 2016 WL 3880774, at *16 (N.D. Cal. July 18, 2016); Imperium IP Holdings v. Samsung Electronics Co., 203 F.Supp.3d 755, 763 (E.D. Tex 2016).

74. Trustees of Bos. Univ. v. Everlight Elecs. Co., 212 F.Supp.3d 254, 258 (D. Mass. 2016).

75. *See* 35 U.S.C. § 271(a). Larami Corp. v. Amron, No. CIV. A. 91-6145, 1993 WL 69581, at *3 (E.D. Pa. Mar. 11, 1993) ("A patent holder can seek to establish patent infringement in either of two ways: by demonstrating that every element of a claim (1) is literally infringed or (2) is infringed under the doctrine of equivalents. To put it a different way, because every element of a claim is essential and material to that claim, a patent owner must, to meet the burden of establishing infringement, 'show the presence of every element *or* its substantial equivalent in the accused device.' *Key Mfg. Group, Inc.,* 925 F.2d at 1447 (emphasis added). If even *one* element of a patent's claim is missing from the accused product, then '[t]here can be no infringement as a matter of law' . . . . *London v. Carson Pirie Scott & Co.,* 946 F.2d 1534, 1538–39 (Fed. Cir.1991).").

76. Read Corp. v. Portec, Inc., 970 F.2d 816, 827 (Fed. Cir. 1992).

exercise due care to determine whether or not they were infringing.[77] In exercising due care, *Underwater Devices* required potential infringers seek the advice of counsel.[78] However, *Underwater Devices* was overruled in *Seagate*, which abandoned the requirement of exercising due care,[79] and additionally, § 298 now explicitly states that failure to seek advice of counsel may not be used as proof of willful infringement.[80] Now, it is *Seagate* that has since been overruled, and it must be evaluated if a duty of due care is still relevant to determining if enhanced damages are warranted.

The Supreme Court does mention the exercise of due care in *Halo* by pointing out § 298.[81] The Supreme Court evaluated § 298 as a provision that "simply addressed the fallout" from *Underwater Devices*.[82] This provision was added in an effort to "protect attorney-client privilege and to reduce pressure on on accused infringers to obtain opinions of counsel for litigation purposes."[83] It was determined that the "probative value of this type of evidence" of due care "is outweighed by the harm" it causes to attorney-client privilege.[84] Additionally, Justice Breyer pointed out in his concurrence that it can be expensive to obtain advice of counsel, which can hinder startup companies.[85] Also, lawyers, scientists, and engineers might incorrectly conclude that a patent or invention is not infringing or that the original patent is invalid without being "wanton" or "reckless" even if advice of counsel is sought.[86]

When this factor was applied to the facts of *Read*, the first question the Federal Circuit addressed was whether the infringer proceeded without a reasonable belief that they would not be held liable for infringing.[87] The court held that an infringer has an affirmative duty to determine that they are not

77. Seaman, *supra* note 44, at 419 ("Until recently, if a potential infringer had actual knowledge of a patent, it was obligated to satisfy 'an affirmative duty to exercise due care to determine whether or not [it] is infringing.'"); *Id.* at 423–25 (explaining *Underwater Devices*).

78. *Id.* (citing Underwater Devices, Inc. v. Morrison-Knudsen, Co., 717 F.2d 1380, 1389 (Fed. Cir. 1983)).

79. In re Seagate Tech., 497 F.3d 1365, 1371 (Fed. Cir. 2007).

80. 35 U.S.C. § 298.

81. Halo Elecs., Inc. v. Pulse Elecs., Inc., 136 S.Ct. 1923, 1935 (2016) ("Section 298 provides that '[t]he failure of an infringer to obtain the advice of counsel' or 'the failure of the infringer to present such advice to the court or jury, may not be used to prove that the accused infringer willfully infringed.'")

82. *Id.*

83. H. R. REP. NO. 112-98, at 53 (2011).

84. *Id.*

85. *Halo*, 136 S.Ct. at 1936 (Breyer, J., concurring).

86. *Id.*

87. Read Corp. v. Portec, Inc., 970 F.2d 816, 828 (Fed. Cir. 1992).

infringing, and that affirmative duty includes seeking the advice of counsel.[88] However, the court did not address what other evidence could be used to show bad faith beyond showing a failure to obtain advice of counsel, or offering proof that the advice of counsel was ignored.[89] *Read* suggests that the only way an infringer can form a good faith belief that they are not infringing is to seek the advice of counsel (exercise due care).[90] But, this is not consistent with the reasoning of *Halo* or § 298.[91] Therefore, district courts will need to determine what a good-faith belief of noninfringement is without an evaluation of whether an accused infringer sought the advice of counsel. Otherwise, this factor at least appears to have been invalidated by the holding of *Halo*.[92]

The eighth factor, added in *Read*, considers the infringer's "'motive for harm'—a subjective inquiry into the accused infringer's state of mind" at the time of the infringement.[93] While discussing the parallel between patent infringement and tort law in *Halo*, the Court looked to the fact that "eligibility for punitive awards is characterized in terms of a defendant's motive or intent."[94] As mentioned earlier, the Supreme Court found the *Seagate* test to be unduly rigid.[95] The Court expressed concern that such a high threshold would exclude from discretionary punishment many of the most guilty offenders.[96] It follows then that an infringer's motive for harm is also still a relevant factor from *Read* that proves consistent with the holding of *Halo*. Additionally, the Court in *Halo* held that it is not the *litigation inspired* defense that is pivotal to the analysis, but the mindset of the infringer at the time of infringement that matters;[97] it is the infringer's motive for harm that mostly heavily weighs in favor of awarding enhanced damages.[98] Therefore, this factor continues to remain relevant in light of *Halo*.

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88. *Id.* (noting that failure to seek the advice of counsel did not "*mandate* a finding of willfulness" but it is an important consideration) (emphasis added).

89. *Id.* at 828–29 ("Those cases where willful infringement is found despite the presence of an opinion of counsel generally involve situations where opinion of counsel was either ignored or found to be incompetent . . . . That an opinion is 'incompetent' must be shown by objective evidence.")

90. *See id.*

91. *See* 35 U.S.C. § 298 (2012); *Halo*, 136 S.Ct. at 1935.

92. *See id.*

93. Micheletti, *supra* note 2, at 998.

94. *Halo*, 136 S.Ct. at 1933 (quoting Kolstad v. Am. Dental Ass'n, 527 U.S. 526, 538 (1999)).

95. *Id.* at 1932 (quoting Octane Fitness, LLC v. Icon Health & Fitness, Inc., 134 S.Ct. 1749, 1755 (2014)).

96. *Id.*

97. *See id.* at 1933; *WBIP, LLC v. Kohler Co.*, 829 Fed.3d 1324, 1340 (Fed. Cir. 2016).

98. *See Halo*, 136 S.Ct. at 1932 (reasoning that someone "who intentionally infringes another's patent—with no doubts about its validity or any notion of a defense—for no purpose other than to steal the patentee's business" is the most deserving of the punishment of enhanced damages.)

"The remainder of the *Read* factors primarily guide the district courts in deciding how much to enhance damages."[99] Since those factors do not discuss whether to award enhanced damages they do not need to be evaluated. If in fact *Seagate* did implicitly overrule *Read*,[100] the fact that *Seagate* was then overruled by *Halo* seems to have made *Read* relevant again for at least two of its factors (one and eight) that are used to determine if enhanced damages are warranted. To reiterate an important point, the evaluation of factor two would need to be done with the utmost caution to avoid the implication that advice of counsel must always be sought to avoid having this factor weigh against an accused infringer. To determine if this is being done by the district courts, an application of how post-*Halo* courts are evaluating the *Read* factors is required.

2. At least three district courts have explicitly adopted the *Read* factors to direct their discussion of enhanced damages under § 284.

In *Imperium IP Holdings (Caymen), Ltd. v. Samsung Electronics Co.*, Samsung Electronics was sued for patent infringement.[101] The jury found that the defendants had willfully infringed on the claims of two patents,[102] and the district court held that enhanced damages were appropriate.[103] While the jury heard the case pre-*Halo* and were instructed based on the willfulness standard of *Seagate*,[104] the district court made its decision post-*Halo*.[105] The district court chose to exercise its discretion by using the *Read* factors to determine if the behavior of the infringer was egregious enough to warrant enhanced damages.[106] The district court noted that "[w]hile the *Read* factors remain helpful to the [c]ourt's execution of discretion, an analysis focused on 'egregious infringement behavior' is the touchstone for determining an award of enhanced damages."[107] An award of enhanced damages does not need to

99. Micheletti, *supra* note 2, at 998–99 (acknowledging that the *Read* factors do not guide the courts in "whether enhancement is authorized.").

100. *See id.* at 998.

101. Imperium IP Holdings v. Samsung Elec. Co., 203 F.Supp.3d 755, 757 (E.D. Tex. 2016).

102. *Id.* at 758.

103. *Id.* at 763.

104. *Id.* at 761.

105. *Id.*

106. *Id.* at 763. The *Imperium* court felt that they could continue based on the jury's ruling of willful infringement because on remand the *Halo* court stated there was, "no basis for a new trial on 'willful misconduct,' which is a sufficient predicate, under *Halo*, to allow the district court to exercise its discretion to decide whether punishment is warranted in the form of enhanced damages." *Id.* at 762 (quoting Halo Elecs. Inc. v. Pulse Elecs. Inc., No. 2014-1731, 667 Fed.Appx. 992, 994, 2016 WL 4151240 at *2 (Fed. Cir. 2016)).

107. *Id.* at 763.

weigh on any particular factor and not all factors are needed to warrant enhanced damages.[108]

While the *Imperium Holdings* court utilized the factors in *Read*, it did not do a step-by-step analysis of each factor.[109] Instead, the court looked at the conduct of the defendant at the time of the accused infringement in light of the *Read* factors and determined that the behavior was egregious enough to warrant enhanced damages.[110] The court, in coming to its conclusion, recognized that copying occurred (the first factor) and the defendants "never undertook any serious investigation to form a good-faith belief as to non-infringement or invalidity" (the second factor), but the court did not specify what qualifies as a serious investigation.[111]

In *Finjan, Inc. v. Blue Coat Systems, Inc.*, Blue Coat Systems was sued for patent infringement.[112] The jury found that Blue Coat Systems infringed only some of the patents alleged and the court proceeded to a bench trial on non-jury issues including Finjan's motion for enhanced damages.[113] The district court used the *Read* factors to guide their decision as to whether enhanced damages were warranted.[114] Contrary to *Imperium Holdings*, the *Finjan* court did a step-by-step analysis of the *Read* factors, and found that the factors alone did not support a finding of enhanced damages.[115] The court evaluated the second and third factors together and found both weighed against a finding of egregious misconduct and enhancement.[116] With regard to the second factor, specifically, the court found that, since the plaintiff was not able to provide sufficient evidence that the defendants were aware of the specific patents-in-suit prior to this lawsuit, the defendant had a good faith belief that the patents were invalid or not infringed.[117]

In *Radware, Ltd. v. F5 Networks, Inc.*, F5 Networks was sued for patent infringement.[118] A jury found that F5 Network's infringement was willful[119]

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108. *See* Read Corp. v. Portec, Inc., 970 F.2d 816, 826–28 (Fed. Cir. 1992).

109. *Imperium*, 203 F.Supp.3d at 763.

110. *Id.* at 764.

111. *Id.*

112. Finjan, Inc. v. Blue Coat Sys., Inc., No. 13-CV-03999-BLF, 2016 WL 3880774, at *1 (N.D. Cali. July 18, 2016).

113. *Id.*

114. *Id.* at *16.

115. *Id.* at *16-17 (using only eight of the nine *Read* factors).

116. *Id.* at *16.

117. *Id.*

118. Radware, Ltd. v. F5 Networks, Inc., No. 5:13-CV-02024-RMW, 2016 WL 4427490, at *1 (N.D. Cal. Aug. 22, 2016).

119. *Id.* at *1.

and the district court subsequently held not to award enhanced damages.[120] Unlike the previous two cases, the district court found that only the fourth factor, the infringer's size and financial condition, supported an award of enhanced damages and declined to award them.[121] That particular factor is supposed to weigh in consideration of how much enhanced damages to award,[122] but in the *Radware* opinion it reads as a factor in favor of awarding enhanced damages. This is not consistent with the interpretation of the *Read* factors.[123]

Thus far these district court cases leave much to be desired in determining if their use of *Read* comports with *Halo*, especially with regard to the second factor. While *Finjan* is consistent with its evaluation of the second factor, it says nothing about whether the defendant needs to seek an opinion of counsel, and it also does not expand much on its reasoning of a "good faith belief."[124] *Imperium* does nothing more than state what a "good faith belief" is not.[125] These three district court decisions are very inconsistent in their analysis of *Read* and it is concerning that none of the courts seemed to know exactly how to analyze the second factor.

B. District Court Determinations That Do Not Use Read

The fact that *Read* appears to still be good law in light of *Halo* does not mean that it definitively should be used by district courts to determine whether to award enhanced damages. Additionally, the debate over whether *Seagate* implicitly overruled *Read* is still heavily debatable. Some courts continued to use both *Seagate* and *Read,* post-*Seagate,* as a step one and step two to evaluating enhanced damages.[126] First, these courts would use *Seagate* to find if there was willful infringement, then *Read* was applied to determine how

120. *Id.* at *8.

121. *Id.* (reasoning that due to the size and revenue of F5, F5 would have been able to afford the $19.2 million in enhanced damages sought in total damages by Radware).

122. Micheletti, *supra* note 2 at, 998–99.

123. *Id.*

124. *See* Finjan, Inc. v. Blue Coat Sys., Inc., No. 13-CV-03999-BLF, 2016 WL 3880774, at *16 (N.D. Cal. July 18, 2016).

125. *See* Imperium IP Holdings v. Samsung Elec. Co., 203 F.Supp.3d 755, 764 (E.D. Tex 2016).

126. Micheletti, *supra* note 2, at 999 ("Thus while the *Bott* and *Read* factors are no longer appropriate in assessing the objective recklessness of the infringer's conduct, district courts may still find them useful in gauging the extent of damage enhancement once willfulness under *Seagate* has been determined."). *See also* Informatica Corp. v. Bus. Objects Data Integration, Inc., 527 F.Supp.2d 1076, 1082-83 (N.D. Cal. 2007); Lee v. Accessories By Peak, 705 F.Supp.2d 249, 256-61 (W.D.N.Y. 2010); Judkins v. HT Window Fashions Corp., 704 F.Supp.2d 470, 479–83 (W.D.Pa. 2010).

much to enhance damages by.[127] In *Halo*, the Supreme Court overruled *Seagate*, instructing district court judges to use their discretion in determining enhanced damages,[128] but overruling *Seagate* does not expressly demand going back to using *Read* as the sole test for enhanced damages. This section will evaluate the decisions of district courts, post-*Halo*, that are not using *Read* to determine if those courts are following the holding of *Halo*.

In *Trustees of Boston University v. Everlight Electronics Co.,* Epistar and Everlight were being sued for patent infringement.[129] Instructions to the jury were made under *Seagate* and the district court found that both defendants willfully infringed the patent, but denied awarding enhanced damages.[130] Trustees of Boston ("BU") sought an award of enhanced damages based on the jury's finding of willful infringement; "BU argue[d] that the jury's willfulness finding was binding on the Court, that enhanced damages [were] required, and that the Court's discretion lies only in deciding the amount of enhanced damages to award."[131] Everlight argued that since *Halo* "rejected the *Seagate* test, the Court should accord no weight to the jury's finding of willful infringement because it was based on the wrong standard.[132]

The court, instead of using the *Read* factors, compared the facts of this case to the facts found in *Halo*.[133] It found that, while Everlight did willfully infringe the patent, it "did not deliberately copy the [plaintiff's] patent" or "try to conceal" the infringing material, it "reasonably investigated the scope of the patent", and "form[ed] a good faith belief that [its] products did not infringe."[134] Therefore, the court found that the defendant's behavior was not egregious enough to warrant enhanced damages in light of the Supreme Court's holding in *Halo*.[135]

In *Brigham and Women's Hospital, Inc. v. Perrigo Company*, Perrigo was sued for patent infringement and a jury held in favor of the plaintiff.[136] On Brigham's motion for enhanced damages the court held that Perrigo's conduct was not egregious enough to warrant enhanced damages and denied Brigham's

127. *See* Informatica Corp., 527 F.Supp.2d at 1082-83; Lee, 705 F.Supp.2d at 256-61; Judkins, 704 F.Supp.2d at 479–83.

128. Halo Elecs., Inc. v. Pulse Elecs., Inc., 136 S.Ct. 1923, 1933–34 (2016).

129. Trustees of Bos. Univ. v. Everlight Elecs. Co., 212 F.Supp.3d 254, 255 (D. Mass. 2016).

130. *Id.*

131. *Id.*

132. *Id.*

133. *Id.* at 257–58.

134. *Id.* at 258.

135. *Id.*

136. Brigham and Women's Hosp., Inc. v. Perrigo Co., 251 F.Supp.3d 285, 288 (D. Mass. 2017).

motion.[137] The court recognized that the Supreme Court cautioned against using a precise rule or formula to determine enhanced damages and explicitly declined to use the *Read* factors in its analysis.[138] The court reasoned that Perrigo had investigated if Brigham's patent was valid and whether Perrigo infringed the patent.[139] The court held Perrigo's defense during the trial was "neither frivolous or vexatious" and, therefore, enhanced damages were not warranted.[140]

Finally, on remand to the district court, in *Halo Electronics, Inc. v. Pulse* Halo sued Pulse for patent infringement. [141] A jury found that Pulse infringed and on remand from the Federal Circuit, the district court held enhanced damages were not warranted.[142] The district court denied enhanced damages for three main reasons: "(1) when [Pulse] learned of Halo's patent, Pulse investigated whether its products infringed, (2) Pulse pursued non-frivolous defenses at trial, and (3) Pulse had a basis to subjectively believe" that at no point was it infringing Halo's patent.[143] Halo argued that since the jury already found the infringement to be willful, a finding of enhanced damages logically followed.[144] The court disagreed, holding that "even a jury's finding of egregious or willful conduct does not require an award of enhanced damages."[145] Thus, "enhanced damages are not automatic"; instead, district courts must look at "all the circumstances and evidence to decide if this is a 'rare' case warranting extraordinary punishment."[146]

The district court in *Halo* observed that since the Supreme Court decision in *Halo* many "district courts have been wary of awarding enhanced damages."[147] The court also briefly discusses the *Read* factors in a footnote, recognizing that "the Supreme Court and Federal Circuit have cautioned" against using the *Read* factors and while they "may be helpful . . . they are not

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137. *Id.* at 293–94.

138. *Id.* at 293 ("Although the various factors set forth in *Read Corp.* may be useful to help determine whether an award of enhanced damages is warranted, the Supreme Court has cautioned that 'there is no precise rule or formula for awarding damages under § 284[.]'") (quoting Halo Elecs., Inc. v. Pulse Elecs., Inc., 136 S.Ct. 1923, 1932 (2016)).

139. *Id.* at 292 "For the same reasons discussed above regarding Brigham's motion for attorney's fees, I find that Perrigo's conduct was not egregious." *Id.* at 293.

140. *Id.* at 292–93.

141. Halo Elecs., Inc. v. Pulse Elecs., Inc., No. 2:07-CV-00331-APG-PAL, 2017 WL 3896672, at *1 (D. Nev. Sept. 6, 2017).

142. *Id.*

143. *Id.*

144. *Id.* at *5.

145. *Id.* at *4.

146. *Id.* at 5.

147. *Id.*

dispositive."[148] The cases that do not use the *Read* factors give more clarity, and, more importantly, provide context for what it means to form a good-faith belief of noninfringement. The cases using the *Read* factors are inconsistent in their evaluations and range from only looking at one factor to every factor.

CONCLUSION

The guidance left by the Supreme Court in the *Halo* decision was not precise, and it left a lot of room for interpretation among district court judges.[149] "This guidance may, in some cases, not be enough to prevent undesirable results."[150] Without any specific guidance from the Supreme Court, some courts have begun to use the *Read* factors,[151] other courts are comparing the facts of a present case to the facts in *Halo* to determine what egregious behavior is,[152] and still other courts are just following the reasoning of *Halo* and making no analysis with facts of other cases.[153] Even despite the fact that *Read* itself is consistent with the holding of *Halo* (but only if the second factor is not evaluated based on whether an accused infringer sought advice of counsel) the Supreme Court in *Halo* was explicit about courts using discretion and discouraged rigid tests.[154] However, post-*Seagate*, some courts began using *Read* only to determine by how much to enhance damages, not to determine if enhanced damages were warranted in the first instance.[155] This taken with the fact that *Read* is still good case law can lead to a compromise amongst all these district courts.

Courts should use their own discretion to decide whether the infringement of the patent has been especially egregious. First, district courts should start by following the example of cases like *Trustees of Boston* and use the facts of *Halo* as an example of what the Supreme Court considered to be especially egregious

148. *Id.* at *4 n.24.

149. *See* Means, *supra* note at 7.

150. *Id.*

151. *See* Finjan, Inc. v. Blue Coat Sys., Inc., No. 13-CV-03999-BLF, 2016 WL 3880774, at *1 (N.D. Cal. July 18, 2016); Radware, Ltd. v. F5 Networks, Inc., No. 5:13-CV-02024-RMW, 2016 WL 4427490, at *1 (N.D. Cal. Aug. 22, 2016); Imperium IP Holdings v. Samsung Elec. Co., 203 F.Supp.3d 755, 763 (E.D. Tex 2016).

152. *See generally* Trustees of Bos. Univ. v. Everlight Elecs. Co., 212 F.Supp.3d 254 (D. Mass. 2016).

153. *See* Brigham and Women's Hosp., Inc. v. Perrigo Co., 251 F.Supp.3d 285, 293 (D. Mass. 2017).

154. *Id.*

155. Micheletti, *supra* note 2, at 999. *See also* Informatica Corp. v. Bus. Objects Data Integration, Inc., 527 F.Supp.2d 1076, 1082-83 (N.D. Cal. 2007); Lee v. Accessories By Peak, 705 F. Supp. 2d 249, 256–61 (N.Y.W.D. 2010); Judkins v. HT Window Fashions Corp., 704 F. Supp. 2d 470, 479–483 (W.D. Penn. 2010).

behavior warranting enhanced damages.[156] Second, district courts need to decide by how much should damages be enhanced. Section 284 allows damages to be enhanced up to three times the amount found or assessed.[157] Utilizing *Read*, in the same way that the courts did post-*Seagate*,[158] the question of by how much to enhance damages can be answered using the factors. Therefore, district courts can follow a two-step process. First, use "'[the] sound legal principles' developed over nearly two centuries of application and interpretation of the Patent Act" to determine what behavior is especially egregious enough to warrant enhanced damages.[159] Preferably, starting with a comparison to the facts of *Halo* similar to *Trustees of Boston*. Second, courts should follow the factors of *Read* to determine how much damages should be enhanced by. Additionally, this framework does not violate § 298 because using due care in the second factor does not concern the question of infringement because infringement will already have been determined.

156. Trustees of Bos. Univ. v. Everlight Elecs. Co., 212 F.Supp.3d 254, 258 (D. Mass. 2016).

157. 35 U.S.C. § 284 (2012).

158. *See* Informatica Corp. v. Bus. Objects Data Integration, Inc., 527 F.Supp.2d 1076, 1082-83 (N.D. Cal. 2007); Lee v. Accessories By Peak, 705 F.Supp.2d 249, 256-61 (W.D.N.Y. 2010); Judkins v. HT Window Fashions Corp., 704 F. Supp. 2d 470, 479-83 (W.D. Penn. 2010).

159. Halo Elecs., Inc. v. Pulse Elecs., Inc., 136 S.Ct. 1923, 1935 (2016) (quoting Martin v. Franklin Cap. Corp., 126 S.Ct. 704, 710 (2005)).

THE ARCHITECTURAL WORKS COPYRIGHT ACT:

CAN IT PROTECT AN ARCHITECT'S STATE OF THE ART DEVELOPMENT WHEN FUNDED THROUGH FEDERAL DOLLARS?

KYLE R. MOORE*

INTRODUCTION

Westlawn Gardens, the multi-million, multi-phase redevelopment, is nearing completion. As it stands, the LEED award winning development is the largest public housing neighborhood in Wisconsin.[1] But what if a commercial company or individual tried to recreate that development; would the original architect's work be protected under copyright law?

Copyright law has provided no answers and the law typically protects the architect, but when federal dollars are handed down to independent agencies

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1. Casey Studhalter, *Green neighborhoods for all in Milwaukee's Westlawn Gardens*, LEED (Apr. 9, 2014), http://www.usgbc.org/articles/green-neighborhoods-all-milwaukee's-westlawn-garden [https://perma.cc/2KRY-7ZET]; *Westlawn Gardens,* THE J. OF THE AM. INST. OF ARCHITECTS (Nov. 24, 2014), http://www.architectmagazine.com/project-gallery/westlawn-gardens-6101 [https://perma.cc/3QNY-HZ8Z?type=image].

the ownership line is blurred.[2] 17 United States Code Section 105, states that "copyright protection under this title is not available for any work of the United States Government, but the United States Government is not precluded from receiving and holding copyrights transferred to it by assignment, bequest, or otherwise."[3] Thus, the federal government cannot create a copyright. As a result, no one knows if an independent housing authority, and the contracting or subcontracting architects, can protect their work when they receive money from the Housing and Urban Development ("HUD"), a cabinet in the executive branch.[4] It would make sense to say that the Housing Authority of the City of Milwaukee ("HACM") has the ability to copyright its project, since it was the agency that procured the various architects to create this masterpiece. However, should HACM be barred from protecting its development, since the funds are from the federal government? And do the architects have any say in this, because, after all, it is the result of their work?

This writer asserts that there should be available protection for both the independent agency and the architects. This Comment will shed light on those questions by analyzing the breadth of the Architectural Works Copyright Protection Act ("AWCPA"), and the ties between the federal government and local agencies who utilize its funds for public purposes. Milwaukee's housing authority will be used as an example, and the first section will provide relevant background on the current AWCPA scheme. The second part of this Comment will analyze the ownership issues that arise from the current AWCPA scheme. Finally, this Comment will assert the relief available to architects whose architectural works are funded with federal dollars.

I. BACKGROUND

A. Architects and Their Architectural Works

Architects plan and design the various buildings, offices, houses, complexes, and structures that we live and breathe in.[5] We often do not think of the impacts that architects have on the world, but they have shaped the world as we see it.[6] In fact, research has shown that the physical environment of a

2. Rory Stott, *The Copyright Law That Should Have Architects Up in Arms*, METROPOLIS MAGAZINE (Apr. 14, 2016), http://www.metropolismag.com/Point-of-View/April-2016/The-Panorama-Copyright/ [https://perma.cc/7Z5D-Q2DY].

3. 17 U.S.C. § 105 (1976).

4. *Works Not Covered by Copyright*, DIGITAL MEDIA LAW PROJECT, http://www.dmlp.org/legal-guide/works-not-covered-copyright [https://perma.cc/7F7U-SKRF].

5. BUREAU OF LABOR STATISTICS, OCCUPATIONAL OUTLOOK HANDBOOK (2018).

6. Tean Chee Ko, Jelena Nikolic, *How can architecture change the world?*, RMJM (Mar. 17, 2016), https://www.rmjm.com/can-architecture-change-world/ [https://perma.cc/5AHH-QWXS].

building can have an impact on its users and patients.[7] Architect Gene Klow remarked that:

> "recent research has demonstrated that the healing experience for patients in healthcare facilities is significantly enhanced when they are in a building that provides a nurturing environment. Just as healthcare facilities can improve the sensory experience of a patient, great architecture can not only meet the individual needs of its inhabitants efficiently, it can also uplift the human spirit."[8]

Architect Chris Johnston added that:

> "[a]rchitecture is a unique blending of the arts with sciences as evidenced by its greatest exponent, Michelangelo. Architects who understand this premise can affect the lives of everyday people with their designs, for better or for worse . . . [g]ood, thoughtful architecture can raise the human spirit to soaring heights, while [a] bad design can crush the life out of its users. It is incumbent upon the architect to not only understand this, but also to strive to achieve it, ensuring clients understand [that] good design will pay for itself in the long term."[9]

An architects' livelihood is often dependent on their ability to create good designs for individuals and companies. An architects' work is vital to our existence and it is not a job that will be easily supplanted by software or machines.[10] That is why architects are highly compensated for their work.[11] But how do architects protect the architectural works that they have put a significant amount of time and energy into? Architects turn to copyright law in those situations.

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7. E.R.C.M. Huisman, E. Morales, J. van Hoof, H.S.M. Kort, *Healing environment: A review of the impact of physical factors on users*, 58 BUILDING AND ENVIRONMENT 70 (2012); Barbara J. Huelat, *The healing experience*, HEALTHCARE DESIGN MAGAZINE (Feb. 1, 2009), http://www.healthcaredesignmagazine.com/trends/architecture/healing-experience/ [https://perma.cc/3X4G-VZEL]; Gene Klow, *How architecture can change the world?*, RMJM (Mar. 17, 2016), https://www.rmjm.com/can-architecture-change-world/ [https://perma.cc/92EC-39DM].

8. Klow, *supra* note 7.

9. Chris Johnston, *How architecture can change the world?*, RMJM (Mar. 17, 2016), https://www.rmjm.com/can-architecture-change-world/ [https://perma.cc/A4UJ-WMUD].

10. Daniel Davis, *Why Architects Can't Be Automated*, ARCHITECT MAGAZINE (June 15, 2015), http://www.architectmagazine.com/technology/why-architects-cant-be-automated_o [https://perma.cc/XA6S-LLSD?type=image].

11. *See* BUREAU OF LABOR STATISTICS, *supra* note 5.

Copyright law has grown significantly since its creation, but its growth has been sluggish in the world of architecture.[12] Congress enacted the first federal copyright law in May, 1790.[13] Since its enactment, copyright law has managed to flourish by promoting creativity, while maintaining the integrity of the various artists, musicians, and actors.[14] Yet, the growth has been slow for architects and especially those procured though local governmental bodies because the Act itself fails to mention local governmental bodies and it does not support federal protection.[15] Moreover, the public nature of architectural works makes copyright issues even more complicated.[16] That is, architectural work is put on full display for individuals by its very nature.[17] The finished products are pervasive.[18] As a result, the AWCPA's protection is interpreted broadly, but it still may not apply to a situation like this.[19]

B. Copyrights in the United States

"Copyright is a form of protection provided by the laws of United States to authors of 'original works of authorship,' including literary, dramatic, musical, artistic, and certain other intellectual works.'"[20] The rights are not unlimited, but it is illegal for anyone to violate any of the rights provided by the copyright law to the owner of the copyright.[21] Architects fall into a distinct category because of the utilitarian nature of their work, but their design work is covered under the Copyright Act.[22] The copyrightable works under the Act include the following categories: (1) literary works; (2) musical works, including any accompanying words; (3) dramatic works, including any accompanying music; (4) pantomimes and choreographic works; (5) pictorial, graphic, and sculptural works; (6) motion pictures and other audiovisual works; (7) sound recordings; and (8) architectural works.[23]

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12. *See* David E. Shipley, *The Architectural Works Copyright Protection Act at Twenty: Has Full Protection Made A Difference?*, 18 J. INTELL. PROP. L. 1 (2010).

13. *Copyright Timeline: A History of Copyright in the United States*, ASSOC. OF RESEARCH LIBRARIES, http://www.arl.org/focus-areas/copyright-ip/2486-copyright-timeline#.WIEkk2NlmgR [https://perma.cc/NE5X-Q2SD].

14. Shipley, *supra* note 12, at 3.

15. 17 U.S.C § 105.

16. Stott, *supra* note 2.

17. *Id.*

18. *Id.*

19. Raphael Winick, *Copyright Protection for Architecture After the Architectural Works Copyright Protection Act of 1990*, 41 DUKE L.J. 1598 (1992).

20. COPYRIGHT BASICS, UNITED STATES COPYRIGHT OFFICE (2017).

21. *Id.*

22. *Id.*

23. *Id.*

Architectural works are secured automatically upon creation, and a work is "created" when it is fixed in a copy or phone record for the first time.[24] However, there are advantages to registering a copyright. The listed advantages include the following:

> "(1) Registration establishes a public record of the copyright claim; (2) before an infringement suit may be filed in court, registration is necessary for works of U.S. origin; (3) if made before or within five years of publication, registration will establish prima facie evidence in court of the validity of the copyright and of the facts stated in the certificate; (4) if registration is made within three months after publication of the work or prior to an infringement of the work, statutory damages and attorney's fees will be available to the copyright owner in court actions. Otherwise, only an award of actual damages and profits is available to the copyright owner; and (5) registration allows the owner of the copyright to record the registration with the U.S. Customs Service for protection against the importation of infringing copies."[25]

C. Housing Authority of the City of Milwaukee and its Federal Government Relationship

HACM is a nonprofit entity that runs and builds public housing developments within Milwaukee.[26] Its funding typically comes from the United States Department of Housing and Urban Development ("HUD"), but HACM also receives funding from other sources.[27] HUD is a cabinet-level agency in the executive branch of the United States government.[28] This is what makes HACM's ownership difficult because of the significant funding that it receives from the federal government.[29] The complexity does not stop there, because HACM procures architects and other businesses to do most of its work.[30]

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24. *Id.*

25. *Id.*

26. *Development Services*, HOUSING AUTHORITY OF MILWAUKEE, http://www.hacm.org/business/development-services [https://perma.cc/EW7T-X7WQ] (last visited Jan. 31, 2018).

27. *Id.*

28. David Forbes, *Inside the agency: What are housing authorities, and how do they work*, CAROLINA PUBLIC PRESS (Feb. 2, 2015), http://carolinapublicpress.org/21689/inside-the-agency-what-are-housing-authorities-and-how-do-they-work/ [https://perma.cc/P9UQ-3MRC].

29. *Id.*

30. *Procurement*, HOUSING AUTHORITY OF MILWAUKEE, http://www.hacm.org/business/procurement (last visited Jan. 31, 2018).

For this particular project, HACM utilized Torti Gallas and Partners, Kindness Architecture and Planning, and Entelechy.[31] Those design firms spent many months working together to come up with a redevelopment plan to change the identity of the neighborhood, and to attract mixed financed individuals.[32] HACM wanted to attract individuals of different social classes to represent a thriving and diverse environment.[33] The rationale is to promote stability and growth for the low-income individuals who reside at the development.[34]

D, AWCPA and the Need for Protection

A private individual or company would not create a multi-million-dollar development without copyright protection. Why should the Housing Authority of the City of Milwaukee and the architects that it procured not receive that same protection? Prior to 1990, copyright protection did not extend to the actual buildings depicted in the plans, blueprints, renderings, and models.[35] However, the copyrightability of the architectural prints, plans, blueprints, renderings, and models, were already established under the original copyright act.[36] The AWCPA would change that, by extending copyright protection to fully constructed works of architecture such as housing developments, condominium complexes, office towers, and parking decks.[37] Thereby, the Act provided full protection to the works of architecture and not just the plans.[38]

There are a couple of reasons behind this expansion. First, the drafters of the AWCPA believed that "[further] protection for works of architecture should stimulate excellence in design."[39] In doing so, architects are now more in line with artists.[40] Second, and more importantly, the United States became a supporter of the Berne Convention.[41] This convention required its members to afford copyright protection to "works of architecture – the constructed design of buildings," which is distinct from the plans, prints, illustrations, and

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31. *2015 Rudy Bruner Award Project Data*, HOUSING AUTHORITY OF THE CITY OF MILWAUKEE, https://ubir.buffalo.edu/xmlui/bitstream/handle/10477/34346/WestlawnGardens_FULL.pdf?sequence=3 [https://perma.cc/KC44-4KGG].

32. *Id.*

33. Studhalter, *supra* note 1.

34. *Id.*; HOUSING AUTHORITY OF THE CITY OF MILWAUKEE, *supra* note 26.

35. Shipley, *supra* note 12, at 3.

36. *Id.*

37. *Id.* at 7.

38. Winick, *supra* note 19, at 1603.

39. Shipley, *supra* note 12, at 9.

40. *Id.* at 59.

41. *Id.* at 4.

sketches.[42] That is, the Berne Convention required the United States to afford "full protection" to architectural works.[43]

However, full protection has not been defined and there has been disputes over what constituted a building that can be protected as an architectural work.[44] The AWCPA defined architectural works as "the design of a building embodied in any tangible medium of expression, including a building, architectural plans, or drawings."[45] Legal precedent has shown that architectural work protection is limited to structures habitable by humans, and the building must be permanent and stationary.[46] Further, precedent has shown that the overall form of the building(s) is protected, but the protection does not cover individual standard features, such as windows and doors.[47] Nevertheless, copyright protects any artistic or graphic authorship that can be identified separately.[48]

E. AWCPA and its Scope of Protection

America's initial reluctance to extend copyright protection to architecture originated in the policy objectives behind the constitutionally mandated purpose.[49] That constitutionally mandated purpose is "[t]o promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."[50] Thus, American intellectual property is based on benefitting the public.[51] That entails for a less restrictive field of law because architecture is ubiquitous and it does more harm to the public than good if severe restrictions are placed on it.[52] For example, if there are major restrictions on architectural works then it could slow the process of architecture at the public's expense because many architects would not be able to use, adapt, and modify other works.[53] Therefore, American intellectual property law did not look to protect architectural works because it was considered a utilitarian work under American law.[54]

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42. *Id.* at 9.
43. *Id.*
44. Winick, *supra* note 19, at 1613; Shipley, *supra* note 12, at 10.
45. Winick, *supra* note 19, at 1612.
46. Shipley, *supra* note 12, at 12.
47. *Id.*
48. *Id.*
49. Winick, *supra* note 19, at 1603.
50. *Id.* at 1600.
51. *Id.* at 1601.
52. Stott, *supra* note 2.
53. Winick, *supra* note 19, at 1601.
54. *Id.* at 1601-02.

However, as stated previously, when the United States got internationally involved with the Berne Convention, this would change.[55] The Berne Convention forced the United States to reexamine the conception of architecture as a utilitarian work under American law.[56] Thus, in order for the United States to comply with the Berne Convention, American copyright law would have to recognize the artistic value of architecture by extending copyright protection to architectural works.[57]

The scope of protection does not go any farther, and is limited insofar as to follow the Constitution and to comply with the Berne Convention.[58] Utilized together, American architects enjoy the right to have its buildings protected, but no farther.[59] Many believe that allowing architects to protect its buildings is too broad and, in fact, frustrates the Constitution.[60] Architecture is evolving around the world and the Berne Convention represents a global and progressive approach.[61]

II. OWNERSHIP ISSUES AND THE RELIEF AVAILABLE

Even with those broad and progressive views, it is still difficult to identify who would have copyright ownership in this particular instance. In general, the copyright in an architectural work is usually owned initially by the author(s) of the work and that includes contributors.[62] Solely paying for architectural or other construction plans or designs does not bestow exclusive rights to an owner absent an express written license or transfer of ownership.[63] There are exceptions, such as cover works of employees, or "works made for hire," but design work for an owner usually will not fall under either of those exceptions.[64] Thus, in the case of construction documents, the owner of the copyright is almost always the architect or engineer who prepared the plans.[65]

It is likely that the architects would own the copyright, here, unless the Housing Authority explicitly went out of its way to negotiate for the written

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55. *Id.* at 1602.
56. *Id.*
57. *Id.*
58. *Id.*
59. *Id.*
60. *Id.*
61. Stott, *supra* note 2.
62. *LLP: Owner vs. Architect: Who Owns the Design?*. FINDLAW, http://corporate.findlaw.com/intellectual-property/llp-owner-vs-architect-who-owns-the-design.html [https://perma.cc/VL2V-7G3W] (last visted Feb. 15, 2018).
63. Karl E. Geier and Scott Hernandez, *Who Owns the Plans? Owners, Architects and Engineers, and the Federal Law of Copyright*, 21 Miller & Starr Real Estate NewsAlert 115 (2010).
64. FINDLAW, *supra* note 62.
65. Geier, *supra* note 63.

license or transfer of ownership. As it stands, the AWCPA does not address copyright ownership, however the American Institute of Architecture ("AIA") contract provides that "the architect shall be deemed the author of the documents and drawings with respect to [the] project and shall retain all rights to said documents including copyrights."[66] Other standard AIA contract language states that the documents and drawings "shall not be used by the owner or others on other projects, for additions to this Project or for completion of this Project by others, unless the architect is judged to be in default under this agreement, except by agreement in writing with appropriate compensation to the architect."[67]

Even further, many design firms subcontract some of their work. It is possible that the design firms would include that language in its contracts when subcontracting out bits and pieces of the project. Therefore, the major issue with ownership here involves the passing down of the federal funds and the general and subcontracting that took place.

Nevertheless, the AWCPA does permit copyright holders to seek several forms of relief under the current scheme.[68] The available relief includes injunctive relief, statutory and actual damages, recovery of the defendant's profits, and impounding or destroying infringing copies.[69] Another problem arises with the forms of relief available for the copyright holder, especially that of injunctive relief. The House Subcommittee has stated that "architectural works [are] different than other forms of authorship [because] [a]rchitectural works are the only form of coprightable subject matter that is habitable."[70] When a copyright holder argues that they are entitled to injunctive relief, the defendant will often invoke economic waste.[71] Essentially, when a litigant invokes the doctrine of economic waste in this particular situation, they are arguing that it would be wasteful for them to have to tear down a building that they have already started developing.[72]

Indeed, the architectural community has argued that injunctive relief should not be granted when the construction of a building is already under way.[73]

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66. Shipley, *supra* note 12.

67. *Id.*

68. Winick, *supra* note 19, at 1632.

69. *Id.*

70. H.R. REP. No. 101-735, at 6944 (1990).

71. Mark R. Hinkston, *Repair or Replace? The Economic Waste Doctrine in Construction Defect Cases*, WISCONSIN LAWYER (Aug. 2011), http://www.wisbar.org/newspublications/wisconsinlawyer/pages/article.aspx?Volume=84&Issue=8&ArticleID=2308 [https://perma.cc/DDZ2-MUJM].

72. *Id.*

73. Winick, *supra* note 19, at 1628.

Perhaps, the tearing down of the building may cause waste to a defendant, but significant harm could also occur to the plaintiff if the building is allowed to encroach. The United States Court of Appeals for the Second Circuit has discussed the availability of injunctive relief for copyright holders and it stated that "[a]ll now agree that injunction is not the automatic consequence of infringement and that equitable considerations are always germane to the determination of whether an injunction is appropriate."[74] Thus, courts are likely to weigh competing factors before determining whether injunctive relief is an appropriate relief.

III. SUGGESTION

An independent agency that uses federal funds should be allowed to own a copyright for its architectural works. In this particular situation, HACM, which is an independent agency, is using federal funds as a part of its funding for a large-scale development. HACM, or any of the design firms that it procured, should be able to copyright that work. There are two reasons for this suggestion: (1) these independent agencies are contractors who work with the U.S. government, and those agencies should not be considered government employees for copyright purposes; and (2) even if these independent agencies have the ability to protect themselves, courts still weigh the equitable remedies for a copyright infringement claim.[75]

First, if the rules that apply to the federal government were imputed upon architectural design firms who are two to three links removed from the federal government, then the applied rules would be far-reaching. It is likely that the architectural firms have an idea that federal funds are included in the money that it is being paid, but when the government is just a helping hand should that bar those architectural firms from protecting its work? The answer to that question is no, because the design firms are building something with a different agenda in mind. The architects likely believe that they are building something for HACM, and that HACM will own that development. Indeed, either HACM or another independent agency will own and run the development and not the government, thus the architects should be able to protect their work in a situation similar to this.

Second, even if HACM or the design firms that it procured are allowed to copyright its architectural work it does not mean that the public nature of the development is destroyed. To wit, courts will weigh the equitable relief

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74. *Id.*

75. *Copyright Law and U.S. Government Works*, COPYRIGHT LAWS, http://www.copyrightlaws.com/us/copyright-laws-in-u-s-government-works/ [https://perma.cc/6DM6-4ML9] (last visited 1/31/2018); Winick, *supra* note 19, at 1628.

available even if a certain claim had merit. Therefore, it will be an uphill battle for the design firms to enforce that protection even with the ability to copyright its work. Thus, if the claim had significant merit then that design firm will be able to protect its masterpiece, however, if the claim does not have any merit then the relief would likely be denied.

CONCLUSION

If protection is needed, let the courts be the judge. There are three factors that went into this conclusion. First, independent architects and engineers are the ones that are punished by this rule and these independent firms may not realize that federal funds are being utilized as a part of the large-scale project. Second, if federal funds are only part of the overall funding then that should not preclude third party architects and engineers from protecting its independent work on that project. Third, courts have done a good job weighing the equitable reliefs available and whether a certain plaintiff requires that relief.

Nevertheless, discouraging protection in situations like this does not promote the purpose of the AWCPA. The constitutional mandated purpose is "[t]o promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."[76] The drafters of the AWCPA believed that "[further] protection for works of architecture should stimulate excellence in design."[77] Thus, protection should be allowed because it would stimulate excellence in the architects or engineers' work. Without that protection, architects and engineers may not do their best work on projects that receive federal funds, because those firms will know that the project would not be protected. However, if protection was afforded, architects and engineers would be encouraged to provide excellent work because they would understand that they can protect the work that they have done. Therefore, the AWCPA should protect architects or engineers that work on projects that are federally funded, because better architectural works benefit the public, and courts can enforce protection only when it is truly warranted.[78]

76. Winick, *supra* note 19, at 1600-01.

77. Shipley, *supra* note 12, at 9.

78. Johnston, *supra* note 9; Winick, *supra* note 19, at 1647.

CONGRESS DOES NOT HIDE ELEPHANTS IN MOUSE-HOLES:

HOW *VIMEO* PAID NO HEED TO THAT CAUTION

MITCH BAILEY*

INTRODUCTION

With the passage of the 1976 Copyright Act, sound recordings fixed prior to February 15, 1972 remained under the protection of the state copyright laws where the works were registered.[1] Some incredible culturally significant songs were fixed before February 15, 1972, including songs from "The Beatles, The Supremes, Elvis Presley, Aretha Franklin, Barbara Streisand, and Marvin Gaye."[2] To date, state law protects the owner's rights without interference from federal law, including the Digital Millennium Copyright Act ("DMCA").[3]

Given its location, the Second Circuit significantly influenced the development of intellectual property law in the United States, especially copyright law.[4] Many businesses where intellectual property rights are "key assets, or at the heart of an endeavor," are concentrated in the greater New York City metropolitan area.[5] Implementing a reasonable application of the DMCA safe harbor provision is thus important for copyright law, but more specifically,

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1. 17 U.S.C. § 301(c) (2012) (provides that federal copyright law does not annul or limit state-law rights or remedies for sound recordings fixed before February 15, 1972).

2. Capitol Records, LLC v. Vimeo, LLC, 826 F.3d 78, 90 (2d Cir. 2016).

3. Digital Millennium Copyright Act, 17 U.S.C. § 512.

4. Kenneth A. Plevan, *The Second Circuit and the Development of Intellectual Property Law: The First 125 Years*, 85 FORDHAM L. REV. 143, 143 (2016).

5. *Id.* ("including television, advertising, publishing, and theater").

the music industry in New York City and other metropolitans in the United States.

This comment focuses on the Second Circuit's interpretation of the Copyright Act of 1976. Section II offers background for the analysis that follows. Section III focuses on whether "red flag" knowledge must pertain to the particular work being sued over in the suit and whether a service provider gains "red flag" knowledge just by looking at an infringing work. Section IV examines the intra-state split between the New York State Appellate Court, First Department, and the Court of Appeals for the Second Circuit on the issue of whether the DMCA safe harbor is applicable to sound recordings fixed before February 15, 1972. Section V discusses the balance needed between the obligations of Internet service providers and copyright holders. In the conclusion section, I look at favorable positions in answering these issues regarding the DMCA safe harbor provisions. Ultimately, I conclude that this issue warrants attention from the Supreme Court.

I. SETTING THE STAGE: THE DIGITAL MILLENNIUM COPYRIGHT ACT

The Digital Millennium Copyright Act was enacted to implement the World Intellectual Property Organization Copyright Treaty and to update domestic copyright for a constantly evolving digital age.[6] Congress enacted the DMCA safe harbors to stimulate growth in this digital age. With a "greater certainty" concerning the legal exposure for infringements that may occur in the "course of common activities," websites and other online service providers would have more incentive to grow and expand their respective businesses.[7] Congress recognized that without such certainty, service providers would hesitate to invest in, and develop, new and valuable Internet services.[8] The DMCA was therefore designed to "clarif[y] the liability faced by service providers who transmit potentially infringing material over their networks," and, in the process, "ensure[] that the efficiency of the Internet will continue to improve and that the variety and quality of the services on the internet continue to expand."[9]

The DMCA establishes a safe harbor in § 512(c), which gives qualifying Internet service providers protection from liability for copyright infringement when their users upload infringing material on the service provider's site and

6. Viacom Int'l, Inc. v. YouTube, Inc., 676 F.3d 19, 26 (2012).

7. S. REP. NO. 105-190, at 8 (1998) (expressing the view that "without clarification of their liability, service providers may hesitate to make the necessary investment in the expansion of the speed and capacity of the Internet").

8. *Id.*

9. *Id.* at 2.

the service provider is unaware of the infringement.[10] A safe harbor is an affirmative defense where defendants have the burden of establishing the statutory requirements.[11] In the context of the DMCA's safe harbor provision, a "service provider," is given a rather expansive definition, encompassing "entit[ies] [that offer] the transmission, routing, or providing of connections for [unmodified] digital online communications."[12]

To qualify for immunity from liability under § 512(c), a service provider must satisfy the following criteria: (1) a service provider cannot have actual or constructive ("red flag") knowledge of infringing content, or upon gaining such knowledge it must "expeditiously" act to remove such content; (2) a service provider cannot "receive a financial benefit directly attributable to the infringing activity" where the service provider "has the right and ability to control" the infringing activity; and (3) a service provider must, "upon notification of claimed infringement [respond] expeditiously to remove, or disable access to, the material that is claimed to be infringing."[13]

In *Viacom International v. YouTube, Inc.*,[14] the Second Circuit held that "service providers must have knowledge or awareness of specific and identifiable instances of infringement on their websites" for there to be secondary liability for copyright infringement.[15] The *Viacom* court explained the difference between two key DMCA provisions, "actual" knowledge and "red flag" knowledge.[16] The difference, as the *Viacom* court explained, is not between "specific" and "generalized" knowledge, rather the difference is between a "subjective" and "objective" standard.[17] Stated differently, "actual" knowledge turns on whether a provider "actually" or "subjectively" knew of specific infringement, whereas "red flag" knowledge turns on whether a provider was subjectively aware of facts that would have made the specific infringement 'objectively' obvious to the reasonable person."[18]

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10. Digital Millennium Copyright Act, 17 U.S.C. § 512(c).

11. *Capitol Records*, 826 F.3d at 95.

12. 17 U.S.C. § 512(k)(1)(A). *See e.g.*, UMG Recordings, Inc. v. Shelter Capital Partners, LLC, 718 F.3d 1006, 1020 (9th Cir. 2013) (holding that a website allowing users to stream video, which features an "'automated process' for making files accessible," is a service that falls within § 512(c)); *Viacom*, 676 F.3d at 38-39 (2d Cir. 2012) (holding that "playback of videos on 'watch' pages," transcoding user-uploaded video, and the function of linking "related videos" all fall within the ambit of "service provider" as defined by § 512(k)(1)(B)).

13. 17 U.S.C. § 512(c)(1)(A)-(C).

14. *Viacom*, 676 F.3d at 31.

15. Plevan, *supra* note 4, at 157 (also commenting that the court's decision is likely to have a lasting impact on the policies and practices of copyright owners and service providers alike).

16. *Viacom*, 676 F.3d at 30.

17. *Id.* at 31.

18. *Id.*

In *Capitol Records, LLC v. Vimeo, LLC*[19] "the Second Circuit addressed an important question of first impression regarding the proper interpretation of the safe harbor provision of the DMCA."[20] Founded in 2004, Vimeo operates an online video-sharing service that allows its users to upload and share original, creative videos that others can stream over the Internet, subject to Vimeo's terms of service.[21] "Vimeo hosted more than 31 million videos and had 12.3 million registered users in 49 countries, who collectively uploaded approximately 43,000 new videos per day."[22] With only a small group of employees dedicated to "community" support issues (16 employees as of 2012), Vimeo does not review every video that is uploaded per day.[23] The *Vimeo* court addressed, among other issues, whether the statutory safe harbor applies to non-preempted state copyright law.[24] The district court relied largely on the Copyright Office Report, ruling that the DMCA safe harbors do not extend to pre-1972 recordings, whereas the court of appeals reached a much different conclusion.[25]

On appeal, the Second Circuit vacated the district court's grant of summary judgment to the plaintiff, which denied safe harbor to pre-1972 recordings.[26] The court acknowledged the Copyright Office's general expertise on the Copyright Act, but rejected its statutory interpretation as a "misreading" that was owed no special deference.[27] Instead, the court held that "[a] literal and natural reading of the text of § 512(c) leads to the conclusion that its use of the phrase 'infringement of copyright' *does* include infringement of state laws of copyright."[28] The Second Circuit found its reading of the plain text of the statute confirmed by the statutory purpose—excluding works protected only by state copyright would defeat the statutory purpose of having a safe harbor.[29]

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19. *Capitol Records*, 826 F.3d at 78.

20. Plevan, *supra* note 4, at 159.

21. On Petition for a Writ of Certiorari to the United States Court of Appeals for the Second Circuit, Brief for Respondents in Opposition, Capitol Records, LLC v. Vimeo, LLC, No. 16-771 at 6 (Feb. 16, 2017).

22. *Id.*

23. *Id.*

24. Plevan, *supra* note 4, at 159 ("In [*Vimeo*], the owner of the copyright in several pre-1972 sound recordings brought claims for direct, secondary, and vicarious copyright infringement against Vimeo, an Internet service provider that allows users to post videos to its website").

25. *Capitol Records*, 826 F.3d at 81 (holding that those recordings are protected by state law, not federal).

26. *Id.* at 99.

27. *Id.* at 88-9.

28. *Id.* (emphasis added).

29. *Id.* at 90 ("Service providers would be compelled either to incur heavy costs of monitoring every posting to be sure it did not contain infringing pre-1972 records, or incurring potentially crushing liabilities under state copyright laws").

Significantly, the court observed that Congress had omitted to qualify the phrase "infringement of copyright" in section 512(c) with the phrase "under this title" as it had in other provisions across the Copyright Act, and therefore concluded the scope of safe harbor was not limited to federal copyright claims.

II. "RED FLAG" KNOWLEDGE

In *Vimeo*, several record companies and music publishing companies brought a copyright infringement action against the online video-sharing platform Vimeo.[30] In this case, the parties filed an interlocutory appeal on certified question—whether "a service provider's viewing of a user-generated video . . . [gave] rise to 'red flag' knowledge of [copyright] infringement."[31] Because the "evidence was not shown to relate to any of the videos at issue" in the copyright infringement action against Vimeo, the Second Circuit held that it was "insufficient to justify a finding of red flag knowledge . . . as to those specific videos."[32] The net effect of this reasoning created a new standard in addressing DMCA safe harbor provisions; "red flag" knowledge is applied on a work-by-work basis.

The Ninth Circuit's decision in *Columbia Pictures Indus., Inc. v. Fung* conflicts with the Second Circuit's decision in *Vimeo*.[33] The defendant in *Fung* argued that he lacked either type of knowledge because he never received the requisite notice of infringement[34] But the Ninth Circuit did not find this argument persuasive. The *Fung* court determined that it did not need to measure the adequacy of the plaintiff's notification of the claimed copyright infringement.[35] Instead, the court adopted a simplified analysis—whether the defendant had red flag knowledge of any infringing activities, while also noting the role of defendant's inducement.[36] Since the defendant had red flag knowledge of a broad range of infringing activities independent of any

30. *Id.* at 81.

31. *Id.* at 87 (stating that the interlocutory appeal also included certified questions of whether safe harbor of DMCA applied to recordings fixed before 1972 and whether evidence showed willful blindness justifying imposition of liability notwithstanding safe harbor provisions).

32. *Id.* at 99 ("[A] showing by plaintiffs of no more than that some employee of Vimeo had some contact with a user-posted video that played all, or nearly all, of a recognizable song is not sufficient to satisfy plaintiffs' burden of proof that Vimeo forfeited the safe harbor [because the] red flag knowledge with respect to *that* video) (emphasis added).

33. Columbia Pictures Indus., Inc. v. Fung, 710 F.3d 1020 (9th Cir. 2013).

34. *Id.* at 1043 ("Under § 512(c)(3)(B), notification of infringement that fails to comply with the requirements set forth in § 512(c)(3)(A) 'shall not be considered . . . in determining whether a service provider has actual knowledge or is aware of facts or circumstances from which infringing activity is apparent.' 17 U.S.C. § 512(c)(3)(B)(i).").

35. *Id.* at 1043.

36. *See id.* at 1043-46

notification, the Ninth Circuit held the DMCA safe harbor provisions were not applicable.[37]

The Ninth Circuit's reasoning in *Fung* expanded the safe harbor analysis—setting the bar much lower. In *Fung*, the court determined that the "record [was] replete with instances of [the defendant] actively encouraging infringement."[38] For example, the *Fung* defendant actively urged users to both upload and download particular copyrighted works.[39] The defendant assisted users in watching copyrighted films.[40] And he assisted users in burning copyrighted materials onto DVDs.[41] The Ninth Circuit employed a common-sense-approach; "it would have been objectively obvious to a reasonable person" the material was copyrighted and not licensed to random members of the public.[42] Additionally, the Ninth Circuit recognized this material as "sufficiently well-known and current," which lowered the red-flag-knowledge-bar lower and thus expanded the safe harbor analysis.[43]

The *Fung* holding came out just one week after the same panel of judges reached a similar decision in *UMG Recordings, Inc. v. Shelter Capital Partners*.[44] The Ninth Circuit reiterated that red flag knowledge requires "specific knowledge of a particular infringing activity.[45] Most significantly, however, the Ninth Circuit did not explicitly mention that "specific knowledge" had to be of a particular work-in-the-suit.[46] *UMG Recordings*' reasoning invited the *Fung* holding one week later—red flag knowledge, which strips a service provider of its entire safe harbor protection, does not have to pertain to a particular work-in-the-suit.[47]

The Ninth Circuit in *Fung* conflicts with the Second Circuit in *Vimeo* over the "current and well-known" standard.[48] In *Vimeo*, the Second Circuit held "the mere fact that a video contains all or substantially all of a piece of recognizable, or even famous, copyrighted music and was [viewed in its entirety] by some employee of a service provider" was not enough "to sustain

37. *Id.* at 1043.

38. *Id.*

39. *Id.*

40. *Id.*

41. *Id.*

42. *Id.* ("[W]hile [the defendant's] inducing actions d[id] not[]render him per se ineligible for protection under § 512(c), they [were] relevant to the court's determination that [the defendant] had 'red flag' knowledge of infringement").

43. *Id.* at 1043.

44. UMG Recordings, Inc. v. Shelter Capital Partners, 718 F.3d 1006 (9th Cir. 2013).

45. *Id.* at 1021.

46. *See id.* at 1021-23.

47. *See Columbia Pictures*, 710 F.3d at 1043.

48. *Capitol Records*, 826 F.3d at 97.

the copyright owner's burden of showing red flag knowledge."[49] Whereas the Ninth Circuit outlined a different standard. In *Fung*, the Ninth Circuit reasoned that infringement "objectively obvious" to a "reasonable person" constitutes red flag knowledge and disqualifies a provider from safe harbor protection.[50] The Ninth Circuit's "objectively obvious" standard effectively set the red-flag-knowledge-bar much lower.[51]

In conclusion, the Second Circuit's decision in *Vimeo* limits red flag knowledge to situations where a service provider actually knows that a specific use of an entire copyrighted work is neither fair use nor licensed, yet does not surmise that it is infringing.[52] The Ninth Circuit decision in *Fung*, however, suggests that Congress expects red flag knowledge to do far more work, incentivizing service providers to act in the face of a red flag, even without notice.[53]

III. THE INTRA-STATE SPLIT

Under the 1976 Copyright Act, sound recordings fixed prior to February 15, 1972, remained under the protection of the state copyright laws where the works were registered.[54]Until the Second Circuit's decision in *Vimeo*, pre-1972 sound recordings had never been covered by federal law.[55] The *Vimeo* holding directly conflicts with the decision of New York's Appellate Division in *UMG Recordings, Inc. v. Escape Media Grp, Inc.*[56] and the view of the Copyright Office.[57] This means that in cases with proper venue in New York, whether or not a defendant can raise a federal defense to a state law claim turns on whether the claim is adjudicated in state or federal court, and thus relies on a jurisdictional hook unrelated to the federal defense. Despite the implications of this intra-circuit split, the whole question here is very simple—whether Congress imposed the DMCA's safe harbor policy on state-protected pre-1972 recordings.

The Second Circuit's decision is not entirely unreasonable. The plain language and structure of the DMCA safe harbor provision supports the Second

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49. *Id.*

50. *See Columbia Pictures*, 710 F.3d at 1043.

51. *Id.*

52. *See Capitol Records,* 826 F.3d at 78.

53. *See Columbia Pictures*, 710 F.3d at 1043.

54. 17 U.S.C. § 301(c) (2012).

55. *See Capitol Records,* 826 F.3d at 81-82 (holding that federal safe harbor protections extend to pre-1972 sound recording that in the past were only governed by state copyright laws).

56. UMG Recordings, Inc. v. Escape Media Grp, Inc., 107 A.D.3d 51, 59 (2013) (concluding that the federal DMCA only applied to post-1972 works).

57. *Id.* at 56.

Circuit's interpretation in *Vimeo*.[58] Congress expressly applied the DMCA to all action for "infringement of copyright," a phrase the Second Circuit read to include actions under both federal and state law, including actions based upon pre-1972 recordings protected only by state law.[59] The Second Circuit also indicated that nowhere in the Copyright Act is the term "infringement of copyright" defined, only "infringer of copyright" is provided a definition.[60] Finally, as the Second Circuit noted, Congress did not limit "infringement" in the safe harbor provisions to infringement claims "under this title," as it did elsewhere in the DMCA and Title 17, which supports the Second Circuit's interpretation.[61]

The construction of 17 U.S.C. § 512(c) invites the Second Circuit's interpretation.[62] In *Vimeo*, the Second Circuit resolved this debate by looking at the DMCA's purpose; for Congress to relieve service providers of the onerous affirmative duty to monitor user uploads for songs by U2, Elvis Costello, Radiohead, Coldplay, Adele, Beyoncé, and Norah Jones, all recorded after 1972, only to impose the burden to monitor equally famous songs by "The Beatles, the Supremes, Elvis Presley, Aretha Franklin, Barbra Streisand, and Marvin Gaye" recorded prior to 1972 is illogical.[63] The Second Circuit thus looked at the purpose of safe harbor provisions.[64] Congress enacted the DMCA to protect copyright holders from online piracy while encouraging the robust expansion of online services.[65] And the safe harbor provisions serve the latter goal by relieving service providers of the crippling liability that would attach if they were strictly liable for every act of copyright infringement by their users.[66]

Although the Second Circuit's holding in *Vimeo* aligns with the purpose of the DMCA, this reasoning relies heavily on several assumptions. To adopt the Second Circuit's reasoning, it must be assumed that Congress used an established phrase to convey a meaning never before ascribed to it and did so without spelling out that new meaning.[67] Moreover, the Second Circuit assumes that Congress intended that new meaning to override (1) its express command that "rights or remedies under the common law or statutes of any

58. *See* 17 U.S.C. § 512(c); *See Capitol Records*, 826 F3d at 89.
59. *Capitol Records,* 826 F.3d at 89.
60. *Id.*
61. *Id.*; 17 U.S.C. §§ 106, 201(a).
62. *See* 17 U.S.C. § 512(c).
63. *See Capitol Records,* 826 F.3d at 90.
64. *Id.*
65. *Id.*; S. REP. NO. 105-190, at 8 (1998).
66. S. REP. NO. 105-190, at 8.
67. Brief for Petitioner at 5, Capitol Records, LLC v. Vimeo, LLC, 826 F.3d 78 (2016) (No. 16-771).

State shall not be annulled or limited by [the Copyright Act]"[68] and (2) the settled presumptions against implied repeal and state-law preemption.[69]

In sum, the plain language and structure of the DMCA safe harbor provisions leave room for debate, which resulted in the intra-circuit split between the Second Circuit and the New York Appellate Division. Although the Second Circuit's interpretation is reasonable, its theory rests on several unqualified assumptions.

IV. THE BALANCE SHIFTS WHEN THE BAR IS SET TOO HIGH

In *Fung*, the Ninth Circuit held that an employee of a service provider, by seeing that numerous famous titles are being uploaded, possessed a red flag knowledge that copyright infringement was likely occurring.[70] The *Fung* holding extends red flag knowledge to *any* infringement not "expeditiously removed" by a service provider, not limited to a work-in-the-suit.[71] The Second Circuit, however, held that *only* red flag knowledge of the work-in-the-suit may be considered in this regard.[72]

Congress could not have intended to require service provider employees to possess industry or legal expertise to adequately suspect likely infringement.

Adopting the Second Circuit's logic places too great a burden on the service provider and defeats the purpose of DMCA safe harbor provisions. Suspecting that copyright infringement is occurring does not require specialized knowledge; it requires mere common-sense. The Second Circuit's opinion conflicts with this common-sense application—a professional employed at a place like Vimeo should be able to make an educated guess that a particular user did not license a song. Applying this common-sense approach aligns with the underlying purpose of the DMCA safe harbor provisions.[73] By enacting the DMCA safe harbor provisions, Congress intended to balance the rights of copyright holders with the takedown capabilities of service providers. This balance is disrupted when the bar is set too high.

The conflict between the Second Circuit and the New York Appellate Division creates an intra-state issue. As addressed earlier, this split means that in cases with proper venue in New York, a defendant's ability to raise a federal defense to a state-law claim is contingent upon whether the claim is adjudicated

68. *Id.* at 2.
69. *Id.* at 27.
70. *See Fung*, 710 F.3d at 1043.
71. *Id.*
72. *See Capitol Records*, 826 F.3d at 97.
73. *See* S. REP. NO. 105-190, at 20 (1998).

in state or federal court. Because New York plays a central role in the music industry, many jurisdictional battles lie ahead unless the conflict is resolved.

When Congress made sound recordings eligible for federal copyright protection, it chose to apply federal law to subsequent creations only, leaving pre-1972 fixed recordings to exclusive state-law governance.[74] In 1971, Congress wrote, "nothing in [the Copyright Act] shall be applied retroactively or construed as affecting in any way rights with respect to sound recordings fixed before the effective date of this Act."[75] Twice thereafter, Congress wrote that "[w]ith respect to sound recordings fixed before February 15, 1972, any rights or remedies under the common law or statutes of any State shall not be annulled or limited by this title."[76] On October 27, 1998, Congress enacted the DMCA, which imposed "limitations on liability" for "infringement of copyright," but did not address pre-1972 recordings.[77] Most importantly, the DMCA enactment did not address the subject of state-law preemption.[78] In 2009, Congress directed the Copyright Office to "conduct a study on the desirability of and means for bringing sound recordings fixed before February 15, 1972, under federal jurisdiction."[79]

The answer is simple: nothing in any relevant statute betrays any intention by Congress to undo this categorical rule.[80] Many indications suggest the answer is that simple. First, Congress repeatedly said it would not "annul or limit" state-law "rights or remedies."[81] In *U.S. Dep't of Treasury v. Fabe*, the Supreme Court made it clear that Congress can be presumed to know that when it writes provisions like the DMCA safe harbor, the courts will treat them as imposing a "clear-statement rule" of non-preemption.[82] Second, the term "infringement of copyright" has always been applied to federal copyright. This is consistent with section 501 of the Copyright Act ("Infringement of Copyright"), which refers specifically to federal rights defined by the Act.[83] Given section 301(c)'s clear and categorical language, in addition to the presumptions against implied repeal and state-law preemption, it would take a

74. *See* Goldstein v. California, 412 U.S. 546, 551-52 (1973).

75. Pub. L. No. 92-140, § 3, 85 Stat. 391, 392 (1971).

76. Pub. L. No. 94-553, § 301(c), 90 Stat. 2541, 2572 (1976).

77. Pub. L. No. 105-304, § 202, 112 Stat. 2860, 2877-86 (1998).

78. *See* Pub. L. No. 105-304, 112 Stat. 2860.

79. H. COMM. ON APPROPRIATIONS, 111TH CONG., OMNIBUS APPROPRIATIONS ACT 2009, H.R. 1105, PUB. L. 111-8, LEG. TEXT AND EXPLANATORY STATEMENT 1769 (Comm. Print 2009).

80. *See* 17 U.S.C. § 301(c) (Pre-1972 recordings are governed by state-law, whereas subsequent recordings are governed by federal law).

81. 17 U.S.C. § 301(c) (2012).

82. *See* U.S. Dep't of Treasury v. Fabe, 508 U.S. 491, 507 (1993).

83. S. REP. NO. 94-473, at 141 (1975).

clear statement from Congress to yield the Second Circuit interpretation. The not-quite-conclusively-ruled-out construction is not persuasive.

The Second Circuit's "textual" and "structural" argument is also misplaced. Terms like "under this title" cannot be used to distinguish between provisions of the Copyright Act that apply only to federally-protected works and those that apply only to state-protected works.[84] Adopting this reasoning leads to absurd results. With limited exceptions, the Copyright Act preempts every equivalent state-law right.[85] Congress thus has no reason to draw federal-state distinctions on a provision-by-provision basis. Indeed, a phrase like "under this title," or "under this section," is merely used to order interactions between provisions of federal law.[86] The Second Circuit also sidesteps any consideration as to whether "under this title" is interchangeable with "under this subsection," or "under this section," which are common phrases not just to the DMCA, but the entire U.S. Code. The Second Circuit's interpretation gives transformative effect to an unremarkable statutory phrase.

CONCLUSION

The damage done by the Second Circuit's decision is not limited to these harms. This decision upends the law on which the music industry has come to rely. Because pre-1972 sound recordings remain so popular, the music industry routinely invests substantial sums to acquire, promote, and market these recordings.[87] Pre-1972 recordings are regularly licensed for a variety of uses, such as sampling an inclusion in movies, television, and video games. Before *Vimeo*, the owners and recording artists with rights in these recordings could rely on state-law to protect their interests. Whereas the Second Circuit holding in *Vimeo* turns this status quo on its head. In conclusion, the Second Circuit's interpretation of the DMCA safe harbor provision is unreasonable and merits review by the Supreme Court.

84. 17 U.S.C. §§ 301(a), (c), (d).
85. 17 U.S.C. § 301(a).
86. *See id.*
87. *See* Plevan, *supra* note 4.