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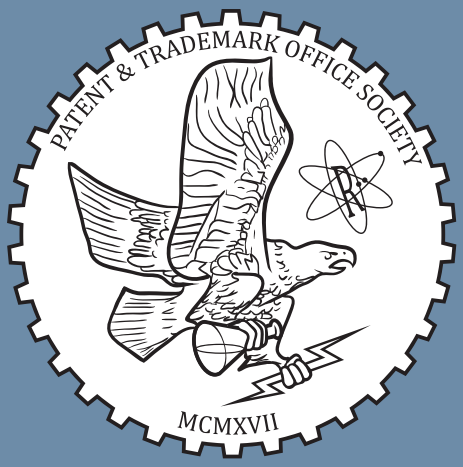

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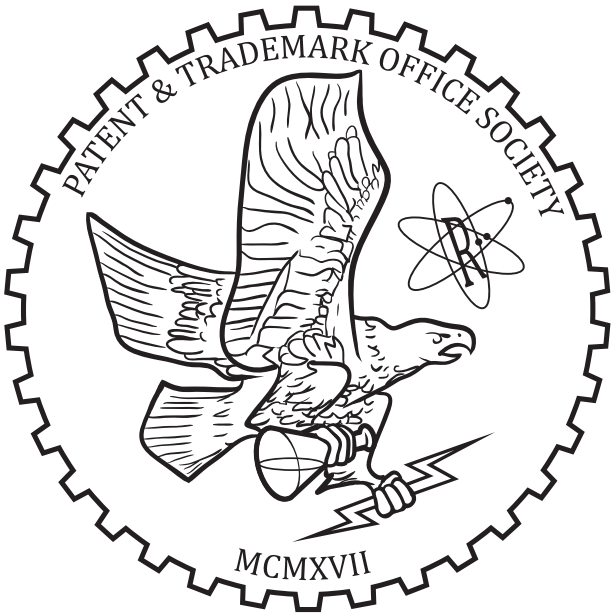

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Alice at Seven

Jasper L. Tran[*]

Abstract

This paper reviews Alice v. CLS Bank's *impact seven years after its issuance and examines the 30 Federal Circuit cases (including their exemplary patent claims) that found eligibility upon* Alice *challenges. The* Alice *invalidation rates at the Federal Circuit (79%) and district courts (51.8%) have lowered over time, averaging cumulatively 55.8% at its six-year mark.*

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Introduction

Alice Corp. v. CLS Bank Int'l[1] (commonly known as "*Alice*") is no stranger to IP readers and needs little introduction. Briefly, the Supreme Court over seven years ago decided *Alice* and raised the patentability standard for (mostly) computer-implemented inventions under 35 U.S.C. § 101,[2] such that implementing an abstract idea on a computer is insufficient to transform that idea into patentable subject matter.[3] At the time, a Supreme Court justice even considered *Alice* a "minor case" in following its prior § 101 framework set forth in *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*[4] two years earlier.[5] But the reality has been the opposite – *Alice* has been a major force in patentability determinations under § 101.

[1] 573 U.S. 208 (2014).

[2] Certain categories are enumerated as patentable in 35 U.S.C. § 101: "process[es], machine[s], manufacture[s], [and] composition[s] of matter." However, there are several exceptions "implicit" in § 101: patents cannot be obtained for "[l]aws of nature, natural phenomena, and abstract ideas." Mayo Collaborative Servs. v. Prometheus Labs., Inc., 566 U.S. 66, 70 (2012) (quoting Diamond v. Diehr, 450 U.S. 175, 185 (1981)).

[3] *Alice*, 573 U.S. at 218–21.

[4] 566 U.S. 66 (2012).

[5] Jasper L. Tran, *Two Years After* Alice v. CLS Bank, 98 J. Pat. & Trademark Off. Soc'y 354, 357 (2016); *see also* Hon. Timothy B. Dyk, *Thoughts on the Relationship Between the Supreme Court and the Federal Circuit*, 16 Chi.-Kent J. Intell. Prop. 67, 74 (2016) ("Before the Supreme Court's decisions in *Bilski*, *Mayo*, *Myriad*, and *Alice*, challenges to patentability based on 35 U.S.C. § 101 were rare. Those challenges now consume a significant portion of our [Federal Circuit] docket."). In fact, the decade preceding *Mayo* only saw a handful of district court cases that invalidated patents under § 101. *See* Climax Molybdenum Co. v. Molychem, LLC, No. 02-cv-311, 2007 WL 3256698 (D. Colo. Nov. 1, 2007); Perfect Web Techs., Inc. v. Infousa, Inc., 89 U.S.P.Q.2d 2001 (S.D. Fla. 2008), *aff'd on other ground*, 587 F.3d 1324 (Fed. Cir. 2009); CyberSource Corp. v. Retail Decisions, Inc., 620 F. Supp. 2d 1068 (N.D. Cal. 2009), *aff'd*, 654 F.3d 1366 (Fed. Cir. 2011); DealerTrack, Inc. v. Huber, 657 F. Supp. 2d 1152 (C.D. Cal. 2009), *aff'd in part, vacated in part, rev'd in part*, 674 F.3d 1315 (Fed. Cir. 2012); Fort Props., Inc. v. Am. Master Lease LLC, 609 F. Supp. 2d 1052 (C.D. Cal. 2009), *aff'd*, 671 F.3d 1317 (Fed. Cir. 2012); Bancorp Servs., L.L.C. v. Sun Life Assurance Co. of Can., 771 F. Supp. 2d 1054 (E.D. Mo. 2011), aff'd, 687 F.3d 1266 (Fed. Cir. 2012); Glory Licensing LLC v. Toys "R" Us, Inc., 2011 WL 1870591 (D.N.J. May 16, 2011); VS Techs., LLC v. Twitter, Inc., 2012 WL 1481508 (E.D. Va. Apr. 27, 2012); CLS Bank Int'l v. Alice Corp. Pty.

For example, in the first month and a half following *Alice*'s release, 830 patent applications were withdrawn from the United States Patent and Trademark Office ("USPTO").[6] At *Alice*'s one-year anniversary (June 19, 2015), lower courts (namely district courts, the Patent Trial and Appeal Board ("PTAB"), and the Federal Circuit) applied *Alice* to invalidate or reject software-based patent claims at an average invalidation rate of 82.9%: 69.7% at the district courts and 94.1% at the Federal Circuit.[7] At *Alice*'s two-year mark (June 19, 2016), the numbers were slightly lower, at an average cumulative invalidation rate of 78.2%: 66.5% at the district courts and 92.3% at the Federal Circuit.[8] When *Alice* was at six (June 19, 2020), the cumulative numbers, as shown in TABLE 1,[9] were even lower (though still the majority); the average cumulative invalidation rate was 55.8%: 51.8% at the district courts and 79% at the Federal Circuit.[10] Specifically, the district courts found ineligibility in 416 out of 803 *Alice* challenges and the Federal Circuit in 109 out of 138. Courts (including the PTAB) have invalidated more than 1,000 patents, and more than 60,000 patent applications have been abandoned before the USPTO following § 101 rejections.[11]

Ltd., 768 F. Supp. 2d 221 (D.D.C. 2011), *aff'd*, 717 F.3d 1269 (Fed. Cir. 2013) (en banc), *aff'd* 134 S. Ct. 2347 (2014); Ass'n for Molecular Pathology v. USPTO, 702 F. Supp. 2d 181 (S.D.N.Y. 2010), *aff'd in part, rev'd in part*, 689 F.3d 1303 (Fed. Cir. 2012), *aff'd in part, rev'd in part*, Ass'n for Molecular Pathology v. Myriad Genetics, Inc., 569 U.S. 576 (2013); King Pharms., Inc. v. Eon Labs, Inc., 593 F. Supp. 2d 501 (E.D.N.Y. 2009) (finding four claims ineligible), *aff'd on other grounds, vacated in part*, 616 F.3d 1267 (Fed. Cir. 2010) (reversing § 101 invalidity determination).

[6] Tristan Gray-Le Coz & Charles Duan, *Apply It to the USPTO: Review of the Implementation of* Alice v. CLS Bank *in Patent Examination*, 2014 PATENTLY-O PAT. L.J. 1, 3 (2014).

[7] Jasper L. Tran, *Software Patents: A One-Year Review of* Alice v. CLS Bank, 97 J. PAT. & TRADEMARK OFF. SOC'Y 532, 545 (2015). Among other things, this *One-Year Review* article discusses *Alice*'s procedural posture in detail.

[8] *Two Years*, *supra* note 5, at 370. As an additional data point, a study examining "each one of the Federal Circuit's more than 100 decisions on patentable subject matter in the three years since *Alice*, including affirmances issued without an opinion under Federal Circuit Rule 36 . . . found the patent to be invalid in more than 90% of its decisions." Paul Gugliuzza & Mark A. Lemley, *Can a Court Change the Law by Saying Nothing?*, 71 VAND. L. REV. 765, 765 (2018).

[9] *See* Mark A. Perry & Jaysen Chung, *Alice at Six: Patent Eligibility Comes of Age*, 20 CHI.-KENT J. INTELL. PROP. 64, 72 (2021). The data, calculated by the number of cases, covers software/technology patents (as the unsurprising majority) and biotechnology/life science patents, but excludes *Alice* challenges for covered business method (CBM) review. For the list of cases and their brief summary, see *id.* at Appendix A, available at https://scholarship.kentlaw.iit.edu/cgi/viewcontent.cgi?article=1298&context=ckjip.

[10] When comparing the numbers in Table 1 above with the numbers at *Alice*'s near five-year mark (March 1, 2019), not much has changed—unsurprisingly. *Cf.* Jasper L. Tran & J. Sean Benevento, Alice *at Five*, 2019 PATENTLY-O PAT. L.J. 25, 28 (2019) (reporting the average cumulative invalidation rate of 56.2%, including 53.7% at the district courts and 76.3% at the Federal Circuit). As a point of reference, the invalidation rate for patents challenged under *Alice* from *Berkheimer*'s issuance (February 2018) to June 2020 had dropped from 67% to 42%. Ryan Davis, Alice *Still Packs a Punch, but with a Little Less Sting*, LAW360 (June 19, 2020, 8:38 PM); *see also* Mark A. Lemley & Samantha Zyontz, *Does* Alice *Target Patent Trolls?* 18 J. EMPIRICAL LEGAL STUD. 47, 64–65 (2021) (noting that the premature outcomes at the district court's § 101 cases has risen on average from 21% pre-*Berkheimer* to 28% post-*Berkheimer*); Perry & Chung, *supra* note 9, at 83 (noting 47% of 154 district court decisions denying early § 101 motions as premature (i.e., factual issues, claim construction) issued in the two years post-*Berkheimer*). Put differently, the observable trend is that the invalidation rate has been decreasing since *Alice*'s issuance, such that the invalidation rate was higher in cases closer to *Alice*'s release. Also worth noting is that the invalidation rate does not follow a normal Gaussian distribution, but is rather left-skewed (or negative skewness, with higher invalidation rate on the right of the x-axis). While the average, as in all statistics, does not tell much about the distribution of each individual data point, it does provide some perspective on the whole group.

[11] *See* Robert R Sachs et al., *Benevolent Despot or Tyrant?* Alice v CLS Bank *Five Years on*, IAM (May 23, 2019).

Table 1	Ineligible	Eligible	Premature to Determine	Total
District Court	416 cases 51.8%	233 cases 29%	154 cases 19.2%	803 cases
Federal Circuit	109 cases 79%	25 cases 18.1%	4 cases 2.9%	138 cases
Total	525 cases 55.8%	258 cases 27.4%	158 cases 16.8%	941 cases

The reasoning for such a high invalidation rate is simple: *Alice* set forth a two-step test to determine whether a challenged patent or patent application is subject matter eligible, and the majority of patents and patent applications have not been able to meet this test.[12] At step one, courts ask "whether the claims at issue are directed to one of those patent-ineligible concepts" (laws of nature, natural phenomena, and abstract ideas).[13] Patent-eligible claims under this step are specific and clearly indicate the improvement over the prior art.[14] Eligible system claims tend to improve the functioning of the computer system itself,[15] while eligible method claims focus on a specific process and how that process is "new and useful."[16] The specification can provide helpful evidence to support eligibility, if it identifies particular improvements over the prior art.[17]

If the claims are directed to "one of [the] patent-ineligible concepts," such as an abstract idea, then the courts proceed to step two to determine whether "the elements of each claim both individually and 'as an ordered combination'" disclose an "inventive concept."[18] If an inventive concept is present, then the claims are patent-eligible.[19] The Federal Circuit explained step two in *Bascom* that "an inventive concept can be found in the non-conventional and non-generic arrangement of known, conventional pieces."[20] Additionally, the Federal Circuit clarified in *Berkheimer* and *Aatrix* that "whether a claim element or combination of

[12] Alice Corp. v. CLS Bank Int'l, 573 U.S. 208, 217–18 (2014).

[13] *Id.* at 217.

[14] *See, e.g.*, Visual Memory LLC v. NVIDIA Corp., 867 F.3d 1253, 1258 (Fed. Cir. 2017) (noting that "key question" in *Enfish* step one was whether "focus of the claims [is] . . . on the specific asserted improvement" (citing Enfish, LLC v. Microsoft Corp., 822 F.3d 1327, 1335–36 (Fed. Cir. 2016))).

[15] *See, e.g.*, *Enfish*, 822 F.3d at 1335 (holding that step one requires deciding "whether the claims are directed to an improvement to computer functionality versus being directed to an abstract idea").

[16] *Rapid Litigation Management Ltd. v. CellzDirect*, 827 F.3d at 1048 (Fed. Cir. 2016) (finding that "the claims are directed to a *new and useful method*" (emphasis added)).

[17] *See, e.g.*, *Visual Memory*, 867 F.3d at 1259, 1260 (The specification "discusses the advantages offered by the technological improvement.").

[18] *Alice*, 573 U.S. at 217–18 (quoting Mayo Collaborative Servs. v. Prometheus Labs., Inc., 566 U.S. 66, 72, 78–80 (2012)).

[19] *Alice*, 573 U.S. at 217–18. In contrast, "[i]t is well settled, though, that automating conventional activities using generic technology does not amount to an inventive concept." LendingTree, LLC v. Zillow, Inc., 656 F. App'x 991, 996 (Fed. Cir. 2016). *See, e.g., id.* (finding claims for internet-based loan applications ineligible); In re Salwan, 681 F. App'x 938, 941 (Fed. Cir. 2017) (finding claims for electronic medical record management ineligible); FairWarning IP, LLC v. Iatric Sys., Inc., 839 F.3d 1089, 1094 (Fed. Cir. 2016) (finding claims for detecting fraudulent access of medical information ineligible); Tranxition, Inc. v. Lenovo (United States) Inc., 664 F. App'x 968, 972 (Fed. Cir. 2016) (finding claims for automated migration of computer configuration information ineligible); OIP Techs., Inc. v. Amazon.com, Inc., 788 F.3d 1359, 1364 (Fed. Cir. 2015) (finding claims for automated price optimization ineligible).

[20] Bascom Glob. Internet Servs., Inc. v. AT&T Mobility LLC, 827 F.3d 1341, 1350 (Fed. Cir. 2016). *Bascom* is discussed in more detail *infra* as case #3.

elements would have been well-understood, routine, and conventional to a skilled artisan in the relevant field at a particular point in time is a question of fact."[21] The test appears, in practice, to be highly subjective[22] and many judges have been confused as to how to apply the *Alice* test.[23] For example, the Federal Circuit's 7-5 denial of rehearing *en banc* in *Athena Diagnostics, Inc. v. Mayo Collaborative Servs., LLC* includes *eight* separate opinions.[24] All eight opinions call for Supreme Court[25] or Congressional intervention.[26]

[21] Berkheimer v. HP Inc., 881 F.3d 1360, 1368 (Fed. Cir. 2018); Aatrix Software, Inc. v. Green Shades Software, Inc., 882 F.3d 1121, 1128 (Fed. Cir. 2018). *Aatrix* is discussed in more detail *infra* as case #11.

[22] *See, e.g.*, Sachs, *supra* note 11 ("*Alice* test is a fancy 'I know it when I see it' shorthand for judges to use to decide whether patent claims have so-called 'inventive merit.'"). *See generally* Jacobellis v. Ohio, 378 U.S. 184, 197 (1964) (Stewart, J., concurring) ("But I know it when I see it . . . .).

[23] For testimonies on such confusion by current and former Federal Circuit judges as well as former USPTO Commissioners, among others, see David O. Taylor, *Confusing Patent Eligibility*, 84 Tenn. L. Rev. 157, 240–44 (2016). A survey of 231 patent attorneys from the 2017 Vault Twenty-Five Best Law Firms for Intellectual Property found that patent prosecutors correctly predicted court outcomes 67.3% of the time, and patent litigators did so at 59.7%. Jason D. Reinecke, *Is the Supreme Court's Patentable Subject Matter Test Overly Ambiguous? An Empirical Test*, 2019 Utah L. Rev. 581, 594, 599, 605 (2019) (concluding that "attorneys might be more worried about *Alice*'s scope than they should be"); *cf.* Jasper L. Tran, *Abstracting About Abstract Idea*, 102 Iowa L. Rev. Online 60 (2016) (joking about the ongoing confusion in applying "abstract idea" under *Alice*). Interestingly, with enough data points post-*Alice*, artificial intelligence (machine learning) has been utilized (to assist humans) to predict which claims would be rejected under the *Alice* test. *See* Ben Dugan, *Mechanizing* Alice*: Automating the Subject Matter Eligibility Test of* Alice v. CLS Bank, 2018 U. Ill. J.L. Tech. & Pol'y 33 (2018).

[24] No. 2017-2508, 2019 WL 2847219 (Fed. Cir. July 3, 2019). To summarize *Athena*, (1) concurring opinion by Judge Lourie (joined by Judges Reyna and Chen): Although we disagree with the Supreme Court, we are bound by its precedent. Thus, there is no need to revisit this case. (2) Concurring opinion by Judge Hughes (joined by Chief Judge Prost and Judge Taranto): "[T]his is not a problem that we can solve. As an inferior appellate court, we are bound by the Supreme Court. . . . I, for one, would welcome further explication of eligibility standards in the area of diagnostics patents." (3) Concurring opinion by Judge Dyk (joined by Judge Hughes, and partially joined by Judge Chen): Section 101 is necessary — sometimes it is the only defense against overbroad patents that would stifle future discoveries. However, the claims in this case are specific enough to have proven utility and provide the Supreme Court with a good vehicle "to refine the *Mayo* framework." And "it is the Supreme Court, not this [Federal Circuit] court, that must reconsider the breadth of *Mayo*." (4) Concurring opinion by Judge Chen: Under *Diehr*, the claims are patent eligible — but not under *Mayo*. (5) Dissenting opinion by Judge Moore (joined by Judges O'Malley, Wallach, and Stoll): The claims in this case should be held eligible, and they are distinguishable from *Mayo* — especially when that case is read in light of *Myriad*. The litigants' "only hope lies with the Supreme Court or Congress." (6) Dissenting opinion by Judge Newman (joined by Judge Wallach): Medical diagnostics methods are critically important for society and the patent system should encourage their development. *Mayo* does not create any anti-diagnosis rule. (7) Dissenting opinion by Judge Stoll (joined by Judge Wallach): Although the decision here is foreclosed by Mayo, the court should rehear the case because it is so important. (8) Dissenting opinion by Judge O'Malley: The Supreme Court is simply wrong in its statutory interpretation of § 101. *See* Dennis Crouch, *Athena Loses on Eligibility – Although 12 Federal Circuit Judges Agree that Athena's Claims Should Be Eligible*, Patently-O (July 3, 2019), https://patentlyo.com/patent/2019/07/eligiblity-although-eligible.html.

[25] *See, e.g.*, Va. Innovation Scis. Inc. v. Amazon.com, Inc., 227 F. Supp. 3d 582, 592 n.3 (E.D. Va. 2017) (The Federal Circuit "cases in which patents were upheld as directed to patent-eligible subject matter are often the most instructive because they help set the boundaries of § 101 invalidity determinations."), *aff'd sub nom.*, Va. Innovation Scis., Inc. v. HTC Corp., 718 F. App'x 988 (Fed. Cir. 2018). Although the Supreme Court asked the Solicitor General ("SG") to weigh in, which he recommended the Court to take the case, the Court nonetheless denied Athena's cert petition on January 13, 2020. *See* Athena Diagnostics, Inc. v. Mayo Collaborative Servs., LLC, 140 S. Ct. 855 (2020). A cert petition with a similar posture from the Supreme Court's 2020 term is currently pending the Court in its 2021 term, awaiting for the SG to weigh in. *See* Am. Axle & Mfg. Inc. v. Neapco Holdings LLC, No. 20-891, 2019 WL 11611081 (Dec. 28, 2020). Even if the SG ends up recommending the Court to take the case, it would be unsurprising if Am. Axel's cert petition would suffer the same fate as Athena's cert petition. This is especially so in light of the fact that the Supreme Court has denied more than 50 cert petitions on § 101 grounds since *Alice*, sending a clear message that it is not interested in re-hearing the § 101 issue any time soon.

[26] *See also, e.g.*, Berkheimer v. HP Inc., 890 F.3d 1369, 1374 (Fed. Cir. 2018) (Lourie, J., joined by Newman, J., concurring) (per curiam) ("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."); *accord* Aatrix Software, Inc. v. Green Shades Software, Inc., 890 F.3d 1354, 1360 (Fed. Cir. 2018) (Lourie, J., joined by Newman, J., concurring) (per curiam); Interval Licensing LLC v. AOL, Inc., 896 F.3d 1335, 1353 (Fed. Cir. 2018) (Plager, J., concurring-in-part, dissenting-

While the Federal Circuit has heard more than 140 § 101 cases in the seven years since *Alice*, worth noting are several categories of cases. Most of the Federal Circuit's post-*Alice* cases fall into the first category, where the Court has found *ineligibility* for patent claims analytically similar to *Alice*, such as business methods and fundamental economic practices using known technology in a routine and conventional manner,[27] and the collection or manipulation of data.[28] Similarly, the Court has consistently found *ineligibility* for diagnostic method claims under *Alice*'s predecessor—*Mayo*.[29] In contrast, biotechnology and life science patents are more likely to survive § 101 challenges compared to software or IT patents.[30] More importantly, 30 cases that stood out from the crowd are those that applied the *Alice* two-step test and actually found *eligibility* in light of *Alice*.[31] Because the Federal Circuit's patent cases are binding on the lower courts (district courts and

in-part) ("go[ing] on record as joining [his] colleagues who have recently expressed similar views about the current state of our patent eligibility jurisprudence, [including Judges Lourie and Newman in *Berkheimer*, as well as] Judge Richard Linn's concurring and dissenting in Smart Systems Innovations, LLC v. Chicago Trans-t Authority, [873 F.3d 1364, 1376 (Fed. Cir. 2017) that] critiqued at length the 'abstract ideas' idea"); Kristen Osenga, *Institutional Design for Innovation: A Radical Proposal for Addressing* § *101 Patent-Eligible Subject Matter*, 68 Am. U. L. Rev. 1191, 1191 (2019) ("The doctrine of patent-eligible subject matter is a mess, and it is weakening patent rights in this country. Nearly everyone, from the bar to the bench and from academia to industry, has called for reform.").

[27] Perry & Chung, *supra* note 9, at 73; *see, e.g.*, Ultramercial, Inc. v. Hulu, LLC, 772 F.3d 709, 717 (Fed. Cir. 2014) (finding ineligible advertising method where advertisers pay for Internet users to view copyrighted materials in exchange for viewing their advertisement); OIP Technologies, Inc. v. Amazon.com, Inc. 788 F.3d 1359, 1364 (Fed. Cir. 2015) (finding ineligible price-optimization method); Mortgage Grader, Inc. v. First Choice Loan Servs., Inc. 811 F.3d 1314, 1326 (Fed. Cir. 2016) (finding ineligible systems and methods for assisting borrowers in obtaining loans); Smartflash LLC v. Apple Inc., 680 F. App'x 977, 984 (Fed. Cir. 2017) (finding ineligible systems and methods for accessing data based on payment); Innovation Scis., LLC v. Amazon.com, Inc., 778 F. App'x 859, 864 (Fed. Cir. 2019) (finding ineligible online method for a payment server to support online buying over the Internet).

[28] Perry & Chung, *supra* note 9, at 74; *see, e.g.*, Content Extraction and Transmission, LLC v. Wells Fargo Bank, 776 F.3d 1343, 1347–49 (Fed. Cir. 2014) (finding ineligible computerized method of digitizing, recognizing, and storing data contained in physical documents); Affinity Labs of Texas, LLC v. Amazon.com, Inc., 838 F.3d 1266, 1272 (Fed. Cir. 2016) (finding ineligible systems for delivering selected media content to portable devices); Intellectual Ventures I LLC v. Capital One Financial Corp., 850 F.3d 1332, 1342 (Fed. Cir. 2017) (finding ineligible systems and methods for collecting, displaying, and manipulating data in XML documents); RecogniCorp, LLC v. Nintendo Co., 855 F.3d 1322, 1328 (Fed. Cir. 2017) (finding ineligible methods for encoding and decoding image data); SAP America Inc. v. InvestPic, LLC, 898 F.3d 1161, 1170 (Fed. Cir. 2018) (finding ineligible systems and methods for calculating, analyzing, and displaying investment data); Dropbox, Inc. v. Synchronoss Techs., 815 F. App'x 529, 534 (Fed. Cir. 2020) (finding ineligible systems for associating a security level with access to data).

[29] Perry & Chung, *supra* note 9, at 77–79; *see, e.g.*, Ariosa Diagnostics, Inc. v. Sequenom, Inc., 788 F.3d 1371, 1373-74, 1379–80 (Fed. Cir. 2015) (finding ineligible method of detecting paternally inherited cell-free fetal DNA in maternal blood); Genetic Techs., Ltd. v. Merial L.L.C., 818 F.3d 1369, 1374–77 (Fed. Cir. 2016) (finding ineligible method of detecting a coding region of a person's genome based on a natural correlation between variations in DNA sequence non-coding regions and allele presence in coding regions); Cleveland Clinic Found. v. True Health Diagnostics LLC, 859 F.3d 1352, 1360–63 (Fed. Cir. 2017) (finding ineligible method of detecting cardiovascular disease in a patient based on a natural correlation between certain enzyme levels and cardiovascular disease); Roche Molecular Sys., Inc. v. CEPHEID, 905 F.3d 1363, 1371, 1374 (Fed. Cir. 2018) (finding ineligible method of detecting a bacterium in a biological sample); Athena Diagnostics v. Mayo Collaborative Servs., 915 F.3d 743, 754–55 (Fed. Cir. 2019) (finding ineligible method of diagnosing neurological disorders by detecting antibodies to a certain protein based on a natural correlation between the presence of those antibodies and the neurological disorders); Cleveland Clinic Found. v. True Health Diagnostics LLC, 760 F. App'x 1013, 1019 (Fed. Cir. 2019) (finding ineligible method of detecting elevated levels of a certain enzyme in the blood sample of a person with cardiovascular disease, in comparison to a control group).

[30] *See* Lemley & Zyontz, *supra* note 10, at 68 (finding patents invalidated at 65.1% of 724 software or IT cases, but only at 50% of 76 biotechnology or life science cases, after reviewing 808 § 101 decisions from the Federal Circuit and district courts five years post-*Alice*); Gugliuzza & Lemley, *supra* note at 8, at 790 (observing that biotechnology's higher likelihood of surviving § 101 challenges than IT after reviewing more than 100 Federal Circuit § 101 decisions three years post-*Alice*).

[31] For an ongoing tally of post-*Alice* Federal Circuit cases, not including no-opinion affirmances under Federal Circuit Rule 36, see https://www.bitlaw.com/patent/section-101-cases.html.

the PTAB), these 30 Federal Circuit cases have been elevated to a status where they operate as a protective shield for patent owners. Because the challenged patents' claims in these cases have survived the *Alice* test, these claims have become exemplary such that many other challenged patent claims want to analogize to, in hopes of being similarly shielded from the *Alice* scythe.[32] Given *Alice*'s subjective test, patent litigators who represent alleged infringers may also benefit by understanding the facts of these Federal Circuit opinions that found eligibility to better prepare their cases. To that end, this paper showcases these 30 exemplary cases to illuminate what claims the Federal Circuit has considered patent eligible in applying *Alice*,[33] followed by a discussion of the USPTO's Patent Subject Matter Eligibility Guidance issued in January and October of 2019—the latter of which is the most current version.[34] Each case summary[35] includes a claim chart illustrating the representative claims at issue for ease of comparison to other claims of interest.[36] The paper ends with concluding thoughts on the regression toward the mean in law, including patent law's IPR and § 101.

[32] *See, e.g.*, Amdocs (Israel) Ltd. v. Openet Telecom, Inc., 841 F.3d 1288 (Fed. Cir. 2016) (analogizing the representative claim at issue to those in DDR Holdings, LLC v. Hotels.com, L.P., 773 F.3d 1245, 1248 (Fed. Cir. 2014) and Bascom Glob. Internet Servs., Inc. v. AT&T Mobility LLC, 827 F.3d 1341 (Fed. Cir. 2016) (stating "Claim 1 is similar to the claims in *DDR Holdings* and *BASCOM*"). These 30 cases together have formed the Federal Circuit's *positive* jurisprudence on § 101 in the seven years post-*Alice*. In contrast, the Federal Circuit cases that found no patent-eligible subject matter in the seven years post-*Alice*—though less but still nonetheless informative—belong to the Federal Circuit's *negative* jurisprudence on § 101.

[33] As Giles Rich, the father of the Patent Act of 1952, put it, "the name of the game is the claim." CLS Bank Int'l v. Alice Corp. Pty., 717 F.3d 1269, 1331 (Fed. Cir. 2013) (Linn & O'Malley, J., dissenting) (quoting Hon. Giles Sutherland Rich, *Extent of Protection and Interpretation of Claims: American Perspectives*, 21 Int'l Rev. Indus. Prop. & Copyright L. 497, 499 (1990)); *see also* 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.").

[34] *See* 2019 Revised Patent Subject Matter Eligibility Guidance, 84 Fed. Reg. 50 (Jan. 7, 2019); October 2019 Patent Eligibility Guidance Update, 84 Fed. Reg. 55942 (Oct. 18, 2019), *available at* https://www.uspto.gov/sites/default/files/documents/peg_oct_2019_update.pdf.

[35] To be abundantly clear, the case summary, including especially the discussion of the inventions, is meant for a strictly factual construction, and should not be attributed as opinions of the authors' employer (and its current/former clients). That is, any statements that lack "plaintiff alleged" or "according to the court" should be construed as though they have already had such a qualifier.

[36] The Federal Circuit did not specifically find a representative claim in every case. In the cases with no explicit finding, the case discussion highlights the claim or claims which the Federal Circuit focused its analysis on.

Federal Circuit's § 101 Cases Finding Eligibility

1. DDR Holdings, LLC v. Hotels.com (Dec. 5, 2014)[37]

Representative Claim 19 of U.S. Patent No. 7,818,399[38]	
[19]	A system useful in an outsource provider serving web pages offering commercial opportunities, the system comprising:
[19(a)]	a computer store containing data, for each of a plurality of first web pages, defining a plurality of visually perceptible elements, which visually perceptible elements correspond to the plurality of first web pages;
[19(a)(i)]	wherein each of the first web pages belongs to one of a plurality of web page owners;
[19(a)(ii)]	wherein each of the first web pages displays at least one active link associated with a commerce object associated with a buying opportunity of a selected one of a plurality of merchants; and
[19(a)(iii)]	wherein the selected merchant, the out-source provider, and the owner of the first web page displaying the associated link are each third parties with respect to each other;
[19(b)]	a computer server at the outsource provider, which computer server is coupled to the computer store and programmed to:
[19(b)(i)]	receive from the web browser of a computer user a signal indicating activation of one of the links displayed by one of the first web pages
[19(b)(ii)]	automatically identify as the source page the one of the first web pages on which the link has been activated;
[19(b)(iii)]	in response to identification of the source page, automatically retrieve the stored data corresponding to the source page; and
[19(b)(iv)]	using the data retrieved, automatically generate and transmit to the web browser a second web page that displays: (A) information associated with the commerce object associated with the link that has been activated, and (B) the plurality of visually perceptible elements visually corresponding to the source page.

In *DDR Holdings, LLC v. Hotels.com*, the Federal Circuit considered the eligibility of a patent "directed to systems and methods of generating a composite web page that combines certain visual elements of a 'host' website with content of a third-party merchant."[39] Prior to this patent, when a visitor clicked on an advertisement for a third-party merchant, the link would direct traffic away from the "host" website and to the third-party's website.[40] The patent at issue prevents merchants from

[37] 773 F.3d 1245 (Fed. Cir. 2014).
[38] *See id.* at 1249–50. Claim 19 is representative of claims 1, 3, and 19. *See* id. at 1249–50, 1255.
[39] *Id.* at 1248.
[40] *Id.*

taking web traffic away from the host.[41] When a visitor clicks a link on the host's website (*e.g.*, a third-party advertisement), the patented system creates a combined page which "retains the host website's 'look and feel'" while simultaneously "display[ing] product information from the third-party merchant."[42]

The Federal Circuit held the patent at issue "clear[ed] the § 101 hurdle" and was patent-eligible.[43] In making its decision, the court looked to the two-step test identified in *Alice*.[44]

The Federal Circuit began its analysis by examining what constitutes a patent-ineligible abstract idea, noting the difficulty of distinguishing between claims that are patent-eligible and those that "add too little to a patent-ineligible abstract concept."[45] Claims that are ineligible are those that are "in substance . . . directed to nothing more than the performance of an abstract business practice on the Internet or using a conventional computer," even if they "recite[] various computer hardware elements."[46] Thus, claims should not be "recited too broadly and generically to be considered sufficiently specific and meaningful applications of their underlying abstract ideas."[47]

The Federal Circuit recognized that it not easy to determine "the precise nature of the abstract idea" as required by step one of *Alice*.[48] Because the claims were eligible under step two, the court moved on without making a specific step one holding.[49]

It explained that, though the claims solve a "business challenge" ("retaining website visitors"), that challenge is "particular to the Internet."[50] In other words, the claims "do not merely recite the performance of some business practice known from the pre-Internet world, along with the requirement to perform it on the Internet."[51] These claims do more than that: "the claimed solution is *necessarily rooted* in computer technology in order to overcome a problem specifically arising in the realm of computer networks."[52] The court found an inventive concept because the claims do not involve a computer network "operating in its normal, expected manner."[53] Instead, the claims send the "visitor to [a] . . . hybrid web page that presents product information from the third party and visual 'look and feel' elements from the host website."[54]

In his dissent, Judge Mayer did not agree with the majority's inventive concept.[55] He found that the claims "simply describe an abstract concept . . . and apply that

[41] *See id.*
[42] *Id.* at 1248–49.
[43] *Id.* at 1255.
[44] *See id.*
[45] *Id.*
[46] *Id.* at 1256.
[47] *Id.*
[48] *Id.* at 1257.
[49] *See id.*
[50] *Id.*
[51] *Id.*
[52] *Id.* (emphasis added).
[53] *Id.* at 1258. The "normal, expected" operation, according to the court, was "sending the website visitor to the third party website that appears to be connected with the clicked advertisement . . . ." *Id.* at 1258–59.
[54] *Id.* at 1259.
[55] *See id.* at 1263 (Mayer, J., dissenting).

concept using a generic computer."[56] He would have held no inventive concept for "achieving [the] goal" described by the claims.[57] In his view, the claims were simply the well-known "idea of having a 'store within a store'" accomplished over the internet.[58]

2. *Enfish, LLC v. Microsoft Corp.* (May 12, 2016)[59]

Representative Claim 17 of U.S. Patent No. 6,151,604[60]	
[17]	A data storage and retrieval system for a computer memory, comprising:
[17(a)]	means for configuring said memory according to a logical table, said logical table including:
[17(a)(i)]	a plurality of logical rows, each said logical row including an object identification number (OID) to identify each said logical row, each said logical row corresponding to a record of information;
[17(a)(ii)]	a plurality of logical columns intersecting said plurality of logical rows to define a plurality of logical cells, each said logical column including an OID to identify each said logical column; and
[17(a)(iii)]	means for indexing data stored in said table.

The Federal Circuit considered a patent on database software in *Enfish, LLC v. Microsoft Corp.*[61] Enfish, LLC asserted two patents against Microsoft: U.S. Patent No. 6,151,604 ("the '604 patent") and U.S. Patent No. 6,163,775 ("the '775 patent").[62]

Prior to the patents at issue, databases stored information in different tables, separated by the type of information each table contained.[63] For example, databases would have a table called "Document Table" that stored information about various documents, while information about various companies would be stored in a separate "Company Table."[64] In the patented system, everything could be stored in one table.[65] The inventive table was also self-referential: the characteristics of each column in the table was defined by a row in the same table.[66]

[56] *Id.* (Mayer, J., dissenting).
[57] *Id.* at 1264 (Mayer, J., dissenting).
[58] *Id.* at 1264–65 (Mayer, J., dissenting). The majority disagreed with this characterization: a physical "'store within a store' . . . [does] not have to account for the ephemeral nature of an internet 'location' or the near-instantaneous transport between these locations . . . which introduces a problem that does not arise in the 'brick and mortar' context." *Id.* at 1258.
[59] 822 F.3d 1327 (Fed. Cir. 2016).
[60] *See id.* at 1336. Claim 17 is representative of claims 17, 31, and 32 of the '604 patent, as well as claims 31 and 32 of the '775 pa*tent. Se*e id.
[61] *See id.* at 1330.
[62] *See id.* at 1330, 1333.
[63] *See id.* at 1330–31.
[64] *Id.* at 1330.
[65] *See id.* at 1332.
[66] *See id.* at 1332–33.

The *Enfish* Court stopped its analysis at step one of the *Alice* inquiry: it held the claims at issue were not directed to an abstract idea and were therefore patent-eligible.[67]

According to the Federal Circuit, the first step of *Alice* requires more than merely "ask[ing] whether the claims *involve* a patent-ineligible concept, because" even the "routinely patent-eligible claim[s]" involve a patent ineligible concept.[68] Instead, the court considered the first step a "stage-one filter to [the] claims, considered in light of the specification, based on whether 'their character as a whole is directed to excluded subject matter.'"[69]

The *Enfish* Court held that, similar to the step two inquiry into inventiveness, *Alice* step one requires questioning "whether the claims are directed to an improvement to computer functionality versus being directed to an abstract idea."[70] It further explained that abstract ideas include "fundamental economic and conventional business practices," as well as math equations.[71] Patents directed to those concepts still fail the first step of *Alice*, even if the steps are "performed on a computer."[72]

The decision counseled courts against "describing the claims at . . . a high level of abstraction and untethered from the language of the claims" because that "all but ensures the exceptions to § 101 swallow the rule."[73] The district court held the claims were "directed to the abstract idea of 'storing, organizing, and retrieving memory in a logical table' . . . ."[74] The Federal Circuit rejected this characterization, instead holding the claims at issue were "specifically directed to a *self-referential* table for a computer database."[75]

The Federal Circuit concluded that the claims were "directed to an improvement of an existing technology," rather than an abstract idea.[76] This conclusion was "bolstered by the specification's teachings that the claimed invention achieves other benefits over conventional databases, such as increased flexibility, faster search times, and smaller memory requirements."[77]

The fact that the invention could "run on a general purpose computer" did not doom the claims because they did not "simply add[] conventional computer components to well-known business practices" or "mathematical formula[e]."[78] Likewise, the improvement does not have to be "defined by reference to 'physical' components . . . ."[79]

The Federal Circuit looked to "[t]he specification's disparagement of conventional data structures," as well as the description of the invention "as

[67] *See id.* at 1336, 1346.
[68] *Id.* at 1335.
[69] *Id.*
[70] *Id.*
[71] *Id.*
[72] *Id.*
[73] *Id.*
[74] *Id.* at 1337.
[75] *Id.*
[76] *Id.*
[77] *Id.*
[78] *Id.* at 1338.
[79] *Id.* at 1339.

including the features that make up a self-referential table," to "confirm that [its] characterization . . . ha[d] not been deceived by the 'draftsman's art.'"[80] The invention was not merely carrying out an abstract idea on a computer.[81] Instead, "the claims [were] directed to a specific implementation of a solution to a problem in the software arts."[82]

3. *Bascom Global Internet Services, Inc. v. AT&T Mobility LLC* (June 27, 2016)[83]

Representative Claim 1 of U.S. Patent No. 5,987,606[84]	
[1]	A content filtering system for filtering content retrieved from an Internet computer network by individual controlled access network accounts, said filtering system comprising:
[1.1]	a local client computer generating network access requests for said individual controlled access network accounts;
[1.2]	at least one filtering scheme;
[1.3]	a plurality of sets of logical filtering elements; and
[1.4]	a remote ISP server coupled to said client computer and said Internet computer network, said ISP server associating each said network account to at least one filtering scheme and at least one set of filtering elements, said ISP server further receiving said network access requests from said client computer and executing said associated filtering scheme utilizing said associated set of logical filtering elements.

Representative Claim 23 of U.S. Patent No. 5,987,606[85]	
[22]	An ISP server for filtering content forwarded to controlled access network account generating network access requests at a remote client computer, each network access request including a destination address field, said ISP server comprising:
[22.1]	a master inclusive-list of allowed sites;
[22.2]	a plurality of sets of exclusive-lists of excluded sites, each controlled access network account associated with at least one set of said plurality of exclusive-lists of excluded sites; and

[80] *Id.*
[81] *See id.*
[82] *Id.*
[83] 827 F.3d 1341 (Fed. Cir. 2016).
[84] *See id.* at 1345. The court did not make a specific finding regarding a representative claim, but "BASCOM point[ed] to Claim 1" of U.S. Patent No. 5,987,606 ("the '606 patent") as "instructive" of the "individually customizable filtering" group of claims. *Id.*
[85] *See id.* at 1345–46. The court did not make a specific finding regarding a representative claim, but "BASCOM point[ed] to Claim 23" of the '606 patent as instructive of the "hybrid filtering scheme" group of claims. Id. at 1345.

[22.3]	a filtering scheme, said filtering scheme allowing said network access request if said destination address exists on said master inclusive-list but not on said at least one associated exclusive-list, whereby said controlled access accounts may be uniquely associated with one or more sets of excluded sites.
[23]	The ISP server of claim 22 further comprising:
[23.1]	a plurality of inclusive-lists of allowed sites, each controlled access user associated with at least one of said plurality of inclusive-lists of allowed sites, said filtering program further allowing said network access request if said requested destination address exists on said at least one associated inclusive-list.

BASCOM sued AT&T, alleging infringement of its patent on internet filtering.[86] In prior art systems, an internet content filter was installed in one of three locations: (1) on each individual computer, (2) on a local network server, or (3) on remote Internet Service Provider (ISP) servers.[87] Under the patented invention, the filter is located on the ISP server.[88] When website access is requested from the ISP server, the server is able to identify the user requesting access and can filter the content differently based on who is requesting the access.[89]

The Federal Circuit held the claims were directed to an abstract idea, but were still patent eligible under step two of *Alice* because there was a sufficiently inventive concept.[90]

In its step one analysis, the Federal Circuit held the claims were "directed to filtering content on the internet."[91] The court explained that "filtering content is an abstract idea because it is a longstanding, well-known method of organizing human behavior . . . ."[92] Thus, the '606 patent is directed to an abstract idea.[93]

The Federal Circuit moved on to analyze the claims under step two.[94] For the claims to be patent eligible, the inventive concept "must be significantly more than the abstract idea itself . . . ."[95] The Federal Circuit agreed with the district court's ruling that, separately, the claim limitations "recite generic computer, network and Internet components, none of which is inventive by itself."[96]

But the Federal Circuit disagreed with the lower court's holding that the combination of limitations recited something "well-understood, routine, [and] conventional."[97] Importantly, the appellate court held "an inventive concept

[86] *See id.* at 1346.
[87] *See id.* at 1343–44.
[88] *See id.* at 1344.
[89] *See id.* at 1344–45.
[90] *See id.* at 1352.
[91] *Id.* at 1348. ("Specifically, claim 1 is directed to a 'content filtering system for filtering content retrieved from an Internet computer network.' Claim 22 similarly is directed to an 'ISP server for filtering content.'").
[92] *Id.*
[93] *See id.* at 1348–49. The court recognized it "sometimes incorporates claim limitations into its articulation of the idea to which a claim is directed," but explained this case is different because the "claims and their specific limitations do not readily lend themselves to a step-one finding that they are directed to a nonabstract idea." *Id.* at 1349.
[94] *See id.* at 1349.
[95] *Id.*
[96] *Id.*
[97] *Id.* at 1349–50.

can be found in the non-conventional and non-generic arrangement of known, conventional pieces."[98] In this case, "[t]he claims do not merely recite the abstract idea of filtering content along with the requirement to perform it on the Internet . . . . Nor do the claims preempt all ways of filtering content on the Internet . . . ."[99] Instead, "they recite a specific, discrete implementation of the abstract idea of filtering content."[100] Because "the patent describes how its particular arrangement of elements is a technical improvement over prior art ways of filtering such content, . . . the claims may be read to 'improve[] an existing technological process."[101]

The Federal Circuit analogized this case to *DDR Holdings*: the patent in that case claimed "a technical way to satisfy an existing problem for website hosts and viewers"; it was "not claiming a business method *per se* . . . ." [102] Likewise, the '606 patent survives step two because it is "claiming a *technology-based solution* . . . to filter content on the Internet that overcomes existing problems with other Internet filtering systems"; it "is not claiming the *idea* of filtering content simply applied to the Internet."[103]

4. *Rapid Litigation Management Ltd. v. CellzDirect, Inc.* (July 5, 2016)[104]

Representative Claim 1 of U.S. Patent No. 7,604,929[105]	
[1]	A method of producing a desired preparation of multi-cryopreserved hepatocytes, said hepatocytes being capable of being frozen and thawed at least two times, and in which greater than 70% of the hepatocytes of said preparation are viable after the final thaw, said method comprising:
[1.1]	subjecting hepatocytes that have been frozen and thawed to density gradient fractionation to separate viable hepatocytes from nonviable hepatocytes,
[1.2]	recovering the separated viable hepatocytes, and
[1.3]	cryopreserving the recovered viable hepatocytes to thereby form said desired preparation of hepatocytes without requiring a density gradient step after thawing the hepatocytes for the second time, wherein the hepatocytes are not plated between the first and second cryopreservations, and wherein greater than 70% of the hepatocytes of said preparation are viable after the final thaw.

U.S. Patent No. 7,604,929 ("the '929 patent") at issue in *CellzDirect* resulted from a discovery that certain liver cells could be frozen twice, and those cells would

[98] *Id.* at 1350.
[99] *Id.*
[100] *Id.* The court noted that merely adding extra "conventional" steps to "perform[] the abstract idea" does not make a patent any less abstract. *Id.* at 1352.
[101] *Id.* at 1350–51.
[102] *Id.* at 1351.
[103] *Id.* (emphasis added).
[104] 827 F.3d 1042 (Fed. Cir. 2016).
[105] *See id.* at 1046. Claim 1 is representative of asserted claims 1 and 5. *Id.*

"behave[] like cells that were once frozen."[106] The process of the '929 patent is an improved process for preserving those cells by freezing a group of cells once, then setting apart and refreezing only the viable cells.[107] This allows liver cells to be "thawed and used later without unacceptable loss of viability."[108] Moreover, the ability to refreeze the cells makes it easier to pool together liver cells from multiple donors.[109]

The district court rejected the claims under § 101.[110] It held that the claims (1) were directed to a law of nature (the ability of liver cells to be frozen multiple times), and (2) lacked the inventive step to make them patent eligible.[111] The Federal Circuit vacated and remanded, holding that the claims were "not directed to a patent-ineligible concept" under step one of *Alice*.[112]

According to the Federal Circuit, the '929 patent is "directed to a new and useful laboratory technique for preserving hepatocytes," not "the ability of hepatocytes to survive multiple freeze-thaw cycles."[113] The court noted that the inventors were not attempting to patent the discovery of the ability of cells to survive, they were instead "claim[ing] applications of that knowledge."[114]

The *CellzDirect* Court distinguished this case from previous cases finding ineligibility: "[a]lthough the claims in each of th[o]se cases employed method steps, the end result of the process, the essence of the whole, was a patent-ineligible concept."[115] However, "the claims [here] are directed to a new and useful method of preserving hepatocyte cells."[116] As evidence that the claims are not directed to a patent-ineligible concept, the court noted "the claims recite a '*method of producing* a desired preparation of multi-cryopreserved hepatocytes.'"[117] It did not matter to the court that one way to explain the invention was by describing "the natural ability of the subject matter to *undergo* the process . . . ."[118] If that were the *Alice* test, then many patent-eligible methods would be ineligible.[119]

The Federal Circuit addressed three Supreme Court cases in its decision.[120] Two of those cases did not contain method claims.[121] The first "held that a mixture of different bacterial species was not patent eligible," while the second held "composition claims to isolated DNA [are] patent ineligible."[122] However, the '929 patent is "directed to a new and useful process of creating that pool, not to the pool

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[106] *Id.* at 1045.
[107] *See id.*
[108] *Id.*
[109] *See id.* at 1045–46.
[110] *See id.* at 1046.
[111] *See id.*
[112] *Id.* at 1052.
[113] *Id.* at 1048.
[114] *Id.* (quoting Ass'n for Molecular Pathology v. Myriad Genetics, Inc., 569 U.S. 576, 596 (2013)) ("They employed their natural discovery to create a new and improved way of preserving hepatocyte cells for later use.").
[115] *Id.*
[116] *Id.*
[117] *Id.*
[118] *Id.* at 1049.
[119] *See id.* (observing that a patent on "treating cancer with chemotherapy" would be ineligible if explained in terms of "cancer cells' inability to survive chemotherapy").
[120] *Id.*
[121] *Id.* (citing Funk Bros. Seed Co. v. Kalo Inoculant Co., 333 U.S. 127, 130–131 (1948); *Myriad*, 569 U.S. at 594–596).
[122] *Id.* (citing *Funk Bros.*, 333 U.S. at 131; *Myriad*, 569 U.S. at 594–596).

itself."[123] This implies that, had the '929 patent been a product claim it would not have survived step one of the *Alice* test. But because the '929 patent is claiming a "new and useful" method, it passes step one.[124] The third case contained "process claims, [but] the court concluded that they were 'directed to' . . . patent-ineligible cffDNA itself." [125] Thus, because the '929 patent is not directed to the liver cells themselves, it can survive step one.[126]

The Federal Circuit briefly addressed step two holding that there is a sufficiently inventive step: the process the claims recite is a significant improvement over the prior art.[127] Moreover, the fact that the steps disclosed in the patent were known separately does not mean there is no inventive step.[128] Combining those steps in a new way can be patent-eligible.[129] Although the individual steps were well known, the prior art disclosed freezing and thawing the hepatocytes *once*.[130] Thus, at step two, it was the "particular 'combination of steps'" that was patentable.[131]

5. *McRO, Inc. v. Bandai Namco Games America Inc.* (Sept. 13, 2016)[132]

Representative Claim 1 of U.S. Patent No. 6,307,576[133]	
[1]	A method for automatically animating lip synchronization and facial expression of three-dimensional characters comprising:
[1.1]	obtaining a first set of rules that define output morph weight set stream as a function of phoneme sequence and time of said phoneme sequence;
[1.2]	obtaining a timed data file of phonemes having a plurality of sub-sequences;
[1.3]	generating an intermediate stream of output morph weight sets and a plurality of transition parameters between two adjacent morph weight sets by evaluating said plurality of sub-sequences against said first set of rules;
[1.4]	generating a final stream of output morph weight sets at a desired frame rate from said intermediate stream of output morph weight sets and said plurality of transition parameters; and
[1.5]	applying said final stream of output morph weight sets to a sequence of animated characters to produce lip synchronization and facial expression control of said animated characters.

[123] *Id.*
[124] *Id.*
[125] *Id.* (citing Ariosa Diagnostics, Inc. v. Sequenom, Inc., 788 F.3d 1371, 1376 (2015)).
[126] *See id.*
[127] *See id.* at 1050.
[128] *See id.* at 1051.
[129] *See id.*
[130] *See id.*
[131] *Id.* ("Repeating a step that the art taught should be performed only once can hardly be considered routine or conventional.").
[132] 837 F.3d 1299 (Fed. Cir. 2016).
[133] *See id.* at 1307 n.3. Claim 1 of U.S. Patent No. 6,307,576 ("the '576 patent") is representative of asserted claims 1, 7–9, and 13 of the '576 patent and claims 1–4, 6, 9, 13, and 15–17 of U.S. Patent No. 6,611,278 ("the '278 patent"). *Id.*

McRO, Inc. sued a collection of video game developers and publishers for patent infringement.[134] The asserted patent involved a method of automatically synchronizing the lips of animated characters with the words they are speaking.[135] The prior art method involved manually setting the position of the character's lips "at certain important times ('keyframes')," then interpolating between the manually set positions to achieve smooth transitions that match the words.[136] Not only does the patent use a ruleset to automatically define the lip position at each keyframe, but it creates added realism by adjusting the mouth position based on the context of what is being said.[137]

The Federal Circuit performed its analysis under step one of *Alice* and held that the claims survived the § 101 challenge because they were not directed to patent-ineligible subject matter.[138]

The Federal Circuit began its analysis by explaining that *Alice* step one requires courts to look at the claims "as a whole . . . ."[139] On the other hand, courts also should not over-simplify the claims "by looking at them generally and failing to account for the specific requirements of the claims."[140] Although the '576 patent did not identify specific rules the invention must use, the claims limited the rules to those "with certain common characteristics . . . ."[141] In other words, the patented method claims a genus of rules.[142]

The Federal Circuit explained that limits on the breadth of claims come from the disclosure requirements of 35 U.S.C. § 112, not § 101.[143] The only § 101 concern implicated by broad claims is preemption, which arises when the claims "are not directed to a specific invention and instead improperly monopolize 'the basic tools of scientific and technological work.'"[144] To satisfy this preemption concern, courts must ask "whether the claims . . . focus on a specific means or method that improves the relevant technology or are instead directed to a result or effect that itself is the abstract idea and merely invoke generic processes and machinery."[145] According to the court, it is possible to patent a *method of producing* a particular effect, even if the effect itself is not patentable.[146]

The Federal Circuit applied these principles to determine whether the claims at issue were directed to an abstract idea.[147] It began by noting that Claim 1 does not simply utilize a computer to automate "conventional activity."[148] The court emphasized the fact that the claimed method was not the same as was

[134] *See id.* at 1308.
[135] *See id.* at 1303.
[136] *Id.* at 1307.
[137] *See id.*
[138] *See id.* at 1316.
[139] *Id.* at 1312–13.
[140] *Id.* at 1313.
[141] *Id.*
[142] *See id.*
[143] *See id.* at 1313–14.
[144] *Id.* at 1314.
[145] *Id.*
[146] *See id.*
[147] *See id.* at 1314–16.
[148] *Id.* at 1314.

previously practiced.[149] Under the prior art method, an animator used "subjective determinations" to synchronize the lips, but under the claimed process, a computer used "specific, limited mathematical rules" to accomplish the goal.[150] Thus, it was "the incorporation of the claimed rules, not the use of the computer, that 'improved [the] existing technological process' . . . ."[151]

Although the patented method did not produce a tangible result, "the concern underlying the exceptions to § 101 is not tangibility, but preemption."[152] McRO was able to show that an alternative process to its patented method exists, but that was not entirely sufficient.[153] Preemption was further prevented by the "specific structure of the claimed rules."[154] The Federal Circuit explained that "[b]y incorporating the specific features of the rules as claim limitations, claim 1 is limited to a specific process . . . and does not preempt approaches that use rules of a different structure or different techniques."[155]

6. Amdocs (Israel) Ltd. v. Openet Telecom, Inc. (Nov. 1, 2016)[156]

Representative Claim 1 of U.S. Patent No. 7,631,065[157]	
[1]	A computer program product embodied on a computer readable storage medium for processing network accounting information comprising:
[1.1]	computer code for receiving from a first source a first network accounting record;
[1.2]	computer code for correlating the first network accounting record with accounting information available from a second source; and
[1.3]	computer code for using the accounting information with which the first network accounting record is correlated to enhance the first network accounting record.

Amdocs (Israel) Ltd. asserted four patents against Opnet Telecom, Inc.: U.S. Patent Nos. 7,631,065 ("the '065 patent"), 7,412,510 ("the '510 patent"), 6,947,984 ("the '984 patent"), and 6,836,797 ("the '797 patent").[158] All four patents involved a system created for accounting and billing by "network service providers."[159]

Prior to Amdocs' patents, the requisite accounting information would all be stored in one place, which resulted in large databases processing considerable

[149] *See id.*
[150] *Id.*
[151] *Id.*
[152] *Id.* at 1315.
[153] *See id.* (quoting *Ariosa*, 788 F.3d at 1379) ("[T]he absence of complete preemption does not demonstrate patent eligibility.").
[154] *Id.*
[155] *Id.* at 1316.
[156] 841 F.3d 1288 (Fed. Cir. 2016).
[157] *See id.* at 1299. Claim 1 of U.S. Patent No. 7,631,065 is representative of asserted claims 1, 4, 7, 13 and 17 of the '065 patent. *Id.* at 1299. The court found other claims representative of the other asserted patents, but applied the same logic to the eligibility analysis. *See* id. at 1302, 1304, 1305. Thus, the other representative claims are not included here.
[158] *See id.* at 1290.
[159] *Id.* at 1291.

amounts of incoming data.[160] The patented system arranges its data processing components in a "distributed architecture" that spreads the processing across the network.[161] As a result, information is "collect[ed] and process[ed] . . . close to its source."[162] This prevents the network from bottlenecking, but still allows data access from a "central location."[163]

A majority of the Federal Circuit held all four patents were eligible under step two of *Alice*.[164] For each patent, the majority "accepted the district court's view of the disqualifying abstract ideas," then explained the inventive concept it found.[165]

The Federal Circuit began its analysis of the '065 patent by examining precedent containing "somewhat facially similar claims" it had previously found both eligible and ineligible.[166] Because the court felt the claims at issue were similar to those in *Bascom* and *DDR*, it moved to step two without making a specific step one holding.[167] Like *DDR*, the claim limitations, when considered individually and as an ordered combination, result in an inventive concept via the distributed architecture.[168] Like *Bascom*, the benefits of the invention here are only possible because of the specific architecture disclosed by the claims.[169]

In the Federal Circuit's view, the "distributed enhancement" recited by the Amdocs patents was a "critical advancement over the prior art . . . ."[170] Despite the use of generic components, the enhancement limitation requires those components to "operate in an unconventional manner to achieve an improvement in computer functionality."[171] Therefore, the claims of the '065 patent contain an inventive concept.[172]

The majority held that each of the other patents was eligible for "reasons similar to" the '065 patent analysis.[173] Thus, the court found all four patents eligible under *Alice* step two.[174]

Judge Reyna disagreed with the majority's "mechanical comparison" of the claims here with the claims in previous § 101 cases.[175] He also took issue with what he viewed as the importation of "innovative limitations" to the claims from the specification.[176]

The dissent found that the '065 and the '797 patents are ineligible under *Alice*.[177] In Judge Reyna's view, claim 1 of the '065 patent only recites functional limitations

[160] *See id.* at 1292.
[161] *Id.* at 1291–92.
[162] *Id.* at 1291.
[163] *Id.* at 1292.
[164] *See id.* at 1307.
[165] *Id.* at 1306.
[166] *Id.* at 1300.
[167] *Id.* (citing Bascom Glob. Internet Servs., Inc. v. AT&T Mobility LLC, 827 F.3d 1341 (Fed. Cir. 2016); DDR Holdings, LLC v. Hotels.com, L.P., 773 F.3d 1245 (Fed. Cir. 2014)).
[168] *See id.* at 1301–02 (citing *DDR Holdings*, 773 F.3d at 1259).
[169] *See id.* at 1302 (citing *Bascom*, 827 F.3d 1341).
[170] *Id.* at 1300.
[171] *Id.* at 1300–01.
[172] *See id.* at 1301.
[173] *Id.* at 1302, 1304, 1305.
[174] *See id.* at 1307.
[175] *Id.*
[176] *Id.*
[177] *See id.*

and does not contain a "specific process for accomplishing the abstract goal of combining data . . . ."[178] Moreover, none of the limitations "confin[e] the claim to a particular means" of performing the abstract idea, so there was no inventive concept.[179] Similarly, the '797 patent only recites steps that "comprise the [ineligible] abstract concept of collecting information about network services . . . ."[180]

Judge Reyna did agree with the majority that both the '510 and the '984 patents were eligible, but disagreed with their methodology.[181] At step one, the court should have determined if the patents were simply "directed to [an abstract] goal" or if they were directed to "a method of achieving" that goal.[182] This method "must [have] meaningfully limit[ed] the claim to a manner of achieving the desired result without unduly foreclosing future innovation."[183] Because the '510 and '984 patents "capture at least some of the *process* by which the disclosed system" achieves its goal, they survive step one.[184]

7. Thales Visionix Inc. v. United States (Mar. 8, 2017)[185]

Independent Claim 1 of U.S. Patent No. 6,474,159[186]	
[1]	A system for tracking the motion of an object relative to a moving reference frame, comprising:
[1.1]	a first inertial sensor mounted on the tracked object;
[1.2]	a second inertial sensor mounted on the moving reference frame; and
[1.3]	an element adapted to receive signals from said first and second inertial sensors and configured to determine an orientation of the object relative to the moving reference frame based on the signals received from the first and second inertial sensors.

Independent Claim 22 of U.S. Patent No. 6,474,159[187]	
[22]	A method comprising determining an orientation of an object relative to a moving reference frame based on signals from two inertial sensors mounted respectively on the object and on the moving reference frame.

[178] *Id.* at 1313.
[179] *Id.* at 1314.
[180] *Id.* at 1319.
[181] *See id.* at 1307.
[182] *Id.* at 1314.
[183] *Id.*
[184] *Id.* at 1315. The quoted language refers specifically to the '510 patent, but Judge Reyna viewed the '984 patent as "analogous to . . . the '510 patent . . . ." *Id.* at 1317.
[185] 850 F.3d 1343 (Fed. Cir. 2017).
[186] *See id.* at 1345. The court did not make a specific finding as to which claim was representative of U.S. Patent No. 6,474,159 ("the '159 patent"). *See id.* The patentees asserted claims 1–5, 11–13, 20, 22–26, 32–34, and 41. *See id.* at 1344. Of the asserted claims, only 1 and 22 are independent, so the court considered those two claims. *See* id. at 1345.
[187] *See id.* at 1345–46. The court did not make a specific finding as to which claim was representative of the '159 patent. *See id.* The patentees asserted claims 1–5, 11–13, 20, 22–26, 32–34, and 41. *See id.* at 1344. Of the asserted claims, only 1 and 22 are independent, so the court considered those two claims. *See* id. at 1345.

The asserted patent in Thales relates to a system for tracking an object's movement relative to a moving platform.[188] Under the prior art, sensors mounted on an object could measure and calculate "position, orientation, and velocity of the object" relative to a predefined starting position.[189] Because small errors in the measurement of the object could propagate into larger ones, tracking systems "generally include[d] at least one other sensor . . . to intermittently correct [those] errors . . . ."[190] The '159 patent identified a problem in this prior art: the object's tracking sensors measured motion relative to earth, while the error-correcting sensors measured "position relative to the moving platform."[191] Combining this data led to "inconsistent position information when the moving platform accelerated or turned."[192]

The patented system purported to solve this problem.[193] The patent disclosed tracking sensors on the platform measuring the direction of gravity, and sensors on the object taking measurements relative to the moving platform.[194] Changing the reference frame in this way allowed the object to be tracked without calculating the position or orientation of the moving platform.[195] This resulted in three improvements: (1) an increased measurement accuracy, (2) a reduced need for extra hardware on the moving platform, and (3) simpler installation.[196]

The lower court granted a motion for judgment on the pleadings because, in its view, the claims were "directed to the abstract idea of using laws of nature governing motion to track two objects" and had no inventive concept. [197] The Federal Circuit rejected this ruling, and instead held that the claims were not directed to an abstract idea under step one.[198]

In its analysis, the Federal Circuit recognized that, at step one, it "must . . . articulate what the claims are directed to with enough specificity to ensure the step one inquiry is meaningful."[199] The court devoted the majority of its § 101 analysis drawing parallels from this case to a Supreme Court case, *Diamond v. Diehr*.[200] In *Diehr*, the patent's "claimed method used [a] well-known . . . equation to calculate the optimal cure time" of rubber.[201] The Supreme Court noted that the mathematical equation itself would not have been patent-eligible, even if it was limited to a particular technology.[202] But the claims at issue in *Diehr* were eligible because "when a claim containing a mathematical formula implements or applies that formula in a structure or process which, when considered as a whole, is

[188] *See id.* at 1344.
[189] *Id.* at 1344–45.
[190] *Id.* at 1345.
[191] *Id.*
[192] *Id.*
[193] *See id.*
[194] *See id.*
[195] *See id.*
[196] *See id.*
[197] *Id.* at 1346.
[198] *See id.* at 1349.
[199] *Id.* at 1347.
[200] *Id.* at 1347–48 (citing Diamond v. Diehr, 450 U.S. 175 (1981)).
[201] *Id.* at 1347 (citing *Diehr*, 450 U.S. at 177 n.2).
[202] *See id.* (citing *Diehr*, 450 U.S. at 191–92).

performing a function which the patent laws are designed to protect," it is patent eligible.[203]

The Federal Circuit viewed the claims of the '159 patent as "nearly indistinguishable" from *Diehr*.[204] The claims here use "navigation equations . . . derived from [the] particular arrangement of sensors" to calculate the position and orientation of the object.[205] The patent's use of equations is simply to facilitate this particular configuration of the sensors.[206] And by using this configuration, the claims "result in a system that reduces errors" present in the prior art systems, "[j]ust as the claims in Diehr reduced the likelihood" of error in the prior art rubber curing process.[207]

The patent specification adds further support to the idea that the claims are not directed to an abstract idea.[208] It identifies the difficulties in the prior art and notes that the claimed arrangement "may seem somewhat strange," but results in the improvements cited by the patent.[209]

The claims are patent eligible under step one because they are "directed to systems and methods that use inertial sensors in a non-conventional manner to reduce errors in measuring the relative position and orientation of a moving object on a moving reference frame."[210]

8. Visual Memory LLC v. NVIDIA Corp. (Aug. 15, 2017)[211]

Claim 1 of U.S. Patent No. 5,953,740[212]	
[1]	A computer memory system connectable to a processor and having one or more programmable operational characteristics, said characteristics being defined through configuration by said computer based on the type of said processor, wherein said system is connectable to said processor by a bus, said system comprising:
[1.1(a)]	a main memory connected to said bus; and
[1.1(b)]	a cache connected to said bus;
[1.2]	wherein a programmable operational characteristic of said system determines a type of data stored by said cache.

[203] *Id.* at 1347–48 (quoting *Diehr*, 450 U.S. at 192).
[204] *Id.* at 1348.
[205] *Id.*
[206] *See id.*
[207] *Id.* (citing *Diehr*, 450 U.S. at 187).
[208] *See id.*
[209] *Id.*
[210] *Id.*
[211] 867 F.3d 1253 (Fed. Cir. 2017).
[212] *See id.* at 1257. The court did not make a specific finding as to which claim was representative of U.S. Patent No. 5,953,740 ("the '740 patent"). *See id.* Instead, it cited claim 1 as an example. *See id.*

The '740 patent at issue in *Visual Memory* relates to computer memory that can be configured to be used with different types of processors.[213] Computers often utilize "a three-tiered memory hierarchy."[214] The first tier is a slow, inexpensive memory (*e.g.*, a hard disk).[215] The second tier is "medium speed memory" used for the computer's main memory.[216] The third tier is a fast, expensive memory known as "processor cache memory."[217] Under the prior art to the '740 patent, memory systems had to be "designed and optimized based on the specific type of processor" used.[218] This meant prior art memory lacked versatility and was expensive.[219] Using a different type of processor decreased the memory system's efficiency, and even systems designed to operate with multiple types of processors had decreased performance for "one or all of the computers."[220]

The '740 patent discloses a memory system that can be programmed to operate differently depending on the processor type it is used with.[221] It consists of a main memory and three separate caches.[222] The caches "self-configure" to use the correct operational characteristic when powered on, allowing the system to perform as well or better than prior art cache memory "many times larger than the cumulative size" of the patented caches.[223] The system also improves the main memory by dividing it into different sections to be accessed by different processor types.[224] Overall, the patent recites a system that "confers a substantial advantage by" creating the ability to use different types of processors with the same memory without harming performance.[225]

The district court granted a 12(b)(6) motion to dismiss because the claims were "directed to the 'abstract idea of categorical data storage'" and it found the patent recites "generic and conventional" computer components, not an inventive concept.[226] The Federal Circuit held the opposite: it ruled the claims were eligible under step one of Alice.[227]

The Federal Circuit cited *Enfish*, explaining that the claims there were directed to an improvement in computer function.[228] To the court, the "key question" in *Enfish*'s step one analysis was whether the "focus of the claims [is] . . . on the specific asserted improvement . . . or, instead, on a process that qualifies as an 'abstract idea' for which computers are invoked merely as a tool."[229]

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[213] *See id.* at 1255.
[214] *Id.*
[215] *See id.*
[216] *Id.*
[217] *Id.*
[218] *Id.*
[219] *See id.*
[220] *Id.*
[221] *See id.* at 1255–56.
[222] *See id.*
[223] *Id.* at 1256.
[224] *See id.*
[225] *Id.* at 1256–57.
[226] *Id.* at 1257.
[227] *See id.* at 1262.
[228] *See id.* at 1258 (citing Enfish LLC v. Microsoft Corp., 822 F.3d 1327 (Fed. Cir. 2016)).
[229] *Id.* (quoting *Enfish*, 822 F.3d at 1335–36).

The *Visual Memory* Court briefly discussed *Thales* as well.[230] It explained the claims there were eligible because they were "directed to 'systems and methods that use inertial sensors in a *non-conventional manner* to reduce errors in measuring . . . .'"[231]

The claims were eligible under step one as "directed to a technological improvement . . . ."[232] The claims focus on the specific improvement, rather than an abstract idea placed on generic computer components.[233] Moreover, the specification identifies improvements over the prior art and "discusses the advantages offered by the technological improvement."[234]

Another reason the Federal Circuit held the patent step one eligible related to preemption concerns.[235] The '740 patent does not attempt to preempt "all types and all forms" of data storage.[236] The court found evidence of this in the specification because it identifies improvements over the prior art.[237] According to the specification, the patent enables use of processors of different types without sacrificing performance.[238] Additionally, manufacturers "no longer need to design a separate memory system for each type of processor."[239] Finally, the specification teaches that the disclosed caches outperform larger ones due to their configurability.[240]

The claims here were distinct from ineligible claims in prior cases because these claims "recite an allegedly new, improved, and more efficient memory system."[241]

Judge Hughes' dissent found that the claims are not directed to an improvement because they do not describe the specific "means or method of implementing" the claimed "programmable operational characteristic" and thus "lack[] any details" describing how the invention is realized.[242] In his view, there was also no inventive concept because the patent only describes "generic computer components," and the claim only uses those components "to perform generic computer functions."[243] The majority found three problems with this.[244] First, at this procedural stage (a 12(b)(6) motion to dismiss), the facts must be read in the light most favorable to the non-moving party (here, the patentee).[245] Second, issues of adequate disclosure fall under enablement requirements, not § 101 eligibility.[246] Third, the claimed invention is the ability to configure the memory, not the specific programming required to implement that configurability.[247]

[230] *See id.* at 1259 (citing Thales Visionix Inc. v. United States, 850 F.3d 1343 (Fed. Cir. 2017)).
[231] *Id.* (quoting *Thales*, 850 F.3d at 1348–49).
[232] *Id.*
[233] *See id.* at 1259–60.
[234] *Id.* at 1259, 1260.
[235] *See id.* at 1259.
[236] *Id.*
[237] *See id.*
[238] *See id.*
[239] *Id.*
[240] *See id.*
[241] *Id.* at 1260.
[242] *Id.* at 1263.
[243] *Id.* at 1264.
[244] *See id.* at 1261.
[245] *See id.*
[246] *See id.* at 1261.
[247] *See id.* at 1261–62.

9. Finjan, Inc. v. Blue Coat Systems, Inc. (Jan. 10, 2018)[248]

Representative Claim 1 of U.S. Patent No. 6,154,844[249]	
[1]	A method comprising:
[1.1]	receiving by an inspector a Downloadable;
[1.2]	generating by the inspector a first Downloadable security profile that identifies suspicious code in the received Downloadable; and
[1.3]	linking by the inspector the first Downloadable security profile to the Downloadable before a web server makes the Downloadable available to web clients.

Finjan owned several patents related to malware identification and protection.[250] The eligibility issue arose with respect to U.S. Patent No. 6,154,844 ("the '844 patent"), which "recite[s] a system and method for providing computer security by attaching a security profile to a downloadable."[251] The patent involves a method of scanning an application downloaded from the web, creating a "security profile" that identifies malware in the application, then attaching the security profile to the downloaded application.[252]

The Federal Circuit held the '844 patent is eligible under step one of the *Alice* test because it is not directed to an abstract idea.[253]

In its step one analysis, the Federal Circuit noted an earlier holding relating to screening applications for dangerous code: "[b]y itself, virus screening is well-known and constitutes an abstract idea."[254] Even introducing an "intermediary computer" to perform the task is "'perfectly conventional' . . . and is also abstract."[255]

The prior art "code-matching" method of virus scanning compared the code in the downloaded application with code of *previously-known* viruses, whereas the '844 patent produces a security profile (including *potential* threats) using a "behavior based" method of scanning.[256] Thus, the Federal Circuit had to determine whether the behavior based method "constitute[d] an improvement in computer functionality."[257] The court found it "does a good deal more."[258] The invention's ability to identify *potentially* dangerous code protects against both unknown viruses and viruses that are disguised to avoid detection by code-matching.[259] Moreover, the invention enables flexibility in virus scanning: users can create or

[248] 879 F.3d 1299 (Fed. Cir. 2018).
[249] *See id.* at 1303. Claim 1 is representative of claims 1, 7, 11, 14, and 41. *See* id. at 1302, 1303.
[250] *See id.* at 1302.
[251] *Id.*
[252] *Id.* at 1303.
[253] *See id.* at 1306.
[254] *Id.* at 1304.
[255] *Id.*
[256] *Id.*
[257] *Id.* at 1304.
[258] *Id.*
[259] *See id.*

be assigned a "security policy" that is easily tailored to the individual and can be "alter[ed] . . . .in response to evolving threats."[260]

Like the claims in *Enfish*, the '844 patent "employs a new kind of file that enables a computer security system to do things it could not do before."[261] Citing the improvements conferred by the patent, the Federal Circuit held it was "directed to a non-abstract improvement in computer functionality."[262]

Finally, the Federal Circuit rejected the arguments of the defendants, who asserted that the claims were still abstract (even if "directed to a new idea") "because they do not sufficiently describe how to implement that idea."[263] The court explained the claims at issue are patent eligible because they "recite more than a mere result. Instead, they recite specific steps . . . that accomplish the desired result."[264] In other words, the claims disclose "an inventive arrangement for accomplishing the result," so the '844 patent is eligible.[265]

10. Core Wireless Licensing S.A.R.L. v. LG Electronics, Inc. (Jan. 25, 2018)[266]

Representative Claim 1 of U.S. Patent No. 8,713,476[267]	
[1]	A computing device comprising a display screen, the computing device being configured to display on the screen a menu listing one or more applications, and additionally being configured to display on the screen an application summary that can be reached directly from the menu, wherein the application summary displays a limited list of data offered within the one or more applications, each of the data in the list being selectable to launch the respective application and enable the selected data to be seen within the respective application, and wherein the application summary is displayed while the one or more applications are in an un-launched state.

In *Core Wireless*, the Federal Circuit considered the eligibility of two patents: US Patent No. 8,713,476 and US Patent No. 8,434,020.[268] Both of these patents are designed to improve display interfaces, especially for displays with small screens.[269] The prior art to these patents required users to do lots of scrolling, changing views, and navigating through layers of information to access data or a function they wanted.[270] The improvement described in these patents allowed for faster access

[260] *Id.*
[261] *Id.* at 1304–05 (citing Enfish LLC v. Microsoft Corp., 822 F.3d 1327 (Fed. Cir. 2016)).
[262] *Id.* at 1305.
[263] *Id.* at 1305–06.
[264] *Id.* at 1305.
[265] *Id.* at 1305–06.
[266] 880 F.3d 1356 (Fed. Cir. 2018).
[267] *See id.* at 1359. The district court found independent claim 1 of U.S. Patent No. 8,713,476 ("the '476 patent") representative of asserted (dependent) claims 8, and 9 of the '476 patent, and dependent claims 11 and 13 of U.S. Patent No. 8,434,020 ("the '020 patent"). *See* id. at 1360.
[268] *See id.* at 1359.
[269] *See id.*
[270] *See id.* at 1363.

to the data and applications by creating a summary window containing data or functions.[271]

The district court denied a motion for summary judgment, holding that the claims were patent eligible.[272] On appeal, the Federal Circuit affirmed this decision.[273] It recognized the claims were not directed to an abstract idea under step one of *Alice*.[274]

The Federal Circuit began by summarizing many of its prior decisions finding eligibility.[275] It first explained that the patent(s) in *Enfish* were eligible because they claimed a "*specific type* of data structure designed to improve the way a computer stores and retrieves data . . . ."[276] Next, the court addressed the claims at issue in *Thales*.[277] There, the claims related to specific configurations and methods that improved computer function by eliminating difficulties in conventional methods.[278] The court then summarized the *Visual Memory* holding: the invention in that case introduced flexibility not available in the prior art and simultaneously eliminated the need to design multiple types of memory for each type of processor.[279] Thus, the claims were eligible.[280] Finally, the court noted that the claims in *Finjan* were eligible because they enabled computer security systems to do new things.[281]

The Federal Circuit held the claims are directed to an improved user interface, not to an index, as asserted by the alleged infringers.[282] The court reached this conclusion because the claimed ways of summarizing and presenting information were specific.[283] Under the claim limitations, the summary window must be accessed in a certain way, the information to be displayed must be limited to certain types, and the relevant applications must be in a particular state (unlaunched).[284] Thus, the patent claims a specific improvement over the prior art: an improved user interface.[285] The specification also supports the court's conclusion because its language teaches the invention as an improvement over the prior art.[286] Therefore, the claims are directed to an improvement in computer functionality and are eligible under *Alice* step one.[287]

[271] *See id.*
[272] *See id.* at 1360.
[273] *See id.* at 1359.
[274] *See id.* at 1363.
[275] *See id.* at 1361–62.
[276] *Id.* at 1362 (quoting Enfish LLC v. Microsoft Corp., 822 F.3d 1327, 1338–39 (Fed. Cir. 2016)).
[277] *See id.* (citing Thales Visionix Inc. v. United States, 850 F.3d 1343 (Fed. Cir. 2017)).
[278] *See id.* (citing *Thales*, 850 F.3d at 1348–49).
[279] *See id.* (citing Visual Memory LLC v. NVIDIA Corp., 867 F.3d 1253, 1259 (Fed. Cir. 2017)).
[280] *See id.* (citing *Visual Memory*, 867 F.3d at 1259).
[281] *See id.* (citing Finjan, Inc. v. Blue Coat Systems, Inc., 879 F.3d 1299, 1304, 1305 (Fed. Cir. 2018)).
[282] *See id.*
[283] *See id.* at 1362–63.
[284] *See id.*
[285] *See id.* at 1363.
[286] *See id.*
[287] *See id.*

11. Aatrix Software v. Green Shades Software (Feb. 14, 2018)[288]

Representative Claim 1 of U.S. Patent No. 7,171,615[289]	
[1]	A data processing system for designing, creating, and importing data into, a viewable form viewable by the user of the data processing system, comprising:
[1.1(a)]	a form file that models the physical representation of an original paper form and establishes the calculations and rule conditions required to fill in the viewable form;
[1.1(b)]	a form file creation program that imports a background image from an original form, allows a user to adjust and test-print the background image and compare the alignment of the original form to the background test-print, and creates the form file;
[1.1(c)]	a data file containing data from a user application for populating the viewable form; and
[1.1(d)]	a form viewer program operating on the form file and the data file, to perform calculations, allow the user of the data processing system to review and change the data, and create viewable forms and reports.

The Federal Circuit considered two patents which relate to systems and methods of generating a "viewable form" of data that users can manipulate on their computer.[290] The prior art to these patents only allowed extraction of data from databases that were "widely available" and had "published . . . schemas."[291] The claims at issue allegedly improved the prior art in two ways: (1) they allowed the use of data from third party applications without having to customize for each application, and (2) they eliminated the need to hand-type data, which resulted in elimination of transcription errors.[292]

The district court held that all the claims were ineligible and granted Green Shades' 12(b)(6) motion to dismiss.[293] Aatrix subsequently asked to file a second amended complaint, arguing that the amended complaint provided allegations and evidence "preclud[ing] a [12(b)(6)] dismissal . . . ."[294] The district court denied this request.[295]

The Federal Circuit vacated the dismissal because the second amended complaint contained factual allegations that the district court should have considered.[296] The Federal Circuit recognized that eligibility can be decided during a 12(b)(6) motion to dismiss, but held that can only be the case where there are no "plausible factual

[288] 882 F. 3d 1121 (Fed. Cir. 2018).
[289] *See id.* at 1223–24. Claim 1 is representative of asserted claims 1, 2 and 22 of U.S. Patent No. 7,171,615 ("the '615 patent"), and claims 1, 13 and 17 of U.S. Patent No. 8,984,393 ("the '393 patent"). *See* id.
[290] *Id.* at 1123.
[291] *Id.* at 1127.
[292] *See id.*
[293] *See id.* at 1124.
[294] *Id.*
[295] *See id.*
[296] *See id.*

allegations" which, when taken as true, prevent such a decision.[297] In other words, the issue of eligibility is a question of law with underlying fact questions that may preclude dismissal under 12(b)(6).[298]

The Federal Circuit explained the proposed second amended complaint had factual allegations which impact the § 101 analysis.[299] First, the proposed amended complaint alleges the patent is directed to an improvement in importing data from third party software.[300] Second, it raises the question of whether a particular claim term "constitutes an inventive concept, alone or in combination with other elements . . . ."[301] Third, it describes the invention's development, the prior art's problems, and "presents specific allegations" about the improvements of the invention.[302] According to the court, "these allegations suggest [the patent] is directed to an improvement in the computer technology itself, and not directed to generic computer components performing conventional activities."[303]

In addition, *Alice* step two requires determining whether the claims recite something "well-understood, routine, and conventional . . . ."[304] That question "is a question of fact" which "cannot be answered adversely to the patentee based on the sources properly considered on a motion to dismiss . . . ."[305] Here, the proposed second amended complaint raised "concrete allegations" related to that inquiry, and the record presented no reason to reject them.[306]

Judge Reyna dissented-in-part; he took issue with adding a "significant factual component" for two reasons.[307] First, adding a fact question opens the door to a flood of extrinsic evidence.[308] Under the majority's holding, all a patentee must do to defeat a motion to dismiss is amend the complaint to allege extrinsic evidence, even if it is inconsistent with the "intrinsic record."[309] This goes against the "utility of the 12(b)(6) procedure" because it is "converted into a full-blown factual inquiry . . . ."[310] Second, "[t]he motion to dismiss on appeal only challenges the first amended complaint," not the second.[311] Judge Reyna felt that the majority was improperly "prejudg[ing]" what it thought the result should be on remand, and found the opinion on the second amended complaint is entirely dicta.[312]

[297] *Id.* at 1125.
[298] *See id.* at 1126.
[299] *See id.*
[300] *See id.* at 1127.
[301] *Id.* at 1126.
[302] *Id.* at 1127 (explaining Aatrix alleged improvements such as decreased memory usage and faster processing).
[303] *Id.*
[304] *Id.* at 1128.
[305] *Id.* (noting proper sources include complaint, patent, and materials subject to judicial notice).
[306] *Id.*
[307] *Id.* at 1130 (Reyna, J., dissenting).
[308] *See id.* (Reyna, J., dissenting).
[309] *See id.* (Reyna, J., dissenting).
[310] *Id.* at 1130–31 (Reyna, J., dissenting).
[311] *Id.* at 1131 (Reyna, J., dissenting).
[312] *Id.* (Reyna, J., dissenting).

12. Vanda Pharms. Inc. v. West-Ward Pharms. Int'l Ltd. (Apr. 13, 2018)[313]

Representative Claim 1 of U.S. Patent No. 8,586,610[314]	
[1]	A method for treating a patient with iloperidone, wherein the patient is suffering from schizophrenia, the method comprising the steps of:
[1.1]	determining whether the patient is a CYP2D6 poor metabolizer by:
[1.1(a)]	obtaining or having obtained a biological sample from the patient; and
[1.1(b)]	performing or having performed a genotyping assay on the biological sample to determine if the patient has a CYP2D6 poor metabolizer genotype; and
[1.2]	if the patient has a CYP2D6 poor metabolizer genotype, then internally administering iloperidone to the patient in an amount of 12 mg/day or less, and
[1.3]	if the patient does not have a CYP2D6 poor metabolizer genotype, then internally administering iloperidone to the patient in an amount that is greater than 12 mg/day, up to 24 mg/day,
[1.4]	wherein a risk of QTc prolongation for a patient having a CYP2D6 poor metabolizer genotype is lower following the internal administration of 12 mg/day or less than it would be if the iloperidone were administered in an amount of greater than 12 mg/day, up to 24 mg/day.

The *Vanda* Court considered the eligibility of the claims recited by U.S. Patent No. 8,586,610 ("the '610 patent").[315] The method claims at issue cover treating schizophrenia patients using a drug called iloperidone.[316] According to the patent, the dosage of the drug is determined based on the activity of a certain gene in the patient.[317] For those patients who have lower activity from that gene ("poor metabolizers"), ordinary treatment could lead to "serious cardiac problems."[318] The '610 patent teaches that poor metabolizers can be more safely treated by giving them a lower than normal dose.[319]

The lower court held that the claims were eligible under § 101 because it was not convinced they recited routine or conventional steps.[320] The Federal Circuit also held the claims were eligible, but it did not address the inventive concept inquiry because it found them eligible under step one.[321]

The Federal Circuit reached its conclusion by distinguishing these claims from similar claims that were previously held patent-ineligible.[322] Unlike the claims in

[313] 887 F.3d 1117 (Fed. Cir. 2018).
[314] *See id.* at 1121. Claim 1 is representative of claims 1–9, 11–13, and 16. *See* id. at 1120.
[315] *See id.* at 1133–36.
[316] *See id.* at 1121.
[317] *See id.*
[318] *Id.*
[319] *See id.*
[320] *See id.* at 1123.
[321] *See id.* at 1134.
[322] *See id.* at 1134–35 (citing Mayo Collaborative Servs. v. Prometheus Labs., Inc., 566 U.S. 66 (2012)).

Mayo, the inventors here "recognized the relationships between" the drug and the body's response, "but that [was] not what [was] claimed."[323] Instead, the patentees "claimed an *application* of that relationship."[324] This was evidenced by the claims themselves, which required a specific dosage to be administered.[325] The court found further support in the specification, which "highlight[ed] the significance of the specific dosages" by explaining the correlation between the dosage and the risk of heart problems.[326]

The Federal Circuit also noted that preemption was not a concern for the '610 patent because the claims involved actually *"using* the natural relationship."[327] In *Mayo*, the claimed test "simply 'indicate[d]' a need to increase or decrease dosage, without . . . other added steps to take," while these claims "recite the steps of *carrying out a dosage regimen* based on the results" of a test.[328]

Because the claims at issue were "directed to a specific method of treatment for specific patients using a specific compound at specific doses to achieve a specific outcome," the Federal Circuit found them patent eligible under *Alice* step one.[329]

Chief Judge Prost dissented, arguing that the claims are indistinguishable from *Mayo*.[330] She explained that, like *Mayo*, the claims of the '610 patent "also set[] forth a natural relationship . . . ."[331] In response to the majority's focus on the specificity of the claims, Chief Judge Prost noted that "reciting specific metes and bounds in the claims did not prevent the Supreme Court from concluding those claims set forth a natural law in *Mayo*."[332] In her view, the patent was directed to a natural law and did not add an inventive concept because "[i]t claim[ed] no more than instructions directing [the] audience to apply the natural law in a routine and conventional manner."[333]

13. Data Engine Technologies LLC v. Google LLC (Oct. 9, 2018)[334]

Representative Claim 12 of U.S. Patent No. 5,590,259[335]	
[1]	In an electronic spreadsheet system for storing and manipulating information, a computer-implemented method of representing a three-dimensional spreadsheet on a screen display, the method comprising:

[323] *Id.* at 1135.
[324] *Id.* (emphasis added).
[325] *See id.*
[326] *Id.*
[327] *Id.* (citing *Mayo*, 566 U.S. at 77).
[328] *Id.* (quoting *Mayo*, 566 U.S. at 75).
[329] *Id.* at 1136.
[330] *Id.* at 1140 (Prost, C.J., dissenting).
[331] *Id.* at 1141 (Prost, C.J., dissenting).
[332] *Id.* (Prost, C.J., dissenting).
[333] *Id.* at 1142 (Prost, C.J., dissenting).
[334] 906 F.3d 999 (Fed. Cir. 2018).
[335] *See id.* at 1004–05. Claim 12 is "representative of all asserted claims of the Tab Patents" (claims 1–2, 12–13, 16–17, 19, 24, 46–47, and 51 of U.S. Patent No. 5,590,259 ("the '259 patent"), claims 1–2, 5–7, 10, 13, and 35 of U.S. Patent No. 5,784,545 ("the '545 patent"), and claims 1, 3, 6–7, 10, 12–13, 15, and 18 of U.S. Patent No. 6,282,551 ("the '551 patent")). Id.

[1.1]	displaying on said screen display a first spreadsheet page from a plurality of spreadsheet pages, each of said spreadsheet pages comprising an array of information cells arranged in row and column format, at least some of said information cells storing user-supplied information and formulas operative on said user-supplied information, each of said information cells being uniquely identified by a spreadsheet page identifier, a column identifier, and a row identifier;
[1.2]	while displaying said first spreadsheet page, displaying a row of spreadsheet page identifiers along one side of said first spreadsheet page, each said spreadsheet page identifier being displayed as an image of a notebook tab on said screen display and indicating a single respective spreadsheet page, wherein at least one spreadsheet page identifier of said displayed row of spreadsheet page identifiers comprises at least one user-settable identifying character;
[1.3]	receiving user input for requesting display of a second spreadsheet page in response to selection with an input device of a spreadsheet page identifier for said second spreadsheet page;
[1.4]	in response to said receiving user input step, displaying said second spreadsheet page on said screen display in a manner so as to obscure said first spreadsheet page from display while continuing to display at least a portion of said row of spreadsheet page identifiers; and
[1.5]	receiving user input for entering a formula in a cell on said second spreadsheet page, said formula including a cell reference to a particular cell on another of said spreadsheet pages having a particular spreadsheet page identifier comprising at least one user-supplied identifying character, said cell reference comprising said at least one user-supplied identifying character for said particular spreadsheet page identifier together with said column identifier and said row identifier for said particular cell.

In *Data Engine Techs.*, the Federal Circuit considered a group of patents it referred to as the "Tab Patents."[336] The court noted the patents disclose systems and methods of adding "familiar, user-friendly interface objects—specifically notebook tabs" to electronic spreadsheets.[337] According to the court, prior to these patents, operating electronic spreadsheets required users to enter various commands to carry out simple tasks, and such commands were often found buried in various menus, but users often memorized the most common commands.[338] The court also noted some prior art electronic spreadsheets allowed three-dimensional data storage via the creation of multiple "pages," but this only served to increase the complexity of using the spreadsheets.[339]

According to the Federal Circuit, compared with the prior art, the invention makes multipage electronic spreadsheets more manageable because the user does

[336] *See id.* at 1002. The Tab Patents include the '259 patent, the '545 patent, and the '551 patent. *See id.* The Federal Circuit also considered U.S. Patent No. 5,303,146, but held it ineligible. *See id.* Thus, it is outside the scope of this paper.
[337] *Id.* at 1002.
[338] *Id.*
[339] *See id.*

not have to remember complicated commands.[340] The court explained the patented system gives the user the ability to switch between multiple different "pages" of spreadsheets by selecting a tab at the bottom of the screen, rather than the prior art method of finding and entering a command.[341]

The district court held that the Tab Patents are ineligible because they are directed to abstract ideas and do not have an inventive step.[342] Specifically, it found they are "directed to the abstract idea of using notebook-type tabs to label and organize spreadsheets."[343] The district court deemed this an abstract idea "that humans have commonly performed entirely in their minds, with the aid of columnar pads and writing instruments."[344]

The Federal Circuit reversed the eligibility decision with respect to the Tab Patents.[345] It held that the claims of the Tab Patents are eligible because they are not directed to an abstract idea, except for claim 1 of the '551 patent.[346]

The Federal Circuit began its analysis of the Tab Patents at step one of *Alice*.[347] According to the court, the patents "provide[] a specific solution to then-existing technological problems in computers and prior art electronic spreadsheets."[348] As discussed above, these spreadsheets were complex and "hindered a user's ability to find or access the many commands and features available . . . ."[349] According to the court, the invention disclosed by the Tab Patents addresses this problem with its "highly intuitive, user-friendly interface . . . ."[350] The court made specific mention of the industry praise received by the invention for its improvements to the ability of computers to function "as a tool able to instantly access all parts of complex three-dimensional electronic spreadsheets."[351]

The Federal Circuit explained that representative claim 12 "recites specific steps detailing the method of navigating through spreadsheet pages."[352] According to the court, the patent "does not recite the idea of navigating . . . using buttons or a generic method of labeling and organizing spreadsheets."[353] Instead, the court found that it "require[s] a specific interface and implementation for navigating complex three-dimensional spreadsheets using techniques unique to computers."[354]

The Federal Circuit analogized the claims of the Tab Patents to those in *Core Wireless*.[355] In that case, the invention was different than the prior art in that it "spared users from time-consuming operations of navigating to, opening up,

[340] *See id.* at 1003.
[341] *Id.* at 1003–04.
[342] *See id.* at 1006.
[343] *Id.*
[344] *Id.*
[345] *See id.*
[346] *See id.* at 1002. The court's analysis with respect to claim 1 of the '551 patent is not discussed here because that claim was found ineligible. *See id.* at 1101. It is thus outside the scope of this paper.
[347] *See id.* at 1007–11.
[348] *Id.* at 1008.
[349] *Id.* at 1008.
[350] *Id.*
[351] *Id.*
[352] *Id.*
[353] *Id.*
[354] *Id.*
[355] *See id.* at 1009 (citing Core Wireless Licensing S.A.R.L. v. LG Electronics, Inc., 880 F.3d 1356 (Fed. Cir. 2018)).

and then navigating within, each separate application."[356] The court found the Tab Patents also recite methods different from the prior art, and those methods improve the ability of users to "rapidly access[] and process[] information."[357]

The Federal Circuit found the claims in *Affinity Labs*, *Capital One*, and *Erie Indemnity* were all dissimilar to the Tab Patents.[358] According to the court, those cases involved claims "directed to displaying a graphical user interface or collecting, manipulating, or organizing information to improve navigation through three-dimensional spreadsheets."[359] On the other hand, the court found the Tab Patents include "a *specific* structure (i.e., notebook tabs) within a *particular* spreadsheet display that performs a *specific* function (i.e., navigating within a three-dimensional spreadsheet)."[360] Therefore, the court held the claims here were dissimilar from the claims the Federal Circuit had previously found ineligible.[361]

According to the Federal Circuit, despite the fact that tabbed notebooks have long been used to organize information, "[i]t is not enough . . . to merely trace the invention to some real-world analogy."[362] The court explained "[t]he eligibility question is not whether anyone has ever used tabs to organize information . . . ."[363] Instead, the "question . . . is whether the claim is 'directed to' the abstract idea itself . . . ."[364] The court answered that question: the claims of the Tab Patents "when read as a whole, in light of the specification, . . . [are] directed to more than a generic or abstract idea as [they] claim[] a particular manner of navigating three-dimensional spreadsheets, implementing an improvement in electronic spreadsheet functionality."[365]

14. Ancora Technologies, Inc. v. HTC America, Inc. (Nov. 16, 2018)[366]

Claim 1 of U.S. Patent No. 6,411,941[367]	
[1]	A method of restricting software operation within a license for use with a computer including an erasable, non-volatile memory area of a BIOS of the computer, and a volatile memory area; the method comprising the steps of:
[1.1]	selecting a program residing in the volatile memory,

[356] *Id.* (citing *Core Wireless*, 880 F.3d at 1363).

[357] *Id.* (citing *Core Wireless*, 880 F.3d at 1363).

[358] *See id.* at 1010 (citing Affinity Labs of Tex., LLC v. DirecTV, LLC, 838 F.3d 1253 (Fed. Cir. 2016); Intellectual Ventures I LLC v. Capital One Fin. Corp., 850 F.3d 1332 (Fed. Cir. 2017); Intellectual Ventures I LLC v. Erie Indem. Co., 850 F.3d 1315 (Fed. Cir. 2017)).

[359] *Id.*

[360] *Id.* (emphasis added).

[361] *See id.* ("[U]nlike ineligible claims that merely 'collect[ ], organiz[e], and display . . . information on a generic display device,' claim 12 recites 'a specific improvement to the way computers . . . operate.'").

[362] *Id.* at 1011.

[363] *Id.*

[364] *Id.*

[365] *Id.*

[366] 908 F.3d 1343 (Fed. Cir. 2018).

[367] *See id.* at 1345–46. The court did not make a specific finding as to which claim was representative of U.S. Patent No. 6,411,941 ("the '941 patent"), nor did it specify which claims were asserted. *See id.* However, it only considered claim 1 because that was where "the parties focused their arguments . . . ." Id. at 1345.

[1.2]	using an agent to set up a verification structure in the erasable, non-volatile memory of the BIOS, the verification structure accommodating data that includes at least one license record,
[1.3]	verifying the program using at least the verification structure from the erasable non-volatile memory of the BIOS, and
[1.4]	acting on the program according to the verification.

The asserted patent the Federal Circuit considered in *Ancora* relates to a method for preventing a computer from running software outside its license.[368] Under one prior art method, license information for software was stored on a hard drive, but that method was susceptible to hacking.[369] Another method involved installing a physical "dongle" in the computer to authenticate software, but that was "costly, inconvenient, and not suitable for internet distribution."[370]

The method in the '941 patent uses a "key" (a unique identifier for a computer which cannot be changed) and a "license record" (a license for each application containing the author's name, the program's name, and the number of users licensed to use the program).[371] The invention of the patent involves storing authentication information in the modifiable "Basic Input Output System" (BIOS) memory instead of on a hard disk or dongle.[372] Under the patent, the license record is encrypted using the computer's key, then stored in BIOS, which is relatively difficult to hack.[373] When the program in question starts up, the computer takes a copy of the license record from the program, encrypts that, then checks to see if the result matches what is stored in BIOS memory.[374] This method is different than the standard use of BIOS memory; it is ordinarily used to store programs that help the computer boot up.[375]

The district court held the claims of the '941 patent ineligible and granted a motion to dismiss, but the Federal Circuit reversed because it found the claims eligible under step one of *Alice*.[376] According to the appellate court, "the claimed advance is a concrete assignment of specified functions among a computer's components to improve computer security," and therefore patentable.[377]

The Federal Circuit began its analysis with a review of eligibility case law.[378] The court characterized its *Core Wireless* holding, explaining that the claims there were not directed to an abstract idea because they were directed to a "specific type of index for a specific type of user."[379] It also cited the *Data Engine* decision.[380]

[368] *See id.* at 1344.
[369] *See id.*
[370] *Id.*
[371] *Id.* at 1345.
[372] *Id.*
[373] *See id.*
[374] *See id.*
[375] *See id.*
[376] *See id.* at 1344.
[377] *Id.*
[378] *Id.* at 1347–48.
[379] *See id.* at 1348 (citing Core Wireless Licensing S.A.R.L. v. LG Electronics, Inc., 880 F.3d 1356, 1362–63 (Fed. Cir. 2018)).
[380] *See id.* (citing Data Engine Techs. LLC v. Google LLC, 906 F.3d 999 (Fed. Cir. 2018)).

The court explained the claims in *Data Engine* were not directed to an abstract idea because they presented "a specific solution to then-existing technological problems," which were "addressed in a particular way . . . ."[381] The *Data Engine* Court distinguished other cases because its claims "recite[d] 'a specific structure (i.e., notebook tabs) within a particular spreadsheet display that performs a specific function (i.e., navigating within a three-dimensional spreadsheet).'"[382] According to the *Ancora* Court, § 101 precedent also shows improvements to computer security can be "non-abstract" improvements to computer function, "if done by a specific technique that departs from earlier approaches to solve a specific computer problem."[383]

Here, the patent "specifically identifies" how it improves computer function "in an assertedly unexpected way[.]"[384] It relies on the unique properties of BIOS memory, which, according to the patent, had not previously been used this way.[385] This unexpected use results in improvements to licensing software.[386] The Federal Circuit further noted the prosecution history supports the assertion that the invention is unexpected.[387]

Because the Federal Circuit found the patent survived step one, it did not continue to step two.[388] However, due to the overlap between the two steps, it explained some of its step two precedent indirectly reinforces the decision.[389] According to the court, the same logic it applied in *Bascom* applied here.[390] There, the claims were eligible despite the fact that internet filtering was known at the time.[391] In both cases, "the patent describes how its particular *arrangement* of elements is a technical improvement over the prior art" methods.[392]

15. Natural Alternatives Int'l, Inc. v. Creative Compounds, LLC (Mar. 15, 2019)[393]

Natural Alternatives asserted five patents against Creative Compounds, LLC: Patent No. 5,965,596, Patent No. 7,825,084, Patent No. 7,504,376, Patent No. 8,993,610, Patent No. 8,470,865, and Patent No. RE45,947.[394] The asserted patents concern dietary supplements which use an amino acid called beta-alanine to prevent fatigue in muscle tissue.[395]

[381] *Id.* (quoting *Data Engine*, 906 F.3d at 1008).
[382] *Id.* (quoting *Data Engine*, 906 F.3d at 1010–11).
[383] *Id.* (The security improvement was "against a computer's unauthorized use of a program . . . .").
[384] *Id.* at 1348–49.
[385] *See id.* at 1348–49.
[386] *See id.*
[387] *See id.* at 1349.
[388] *See id.*
[389] *See id.*
[390] *See id.* (citing Bascom Glob. Internet Servs., Inc. v. AT&T Mobility LLC, 827 F.3d 1341 (Fed. Cir. 2016)).
[391] *See id.* (citing *Bascom*, 827 F.3d at 1349–50).
[392] *Id.* (emphasis added) (quoting *Bascom*, 827 F.3d at 1349–50).
[393] 918 F.3d 1338 (Fed. Cir. 2019).
[394] *See id.* at 1341.
[395] *See id.*

The district court entered a judgment on the pleadings, holding that the asserted claims are not patent eligible.[396] But the Federal Circuit reversed, holding that the claims survive step one of *Alice* because they are not directed to an ineligible concept.[397] The Federal Circuit divided the patents into three sections: method claims,[398] product claims,[399] and manufacturing claims.[400]

a) The "Method Claims"

Representative Claim 1 of U.S. Patent No. 5,965,596[401]	
[1]	A method of regulating hydronium ion concentrations in a human tissue comprising:
[1.1]	providing an amount of beta-alanine to blood or blood plasma effective to increase beta-alanylhistidine dipeptide synthesis in the human tissue; and
[1.2]	exposing the tissue to the blood or blood plasma, whereby the concentration of beta-alanylhistidine is increased in the human tissue.

Representative Claim 1 of U.S. Patent No. 8,470,865[402]	
[1]	A method of increasing anaerobic working capacity in a human subject, the method comprising:
[1.1(a)]	providing to the human subject an amount of an amino acid to blood or blood plasma effective to increase beta-alanylhistidine dipeptide synthesis in the tissue, wherein said amino acid is at least one of:
[1.1(a)(i)]	beta-alanine that is not part of a dipeptide, polypeptide or oligopeptide;
[1.1(a)(ii)]	an ester of beta-alanine that is not part of a dipeptide, polypeptide or oligopeptide; or
[1.1(a)(iii)]	an amide of beta-alanine that is not part of a dipeptide, polypeptide or oligopeptide; and
[1.1(b)]	exposing the tissue to the blood or blood plasma, whereby the concentration of beta-alanylhistidine is increased in the tissue,
[1.2]	wherein the amino acid is provided through a dietary supplement.

The Federal Circuit considered two representative claims from this set: claim 1 of the '596 patent, and claim 1 of the '865 patent.[403] Though both of these claims "utilize an underlying natural law," that does not mean they are directed to the

[396] *See id.*
[397] *See id.* at 1350.
[398] *See id.* at 1343.
[399] *See id.* at 1347.
[400] *See id.* at 1349.
[401] *See id.* at 1343. Claim 1 of U.S. Patent No. 5,965,596 ("the '596 patent") is representative, but the court did not specifically identify which claims were asser*ted. Se*e id.
[402] *See id.* at 1343–44. Claim 1 of U.S. Patent No. 8,470,865 ("the '865 patent") is representative, but the court did not specifically identify which claims were asser*ted. See* id.
[403] *See id.* at 1343.

natural law.[404] Similar to the claims in *Vanda*, the Method Claims "contain specific elements that clearly establish they are doing more than simply reciting a natural law."[405] Those specific elements include identifying the result the method achieves, identifying "a compound to be administered to achieve the claimed result," and placing a limitation on the dosage to be administered.[406] Following the *Vanda* Court's analysis, the Federal Circuit found further support in the specification, which identifies a method to determine the dosage.[407] As a result, the Method Claims go "far beyond merely stating a law of nature . . . ."[408]

It did not matter to the Federal Circuit that the active ingredient was "a molecule that occurs in nature and is consumed as part of the human diet . . . ."[409] It explained that claiming a method *using* a natural product is different than claiming the natural product itself.[410] Furthermore, the claims required administering an amount of the active ingredient that is not naturally occurring, and in fact "greatly exceeds natural levels."[411]

Because the Method Claims were treatment claims which "cover using a natural product in unnatural quantities to alter a patient's natural state" and because they outline particular dosages to be applied, the Federal Circuit held the Method Claims survive step one.[412] Even if the court reached step two of *Alice*, it recognized there were factual questions about whether the "dietary supplement limitation was well-understood, routine, and conventional . . . ."[413] This factual dispute meant that the eligibility question should not have been determined adversely to the non-movant (patentee) at this procedural stage.[414]

b) The "Product Claims"

Representative Claim 6 of U.S. Patent No. 7,504,376[415]	
[1]	A composition, comprising:
[1.1]	glycine; and
[1.2(a)]	an amino acid selected from the group consisting of a beta-alanine, an ester of a beta-alanine, and an amide of a beta-alanine, or
[1.2(b)]	a di-peptide selected from the group consisting of a beta-alanine di-peptide and a beta-alanylhistidine di-peptide.

[404] *Id.* at 1345.
[405] *Id.*
[406] *Id.* at 1345–46.
[407] *See id.* at 1346.
[408] *Id.*
[409] *Id.*
[410] *See id.*
[411] *Id.*
[412] *Id.* at 1346–47.
[413] *Id.* at 1347.
[414] *See id.*
[415] *See id.* at 1347–48. Claim 6 of U.S. Patent No. 7,504,376 is representative, but the court did not specifically identify which claims were asser*ted. See* id.

[5]	The composition of claim 1, wherein the composition is a dietary supplement or a sports drink.
[6]	The composition of claim 5, wherein the dietary supplement or sports drink is a supplement for humans.

Representative Claim 1 of U.S. Patent No. 7,825,084[416]	
[1]	A human dietary supplement, comprising a beta-alanine in a unit dosage of between about 0.4 grams to 16 grams, wherein the supplement provides a unit dosage of beta-alanine.

The Federal Circuit held the Product Claims were not "directed to beta-alanine," a natural product.[417] Although these claims "incorporate natural products" into their specific formulations, the court recognized those formulations "have different characteristics" than in the naturally occurring state and, consequently, can be used differently than the natural products themselves.[418] Those characteristics include "particular dosage forms."[419] According to the court, the allegations relating to the utility of the particular dosage forms were sufficient to survive a judgment on the pleadings.[420]

The Federal Circuit further noted that the fact that two natural products were combined into one was "not necessarily sufficient" to show the claims should fail step one.[421] Here, it was important that glycine and beta-alanine were combined to produce "synergistic effects allowing for outcomes that the individual components would not have."[422]

Even if the Federal Circuit had moved on to step two, the Product Claims raised the same factual question as the Method Claims, so a determination was not appropriate at this procedural phase.[423]

c) The "Manufacturing Claims"

Representative Claim 1 of U.S. Patent No. 8,993,610[424]	
[1]	Use of beta-alanine in manufacturing a human dietary supplement for oral consumption;

[416] *See id.* at 1347–48. Claim 1 of U.S. Patent No. 7,825,084 is representative, but the court did not specifically identify which claims were asser*ted. See* id.

[417] *Id.* at 1348.

[418] *Id.*

[419] *Id.*

[420] *See id.* at 1349. For example, the '376 patent requires enough beta-alanine in a sports drink to "effectively increase[] athletic performance," and the patent "provides a method for determining such an amount." *See id.* at 1346.

[421] *Id.* at 1349.

[422] *Id.* An expert declaration, an article attached to an expert report, and a sentence in the specification supported the allegations of synergistic effect. *See id.*

[423] *See id.*

[424] *See id.* at 1349–50. Claim 1 of U.S. Patent No. 8,993,610 is representative, but the court did not specifically identify which claims were asser*ted. See* id.

[1.1]	supplying the beta-alanine, which is not part of a dipeptide, polypeptide or oligopeptide, as a single ingredient in a manufacturing step of the human dietary supplement or
[1.2]	mixing the beta-alanine, which is not part of a dipeptide, polypeptide or oligopeptide, in combination with at least one other ingredient for the manufacture of the human dietary supplement,
[1.3]	whereby the manufactured human dietary supplement is for oral consumption of the human dietary supplement in doses over a period of time increases beta-alanyl histidine levels in muscle tissue sufficient to delay the onset of fatigue in the human.

The Federal Circuit only addressed the Manufacturing Claims briefly.[425] It noted that these claims were "even further removed from the natural law and product of nature at issue in the Method Claims and Product Claims."[426] Given that the other two sets of claims were not directed to laws or products of nature, the court did not see how the "manufacture of [that] non-natural supplement" could fail step one.[427]

16. SRI Int'l, Inc. v. Cisco Systems, Inc. (Mar. 20, 2019, modified July 12, 2019)[428]

Representative Claim 1 of U.S. Patent No. 6,711,615[429]	
[1]	A computer-automated method of hierarchical event monitoring and analysis within an enterprise network comprising:
[1.1]	deploying a plurality of network monitors in the enterprise network;
[1.2]	detecting, by the network monitors, suspicious network activity based on analysis of network traffic data selected from one or more of the following categories: {network packet data transfer commands, network packet data transfer errors, network packet data volume, network connection requests, network connection denials, error codes included in a network packet, network connection acknowledgements, and network packets indicative of well-known network-service protocols};
[1.3]	generating, by the monitors, reports of said suspicious activity; and
[1.4]	automatically receiving and integrating the reports of suspicious activity, by one or more hierarchical monitors.

[425] *See id.*

[426] *Id.* at 1350.

[427] *Id.*

[428] 918 F.3d 1368 (Fed. Cir. Mar. 20 2019); 930 F.3d 1295 (Fed. Cir. July 12 2019). The Federal Circuit modified its opinion without changing anything of substance in its § 101 analysis.

[429] *See id.* at 1373. Claim 1 is representative of claims 1–4, 14–16, and 18 of the '615 patent, as well as claims 1–4, 12–15, and 17 of the '203 pat*ent. See* id.

In *SRI International Inc.*, the Federal Circuit addressed two patents regarding the detection of hackers in a computer network.[430] The court explained that some security threats to computer networks are only detectable by analyzing information from several different sources.[431] Without this type of analysis, it would be difficult or impossible to detect attacks where an intruder tries to log into several different computers in a network simultaneously.[432] SRI researched the detection of intrusion into networks, and attempted to solve this problem with U.S. Patent Nos. 6,484,203 ("the '203 patent") and 6,711,615 ("the '615 patent").[433]

Cisco moved for summary judgment, asserting the claims were ineligible under § 101.[434] The district court denied the motion, so Cisco appealed.[435] The Federal Circuit held the claims were eligible under step one of *Alice* and affirmed. [436]

The majority noted that the claims focus on an improvement to computer technology: "providing a network defense system that monitors network traffic in real-time to automatically detect large-scale attacks."[437] The specification supported this conclusion because it laid out problems in the prior art and explained how the invention overcomes them.[438] According to the specification, the integration of the networks makes them vulnerable to hacking.[439] Even "localized" problems can lead to much larger scale effects.[440] The specification explained the invention was designed to solve these problems.[441]

Cisco argued that the claims were analogous to *Electric Power Group, LLC v. Alstom S.A.*[442] The Federal Circuit disagreed because those claims "were drawn to using computers as tools to solve a power grid problem, rather than improving the functionality of computers and computer networks themselves."[443] Like the *DDR Holdings* case, the '615 claims do more than recite the conventional operation of a computer network; here, they actually *prevent* normal functioning of ordinary computer networks.[444]

Judge Lourie dissented from the Federal Circuit's eligibility analysis.[445] In his view, the claims "differ very little from the claims in *Electric Power Group* . . . ."[446] He found the claims were "directed to the abstract idea of monitoring network security" because they simply use a computer as a tool to move information. [447] The claims have no inventive concept because, even viewed in light of the specification,

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[430] *See id.* at 1372.
[431] *See id.*
[432] *See id.*
[433] *See id.*
[434] *See id.* at 1373.
[435] *See id.* at 1373, 1374.
[436] *See id.* at 1376.
[437] *Id.* at 1375.
[438] *See id.* ("The specification bolsters our conclusion that the claims are directed to a technological solution to a technological problem.").
[439] *See id.*
[440] *Id.*
[441] *See id.*
[442] 830 F.3d 1350 (Fed. Cir. 2016). *See SRI Int'l*, 918 F.3d at 1375.
[443] *See SRI Int'l*, 918 F.3d at 1375.
[444] *See id.* at 1376 (citing DDR Holdings, LLC v. Hotels.com, L.P., 773 F.3d 1245, 1258 (Fed. Cir. 2014)).
[445] *See id.* at 1384 (Lourie, J., dissenting).
[446] *Id.* (Lourie, J., dissenting).
[447] *Id.* at 1385 (Lourie, J., dissenting).

they only require conventional components.[448] The claims were "result-focused, functional claims that effectively cover any solution to an identified problem," so they were ineligible.[449]

17. Endo Pharms. Inc. v. Teva Pharms. USA, Inc. (Mar. 28, 2019)[450]

Representative Claim 1 of U.S. Patent No. 8,808,737[451]	
[1]	A method of treating pain in a renally impaired patient, comprising the steps of:
[1.1(a)]	providing a solid oral controlled release dosage form, comprising:
[1.1(a)(i)]	about 5 mg to about 80 mg of oxymorphone or a pharmaceutically acceptable salt thereof as the sole active ingredient; and
[1.1(a)(ii)]	a controlled release matrix;
[1.1(b)]	measuring a creatinine clearance rate of the patient and determining it to be
[1.1(b)(a)]	less than about 30 ml/min,
[1.1(b)(b)]	about 30 mL/min to about 50 mL/min,
[1.1(b)(c)]	about 51 mL/min to about 80 mL/min, or
[1.1(b)(d)]	above about 80 mL/min; and
[1.1(c)]	orally administering to said patient, in dependence on which creatinine clearance rate is found, a lower dosage of the dosage form to provide pain relief;
[1.2]	wherein after said administration to said patient, the average AUC of oxymorphone over a 12-hour period is less than about 21 ng·hr/mL.

The *Endo Pharmaceuticals* Court considered a patent disclosing a method for treating the pain of patients with "renal impairment" (*i.e.*, poor kidney function) using a drug called oxymorphone.[452] Impaired kidney function can result in the buildup of drugs in a person's body, because the drugs would normally be filtered out by the kidneys.[453] The inventor of U.S. Patent No. 8,808,737 ("the '737 patent") discovered that people with more severe impairment need less oxymorphone than was typical.[454]

The treatment method claimed in the '737 patent "advantageously allows" for those with reduced kidney function to take less oxymorphone, but still reduce their pain.[455] As described in the specification, the claimed method "'avoid[s] possible issues in dosing' and 'allows for treatment with 'the lowest available dose . . . .'"[456]

[448] *See id.* (Lourie, J., dissenting).
[449] *Id.* (Lourie, J., dissenting).
[450] 919 F.3d 1347 (Fed. Cir. 2019).
[451] *See id.* at 1350–51. Claim 1 is representative of claims *1–6*. *See* id.
[452] *Id.* at 1348.
[453] *See id.* at 1349.
[454] *See id.*
[455] *Id.* at 1349.
[456] *Id.* at 1350.

Thus, the '737 patent allegedly improves on the prior art by allowing "renally impaired pain patients to be treated safely and effectively . . . ."[457]

The district court held the claims were not patent eligible.[458] In its view, they were directed to the natural law that "the bioavailability of oxymorphone is increased in people with severe renal impairment."[459] The district court found no inventive concept because the patent simply requires using a "well known method" to "obtain the necessary information to apply a law of nature," then merely "instructs the administration of the correct dosage . . . depending on the severity of the renal impairment . . . ."[460]

The Federal Circuit held the claims were not directed to an ineligible concept, and survived *Alice* step one.[461] It reasoned the claims were actually directed to a "method of using oxymorphone . . . to treat pain in a renally impaired patient." [462]

The Federal Circuit reached its conclusion first by noting that the claims recite specific steps.[463] Next, it explained that other parts of the patent (including the abstract, title, and summary) also support the holding because they "all describe the invention as a 'method of treating pain' in patients with renal impairment."[464] Finally, the specification lends support by "predominantly describ[ing] the invention" in terms of its advantages.[465]

According to the Federal Circuit, these claims are "legally indistinguishable" from those in *Vanda*.[466] Both sets of claims are treatment methods, both "recite the steps of carrying out a dosage regimen based on the results of . . . testing," and both "require specific treatment steps."[467] Like in *Vanda*, the inventor of the '737 patent recognized the natural law, but did not claim only that.[468] Instead, he claimed an application of the relationship he recognized.[469] Therefore, the claims were "directed to more than just reciting the natural relationship."[470]

The Federal Circuit also distinguished the claims at issue from those in *Mayo*.[471] First, the claim in *Mayo* "as a whole was not directed to the application of a drug to treat a particular disease."[472] Second, the "administering step in *Mayo* . . . simply describe[d] giving the drug to a patient," whereas here, "the administering step . . . describes giving a specific dose of the drug based on the results of kidney

[457] *Id.* at 1349.
[458] *See id.* at 1351.
[459] *Id.*
[460] *Id.*
[461] *See id.* at 1353.
[462] *Id.*
[463] *See id.* (describing the steps as "(a) providing a pharmaceutical . . . , (b) testing the patient for a disease state . . . , and then (c) administering the pharmaceutical . . . based on" an indicator in the amount necessary to maintain a certain level of oxymorphone in the body).
[464] *Id.*
[465] *Id.*
[466] *Id.* (citing Vanda Pharm. v. West-Ward Pharm. Int'l Ltd., 887 F.3d 1117 (Fed. Cir. 2018)).
[467] *Id.* at 1353–54 (citing *Vanda*, 887 F.3d at 1135).
[468] *See id.* at 1354.
[469] *See id.*
[470] *Id.* This was also because, in the court's view, the combination of the "administering step" and the "wherein clause" sufficiently "identif[ied] the appropriate schedule and dose . . . to administer," so the claims did "more than just recognize the need to lower a dose." *Id.* at 1355.
[471] *See id.* at 1354.
[472] *Id.* (citing Mayo Collaborative Servs. v. Prometheus Labs., Inc., 566 U.S. 66, 74 (2012)).

function testing."[473] In other words, the *Mayo* claims did not "confine their reach to particular applications of" natural laws, while the '737 claims do limit their reach.[474] Third, this case does not raise concerns of preemption.[475] Unlike *Mayo*, the claims in this case do not "tie up the doctor's subsequent treatment decision" because they "provide a specific dosage regimen through the wherein clause."[476]

Moreover, the Federal Circuit found the end result of the '737 patent "not simply an observation or detection."[477] Because these claims recite "a *treatment* method, not a detection method," and because that method is recited "specific[ally,]" they are directed to a "new and useful method of treating pain in patients with" renal failure.[478] Thus, they are patent eligible.[479]

18. Uniloc USA, Inc. v ADP, LLC (May 24, 2019)[480]

The Federal Circuit considered four patents in its *Uniloc* decision, but only found two of them eligible.[481] U.S. Patent Nos. 7,069,293 ("the '293 patent") and 6,324,578 ("the '578 patent") both relate to software installation, but the court separated its analysis with respect to each patent.[482]

The district court dismissed the complaint because it held the patents to be ineligible.[483] The Federal Circuit reversed and remanded with respect to both the '293 patent and the '578 patent because it found them eligible under *Alice* step one.[484]

a) The '293 Patent

Claim 1 of U.S. Patent No. 7,069,293[485]	
[1]	A method for distribution of application programs to a target on-demand server on a network comprising the following executed on a centralized network management server coupled to the network:
[1.1]	providing an application program to be distributed to the network management server;
[1.2]	specifying a source directory and a target directory for distribution of the application program;

[473] *Id.* (citing *Mayo*, 566 U.S. 66).
[474] *Id.*
[475] *See id.* at 1354–55.
[476] *Id.* at 1354–55.
[477] *Id.* at 1356 (citing Rapid Litigation Management Ltd. v. CellzDirect, Inc., 827 F.3d 1042 (Fed. Cir. 2016)).
[478] *Id.* at 1354.
[479] *See id.* at 1353.
[480] No. 2018-1132, 2019 WL 2245938 (Fed. Cir. May 24, 2019).
[481] *See id.* at *1. Two of those patents (U.S. Patent Nos. 6,510,466 and 6,728,766) were found ineligible, and are not considered here because they are outside the scope of this paper. *See id.* at *8, *9.
[482] *See id.* at *8, *9.
[483] *See id.* at *1.
[484] *See id.* at *1, *6.
[485] *See* U.S. Patent No. 7,069,293 col. 21 l. 21–37. The court did not designate a representative claim, but Uniloc cited Claim 1 when arguing *Alice* step one. *See U*niloc, 2019 WL 2245938, at *4.

[1.3]	preparing a file packet associated with the application program and including a segment configured to initiate registration operations for the application program at the target on-demand server; and
[1.4]	distributing the file packet to the target on-demand server to make the application program available for use by a user at a client.

U.S. Patent No. 7,069,293 ("the '293 patent") relates to distributing and installing software from a centralized location on a network.[486] In its analysis, the Federal Circuit explained that, although the claims' "goal" is functional,[487] "the patent claims a particular improvement in *how*" that goal is accomplished.[488] The court recognized the claims are obviously focused on that improvement, and the specification has a similar focus.[489] Moreover, the court noted the record does not indicate "such network architecture was so conventional as to exclude that . . . limitation in" determining what the patent is directed to.[490]

The Federal Circuit further held the fact that the specification illustrates the invention using "off-the shelf components" did not automatically make it directed to an ineligible category.[491] The specification described *implementing* the invention using those off-the shelf components; it did not simply claim their "routine activity."[492] This implementation actually enhanced the function of those prior art components, which, according to the court, "was the heart of the patent's allowance."[493] Because "the focus of the claimed advance" here was a "particular improvement in the functioning of [the] prior art," the claims of the '293 patent are not directed to an abstract idea.[494]

b) The '578 Patent

Representative Claim 1 of U.S. Patent No. 6,324,578[495]	
[1]	A method for management of configurable application programs on a network comprising the steps of:
[1.1]	installing an application program having a plurality of configurable preferences and a plurality of authorized users on a server coupled to the network;

[486] *See Uniloc*, 2019 WL 2245938, at *4–5.
[487] Specifically, the goal is "to allow centralized distribution of software." *See id.* at *5.
[488] *Id.* at *5 ("[I].e. by use of a file packet to enable the further functionality of initiating on-demand registration of the application.").
[489] *See id.*
[490] *Id.*
[491] *Id.*
[492] *Id.*
[493] *Id.*
[494] *Id.*
[495] *See* U.S. Patent No. 6,324,578 col. 14 l. 63–col. 15 l. 13. The lower court designated claim 1 representative, and the Federal Circuit "analyze[d] all the asserted claims in the '578 patent based on claim 1." *See U*niloc, 2019 WL 2245938, at *6 n.4.

[1.2]	distributing an application launcher program associated with the application program to a client coupled to the network;
[1.3]	obtaining a user set of the plurality of configurable preferences associated with one of the plurality of authorized users executing the application launcher program;
[1.4]	obtaining an administrator set of the plurality of configurable preferences from an administrator; and
[1.5]	executing the application program using the obtained user set and the obtained administrator set of the plurality of configurable preferences responsive to a request from the one of the plurality of authorized users.

Claim 1 of U.S. Patent No. 6,324,578 ("the '578 patent") recites the existence of both user preferences and administrator preferences for a software program.[496] The administrator preferences are specifically stored on a server.[497] Under the patent, a user is given an application launcher for the program in question.[498] This setup allows users to install applications on-demand with their custom preferences and the administrator's custom preferences.[499]

In the Federal Circuit's view, claim 1 of the '578 patent is "directed to a particular way of using a conventional application server to nevertheless allow on-demand installation of an application incorporating preferences from two different sources by adding the application manager and configuration manager as additions to each application."[500] The added application manager and configuration manager are not "merely fulfill[ing] their ordinary roles"; they are being used together in "a different way of achieving" the claimed improvement.[501] Therefore, the patent is not directed to an abstract idea.[502]

Had the Federal Circuit held the claims abstract under step one, it clarified that they would survive step two.[503] The court would have found an inventive concept because the claims recite an unconventional arrangement of components that achieved the asserted improvement, like the claims in *Bascom*.[504]

[496] *See Uniloc*, 2019 WL 2245938, at *6.
[497] *See id.*
[498] *See id.*
[499] *See id.*
[500] *Id.*
[501] *Id.*
[502] *See id.*
[503] *See id.*
[504] *See id.* (citing Bascom Glob. Internet Servs., Inc. v. AT&T Mobility LLC, 827 F.3d 1341, 1350 (Fed. Cir. 2016)).

19. Cellspin Soft, Inc. v. Fitbit, Inc. (June 25, 2019)[505]

Representative Claim 1 of U.S. Patent No. 8,738,794[506]	
[1]	A method for acquiring and transferring data from a Bluetooth enabled data capture device to one or more web services via a Bluetooth enabled mobile device, the method comprising:
[1.1]	providing a software module on the Bluetooth enabled data capture device;
[1.2]	providing a software module on the Bluetooth enabled mobile device;
[1.3]	establishing a paired connection between the Bluetooth enabled data capture device and the Bluetooth enabled mobile device;
[1.4]	acquiring new data in the Bluetooth enabled data capture device, wherein new data is data acquired after the paired connection is established;
[1.5]	detecting and signaling the new data for transfer to the Bluetooth enabled mobile device, wherein detecting and signaling the new data for transfer comprises:
[1.5(a)]	determining the existence of new data for transfer, by the software module on the Bluetooth enabled data capture device; and
[1.5(b)]	sending a data signal to the Bluetooth enabled mobile device, corresponding to existence of new data, by the software module on the Bluetooth enabled data capture device automatically, over the established paired Bluetooth connection, wherein the software module on the Bluetooth enabled mobile device listens for the data signal sent from the Bluetooth enabled data capture device, wherein if permitted by the software module on the Bluetooth enabled data capture device, the data signal sent to the Bluetooth enabled mobile device comprises a data signal and one or more portions of the new data;
[1.5(c)]	transferring the new data from the Bluetooth enabled data capture device to the Bluetooth enabled mobile device automatically over the paired Bluetooth connection by the software module on the Bluetooth enabled data capture device;
[1.5(d)]	receiving, at the Bluetooth enabled mobile device, the new data from the Bluetooth enabled data capture device;
[1.5(e)]	applying, using the software module on the Bluetooth enabled mobile device, a user identifier to the new data for each destination web service, wherein each user identifier uniquely identifies a particular user of the web service;
[1.5(f)]	transferring the new data received by the Bluetooth enabled mobile device along with a user identifier to the one or more web services, using the software module on the Bluetooth enabled mobile device;

[505] No. 2018-1817, 2019 WL 2588278 (Fed. Cir. June 25, 2019).

[506] *See id.* at *1–*2. The court treated claims 1 and 16 as representative of asserted claims 1–4, 7, 9, 16–18, and 20–21 of the '794 patent because Cellspin only offered "separate arguments" for those two claims. The court considered other claims representative of the remaining three patents, but noted that the representative claims were all "substantially similar." *Id.* at *3. As a result, the court only explicitly detailed claim 1 of the '794 patent; the other claims were described in terms of their differences. *See* id. at *1–*3.

[1.5(g)]	receiving, at the one or more web services, the new data and user identifier from the Bluetooth enabled mobile device, wherein the one or more web services receive the transferred new data corresponding to a user identifier; and
[1.5(h)]	making available, at the one or more web services, the new data received from the Bluetooth enabled mobile device for public or private consumption over the internet, wherein one or more portions of the new data correspond to a particular user identifier.

The Federal Circuit considered the eligibility of four patents in the *Cellspin Soft* case: U.S. Patent Nos. 8,738,794 ("the '794 patent"), 8,892,752 ("the '752 patent"),[507] 9,258,698 ("the '698 patent"),[508] and 9,749,847 ("the '847 patent").[509] All four patents share a specification and relate to uploading content to a website through a "mobile device," which is connected to a "data capture device . . . ."[510] Under the prior art, a person looking to capture content (such as a digital picture) and upload it to the internet needed a "memory stick or cable" separate from the data capture device.[511]

The '794 patent attempts to solve that problem by pairing the data capture device with a mobile device "via short-range wireless communication . . . such as Bluetooth."[512] An application stored on the mobile device "detects and receives content" over that connection.[513] Then, the mobile device "automatically" uploads that content to a website.[514]

Claim 1 of the '794 patent involves a "push" mode where the data capture device starts the data transfer by sending a signal to the mobile device.[515] Claim 16 "is essentially the same as claim 1," but it involves a "pull" mode where the mobile device starts the transfer by asking the data capture device if there is content to upload.[516]

The limitations of claim 1 of the '752 patent effectively only differ from that of the '794 patent in two ways.[517] First, the '752 patent specifically requires establishing a connection between the mobile device and data capture device with an encryption key for the devices to identify themselves.[518] Second, the '752 patent states that the mobile device must transmit content to an "internet service" using hypertext transfer protocol (HTTP).[519]

[507] Cellspin asserted claims 1, 2, 4–5 and 12–14 of the '752 patent. *Id.* at *3. However, the court only addressed claim 1 because Cellspin "only offer[ed] separate arguments as to eligibility with respect to claim 1." *Id.*

[508] Cellspin asserted claims 1, 3–5, 7–8, 10–13, and 15–20 of the '698 patent. *Id.* at *3. However, the court only addressed claim 5 because Cellspin "only offer[ed] separate arguments as to claim 5." *Id.*

[509] *See id.* at *1–*3. Cellspin asserted claims 1–3 of the '847 patent. *Id.* at *3. However, the court only addressed claim 1 because Cellspin "only offer[ed] separate arguments as to claim 1." *Id.*

[510] *Id.* at *1.

[511] *Id.*

[512] *Id.*

[513] *Id.*

[514] *Id.*

[515] *Id.* at *2.

[516] *Id.*

[517] *See id.* at *3.

[518] *See id.*

[519] *Id.*

Claim 5 of the '698 patent is "substantially similar" to claim 1 of the '752 patent.[520] The only differences are that the '698 patent specifies a digital camera instead of a data capture device, and that the '698 patent does not reference Bluetooth.[521]

According to the Federal Circuit, claim 1 of the '847 patent is "substantially similar" to claim 1 of the '752 patent.[522]

The district court granted a 12(b)(6) motion to dismiss, finding the claims ineligible as directed to an abstract idea without an inventive concept.[523] With respect to the '794 claims, Cellspin argued "there was a factual dispute about whether the 'combination' of these elements was 'well-understood, routine and conventional.'"[524] But the district court "did not reach the issue" in part because Cellspin did not identify support in the specification for the inventive concepts it alleged.[525] With respect to the other patents, the district court held they were directed to an abstract idea, and the differences with the '794 claims were not enough to evidence an inventive concept.[526]

The Federal Circuit found the claims directed to an abstract idea.[527] But it explained that the district court should not have "ignor[ed] [the] allegations that, when properly accepted as true, preclude the grant of a motion to dismiss."[528] Thus, the Federal Circuit vacated the decision and remanded the case.[529]

Under step one, the Federal Circuit held the claims are not directed to an improvement in functionality, but are directed to "the [abstract] idea of capturing and transmitting data from one device to another."[530] The specification acknowledges that content could already be transferred from an "internet-incapable" data capture device to the internet.[531] In the court's view, these patents merely automate that existing process.[532] Thus, "the claims as a whole, across all four patents, are directed to an abstract idea."[533]

The Federal Circuit next turned to step two of *Alice* to search for an inventive concept.[534] It explained that the district court should not have disregarded Cellspin's allegations merely because Cellspin did not cite support in the specification.[535] As long as the inventive concept is "recited by the claims, the specification need not expressly list all the reasons why the claimed structure is unconventional."[536] In *Aatrix*, the allegations in the complaint were sufficient to survive a motion to

[520] *Id.*
[521] *See id.*
[522] *Id.*
[523] *See id.* at *4.
[524] *Id.*
[525] *Id.*
[526] *See id.* at *5.
[527] *See id.* at *6.
[528] *Id.*
[529] *See id.*
[530] *Id.*
[531] *Id.* at *7.
[532] *See id.* ("[T]he need to perform tasks automatically is not a unique technical problem.").
[533] *Id.* at *6.
[534] *See id.* at *7.
[535] *See id.* at *8.
[536] *Id.*

dismiss.[537] But allegations are not automatically sufficient; they must be "plausible and specific factual allegations that aspects of the claims are inventive . . . ."[538]

Here, the allegations were sufficient because they were specific and plausible, and related to why the invention was unconventional.[539] Cellspin's allegations contained multiple ways the claims were (arguably) unconventional.[540] In the prior art, data capture devices with built-in wireless internet were bulky and expensive.[541] The complaints alleged several benefits over this prior art.[542] First, the claimed data capture device only has one function, so it is smaller and cheaper.[543] Second, the patented system as a whole is simpler to operate.[544] Third, users can "access and upload data even if the capture device is physically inaccessible . . . ."[545] Cellspin also argued that separating the capturing content step from the publishing step was unconventional, in light of the prior art.[546] Lastly, the allegations asserted that the ordered combination of the claimed elements was inventive.[547] Prior art methods merely forwarded content as it was captured.[548] The claims here require a connection with the mobile device first, which "ensures that data is only transmitted if the mobile device is capable of receiving it."[549] Therefore, the Federal Circuit could not, as a matter of law, conclude that the claims were ineligible under *Alice* step two.[550]

20. Koninklijke KPN N.V. v. Gemalto M2M GMBH (Nov. 15, 2019)[551]

Claim 2 of U.S. Patent No. 6,212,662[552]	
[1]	A device for producing error checking based on original data provided in blocks with each block having plural bits in a particular ordered sequence, comprising:
[1.1]	a generating device configured to generate check data; and
[1.2]	a varying device configured to vary original data prior to supplying said original data to the generating device as varied data;

[537] *See id.* (citing Aatrix Software, Inc. v. Green Shades Software, Inc., 882 F.3d 1121, 1128 (Fed. Cir. 2018)).
[538] *Id.*
[539] *See id.*
[540] *See id.* at *7.
[541] *See id.*
[542] *See id.*
[543] *See id.*
[544] *See id.*
[545] *Id.*
[546] *See id.*
[547] *See id.* at *8.
[548] *See id.*
[549] *Id.*
[550] *See id.* at *10.
[551] No. 2018-1863, 2019 WL 6041479 (Fed. Cir. Nov. 15, 2019).
[552] *See id.* at *3. The court did not make a specific finding as to which claim was representative of U.S. Patent No. 6,212,662. Instead, it listed all four claims of the patent, but only dependent claims 2–4 were at issue on appeal. *See* id. at *1, *3. Out of the claims at issue, claim 2 would be the representative claim because claim 4 depends on claim 3, which depends on claim 2.

[1.3]	wherein said varying device includes a permutating device configured to perform a permutation of bit position relative to said particular ordered sequence for at least some of the bits in each of said blocks making up said original data without reordering any blocks of original data.
[2]	The device according to claim 1, wherein the varying device is further configured to modify the permutation in time.

In a recent opinion, the Federal Circuit analyzed the eligibility of claims 2, 3, and 4 of U.S. Patent No. 6,212,662 ("the '662 patent").[553] The '662 patent involves creation of "check data" used in data transmission systems to ensure the accuracy of a communication.[554] Before transmitting data, the sender creates check data, which is "effectively . . . a short-hand representation of the content of the original data . . . ."[555] Then, the sender transmits the data with the check data appended.[556] When the receiver gets the transmission, it generates check data of its own, based on what it received.[557] The receiver compares the check data it created with the check data from the sender.[558] If the check data matches, the data received is likely accurate.[559] If the check data does not match, an error occurred during transmission, and the data received is inaccurate.[560]

Prior art systems generated check data using the same process each time.[561] But there was a problem inherent in the approach: the two sets of check data could match by pure coincidence, even when the data was inaccurate.[562] As a result, the receiver would not detect the error.[563] The problem was worse for "systematic errors," or errors that repeat in the same undetectable way for different blocks of data.[564] The '662 patent fixed the problem by "var[ying] the way check data [was] generated from time to time so that the same defective check data does not continue to be produced for the same type of persistent systematic error."[565] This "almost always prevent[ed]" issues because it increased the chance that systematic errors would be found.[566]

The district court found the claims ineligible when it granted the alleged infringers' Rule 12(c) motion for judgment on the pleadings.[567] It held that all the claims were directed to the "abstract idea of reordering data and generating additional data."[568] Specifically, dependent claims 2, 3, and 4 were directed to an abstract idea because they did not explain how the generation method was

[553] *See id.* at *1.
[554] *Id.*
[555] *Id.* at *2.
[556] *See id.*
[557] *See id.*
[558] *See id.*
[559] *See id.*
[560] *See id.*
[561] *See id.*
[562] *See id.*
[563] *See id.* at *1.
[564] *Id.*
[565] *Id.* at *3.
[566] *Id.* at *1.
[567] *See id.* at *4.
[568] *Id.*

varied.[569] The district court also held that the claims failed *Alice* step two because they did not capture the asserted inventive concept.[570]

The Federal Circuit disagreed, finding the claims eligible under *Alice* step one because they were "directed to an improved check data generating device that enables a" specific improvement over the prior art.[571] In its step one analysis, the Federal Circuit looked to whether the claims focused on a specific improvement or an abstract idea that simply involved computers as a tool.[572] The Federal Circuit noted that it had found eligibility in previous cases where software claims "made non-abstract improvements to existing technological processes and computer technology."[573] It explained that "[a]n improved result, without more stated in the claim, is not enough to confer eligibility to an otherwise abstract idea."[574] Instead, eligible claims are required to "recite a specific means or method that solves a problem in an existing technological process."[575] In this case, the claims improved the functioning of prior art systems by setting forth a process to vary generation ("permutation of bit[s]") and by requiring that process to be "modified 'in time.'"[576] This resulted in a "specific implementation of varying the way check data" was generated.[577]

The Federal Circuit further explained that, if a claim is "directed to improving the functionality of one tool . . . that is part of an existing system," the claim "does not necessarily need to recite how that tool is applied in the overall system" to be a patent-eligible improvement.[578] Here, changing the permutation "in time" was a "sufficiently specific implementation" of varying check data generation.[579] That implementation "improve[d] the functioning of the . . . process of detecting systematic errors in data transmissions."[580] Thus, the claims did not merely recite the goal of improved error detection; instead, they claimed a way to "accomplish[] that goal—*i.e.*, by varying the way check data is generated by modifying the permutation applied to different data blocks."[581]

The Federal Circuit viewed these claims similar to those found eligible in *Finjan* and dissimilar to claims in other cases that were directed to the abstract idea of "data manipulation."[582] The *Finjan* patent involved a method that enabled security systems to do new things.[583] Here, the patent used a

[569] *See id.*
[570] *Id.*
[571] *Id.* at *1.
[572] *See id.* at *5.
[573] *Id.*
[574] *Id.* at *6.
[575] *Id.*
[576] *Id.* at *3, *6.
[577] *Id.*
[578] *Id.* at *6.
[579] *Id.* at *7.
[580] *Id.*
[581] *Id.*
[582] *Id.* at *6, *7–8 (citing Finjan, Inc. v. Blue Coat Sys., Inc., 879 F.3d 1299 (Fed. Cir. 2018); TwoWay Media Ltd. v. Comcast Cable Commc'ns, LLC, 874 F.3d 1329 (Fed. Cir. 2017); RecogniCorp, LLC v. Nintendo Co., 855 F.3d 1322 (Fed. Cir. 2017); Intellectual Ventures I LLC v. Capital One Fin. Corp., 850 F.3d 1332 (Fed. Cir. 2017); Digitech Image Techs., LLC v. Elecs. for Imaging, Inc., 758 F.3d 1344 (Fed. Cir. 2014)).
[583] *See id.* at *6 (citing *Finjan*, 879 F.3d 1299).

new approach to check data generation that enabled detection of previously undetectable errors.[584] In contrast, the claims in the data manipulation cases were too general, and not "limited to a specific improvement in computer functionality."[585] They "failed to recite a specific enough solution to make the asserted technological improvement concrete."[586] But in this case, even though the claims involved processing data (*i.e.*, "reordering information via permutation"), they "specifically recite[d] how th[e] permutation [was] used (*i.e.*, modifying the permutation applied to different data blocks)."[587] And that specific implementation was "a key insight to enabling prior art error detection systems to catch previously undetectable systematic errors."[588] For those reasons, the claims "sufficiently capture[d] the specific asserted improvement," so they were not directed to an abstract idea.[589]

21. Boehringer Ingelheim Pharms. Inc. v. Mylan Pharms. Inc. (Mar. 16, 2020)[590]

Representative Claim 1 of U.S. Patent No. 8,853,156[591]	
[1]	A method of treating and/or preventing metabolic diseases in a patient for whom metformin therapy is inappropriate due to at least one contraindication against metformin comprising
[1.1]	orally administering to the patient a DPP-IV inhibitor wherein the contraindication is selected from the group consisting of:
[1.1(a)]	renal disease, renal impairment or renal dysfunction, unstable or acute congestive heart failure, acute or chronic metabolic acidosis, and hereditary galactose intolerance.

In *Boehringer Ingelheim Pharms. Inc.*, the Federal Circuit considered the eligibility of method claims related to the treatment and/or prevention of metabolic diseases such as type 2 diabetes mellitus with DPP-IV inhibitors such as linagliptin "in patients for whom normal metformin therapy is not appropriate."[592]

Boehringer argued that the claims were directed to a "method of treating a specific disease ([type 2 diabetes mellitus]) for specific patients (with renal impairment) using a specific compound (linagliptin) at specific doses (same dose in patients with renal impairment as in patients with normal renal function) to achieve a specific outcome."[593] Mylan argued that the claims were directed to the

[584] *See id.*
[585] *Id.* at *7.
[586] *Id.*
[587] *Id.* at *8.
[588] *Id.*
[589] *Id.*
[590] 803 F. App'x 397 (Fed. Cir. 2020).
[591] *See id.* at 400. Claim 1 is representative of claims 10–17, 24 and 25 of U.S. Patent No 8,853,156 ("the '156 patent"). *See* id.
[592] *Id.* at 399.
[593] *Id.* at 400.

natural law that "certain DPP-IV inhibitors (including linagliptin) are metabolized by the liver rather than the kidney."[594]

The Federal Circuit held that consistent with its decision in *Vanda Pharms. Inc. v. West-Ward Pharms. Int'l Ltd.*,[595] the claims were directed to a particular method of treatment under *Alice* step one and are therefore patent eligible.[596]

The Federal Circuit's analysis further stated that the '156 patent's claims were likewise directed to a method of treating type 2 diabetes mellitus using a DPP-IV inhibitor, such as linagliptin.[597] That "certain DPP-IV inhibitors (including linagliptin) are metabolized by the liver rather than the kidney… does not make the claim 'directed to' that natural ability."[598]

22. CardioNet, LLC v. InfoBionic, Inc. (Apr. 17, 2020)[599]

Claim 1 of U.S. Patent No. 7,941,207[600]	
[1]	A device, comprising:
[1.1]	a beat detector to identify a beat-to-beat timing of cardiac activity;
[1.2]	a ventricular beat detector to identify ventricular beats in the cardiac activity;
[1.3]	variability determination logic to determine a variability in the beat-to-beat timing of a collection of beats;
[1.4]	relevance determination logic to identify a relevance of the variability in the beat-to-beat timing to at least one of atrial fibrillation and atrial flutter; and
[1.5]	an event generator to generate an event when the variability in the beat-to-beat timing is identified as relevant to the at least one of atrial fibrillation and atrial flutter in light of the variability in the beat-to-beat timing caused by ventricular beats identified by the ventricular beat detector.

In *CardioNet, LLC*, the Federal Circuit considered the eligibility of claims drawn to a device for detecting and reporting the presence of atrial fibrillation or atrial flutter in a patient.[601] Specifically, the device detected beat-to-beat timing of cardiac activity, detected premature ventricular beats (irregular beats that interrupt the normal heart rhythm), and determined the relevance of the beat-to-beat timing to atrial fibrillation or atrial flutter, taking into account the variability in the beat-to-beat timing caused by premature ventricular beats.[602]

[594] *Id.*
[595] 887 F.3d 1117 (Fed. Cir. 2018).
[596] *Boehringer*, 803 F. App'x at 400.
[597] *Id.*
[598] *Id.* at 401. *See* Rapid Litigation Mgmt. Ltd. v. CellzDirect, Inc., 827 F.3d 1042, 1049 (Fed. Cir. 2016) (stating that the "natural ability of the subject matter to *undergo* the process does not make the claim 'directed to' that natural ability").
[599] 955 F.3d 1358 (Fed. Cir. 2020).
[600] *See* id. at 1365. Claim 1 is representative of claims 1–3, 7, 10–12 and 22 of U.S. Patent No. 7,941,207 ("the '207 patent").
[601] *Id.* at 1364.
[602] *Id.* at 1365.

The '207 patent described a number of advantages achieved by the claimed cardiac monitoring device.[603] For instance, by analyzing the beat-to-beat timing for atrial fibrillation or atrial flutter while also taking into account the variability in the beat-to-beat timing caused by premature ventricular beats, the device could more accurately distinguish atrial fibrillation and atrial flutter from other types of arrhythmias and had "improved positive predictability" of atrial fibrillation and atrial flutter.[604]

InfoBionic filed a motion to dismiss for failure to state a claim pursuant to Rule 12(b)(6), arguing that the asserted claims are directed to patent-ineligible subject matter under § 101.[605]

The Federal Circuit applied the standard in *Alice*, where the Supreme Court articulated a two-step test for examining patent eligibility when a patent claim is alleged to involve one of these three types of subject matter.[606] The court began with *Alice* step one, and looked to whether the claims "focus[ed] on a specific means or method that improve[d] the relevant technology or [were] instead directed to a result or effect that itself [was] the abstract idea and merely invoke[d] generic processes and machinery."[607] The Federal Circuit held that the asserted claims of the '207 patent were directed to patent-eligible subject matter.[608]

When read as a whole, and in light of the written description, the Federal Circuit concluded that claim 1 of the '207 patent was directed to an improved cardiac monitoring device and not to an abstract idea.[609] In particular, the language of claim 1 indicated that it was directed to a device that detected beat-to-beat timing of cardiac activity, detected premature ventricular beats, and determined the relevance of the beat-to-beat timing to atrial fibrillation or atrial flutter, taking into account the variability in the beat-to-beat timing caused by premature ventricular beats identified by the device's ventricular beat detector.[610] The court held that the claims "focus on a specific means or method that improves" cardiac monitoring technology; they are not "directed to a result or effect that itself is the abstract idea and merely invoke generic processes and machinery."[611]

The written description confirmed the Federal Circuit's conclusion by explaining that, by identifying "variability in the beat-to-beat timing ... as relevant to the at least one of atrial fibrillation and atrial flutter in light of the variability in the beat-to-beat timing caused by ventricular beats identified by the ventricular beat detector," the claimed invention achieve[d] multiple technological improvements.[612]

In addition, there was also no suggestion in the '207 patent's written description that doctors were "previously employing" the techniques performed on the claimed device.[613] Nothing in the record in this case suggested that the claims

[603] *Id.* at 1366.
[604] *Id.*
[605] *Id.*
[606] *Id.* at 1367.
[607] *Id.* at 1368 (quoting McRO, Inc. v. Bandai Namco Games Am. Inc., 837 F.3d 1299, 1314 (Fed. Cir. 2016)).
[608] *Id.*
[609] *Id.*
[610] *Id.*
[611] *Id.* (quoting *McRO*, 837 F.3d at 1314).
[612] *Id.*
[613] *Id.* at 1370.

merely computerize pre-existing techniques for diagnosing atrial fibrillation and atrial flutter.[614]

23. Uniloc USA, Inc. v. LG Elecs. USA, Inc. (Apr. 30, 2020)[615]

Representative Claim 2 of U.S. Patent No. 6,993,049[616]	
[1]	A primary station for use in a communications system comprising at least one secondary station, wherein means are provided
[1.1]	for broadcasting a series of inquiry messages, each in the form of a plurality of predetermined data fields arranged according to a first communications protocol, and
[1.2]	for adding to each inquiry message prior to transmission an additional data field for polling at least one secondary station.

The Federal Circuit considered a patent related to a communication system for a primary station and secondary station (e.g., a computer mouse or keyboard).[617] In the prior art, such as Bluetooth, to join a piconet, primary stations needed to complete an "inquiry procedure" to identify secondary stations and allow secondary stations to issue a request to join, and a "page procedure" to invite secondary stations to join the piconet.[618] After the secondary station is joined, to determine whether they have information to transmit, "primary stations alternate between sending inquiry messages to identify new secondary stations and polling secondary stations already connected to the piconet, including parked devices to determine whether they have information to transmit."[619] The problem '049 identified was that "a secondary station could experience delays of tens of seconds both in initially joining a piconet and in transmitting data after entering park mode." The claims at issue allegedly improved communications systems "by including a data field for polling as part of the inquiry message, thereby allowing primary stations to send inquiry messages and conduct polling simultaneously" in order to enable "a rapid response time without the need for a permanently active communication link between a parked secondary station and the primary station."[620]

The lower court held that claims were ineligible under § 101 because it reasoned the asserted claims are directed to the abstract idea of "additional polling in a wireless communication system" and failed to recite an inventive concept to save the claims.[621] The Federal Circuit reversed.[622]

[614] *Id.*
[615] 957 F.3d 1303 (Fed. Cir. 2020).
[616] *See* id. at 1305–06.
[617] *See id.* at 1305.
[618] *See id.*
[619] *See id.*
[620] *See id.*
[621] Uniloc USA Inc. v. LG Elecs. USA Inc., 379 F. Supp. 3d 974, 1000 (N.D. Cal. 2019); *see also id.*, 957 F. 3d 1303, 1305 (N.D. Cal. 2020).
[622] *See Uniloc*, 957 F.3d at 1305, 1306.

At *Alice* step one, the Federal Circuit held that the invention was not directed to an abstract idea but "are directed to a specific asserted improvement to the functionality of the communication system itself."[623]

The Federal Circuit found the claims at issue dissimilar to those in *Digitech* and *Two-Way Media*. Those cases, according to the court, these cases were not directed to technological improvements. In *Digitech*, the claims were ineligible as directed to the abstract idea of "gathering and combining data that does not require input from a physical device."[624] *Two-Way Media*, "recited a series of abstract steps . . . using 'result-based functional language' without the means for achieving any purported technological improvement."[625]

Warning about legal interpretations that would "resurrect[] a bright-line machine-or-transformation test, or creat[e] a categorical ban on software patents," the court noted that mere "compatibility with conventional communication systems does not render [a claim] abstract."[626] "Nor does the fact that the improvement is not defined by reference to 'physical' components."[627]

The court emphasized that the "claims at issue do not merely recite generalized steps to be performed on a computer using conventional computer activity" but "change[s] . . . the manner of transmitting data" by "adding to each inquiry message prior to transmission an additional data field for polling at least one secondary station."[628] It is this specific technological "change in the manner of transmitting data results in reduced response time by peripheral devices which are part of the claimed system."[629] the court contrasted how the technological solution delays of 10.24 seconds could be reduced to a fraction of a second in certain cases, [630] The court concluded the claims were directed to a non-abstract "specific improvement in the functionality of the communication system itself, namely the reduction of latency experienced by parked secondary stations."[631]

[623] *See id*. at 1309.
[624] *See id*. at 1308 (citing Digitech Image Techs., LLC v. Elecs. for Imaging, Inc., 758 F.3d 1344, 1351 (Fed. Cir. 2014)).
[625] *See id*. (citing Two-Way Media Ltd. v. Comcast Cable Commc'ns, LLC, 874 F.3d 1329, 1334 (Fed. Cir. 2017)).
[626] *See id*.
[627] *See id*. (citing Enfish, LLC v. Microsoft Corp., 822 F.3d 1327, 1339 (Fed. Cir. 2016)).
[628] *See id*.
[629] *See id*.
[630] *See id*. at 1309.
[631] *See id*.

24. Packet Intelligence LLC v. NetScout Sys., Inc. (July 14, 2020)[632]

Representative Claim 19 of U.S. Patent No. 6,954,789[633]	
[19]	A packet monitor for examining packets passing through a connection point on a computer network, each packet[] conforming to one or more protocols, the monitor comprising:
[19.1]	(a) a packet acquisition device coupled to the connection point and configured to receive packets passing through the connection point;
[19.2]	(b) an input buffer memory coupled to and configured to accept a packet from the packet acquisition device;
[19.3]	(c) a parser subsystem coupled to the input buffer memory and including a slicer, the parsing subsystem configured to extract selected portions of the accepted packet and to output a parser record containing the selected portions;
[19.4]	(d) a memory for storing a database comprising none or more flow-entries for previously encountered conversational flows, each flow-entry identified by identifying information stored in the flow-entry;
[19.5]	(e) a lookup engine coupled to the output of the parser subsystem and to the flow-entry memory and configured to lookup whether the particular packet whose parser record is output by the parser subsystem has a matching flow-entry, the looking up using at least some of the selected packet portions and determining if the packet is of an existing flow; and
[19.6]	(f) a flow insertion engine coupled to the flow-entry memory and to the lookup engine and configured to create a flow-entry in the flow-entry database, the flow-entry including identifying information for future packets to be identified with the new flow-entry, the lookup engine configured such that if the packet is of an existing flow, the monitor classifies the packet as belonging to the found existing flow; and if the packet is of a new flow, the flow insertion engine stores a new flow-entry for the new flow in the flow-entry database, including identifying information for future packets to be identified with the new flow-entry, wherein the operation of the parser subsystem depends on one or more of the protocols to which the packet conforms.

The Federal Circuit considered a group of patents directed to "monitoring packets exchanged over a computer network."[634]According to both the court and district court, prior art systems packet monitors "could not identify disjointed connection flows as belonging to the same conversational flow," so "to measure the amount or type of information being transmitted by a particular application or protocol,

[632] 965 F.3d 1299 (Fed. Cir. 2020).

[633] *See id.* at 1303–04. The claims asserted on appeal as ineligible are "claims 10 and 17 of U.S. Patent 6,665,725," "claims 1 and 5 of U.S. Patent 6,839,751," and "claims 19 and 20 of U.S. Patent 6,954,789" ("the '789 patent"). *Id*. at 1303. "Although the asserted claims include varied language, the parties treat claim 19 of the '789 patent as representative of all of the asserted claims for infringement and invalidity." Id. at 1304.

[634] *See id*. at 1303.

a network monitor must measure all of the connection flows through which that application or protocol transmits packets."[635]

The district court found that compared with the prior art, the claimed packet monitor "could provide a granular, nuanced, and useful classification of network traffic" and enable functionality like "an improved ability to classify and diagnose network congestion while providing increased network visibility to identify intrusions and malicious attacks." [636] The Federal Circuit affirmed.

The Federal Circuit began its analysis with *Alice* step one.[637] According to the court, the patents "solve[s] a technological problem by identifying and refining a conversational flow such that different connection flows can be associated with each other and ultimately with an underlying application or protocol." The invention "meet[s] a challenge unique to computer networks, identifying disjointed connection flows in a network environment" and is directed to "a specific improvement in computer technology: a more granular, nuanced, and useful classification of network traffic" where "elements recited in the claims refer to specific technological features functioning together to provide that granular, nuanced, and useful classification of network traffic, rather than an abstract result."[638]

The court analogized the claims with those in *Enfish* and *SRI*.[639] In *Enfish*, the court explained, the self-referential table embodied an improvement in the way computers operate, "function[ing] differently from conventional databases, providing increased flexibility, faster search times, and smaller memory requirements."[640] In *SRI*, the court found "the claims were not using a computer as a tool but, instead, recited a specific technique for improving computer network security" when using network monitors, detecting suspicious network activity, and generating and analyzing reports of suspicious activity.[641] The court noted how it "relied on statements in the specification that the claimed invention purported to solve weaknesses in the prior art by providing a framework" for recognizing the technical problem, and how it found claims in *SRI* were non-abstract even though they "recited general steps for network monitoring with minimal detail present in the claim limitations themselves."[642] Here, the court highlighted Packet Intelligence's specific claimed elements of the "parser subsystem," checking packet information against "flow-entry memory" by a "lookup engine" and "determining whether the packet matches an entry in the flow-entry database" to update or create a new entry.[643] Thus, the court found Packet Intelligence's "claimed invention presented a technological solution to a technological problem" where the specification "likewise explain[ed] how the elements recited in the claims refer to specific technological features functioning together to provide

[635] *See id*. at 1307 (internal quotations omitted).
[636] *See id*. at 1308 (internal quotations omitted).
[637] *See id*. at 1309.
[638] *See id*.
[639] *See id*.
[640] *See id*. (citing Enfish, LLC v. Microsoft Corp., 822 F.3d 1327, 1335–36 (Fed. Cir. 2016)).
[641] *See id*. (citing SRI Int'l, Inc. v. Cisco Sys., Inc., 930 F.3d 1295, 1301, 1303 (Fed. Cir. 2019)).
[642] *See id*. (citing *SRI*, 930 F.3d at 1301, 1303).
[643] *See id*.

that granular, nuanced, and useful classification of network traffic, rather than an abstract result."[644]

Dissenting in part, Judge Reyna noted how, in contrast to the specification, the representative claim "does not recite how the individual packets are actually 'identified' as belonging to a conversational flow beyond the functional requirement that '*identifying* information' is used."[645] The claim likewise does not encompass the details of the filter, including how "the information necessary for identifying a conversational flow must be 'adaptively determined' through an iterative process in which increasingly specific 'signatures' are generated through analysis of patterns in the sequence of passing packets" or the preferred embodiment's "'parsing-pattern-structures and extraction-operations database' compiled from 'protocol description language files' that describe 'patterns and states of all protocols that [c]an occur at any layer, including ... what information to extract for the purpose of identifying a flow, and ultimately, applications and services.'"[646] Further, "none of these processes or components are recited in claim 19, and the claim elements have not been construed as limited to the structures and processes disclosed in the embodiments."[647] Accordingly, Judge Reyna reasoned, as the "the claims do not disclose how the desired result of 'identif[ying]' packets as belonging to a conversational flow is achieved," "[t]he absence of a concrete technological solution in claim 19 distinguishes it from the claims at issue in *SRI*" where the specific technique of multiple network monitors, how the network traffic data was analyzed from specific categories, and integration of suspicious activity reports into hierarchical monitors was specifically claimed.[648] Thus, Judge Reyna concluded that "the components and operations actually recited in the claim does not provide 'the specificity required to transform a claim from one claiming only a result to one claiming a way of achieving it'" and fails at *Alice* step one.[649]

Judge Reyna also warned that holding the instant claims as eligible under *Alice* step one "would be an anomalous result if we were not permitted to look to unclaimed details at *Alice* Step 2" for determining inventive concept, "but could use the same details as the 'focus' of the claim at *Alice* Step 1 to avoid reaching Step 2"—"a court cannot rely on unclaimed details in the specification as the "focus" of the claim for § 101 purposes."[650]

Turning to *Alice* Step 2, Judge Reyna pointed out that the district court's step 2 analysis identified that the only differences between claimed and prior art monitors was "the ability to identify disjoined connection flows as belonging to the same conversational flow and the attendant benefits of that concept," which were "distinctions are based on nothing more than the abstract idea itself, and thus cannot serve as inventive concepts supporting patentability at *Alice* Step 2."[651]

[644] *See id*.
[645] *See id*. at 1317 (Reyna, J., concurring-in-part, dissenting-in-part).
[646] *See id*.
[647] *See id*.
[648] *See id*. at 1318 (Reyna, J., concurring-in-part, dissenting-in-part).
[649] *See id*. at 1317 (Reyna, J., concurring-in-part, dissenting-in-part).
[650] *See id*. at 1318–19 (Reyna, J., concurring-in-part, dissenting-in-part).
[651] *See id*. at 1319 (Reyna, J., concurring-in-part, dissenting-in-part).

Therefore, Judge Reyna recommended remand where "the salient factual inquiry should be whether the components and operations recited in each claim contain anything inventive beyond the abstract concept of classifying by conversational flow."[652]

25. XY, LLC v. Trans Ova Genetics, LC (July 31, 2020)[653]

Representative Claim 1 of U.S. Patent No. RE46,559[654]	
[1]	A method of operating a flow cytometry apparatus with at least n detectors to analyze at least two populations of particles in the same sample, the method comprising:
[1(a)]	establishing a fluid stream in the flow cytometry apparatus with at least n detectors, the at least n detectors including a first detector and a second detector;
[1(b)]	entraining particles from the sample in the fluid stream in the flow cytometry apparatus;
[1(c)]	executing instructions read from a computer readable memory with a processor, the processor being in communication with the first detector in the flow cytometer, to detect a first signal from the first detector based on individual particles in the fluid stream;
[1(d)]	executing instructions read from the computer readable memory with the processor, the processor being in communication with the second detector in the flow cytometer, to detect a second signal from the second detector based on the individual particles in the fluid stream;
[1(e)]	executing instructions read from the computer readable memory with the processor to convert at least the first signal and the second signal into n-dimensional parameter data for detected particles in the sample, wherein the n-dimensional parameter data for particles from the at least two populations overlap in at least one of the dimensions;
[1(f)]	executing instructions read from the computer readable memory with the processor to rotationally alter the n-dimensional parameter data so that spatial separation of the data from the particles from the at least two populations in the at least one dimension that is overlapped is increased;
[1(g)]	executing instructions read from the computer readable memory with the processor to real-time classify each of the individual detected particles into one of a first population and a second population of the at least two populations based on at least the rotationally altered n-dimensional parameter data; and
[1(h)]	using the real-time classification, sorting the individual particles with the flow cytometer.

[652] *See id*.
[653] 968 F.3d 1323 (Fed. Cir. 2020).
[654] *See id*. at 1328. Claim 1 is representative of claims 1–23 of U.S. Patent No. RE46,559 ("the '559 patent"). *See* id. at 1328–29.

In *XY, LLC*, the Federal Circuit considered the patent-eligibility of the Reissue of Patent '559 whose claims were directed to improving flow cytometric analysis for sorting non-human mammalian particles.[655] Specifically, XY's claims an improvement of the mathematical equations that "result in enhanced discrimination between populations of particles."[656]

The district court held that the '559 patent claims were ineligible under § 101.[657] They determined at *Alice* step one, claim 1 of the '559 patent was direct to the abstract idea of a "mathematical equation that permits rotating multidimensional data," reasoning that it reduces to a mathematical concept.[658] At *Alice* step two, the lower court found there was no "inventive concept" because all claim elements were known in prior art.[659] The Federal Circuit reversed this decision.[660]

The Federal Circuit disagreed with the district court's assertion that the claims are "directed to 'the mathematical equation that permits rotating multi-dimensional data,'"[661] and noted that they "are directed to a patent eligible improvement to a method of sorting particles using flow cytometry technology, not to an abstract idea."[662]

The Federal Circuit expressly relied on the Supreme Court's decision in *Diamond v. Diehr*, and their previous decision in *Thales Visionix Inc. v. United States* in its step one analysis. It noted that the '559 patent claims are analogous to the claims in *Diehr* because they each represent a "purported improvement to otherwise-known industrial or laboratory processes through specific application of mathematical algorithms."[663] Similarly, the *Thales* and '559 claims each improve results.[664] Each supporting that the asserted '559 patent claims "perform a function which patent laws were designed to protect."[665]

The Federal Circuit rejected Trans Ova's argument that the '559 patent claims were analogous to the claims in *Parker v. Flook* that were held ineligible.[666] In *Flook*, the claims were providing nothing more than "a formula for computing an updated alarm limit," whereas the asserted '559 patent claims recited an improved method.[667]

Next, the Federal Circuit then addressed the district court's ineffective analogy to *Cleveland Clinic Found. v. True Health Diagnostics LLC*.[668] The *Cleveland Clinic* claims used a known laboratory technique, while the asserted '559 patent claims purport to improve a laboratory technique.[669]

[655] *Id.* at 1326.
[656] *Id.*
[657] *Id.*
[658] *Id.* at 1329 (quoting Alice Corp. Pty. Ltd. v. CLS Bank Int'l, 573 U.S. 208, 217 (2014)).
[659] *Id.*
[660] *Id.*
[661] *Id.* at 1329 (quoting *Alice*, 573 U.S. 208 at 217).
[662] *Id.* at 1326.
[663] *Id.* at 1330 (quoting Diamond v. Diehr, 450 U.S. 175, 179 n.5 (1981)).
[664] *Id.* at 1331 (citing Thales Visionix Inc. v. United States, 850 F.3d 1343 (Fed. Cir. 2017)).
[665] *Id.*
[666] *Id.* at 1332.
[667] *Id.* (quoting Parker v. Flook, 437 U.S. 584 (1978)).
[668] *Id.* at 1323 (quoting Cleveland Clinic Found. v. True Health Diagnostics LLC, 859 F.3d 1352 (2017)).
[669] *Id.*

Because the lower court erred in the step one analysis and the claims were not directed to an abstract idea at *Alice* step one, the Federal Circuit did not discuss the second step.[670]

Trans Ova had also filed a motion to dismiss the infringement allegations of '422, '116, and '769 patents asserting they were barred by the doctrine of claim preclusion from an earlier 2012 lawsuit.[671] The District Court granted this motion because the patents were issued before XY filed their 2012 lawsuit and because their allegations of infringement "address the same, or substantially same subject matter as previously filed claims and [are] directed at a previously accused product of process."[672] The Federal Circuit found this reasoning to be in error and vacated this decision.[673]

26. Illumina, Inc. v. Ariosa Diagnostics, Inc. (Aug. 3, 2020)[674]

Representative Claim 1 of U.S. Patent No. 9,580,751[675]	
[1]	A method for preparing a deoxyribonucleic acid (DNA) fraction from a pregnant human female useful for analyzing a genetic locus involved in a fetal chromosomal aberration, comprising:
[1(a)]	extracting DNA from a substantially cell-free sample of blood plasma or blood serum of a pregnant human female to obtain extracellular circulatory fetal and maternal DNA fragments;
[1.1(b)]	producing a fraction of the DNA extracted in (a) by:
[1.1(b)(i)]	size discrimination of extracellular circulatory DNA fragments, and
[1.1(b)(ii)]	selectively removing the DNA fragments greater than approximately 500 base pairs,
[1.2(b)]	wherein the DNA fraction after (b) comprises a plurality of genetic loci of the extracellular circulatory fetal and maternal DNA; and
[1(c)]	analyzing a genetic locus in the fraction of DNA produced in (b).

Representative Claim 1 of U.S. Patent No. 9,738,931[676]	
[1]	A method, comprising:
[1(a)]	extracting DNA comprising maternal and fetal DNA fragments from a substantially cell-free sample of blood plasma or blood serum of a pregnant human female;
[1.1(b)]	producing a fraction of the DNA extracted in (a) by:

[670] *Id.*
[671] *Id.*
[672] *Id.*
[673] *Id.*
[674] 967 F.3d 1319 (Fed. Cir. 2020).
[675] *See* id. at 1323. Claim 1 is representative of claims 1–2, 4–5, and 9–10 of U.S. Patent No. 9,580,715 ("the '715 patent").
[676] *See* id. at 1004–05. Claim 1 is representative of claims 1–2 and 10–14 of U.S. patent No. 9,738,931 ("the '931 patent").

[1.1(b)(i)]	size discrimination of extracellular circulatory fetal and maternal DNA fragments, and
[1.1(b)(ii)]	selectively removing the DNA fragments greater than approximately 300 base pairs,
[1.2(b)]	wherein the DNA fraction after (b) comprises extracellular circulatory fetal and maternal DNA fragments of approximately 300 base pairs and less and a plurality of genetic loci of the extracellular circulatory fetal and maternal DNA fragments; and
[1(c)]	analyzing DNA fragments in the fraction of DNA produced in (b).

In *Illumina, Inc.*, the Federal Circuit considered claims of two related patents directed to finding a solution to the problem of distinguishing and separating the tiny amount of fetal DNA from the vast amount of maternal DNA in maternal plasma and serum which other researchers discarded as medical waste.[677] Specifically, Illumina, Inc. claimed methods of preparing a fraction of cell-free DNA that was enriched in fetal DNA.[678] The methods of preparation included size discrimination of the DNA based on size parameters that the inventors selected to balance the need to remove enough longer maternal DNA fragments to enrich the sample but also leave behind enough shorter fetal DNA fragments to allow for testing.[679]

The Federal Circuit applied the two-part test set forth by the Supreme Court to distinguish claims to patent-eligible applications of laws of nature and natural phenomena from claims that impermissibly tie up such laws and phenomena.[680] First, the Federal Circuit examined whether the claims were "directed to" a law of nature or natural phenomenon.[681] The Federal Circuit stated, "If—and only if—they are, then we proceed to the second inquiry, where we examine whether the limitations of the claim apart from the law of nature or natural phenomenon, considered individually and as an ordered combination, 'transform the nature of the claim' into a patent-eligible application."[682]

The Federal Circuit analogized to *CellzDirect*, where the inventors discovered the natural phenomenon "that some fraction of hepatocytes are capable of surviving multiple freeze-thaw cycles."[683] Having made that discovery, the *CellzDirect* inventors patented an "improved process of preserving hepatocytes," that comprised freezing, thawing, removing the non-viable and freezing the viable hepatocytes.[684] The Federal Circuit found that their claimed invention was patent-eligible because it was "not simply an observation or detection of the ability of hepatocytes to survive multiple freeze-thaw cycles. Rather, the claims

[677] *Id.* at 1321.
[678] *Id.* at 1322.
[679] *Id.* at 1323.
[680] *Id.* at 1324.
[681] *Id.* at 1325 (quoting Alice Corp. Pty. Ltd. v. CLS Bank Int'l, 573 U.S. 208, 217 (2014)).
[682] *Id.* (quoting Mayo Collaborative Servs. v. Prometheus Lab'ys, Inc., 566 U.S. 66, 78 (2012)).
[683] *Id.* (citing Rapid Litig. Mgmt. Ltd. v. CellzDirect, Inc., 827 F.3d 1042, 1045 (Fed. Cir. 2016)).
[684] *CellzDirect*, 827 F.3d at 1045.

are directed to a new and useful method of preserving hepatocyte cells."[685] The inventors in *CellzDirect* did not invent hepatocytes or impart to hepatocytes an ability to survive cycles of freezing and thawing.[686] Instead, they discovered that hepatocytes naturally have that ability, and they exploited that phenomenon in a patent-eligible method.[687]

So too here, the inventors of the '751 and '931 patents obviously did not invent cell-free fetal DNA or the relative size distribution of fetal and maternal cell-free DNA in maternal blood.[688] And, like in *CellzDirect*, the inventors used their discovery to invent a method of preparing a fraction of DNA that includes physical process steps with human-engineered size parameters to selectively remove some maternal DNA in blood to produce a mixture enriched in fetal DNA.[689]

The Federal Circuit rejected the argument that the techniques for size discriminating and selectively removing DNA fragments that are used to practice the invention were well-known and conventional.[690] While the court recognized, that the inventors of the '751 and '931 patents did not invent centrifugation, chromatography, electrophoresis, or nanotechnology, conventional separation technologies can be used in unconventional ways.[691] Thus, the claims are directed to a human-engineered method rather than the natural size distributions of cell-free DNA.[692] Moreover, while such conventionality considerations may be relevant to the inquiry under *Alice/Mayo* step two, or to other statutory considerations such as obviousness that are not at issue before us in this case, they do not impact the *Alice/Mayo* step one question whether the claims themselves are directed to a natural phenomenon.[693]

Rather than focusing on what the inventors of the '751 and '931 patents did not invent, the Federal Circuit focused their *Alice/Mayo* step one analysis on what the inventors *did* purport to invent and what they claimed in their patents: methods for preparing a fraction of cell-free DNA by the physical process of size discriminating and selectively removing DNA fragments longer than a specified human-engineered threshold.[694] Those methods were "directed to" more than merely the natural phenomenon that the inventors discovered and therefore, the court concluded at step one of the *Alice/Mayo* test that the claims were not directed to a patent-ineligible concept, therefore there was no need to reach step two of the test.[695]

Judge Reyna dissented, stating that the claims, written description, and legal precedent converge to a conclusion that the '751 and '931 patents cover patent ineligible subject matter.[696] He took the position that the asserted claims are directed

[685] *Id.* at 1048.
[686] *Id.* at 1045.
[687] *Illumina*, 967 F.3d at 1328.
[688] *Id.*
[689] *Id.*
[690] *Id.*
[691] *Id.*
[692] *Id.* at 1329.
[693] *Id.*
[694] *Id.*
[695] *Id.*
[696] *Id.* at 1330 (Reyna, J., dissenting).

to a natural phenomenon, the patents' sole claimed advance is the discovery of that natural phenomenon, and the application of the natural phenomenon utilizes routine steps and conventional procedures that are well known in the art.[697] He also opined that the patents in the appeal proclaim a surprising discovery that has advanced the medical arts in an area of great need.[698] He reasoned that without doubt, scientists are entitled to great credit and recognition for such a discovery, but, under U.S. patent law, they are not entitled to a patent.[699]

27. EcoServices, LLC v. Certified Aviation Servs., LLC (Oct. 8, 2020)[700]

Representative Claim 1 of U.S. Patent No. 9,162,262[701]	
[1]	A system for washing turbine engines comprising:
[1.1]	a washing unit for providing a washing liquid to the turbine engines;
[1.2]	an information detector configured to gather information related to engine type; and
[1.3]	a control unit configured to accept the information related to engine type from the information relating to engine type from a set of preprogrammed washing programs, and further configured to regulate the washing unit according to washing parameters associated with the washing program used.

Representative Claim 1 of U.S. Patent No. 5,868,860[702]	
[1]	A method of washing turbine compressors, which operate with large quantities of air and therefore become internally soiled by and coated with contaminants carried by the air, therewith giving rise to greater fuel consumption, higher temperatures and higher emissions with substantially impaired efficiency as a result thereof,
[1.1]	wherein small quantities of finely-divided liquid are sprayed onto and through the turbine compressors, characterized by running the turbine compressors and spraying the finely-divided liquid quantities through at least one nozzle towards and through the turbine compressor at an overpressure within the range of 50-80 bars and at a liquid particle size in the range of 250-120µm,
[1.2]	and with a total volumetric flow through the nozzle or nozzles within the range of 0.5-60 l/min.,
[1.3]	and with a liquid particle velocity of 100-126 m/sec., whereby the liquid is finely-divided to a degree at which the particles of liquid will follow the same routes through the turbine compressor as those previously taken by the air-borne contaminants, when spraying said liquid onto and through said turbine compressor.

[697] *Id*.
[698] *Id*.
[699] *Id*.
[700] 830 F. App'x 634 (Fed. Cir. 2020).
[701] *See id*. at 635. Claim 1 is representative of claims 1, 9, and 14 of U.S. Patent No. 9,162,262 ("the '262 patent"). *See* id.
[702] *See id*. at 635. Claim 1 is representative of claims 1 and 2 of U.S. Patent No. 5,868,860 ("the '860 patent"). *See* id.

In *EcoServices, LLC*, the Federal Circuit considered two patents pertaining to washing airplane engines owned by EcoServices, LLC.[703] Specifically, the '262 patent describes a system for automatically controlling a washing procedure for the specific engine being washed.[704] The '860 patent directs the use of a method of washing turbine compressors.[705]

A jury found that EcoServices' patents were valid and that Certified Aviation Services (CAS) had infringed and awarded damages of $1,949,600.[706] The District Court then denied all of CAS's post-trial motions.[707] On appeal, CAS argued the '262 patent was invalid, the '860 patent was invalid, and that the District Court erred in awarding supplemental damages.[708] The Federal Circuit affirmed the patent validity decisions, but reversed the supplemental damages reward.[709]

The Federal Circuit begins by considering the '262 patent and whether its claims 1, 9, and 14 are valid, constructed properly, and obvious.[710]

At *Alice* step one, the Federal Circuit held that the claims were not directed to an abstract idea but "to an improved system for washing jet engines."[711] These claims "do not recite the mere desired result of automated jet engine washing, but rather, recite a specific solution for accomplishing that goal."[712] Thus, the systems of the claims achieve a level of automation over the prior art human-operated washing systems, and provide several advantages.[713]

The court notes that, contrary to CAS's arguments, the fact that the claims require an "information unit", a computer in this instance, it does not mean the claims are directed to an abstract idea.[714] Instead, the claims "are directed to a specific combination of a type of washing unit, information detector, and control unit, configured in a certain way to create technical improvements to systems for washing jet engines."[715] The Federal Circuit further notes that CAS erroneously relies on three precedential cases as they all address the use of a computer in the context of *Alice* under step two.[716]

Because the claims at issue are not directed to an abstract idea, the court notes they need not reach *Alice* step two.[717]

Dissenting in part, Judge Dyk states that he would not have ruled the claims for the '262 as patent eligible because the claims "simply describe the generic computer apparatus used to further automate the previous manual process that utilized automated washing systems."[718] He notes that previous cases "have held

[703] *Id.*
[704] *Id.* at 636.
[705] *Id.* at 637.
[706] *Id.*
[707] *Id.*
[708] *Id.* at 635.
[709] *Id.*
[710] *Id.* at 640.
[711] *Id.* at 642.
[712] *Id.*
[713] *Id.*
[714] *Id.* at 643.
[715] *Id.*
[716] *Id.* at 644.
[717] *Id.* at 645.
[718] *Id.* at 652 (Dyk, J., concurring-in-part, dissenting-in-part).

that the mere automation of manual processes using generic components is directed to an abstract idea."[719] Thus, there are no improvements that do not stem from the computerization of well-known activities.[720] He continues that at step two, we search for an "inventive concept",[721] and that here, EcoServices's claims are generic and conventional and therefore not the "inventive concept" they are required to be.[722]

28. TecSec, Inc. v. Adobe Inc. (Oct. 23, 2020)[723]

Representative Claim 1 of U.S. Patent No. 5,369,702[724]	
[1]	A method for providing multi-level multimedia security in a data network, comprising the steps of:
[1.1]	A) accessing an object-oriented key manager;
[1.2]	B) selecting an object to encrypt;
[1.3]	C) selecting a label for the object;
[1.4]	D) selecting an encryption algorithm;
[1.5]	E) encrypting the object according to the encryption algorithm;
[1.6]	F) labelling the encrypted object;
[1.7]	G) reading the object label;
[1.8]	H) determining access authorization based on the object label; and
[1.9]	I) decrypting the object if access authorization is granted.

The Federal Circuit considered a group of patents it referred to as the "DCOM patents."[725] These related to "particular systems and methods for multi-level security of various kinds of files being transmitted in a data network."[726] The method is directed to "access controls and encryption" of digital objects, which are then further "embedded or nested within a container object, which, if itself encrypted and access-controlled, provides a second layer of security."[727] The court highlighted the Specification's discussion of prior art systems, which, when using multi-level security with multiple encryption keys "is quite unwieldy, inflexible, and difficult to manage by a security officer or key administrator."[728]

[719] *Id.* at 655 (Dyk, J., concurring-in-part, dissenting-in-part).
[720] *Id.*
[721] *Id.* at 656 (Dyk, J., concurring-in-part, dissenting-in-part) (quoting Alice Corp. Pty. Ltd. v. CLS Bank Int'l, 573 U.S. 208, 217 (2014)).
[722] *Id.*
[723] 978 F.3d 1278 (Fed. Cir. 2020).
[724] *See id.* at 1283-84. "Claims 1 and 8 of the '702 patent are representative of the asserted claims" in U.S. Patent Nos. 5,369,702 ("the '702 patent"), 5,680,452, 5,717,755, and 5,898,781. *Id.* Claim 8 is a system that carries out claim 1 method using the components of a "system memory," "an encryption algorithm module," "an object labelling subsystem," "a decryption algorithm module," and "an object label identification subsystem." *See id.*
[725] The "DCOM patents" are "U.S. Patents Nos. 5,369,702, 5,680,452, 5,717,755, and 5,898,781." *Id.*
[726] *See id.*
[727] *See id.* at 1282 (internal quotations omitted).
[728] *See id.* at 1295 (quoting '702 patent, col. 2, lines 25–29).

According to the Specification, the Federal Circuit noted, compared with prior art systems, "[b]y employing a *secure labelling technique in addition to encryption*," the invention provides that "the sender can be assured that people having the correct key to decrypt the message but working at different terminals will not receive or be allowed to access the communication."[729]

The district court denied Adobe's motion for summary judgment based on alleged ineligibility under § 101, finding judgment for TecSec on patent eligibility.[730] The Federal Circuit affirmed.

The Federal Circuit began its analysis at step one of *Alice*. According to the court, the patents provide a solution to the problem with multi-level security—"a problem specific to computer data networks. The patent focuses on allowing for the simultaneous transmission of secure information to a large group of recipients connected to a decentralized network—an important feature of data networks—but without uniform access to all data by all recipients."

The Federal Circuit emphasized that claim 1 "goes beyond managing access to objects using multiple levels of encryption, as required by 'multilevel ... security.'" And "expressly requires, as well, accessing an 'object-oriented key manager' and specified uses of a 'label' as well as encryption for the access management."[731] It chided Adobe's characterization of the invention as merely "multi-level . . . security," noting that "[t]o disregard those express claim elements is to proceed at 'a high level of abstraction' that is 'untethered from the claim language' and that 'overgeneraliz[es] the claim.'"[732]

The court compared the claims to those in *Uniloc*, where the claims were "directed to solving a problem of reducing communication time by using otherwise-unused space in a particular protocol-based system," and those in *Ancora*, where the claims were "directed to solving a problem presented by particularly easy unauthorized use of software by placing the software in an especially secure computer location."[733] The court then found that the claims in the instant invention were "directed to improving a data network's basic functioning by enabling secure and efficient transmission to intended recipients when use is made of the basic multicasting functionality of such a data network."[734]

Thus, according to the Federal Circuit, "although the patent involves multilevel security, that does not negate the conclusion that the patent is aimed at solving a particular problem of multicasting computer networks."[735] Thus, the claims were "directed to improving a basic function of a computer data-distribution network, namely, network security."[736]

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[729] *See id*. at 1296 (quoting '702 patent, col. 2, lines 51–55).

[730] *See id*. at 1292.

[731] *See id*. at 1295.

[732] *See id*. (quoting Enfish, LLC v. Microsoft Corp., 822 F.3d 1327, 1337 (Fed. Cir. 2016)). *See also id*. at 1297, where the court denies Adobe's attempt to change their argument's articulation of the abstract idea to "managing access to objects using multiple layers of encryption *and labels*."

[733] *See id*. at 1296 (citing Uniloc USA, Inc. v. LG Elecs. USA, Inc., 957 F.3d 1303, 1305 (Fed. Cir. 2020), and Ancora Techs., Inc. v. HTC Am., Inc., 908 F.3d 1343, 1349 (Fed. Cir. 2018)).

[734] *See id*.

[735] *See id*.

[736] *See id*.

29. C R Bard Inc. v. AngioDynamics, *Inc.* (Nov. 10, 2020)[737]

Representative Claim 1 of U.S. Patent No. 8,475,417[738]	
[1]	An assembly for identifying a power injectable vascular access port, comprising:
[1.1]	a vascular access port comprising a body defining a cavity, a septum, and an outlet in communication with the cavity;
[1.2]	a first identifiable feature incorporated into the access port perceivable following subcutaneous implantation of the access port, the first feature identifying the access port as suitable for flowing fluid at a fluid flow rate of at least 1 milliliter per second through the access port;
[1.3]	a second identifiable feature incorporated into the access port perceivable following subcutaneous implantation of the access port, the second feature identifying the access port as suitable for accommodating a pressure within the cavity of at least 35 psi, wherein one of the first and second features is a radiographic marker perceivable via x-ray; and
[1.4]	a third identifiable feature separated from the subcutaneously implanted access port, the third feature confirming that the implanted access port is both suitable for flowing fluid at a rate of at least 1 milliliter per second through the access port and for accommodating a pressure within the cavity of at least 35 psi.

Representative Claim 8 of U.S. Patent No. 8,805,478[739]	
[8]	A method of performing a power injection procedure, comprising:
[8.1]	providing an access port including a cannulaimpenetrable housing and a radiographic feature indicating that the access port is suitable for flowing fluid at a rate of at least 1 milliliter per second through the access port;
[8.2]	implanting the access port in a subcutaneous pocket formed under a patient's skin;
[8.3]	taking an image of the implanted access port via imaging technology;
[8.4]	identifying the access port as being suitable for flowing fluid at a rate of at least 1 milliliter per second through the access port via the image of the radiographic feature of the access port;
[8.5]	and injecting contrast media fluid through the access port at a rate of at least 1 milliliter per second.

In *C R Bard Inc.*, the Federal Circuit considered patents related to vascular access ports, which are devices implanted beneath the skin to allow medical professionals

[737] 979 F.3d 1372 (Fed. Cir. 2020).

[738] *See id.* at 1375. Claim 1 is representative of claims 5, 6, 12, and 13 of U.S. Patent No 8,475,417 ("the '417 patent"). *See* id. at 1376.

[739] *See id.* at 1375. Claim 1 is representative of claims 3, 5, 9, and 11 of U.S. Patent No 8,805,478 ("the '478 patent"). *See* id. at 1376.

to inject fluid without being required to start a new intravenous line each time.[740] On the device, Bard had etched the letters "CT" in titanium foil so the device could be detected during an x-ray scan.[741]

During argument, the District Court *sua sponte* asked whether the issue of patent eligibility and printed matter was ripe for decision.[742] In an opinion granting AngioDynamic's JMOL motion, the court stated the asserted claims were invalid because they were directed to printed matter as ineligible subject matter.[743] The Federal Circuit reversed.[744]

Following a determination that the lower court erred in granting JMOL of non-infringement[745] and willful infringement,[746] the Federal Circuit turned to addressing the printed matter issue.[747] The court sets out that certain "printed matter" falls outside the scope of patentable subject matter under U.S. patent law,[748] and that printed matter today "encompasses any information claimed for its communicative content."[749] Further, "the doctrine prohibits patenting such printed matter unless it is 'functionally related' to its 'substrate,' which encompasses the structural elements of the claimed invention."[750] The court goes on to find that the markers on the devices "do not create a functional relationship between the printed information and substrate," and are thus printed matter and not entitled to patentable weight.[751]

The Federal Circuit comments that the printed matter doctrine is typically invoked in a §§ 102 or 103 analysis,[752] but goes on to state that claims directed to printed matter can be determined under the two-step *Alice* framework.[753] This analysis is consistent with post-*Alice* decisions that recognize "that the mere conveyance of information that does not improve the functioning of the claimed technology is not patent-eligible subject matter under § 101."[754] The court then holds that "a claim may be found patent ineligible under § 101 on the grounds that it is directed solely to non-functional printed matter and the claim contains no additional inventive concept."[755]

Turning to the claims at issue, the court states that when each claim is read as a whole, "the focus of the claimed advance is not solely on the content of the information conveyed, but also on the means by which that information is conveyed."[756] Specifically, that there is a specific need for easy vascular access and

[740] *Id.*
[741] *Id.*
[742] *Id.* at 1377.
[743] *Id.*
[744] *Id.* at 1374.
[745] *Id.* at 1378.
[746] *Id.* at 1380.
[747] *Id.*
[748] *Id.* at 1381. *See AstraZeneca LP v. Apotex, Inc.*, 633 F.3d 1042, 1064 (Fed. Cir. 2010).
[749] *Id.*
[750] *Id.* (quoting *Praxair Distrib., Inc. v. Mallinckrodt Hosp. Prods. IP Ltd.*, 890 F.3d 1024, 1032 (Fed. Cir. 2018)).
[751] *Id.* at 1382.
[752] *Id.* at 1383.
[753] *Id.* at 1382.
[754] *Id.* at 1383.
[755] *Id.*
[756] *Id.* at 1384.

that the marker is useful because it allows the device to be readily identified.[757] The court then holds that there was insufficient evidence that, at *Alice* step-two, the use of the marker was not an inventive concept.[758] The Federal Circuit then concludes that the asserted claims are patent-eligible because, in their entireties, are not solely directed to printed matter.[759]

30. GREE, Inc. v. Supervell Oy (Nov. 19, 2020)[760]

Representative Claim 1 of U.S. Patent No. 9,597,594[761]	
[1]	A method for controlling a computer that is provided with a storage unit configured to store game contents arranged within a game space, first positions of the game contents within the game space, and a template defining second positions of one or more of the game contents, and that progresses a game by arranging the game contents within the game space based on a command by a player, the method comprising:
[1.1]	when the template is applied to a predetermined area within the game space based on the command by the player, moving, by the computer, the game contents arranged at the first positions within the game space to the second positions of the game contents defined by the template within the predetermined area.

Representative Claim 5 of U.S. Patent No. 9,597,594[762]	
[5]	The method according to claim 1, wherein when the number of game contents arranged within the game space is smaller than the number of game contents for which the second positions are defined by the template, the computer moves the game contents arranged at the first positions within the game space to the second positions of the game contents defined by the template to which the moving distance is the smallest.

Representative Claim 6 of U.S. Patent No. 9,597,594[763]	
[6]	The method according to claim 5, wherein out of the second positions of the game contents defined by the template, the computer displays positions on which no game contents are arranged and the game contents, in a discernible condition.

[757] *Id.*
[758] *Id.*
[759] *Id.*
[760] 834 F. App'x 583 (Fed. Cir. 2020).
[761] *See id.* at 584. Claim 1 is representative of claims 1, 8, and 10–20 of U.S. Patent No. 9,597,594 ("the '594 patent"). *See* id. at 586.
[762] *See id.* at 584. Claim 1 is representative of claims 2–7, and 9 of U.S. Patent No. 9,597,594. *See* id. at 586.
[763] *See id.* at 584. Claim 1 is representative of claims 2–7, and 9 of U.S. Patent No. 9,597,594. *See* id. at 586.

Representative Claim 7 of U.S. Patent No. 9,597,594[764]	
[7]	The method according to claim 1, wherein when the number of game contents arranged within the game space is larger than the number of game contents for which the second position[s] are defined by the template, the computer moves the game contents arranged at the first positions within the game space for which the moving distance to the second positions of the game contents defined by the template is the smallest, to the positions.

In *Gree, Inc.*, the Federal Circuit considered the patent eligibility of a city-building games, in which "a player builds a city within a virtual space provided in the game program," and whether the PTAB erred in their findings that majority of the claims were ineligible.[765] The claimed invention employs templates to improve usability by defining positions of game contents.[766] These templates are applied to a predetermined area and operation that allows players to rearrange large quantities in a single operation.[767]

After the '594 patent was issued to Gree, Supercell petitioned for post-grant review of the patent, asserting that claims 1–20 are patent ineligible.[768]

The Board ultimately found that claims 1, 8, and 10–20 were ineligible, and that claims 2–7 and 9 were eligible.[769] In applying *Alice* step one, the Board agreed with Supercell that the claims of the '594 patent are directed to the abstract idea of "creating and applying a template of positions of one or more game contents."[770] They found Supercell's characterization of the '594 patent as "simply automating the known game of correspondence chess" persuasive.[771] At *Alice* step two, the Board held that claims 1, 8, and 10–20 lacked an inventive concept, but that claims 2–7 and 9 each recite an inventive concept.[772] The Federal Circuit only partially agreed, however, with the Board's findings.

The Federal Circuit agreed with the Board's findings under *Alice* step one that the claims are generally directed to the abstract idea of creating and applying a template.[773] Turning to step two, the Court found that nearly all of the claims lacked an inventive concept.[774] Claims 1–4 and 8–20 were "merely invok[ing] generic computer components performing their standard functions."[775] Further, the claims were "so broad that they encompass automation of…well understood, routine, conventional activity."[776]

The Court did agree with the Board that claims 5–7 were eligible because they include a significantly more than abstract idea because they direct mismatched

[764] *See id.* at 584. Claim 1 is representative of claims 2–7, and 9 of U.S. Patent No. 9,597,594. *See* id. at 586.
[765] *Id.*
[766] *Id.*
[767] *Id.* at 585.
[768] *Id.* at 586.
[769] *Id.*
[770] *Id.*
[771] *Id.*
[772] *Id.* at 587.
[773] *Id.*
[774] *Id.* at 589.
[775] *Id.*
[776] *Id.*

template scenarios.[777] Specifically, these claims recite "specific steps for applying templates in mismatched template scenarios . . . requir[ing] something more than automating correspondence chess."[778]

The court also criticized the Board's analysis under § 101, noting it appeared inconsistent with prior analyses.[779] Particularly that it disagreed with the Board's inference "that a proper § 101 analysis may consider some claim limitations only at *Alice* step one and others only at *Alice* step two."[780] Instead, a proper *Alice* analysis requires that the claims be considered in their entirety in both steps.[781]

USPTO's January and October 2019 Patent Eligibility Guidance Updates

Meanwhile, the USPTO has continued to revise patent examination procedures to assist patent examiners in interpreting *Alice* and its progeny.[782] On January 7, 2019, the USPTO released its sixth update, the Patent Subject Matter Eligibility Guidance ("2019 PEG"),[783] marking a shift in the USPTO's review process to increase allowances of patent applications facing scrutiny under § 101.[784] The 2019 PEG's stated purpose is to "more accurately and consistently identify claims that recite a practical application of a judicial exception (and thus are not 'directed to' a judicial exception), thereby increasing predictability and consistency in the patent eligibility analysis."[785] In short, the 2019 PEG splits step 2A of its version of the *Alice* test (which determines whether a given invention is "directed to" a patent ineligible abstract idea) into two prongs: Prong One asks whether the claim recites an abstract idea, law of nature, or natural phenomenon; if it does, Prong Two asks whether the claim recites additional elements that integrate the judicial exception into a practical application.[786]

[777] *Id*.
[778] *Id*. at 590.
[779] *Id*.
[780] *Id*.
[781] *Id*.
[782] *See generally* Brendan Costello, *Rulemaking § 101*, 129 Yale L.J. 2178, 2196–2217 (2020) (summarizing the USPTO's § 101 guidance and the courts' reliance thereof). *But see* Brooks Kenyon, *Deference Runs Deep: The Ill Effects of* Alice, 2016 B.C. Intell. Prop. & Tech. F. 10, at *4–5 (2016) (criticizing the USPTO's internal guidelines because they only mirror the Federal Circuit's decisions on software, resulting in an alarmingly high rejection rate and predicting that examiners will hesitate to issue patent claims, and such hesitation is premised on the guidelines and orders from their supervisors in the examining core).
[783] *See* Costello, *supra* note 781, at 2210; 2019 Revised Patent Subject Matter Eligibility Guidance, 84 Fed. Reg. 50 (Jan. 7, 2019); *see also* Jay P. Kesan & Runhua Wang, *Eligible Subject Matter at the Patent Office: An Empirical Study of the Influence of Alice on Patent Examiners and Patent Applicants*, 105 Minn. L. Rev. 527, 554 (2020) (noting that since *Alice*, "patent examiners have rejected a staggering number of patent applications in different technology areas under § 101").
[784] *See, e.g.*, Dennis Crouch, *USPTO Eligibility Examination Practice*, Patently-O (Oct. 17, 2019) https://patentlyo.com/patent/2019/10/eligibility-examination-practice.html ("Under Dir. Iancu, the USPTO has taken a seemingly broader view of eligibility than the Supreme Court, albeit much narrower than before *Bilski*, *Alice*, and *Mayo*."); Jessica L.A. Marks & Virginia L. Carron, *Courts Are Trending Toward Broader Patent Eligibility*, Food Dive (Nov. 21, 2018) ("Each of these [eligibility] memoranda indicate that the USPTO is interested in allowing more patents."); *cf.* 2019 Revised Patent Subject Matter Eligibility Guidance, 84 Fed. Reg. at 50 (explaining that 2019 PEG changes address concerns of *patent stakeholders* regarding "clarity and predictability" as well as "the proper scope and application of the 'abstract idea' exception").
[785] 2019 PEG, 84 Fed. Reg. at 53.
[786] *Id.* at 54.

On October 17, 2019, the USPTO issued a 22-page update ("October 2019 PEG Update") of its 2019 PEG for patent examiners, which is the most current version and worth reading in its entirety.[787] Instead of changing the 2019 PEG, the October 2019 PEG Update clarifies the 2019 PEG's application in five areas: (1) the evaluation of whether a claim *recites* (*i.e.*, *sets forth* or *describes*) a judicial exception; (2) the scope of the *groupings* of abstract ideas enumerated in the 2019 PEG (*i.e.*, mathematical concepts, certain methods of organized human activity, or mental processes); (3) the evaluation of whether a judicial exception is integrated into a *practical application* (*i.e.*, exhibiting improvements to the functioning of a computer or any other technology or technical field, particular machine, particular transformation, other meaningful limitations, or particular treatment); (4) the establishment of a *prima facie* case and the role of evidence with respect to eligibility rejections; and (5) the application of the 2019 PEG in the patent examining corps.[788] The October 2019 PEG Update also provided four new examples (Examples 43 to 46) demonstrating application of the 2019 PEG to hypothetical inventions and an updated case law chart that lists selected § 101 cases from the Supreme Court and the Federal Circuit.[789]

In June 2020, the USPTO published the Ninth Edition, Revision 10.2019 (revised June 2020) of the Manual of Patent Examination Procedure ("MPEP"), particularly §§ 2103– 2106.07(c), to incorporates the April 19, 2018 *Berkheimer* Memo,[790] the 2019 PEG, the October 2019 PEG Update.[791] "[A]ll references to those materials should be directed to the MPEP."[792]

If the USPTO's continued revisions of its patent examination procedures, such as the 2019 PEG and the October 2019 PEG Update, achieve its goal at better resolving *Alice* issues at the patent application stage, it may drive the Alice's invalidation rate down further in the future.[793] However, commentators have found that the USPTO has taken a broader view on eligibility than courts are willing to adopt, which would operate to drive *Alice*'s invalidity rate back up.[794] Perhaps it's just a wash.

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[787] *See* October 2019 Patent Eligibility Guidance Update, 84 Fed. Reg. 55942 (Oct. 18, 2019), *available at* https://www.uspto.gov/sites/default/files/documents/peg_oct_2019_update.pdf.

[788] *Id.*

[789] *Id.*

[790] *See* Memorandum, *Changes in Examination Procedure Pertaining to Subject Matter Eligibility, Recent Subject Matter Eligibility Decision (*Berkheimer v. HP, Inc.*)*, U.S. Pat. Trademark Off. (Apr. 19, 2018), *available at* https://www.uspto.gov/sites/default/files/documents/memo-berkheimer-20180419.PDF.

[791] *Subject Matter Eligibility*, U.S. Pat. Trademark Off., https://www.uspto.gov/patents/laws/examination-policy/subject-matter-eligibility (last visited Aug. 15, 2021).

[792] *Id.*

[793] It is possible that many of the newer issued patents (with post-*Alice* grant dates) may not have been asserted yet because the life of a patent spans at least 20 years and it has only been seven years since *Alice*'s conception. *See* 35 U.S.C. § 154(a)(2). That is, it could be that many of the older patents have been the ones at issue in *Alice*'s progeny cases.

[794] *See* the sources cited in *supra*, note 587. For instance, at least four cases have discussed the USPTO's 2019 PEG Updates, only one of which viewed it favorably. *See* Boom! Payments, Inc. v. Stripe, Inc., 19-cv-00590, 2019 U.S. Dist. LEXIS 211552, at *1–2 (N.D. Cal. Nov. 19, 2019) (relying on and quoted the 2019 PEG in its reasoning for finding that the claims were directed to patent-ineligible abstract ideas); Uniloc USA Inc. v. LG Elecs. USA Inc., 379 F. Supp. 3d 974, 984–88, 997 (N.D. Cal. 2019) (dismissing arguments that the claims were not directed to abstract ideas for not falling within any of the categories enumerated in the 2019 PEG because the 2019 PEG did not have the force and effect of law); Citrix Sys., Inc. v. AVI Networks, Inc., 363 F. Supp. 3d 511, 521–24 (D. Del. 2019) (finding Citrix's argument by analogy to an express example in the 2019 PEG to be unpersuasive, despite similarity of the challenged claims, because the 2019 PEG was not binding authority); United Cannabis Corp. v. Pure Hemp Collective Inc., No. 18-cv-1922, 2019 U.S. Dist. LEXIS 66092, at *12 n.2 (D. Colo. Apr. 17, 2019) (dismissing references to the 2019 PEG, finding

Conclusion: Regression Toward the Mean in Law

In the seven years since conception, *Alice*'s subjective two-prong test remains unsurprisingly confusing to apply. That is because the Supreme Court's concept of "abstract idea" from *Alice* is theoretically quite abstract.[795] To concretize this sort of abstraction, providing examples would have aided courts and lawyers in understanding and applying such abstract idea in their patent-eligibility analysis. Hopefully, these illustrated 30 Federal Circuit cases (and their exemplary patent claims) that found eligibility upon *Alice* challenges will serve as helpful guideposts for eligibility analysis, in both claim drafting and patent litigation. Worth pointing out is the pattern of the timing of when these Federal Circuit cases came out – only 4 out of 30 were issued in the first (approximately) two years; in the latter five years, 26 cases followed. It appears as though the Federal Circuit took a while to find their feet, waiting for the percolation of the district court cases before becoming bolder in applying *Alice*'s two-prong test and finding eligibility.

Statistically, the *Alice* invalidation rate at its six-year mark, though relatively lower, still remains the majority (averaging cumulatively 55.8%), but it has decreased over time. At *Alice*'s one-year mark (June 2015), the invalidation rate was averaging 82.9%.[796] In the two and a half years after *Berkheimer*'s issuance in February 2018, the *Alice* invalidation rate has dropped from 67% to 42%.[797] In short, the § 101 landscape has evidently calmed (somewhat) and become more predictable since the issuance of *Alice* and its progeny, *Berkheimer*.[798]

In litigation as in life, the proof of the pudding is in the tasting.[799] The decrease in *Alice*'s invalidation rate as time goes on demonstrates the application of an important statistical phenomenon to sudden changes in law[800]—regression toward the mean (also known as reversion to the mean) as the long-term equilibrium.[801] Soon after *Alice*'s issuance, defendants rushed to raise § 101 defenses against asserted claims and evidently succeeded in invalidating the majority of them (82.9% at year one and 78.2% at year two) because there were too many *Alice*-susceptible claims asserted then.[802] As time passed, patentees wised up and refrained from

that it did not inform the court's analysis in this particular case).

[795] *See Abstracting*, *supra* note 23.

[796] *One-Year Review*, *supra* note 7, at 545.

[797] Davis, *supra* note 10.

[798] *See* discussion, *supra* note 26.

[799] *See* Charles E. Clark, *Foreword*, 42 Iowa L. Rev. 151, 151 (1957) ("[I]n litigation as in other things the proof of the pudding is in the eating" (citing De Cervantes, Don Quixote c. 10 (1605)); Kurowski v. Krajewski, 848 F.2d 767, 776 (7th Cir. 1988) (Easterbrook, J.) ("It is fair to judge a pudding by the eating, and fair to judge litigating decisions by their results.").

[800] *See also* Benjamin N. Cardozo, Paradox of Legal Science 10 (1928) ("There is change whether we will it or not."); Heraclitus of Ephesus (Greek philosopher, 535 BCE–475 BCE) (Change is the only constant in life). "Because law looks backwards, it has difficulty dealing with change." Frederick Schauer, *Internet Privacy and the Public-Private Distinction*, 38 Jurimetrics 555, 555 (1998).

[801] *See generally* Francis Galton, *Regression Towards Mediocrity in Hereditary Stature*, 15 J. Anthropological Inst. Gr. Brit. & Ir. 246, 246–63 (1886). For a historical account of regression toward the mean, see Stephen M. Stigler, *Regression Towards the Mean, Historically Considered*, 6 Stat. Methods Med. Res. 103, 103–14 (1997).

[802] *One-Year Review*, *supra* note 7, at 545; *Two Years*, *supra* note 5, at 370; *see also* Lemley & Zyontz, *supra* note 10, at 63–64 (arguing that early § 101 cases post-*Alice* reflected low-hanging fruits, which "were more likely to invalidate patents." As the low-hanging fruits are cleared, and "as weaker cases possibly settle sooner, it makes sense that the

asserting many of their *Alice*-susceptible patents (*e.g.*, software patents) in light of the high *Alice* invalidation rate. Meanwhile, even defendants in cases less directly related to *Alice* came to believe § 101 defenses are easy to win and asserted *Alice* arguments anyway. Evidently, they were wrong, as the percolation of the district court cases eventually found their way to the Federal Circuit, resulting in the 26 Federal Circuit cases from year three onward finding eligibility under the *Alice* test.[803] In short, the net effect of asserting fewer *Alice*-susceptible and more *Alice*-irrelevant claims resulted in the decrease in *Alice*'s invalidation rate (55.8% after six years) as it regresses toward the mean.

Patent law saw another instance of regression toward the mean when *Inter Partes* Reviews (IPRs) was enacted on September 16, 2012 as part of the America Invents Act.[804] In the first few months (Q1 2014) of the Final Written Decisions, the PTAB invalidated more than 90% of IPR-instituted claims.[805] This led to the then-accepted view of the PTAB as the "patent death squad," as dubbed by Judge Rader.[806] As seen in the *Alice* situation, patentees here also wised up and refrained from asserting many of their IPR-susceptible patents, and defendants in cases with weak invalidity arguments also came to believe IPRs are easy to win and petitioned for IPRs anyway. Like *Alice*, the net effect of these two natural responses has resulted in a decrease of the PTAB's invalidation rate as it regresses toward the mean, which is at about the same rate as the district court and the European Patent Office—in the low 40% range.[807] Indeed, statistics has consistently shown that with enough data points (*i.e.*, as time goes on in the real world), the true signal will eventually reveal itself after the false noises fall away. As Justice Holmes wisely imparted, good ideas shall flourish and bad ideas shall fail in a competitive marketplace of ideas.[808]

invalidation rate will decline.").

[803] *See also* Gugliuzza & Lemley, *supra* note 8, at 768 ("Once the Federal Circuit begins reviewing more decisions upholding validity, the court's high rate of finding invalidity could decrease.").

[804] Leahy–Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011).

[805] *See* Daniel F. Klodowski et al., *Special Report – PTAB IPR Stats Over Time for Q2 2019*, AIA Blog (Aug. 13, 2019).

[806] *See* Jasper L. Tran, *Unconstitutional Appointment of Patent Death Squad*, 90 Geo. Wash. L. Rev. On the Docket at n.4 (June 29, 2021) (quoting former Chief Judge Randall Rader of the Federal Circuit).

[807] *See* Josh Landau, *A Little More Than Forty Percent: Outcomes At The PTAB, District Court, and the EPO*, Pat. Progress (May 1, 2018); John R. Allison et al., *Our Divided Patent System*, 82 U. Chi. L. Rev. 1073, 1100 (2015) (examining every merits decision on every patent case filed in 2008 and 2009 and finding district court's invalidation rate at 42.6%); *see also* Jasper L. Tran et al., *Discretionary Denials of IPR Institution*, 19 Chi.-Kent J. Intell. Prop. 253 (2019) (discussing how the scheduled trial dates at the district court's proceedings affect whether the PTAB decides to institute IPR).

[808] Abrams v. United States, 250 U.S. 616, 630 (1919) (Holmes, J., dissenting) ("[T]he ultimate good desired is better reached by free trade in ideas—that the best test of truth is the power of the thought to get itself accepted in the competition of the market, and that truth is the only ground upon which their wishes safely can be carried out."). Though the phrase "marketplace of ideas" has often been credited to Holmes, it was Justice Brennan's turn of phrase. *See* Lamont v. Postmaster Gen., 381 U.S. 301, 308 (1965) (Brennan, J., concurring) ("The dissemination of ideas can accomplish nothing if otherwise willing addressees are not free to receive and consider them. It would be a barren marketplace of ideas that had only sellers and no buyers."). *See generally* Vincent Blasi, *Holmes and the Marketplace of Ideas*, 2004 Sup. Ct. Rev. 1, 24 (2004).