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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte MICHAEL N. SIMCOCK and DAVID L. PERKINS

Appeal 2018-003421
Application 14/888,198
Technology Center 2800

Before JAMES C. HOUSEL, MICHELLE N. ANKENBRAND, and
LILAN REN, *Administrative Patent Judges*.

HOUSEL, *Administrative Patent Judge*.

DECISION ON APPEAL¹

Appellant² appeals under 35 U.S.C. § 134(a) from the Examiner’s decision finally rejecting claims 1–26 under 35 U.S.C. § 102(a)(1) as anticipated by U.S. Patent Application Publication No. 2012/0150451 A1, published June 14, 2012 (“Skinner”) and provisionally rejecting claims 17–21 under the ground of non-statutory obviousness-type double patenting as

¹ Our decision refers to the Specification (“Spec.”) filed October 30, 2015, the Examiner’s Final Office Action (“Final”) dated May 25, 2017, Appellant’s Appeal Brief (“Appeal Br.”) filed August 24, 2017, the Examiner’s Answer (“Ans.”) dated December 11, 2017, and Appellant’s Reply Brief (“Reply Br.”) filed February 9, 2018.

² Appellant is the Applicant, Halliburton Energy Services, Inc., which is identified in the Appeal Brief as the real party in interest (Appeal Br. 2).

unpatentable over claims 1 and 11–13 of copending U.S. Patent Application No. 13/657,981, filed October 23, 2012 (“Jones”). We have jurisdiction over the appeal under 35 U.S.C. § 6(b).

We REVERSE, but designate a NEW GROUND OF REJECTION as to claims 1–15 pursuant to 37 C.F.R. § 41.50(b).

STATEMENT OF THE CASE

The invention relates to multivariate optical computing devices and methods that utilize an Integrated Computational Element (“ICE”) designed to detect multiple sample characteristics (Spec. 1:5–6). Appellant discloses that one type of an ICE is an optical thin film interference device, also known as a Multivariate Optical Element (“MOE”) (*id.* at 1:17–18).

Claims 1, 17, and 19, reproduced below from the Claims Appendix to the Appeal Brief, are illustrative of the subject matter on appeal.

1. A method for designing an Integrated Computational Element (“ICE”), comprising:
 - defining a preliminary ICE design;
 - defining a first chemical system having one or more components;
 - defining a second chemical system having one or more components;
 - determining a first performance factor of the preliminary ICE design which corresponds to the first chemical system;
 - determining a second performance factor of the preliminary ICE design which corresponds to the second chemical system;
 - summing the first and second performance factors to produce a total performance factor; and
 - determining a final ICE design based upon the total performance factor.

17. An Integrated Computational Element (“ICE”) which approximates a regression vector of a plurality of chemical systems.

19. An optical computing device, comprising:
 - an electromagnetic radiation source which produces electromagnetic radiation that optically interacts with a fluid sample to produce sample-interacted light;
 - at least one Integrated Computational Element ("ICE") that approximates a regression vector of a plurality of chemical systems, the at least one ICE being positioned to optically interact with the sample-interacted light to produce optically-interacted light that corresponds to at least one characteristic within the fluid sample; and
 - an optical transducer positioned to receive the optically-interacted light and thereby generate a signal corresponding to the at least one characteristic of the fluid sample.

ANALYSIS

Obviousness-type Double Patenting Rejection

As an initial matter, we note that the Jones application is no longer pending. Therefore, this rejection is moot.

Anticipation Rejection

Anticipation under 35 U.S.C. § 102 requires that each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *In re Robertson*, 169 F.3d 743, 745 (Fed. Cir. 1999). But, disclosure of each element is not quite enough. Anticipation also requires the presence of a single prior art disclosure of all elements of a claimed invention arranged as in the claim. *Finisar Corp. v. DirecTV Group, Inc.*, 523 F.3d 1323, 1334-35 (Fed. Cir. 2008); *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1370 (Fed. Cir. 2008) (Clarifying that an anticipation “test is thus more accurately understood to mean ‘arranged or combined in the same way as in the claim.’”).

The issue before us on appeal of this rejection is whether the Examiner reversibly erred in finding that Skinner’s ICE, the method of its

design, as well as optical computing device and method of using it, anticipates Appellant's claimed invention. For the reasons presented in the Appeal and Reply Briefs and below, we answer this question in the affirmative and, therefore, do not sustain this rejection. We note that claims 1–15 recite methods for designing an Integrated Computational Element (“ICE”), whereas claims 16–18 recite ICE devices, claims 19–21 recite optical computing devices using at least one ICE device, claims 22–25 recite optical computing methods with an ICE device, and claim 26 recites a system comprising processing circuitry to implement the method of claim 1. For the reasons given below, we treat each of these claim groupings separately.

Claims 1–15

The Examiner finds that Skinner teaches a method for designing an ICE comprising defining a preliminary ICE design, defining first and second chemical systems each having one or more components, determining first and second performance factor of the preliminary ICE design corresponding, respectively, to the first and second chemical systems, summing these performance factors to produce a total performance factor, and determining a final ICE design based upon the total performance factor (Final 14–15). The Examiner specifically finds that Skinner's ICE is designed to measure different fluids, e.g., petroleum and drilling oil, and also finds that the chemical compounds in petroleum can be chosen to offer first and second chemical systems, thereby ensuring that each chemical system has its own spectral signature (*id.* at 14). In addition, the Examiner finds that Skinner's dot products correspond to the recited first and second performance factors,

wherein at least two dot products calculated using vector regression are added or summed (*id.*).

Appellant argues that Skinner differs from the claimed invention in that Skinner fails to teach a single ICE predictive of multiple, *different* chemical systems (Appeal Br. 6–7).³ Appellant contends that unlike the claimed invention, Skinner’s ICE is only predictive of a single chemical system (*id.* at 7). In order to detect a plurality of chemical systems, Appellant asserts that Skinner utilizes multiple ICEs, rather than a single ICE (*id.* at 7–8). Appellant concedes that it is possible to design an ICE to be predictive for any number of chemical systems, but argues that such an ICE, once fabricated in accordance with Skinner’s disclosure, is only predictive for a single chemical system (*id.* at 8). In this regard, Appellant contends that a “chemical system” is defined as comprising “one or more chemical components,” wherein the “components are a spectral data set representing a target characteristic and interferences associated with the chemical system” (*id.* at 6–7).

Appellant’s arguments are persuasive of reversible error. As Appellant concedes, there is little doubt that Skinner teaches an ICE that can be designed to be used with a variety of chemical systems. However, as

³ We note Appellant construes the claims as requiring that the plural chemical systems are different. We further note that the Examiner does not offer a different construction. Because the entire application is directed to producing and using an ICE that approximates the regression vector for plural chemical systems that are different, we likewise accept this construction as the broadest reasonable construction consistent with the Specification. *In re ICON Health & Fitness, Inc.*, 496 F.3d 1374, 1379 (Fed. Cir. 2007); *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004).

Appellant contends, Skinner fails to teach designing a single ICE based on plural, different chemical systems. *See* Skinner, Figs. 10 and 11 (requiring multiple MOEs to measure different chemical systems). Thus, the record does not support the Examiner's findings that Skinner teaches defining first and second chemical systems each having one or more components, and determining a first and a second performance factor of the preliminary ICE design corresponding, respectively, to the first and second chemical systems, where these performance factors are summed to provide a total performance factor from which the final ICE design is based. Although Skinner appears to provide an ICE for each of different fluids, such as petroleum and drilling oil, where each fluid would be a different chemical system each having a data set with its own spectral signature (*id.*; *see also* ¶¶ 62, 75, and 76), the Examiner fails to support the finding that Skinner ever combines spectral data sets from different chemical systems when designing a single ICE. Indeed, Skinner's teaching of summing dot products of the passed wavelengths and corresponding vectors is performed on a single spectral data set (*id.* ¶¶ 60–61), and is not a step of summing performance factors of a preliminary ICE design for different chemical systems.

Accordingly, we are persuaded of reversible error in the Examiner's finding that Skinner anticipates claims 1–15.

Claim 16

Claim 16 recites an ICE fabricated by the method of claim 1. Here, the Examiner does not specifically address this product-by-process claim, instead relying on the earlier finding that Skinner anticipates method claim 1. Because we determine that this finding is erroneous, we likewise find reversible error in the Examiner's rejection of claim 16.

Claims 17–18

Claim 17 recites an ICE “which approximates a regression vector of a plurality of chemical systems.” Claim 18 depends from claim 17 and further requires that the chemical systems comprise a single characteristic in different fluids, a single characteristic having differing concentration ranges in a single fluid, or different characteristics.

The Examiner finds Skinner teaches an ICE designed to detect/measure chemical elements of a chemical makeup of samples which allow measuring the amount of fuel and/or its chemical makeup from the intensity of the spectral optical signal as known in spectroscopy, by using a regression vector (Ans. 8). The Examiner also finds Skinner teaches employing plural ICE devices sequentially to measure the concentration of various chemical species burning in a flare (*id.* at 8–9).

As above, the Examiner reversibly errs in finding that Skinner anticipates the ICE of claims 17 and 18 because there is no support that Skinner’s ICE is designed so as to approximate a regression vector of plural, different chemical systems. The fact that Skinner requires plural ICE devices to detect or measure the various chemical species burning in a flare supports Appellant’s argument that Skinner’s individual ICEs are each designed for a single chemical system, not plural, different chemical systems.

Claims 19–25

Claims 19 and 22 recite an optical computing device and an optical computing method, respectively, which include at least one ICE that “approximates a regression of a plurality of chemical systems.” As discussed above, we are persuaded of reversible error in the finding that

Skinner anticipates such an ICE. Likewise, we are persuaded that Skinner fails to anticipate an optical computing device and method using such an ICE.

Claim 26

Claim 26 recites a system comprising processing circuitry to implement the method of claim 1. The Examiner finds that Skinner teaches a computer and electric circuitry used to produce an ICE according to claim 1. As discussed above, Appellant persuades us that the Examiner reversibly erred in finding that Skinner anticipates the method of claim 1. For the same reasons, we are also persuaded that Skinner fails to anticipate the system comprising processing circuitry to implement the method of claim 1.

New Ground of Rejection

Claims 1–15 and 26 are newly rejected under 35 U.S.C. § 101 as being directed to patent ineligible subject matter.

Legal Framework

An invention is patent eligible if it claims a “new and useful process, machine, manufacture, or composition of matter.” 35 U.S.C. § 101. However, the Supreme Court has long interpreted 35 U.S.C. § 101 to include implicit exceptions: “[l]aws of nature, natural phenomena, and abstract ideas” are not patentable. *E.g.*, *Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208, 216 (2014).

In determining whether a claim falls within an excluded category, our inquiry focuses on the Supreme Court’s two-step framework, described in *Mayo* and *Alice*. *Id.* at 217–18 (citing *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 75–77 (2012)). In accordance with that framework, we first determine what concept the claim is “directed to.”

See Alice, 573 U.S. at 219 (“On their face, the claims before us are drawn to the concept of intermediated settlement, *i.e.*, the use of a third party to mitigate settlement risk.”); *see also Bilski v. Kappos*, 561 U.S. 593, 611 (2010) (“Claims 1 and 4 in petitioners’ application explain the basic concept of hedging, or protecting against risk.”).

Concepts determined to be abstract ideas, and thus patent ineligible, include certain methods of organizing human activity, such as fundamental economic practices (*Alice*, 573 U.S. at 219–20; *Bilski*, 561 U.S. at 611); mathematical formulas (*Parker v. Flook*, 437 U.S. 584, 594–95 (1978)); and mental processes (*Gottschalk v. Benson*, 409 U.S. 63, 69 (1972)). Concepts determined to be patent eligible include physical and chemical processes, such as “molding rubber products” (*Diamond v. Diehr*, 450 U.S. 175, 191 (1981)); “tanning, dyeing, making water-proof cloth, vulcanizing India rubber, smelting ores” (*id.* at 182 n.7 (quoting *Corning v. Burden*, 56 U.S. 252, 267–68 (1854))); and manufacturing flour (*Benson*, 409 U.S. at 69 (citing *Cochrane v. Deener*, 94 U.S. 780, 785 (1876))).

In *Diehr*, the claim at issue recited a mathematical formula, but the Supreme Court held that “[a] claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a mathematical formula.” *Diehr*, 450 U.S. at 176; *see also id.* at 191 (“We view respondents’ claims as nothing more than a process for molding rubber products and not as an attempt to patent a mathematical formula.”). Having said that, the Supreme Court also indicated that a claim “seeking patent protection for that formula in the abstract . . . is not accorded the protection of our patent laws, . . . and this principle cannot be circumvented by attempting to limit the use of the formula to a particular technological

environment.” *Id.* (citing *Benson and Flook*); *see, e.g., id.* at 187 (“It is now commonplace that an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection.”).

If the claim is “directed to” an abstract idea, we turn to the second step of the *Alice* and *Mayo* framework, where “we must examine the elements of the claim to determine whether it contains an ‘inventive concept’ sufficient to ‘transform’ the claimed abstract idea into a patent-eligible application.” *Alice*, 573 U.S. at 221 (quotation marks omitted). “A claim that recites an abstract idea must include ‘additional features’ to ensure ‘that the [claim] is more than a drafting effort designed to monopolize the [abstract idea].’” *Id.* (quoting *Mayo*, 566 U.S. at 77). “[M]erely requir[ing] generic computer implementation[] fail[s] to transform that abstract idea into a patent-eligible invention.” *Id.*

The Office recently published revised guidance on the application of § 101. USPTO’s January 7, 2019 Memorandum, *2019 Revised Patent Subject Matter Eligibility Guidance* (“Memorandum”), 84 Fed. Reg. 50. Under that guidance, we first look to whether the claim recites:

- (1) any judicial exceptions, including certain groupings of abstract ideas (i.e., mathematical concepts, certain methods of organizing human activity such as a fundamental economic practice, or mental processes); and
- (2) additional elements that integrate the judicial exception into a practical application (*see* MPEP § 2106.05(a)–(c), (e)–(h)).

Only if a claim recites a judicial exception and does not integrate that exception into a practical application, do we then look to whether the claim:

- (3) adds a specific limitation beyond the judicial exception that is not “well-understood, routine, conventional” in the field

(*see* MPEP § 2106.05(d)); or

- (4) simply appends well-understood, routine, conventional activities previously known to the industry, specified at a high level of generality, to the judicial exception.

See generally Memorandum.

Analysis

Applying the guidance set forth in the Memorandum, we conclude that claims 1–15 and 26 do not recite patent-eligible subject matter.

Revised Step 2A, Prong One—Directed to a Judicial Exception

The Memorandum instructs us first to determine whether each claim recites any judicial exception to patent eligibility. 84 Fed. Reg. at 54. The Memorandum identifies three judicially-exceptioned groupings: (1) mathematical concepts, (2) certain methods of organizing human activity such as fundamental economic practices, and (3) mental processes. *Id.* at 52. We primarily focus here on the third grouping—mental processes.⁴

Although the Specification describes the invention as directed to a structure that Appellant refers to as an ICE, and, more particularly, to a multivariate optical element designed to detect multiple sample characteristics in a plurality of different chemical systems, claims 1–15 and 26 are not directed to such a structure, but to methods and a system for its design. These design methods and system are directed to the abstract concept of mental processes, wherein the defining steps merely present the information that will be processed and the determining steps merely present a parameter or parameters from the defined information that are summed so as to determine a final design. Appellant’s design process is analogous to an

⁴ As discussed further below, the “summing” step of the method also implicates the first grouping—mathematical concepts.

engineer designing, for instance, the structure of a house to stand up to a hurricane and a flood by selecting a preliminary design composed of two-by-fours, trusses, and other structures needed to hold up the roof and keep the house from falling down, based on the known ability of the various lumber structures to bear weight, determining the performance factor for the preliminary design withstanding the force of hurricane winds and the performance factor for the preliminary design withstanding flood waters, summing both performance factors, and then determining a final design capable of withstanding both a hurricane and a flood by reviewing and resetting the placement of the various structures in the basic design. These are mental steps whether they are performed on a computer or in one's mind.

With regard to claim 1, in particular, each of the defining steps is recited at a high level of generalization and merely provides information to be used in the process. Providing information is a step that can be performed in the human mind. As such, these defining steps, including the steps of (1) "defining a preliminary ICE design," (2) "defining a first chemical system having one or more components," and (3) "defining a second chemical system having one or more components," are mental steps directed to a mental process. Similarly, each of the determining steps is also recited at a high level of generalization and merely provides information, as a result of reasoning, observation, research, or calculation, to be used in the process. Again, determining information is a step that can be performed in the human mind. As such, these determining steps, including (4) "determining a first performance factor of the preliminary ICE design which corresponds to the first chemical system," (5) "determining a second performance factor of the preliminary ICE design which corresponds to the

second chemical system,” and (6) “determining a final ICE design based upon the total performance factor,” are mental steps directed to a mental process. The remaining step recited in claim 1, the step of “summing the first and second performance factors to produce a total performance factor,” recites a basic mathematical operation, addition, and is directed to a mathematical concept.

Independent claim 12 recites a single defining step, specifically, (1) “defining a plurality of chemical systems that each represent one or more components,” and a single determining step, specifically, (2) “determining a single ICE design that corresponds to the plurality of chemical systems” (Appeal Br. 14 (Claims App’x)). Thus, claim 12 recites the defining and determining steps at an even higher level of generality than claim 1. Fundamentally, this claim is directed to a mental process for substantially the same reasons as provided above regarding claim 1. The defining step merely provides information that can be used in the process, wherein providing information is a step that can be performed in the human mind. The determining step merely provides information, as a result of reasoning, observation, research, or calculation, to be used in the process, wherein the determining information is a step that can be performed in the human mind. As such, the defining and determining steps are mental steps, and claim 12, therefore, is directed to a mental process.

We further note that these steps are similar to other concepts the courts have identified as abstract mental processes. *See Synopsys, Inc. v. Mentor Graphics Corp.*, 839 F.3d 1138 (Fed. Cir. 2016) (methods of logic circuit design, comprising converting a functional description of a level sensitive latch into a hardware component description of the latch); *Digitech*

Image Techs., LLC v. Elecs. for Imaging, Inc., 758 F.3d 1344 (Fed. Cir. 2014) (organizing information through mathematical correlations). In *Electric Power Group*, our reviewing court explained that concepts of collecting and analyzing information, when broadly claimed, fall within the “realm of abstract ideas”:

Information as such is an intangible. *See Microsoft Corp. v. AT & T Corp.*, 550 U.S. 437, 451 n.12 (2007); *Bayer AG v. Housey Pharm., Inc.*, 340 F.3d 1367, 1372 (Fed. Cir. 2003).

Accordingly, we have treated collecting information, including when limited to particular content (which does not change its character as information), as within the realm of abstract ideas. *See, e.g., Internet Patents*, 790 F.3d at 1349; *OIP Techs., Inc. v. Amazon.com, Inc.*, 788 F.3d 1359, 1363 (Fed. Cir. 2015); *Content Extraction & Transmission LLC v. Wells Fargo Bank, Nat’l Ass’n*, 776 F.3d 1343, 1347 (Fed. Cir. 2014); *Digitech Image Techs., LLC v. Elecs. for Imaging, Inc.*, 758 F.3d 1344, 1351 (Fed. Cir. 2014); *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1370 (Fed. Cir. 2011). In a similar vein, we have treated analyzing information by steps people go through in their minds, or by mathematical algorithms, without more, as essentially mental processes within the abstract-idea category. *See, e.g., TLI Commc’ns*, 823 F.3d at 613; *Digitech*, 758 F.3d at 1351; *SmartGene, Inc. v. Advanced Biological Labs., SA*, 555 F. App’x 950, 955 (Fed. Cir. 2014); *Bancorp Servs., L.L.C. v. Sun Life Assurance Co. of Canada (U.S.)*, 687 F.3d 1266, 1278 (Fed. Cir. 2012); *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1372 (Fed. Cir. 2011); *SiRF Tech., Inc. v. Int’l Trade Comm’n*, 601 F.3d 1319, 1333 (Fed. Cir. 2010); *see also Mayo*, 132 S. Ct. at 1301; *Parker v. Flook*, 437 U.S. 584, 589–90 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972). And we have recognized that merely presenting the results of abstract processes of collecting and analyzing information, without more (such as identifying a particular tool for presentation), is abstract as an ancillary part of such collection and analysis. *See, e.g., Content Extraction*, 776 F.3d at 1347; *Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 715 (Fed. Cir. 2014).

Electric Power Group, LLC v. Alstom, S.A., 830 F.3d 1350, 1353–54 (Fed. Cir. 2016).

Dependent claims 2–11 and 13–15 recite additional limitations on the information the defining steps provide and/or the manner by which the determining steps are performed. As discussed above, merely limiting the type and/or format of the information here does not render the mental process any less abstract. With regard to the manner by which the determining steps are performed, we note that claim 5 recites, (1) “applying a regression vector of the preliminary ICE design to the first data set,” and (2) “applying the regression vector of the preliminary ICE design to the second data set” (Appeal Br. 14 (Claims App’x)), whereas claim 14 recites, (3) “applying a regression vector to the calibration data sets to thereby determine a performance factor” (*id.*). Regression vector analysis is a mathematical operation and, therefore, is an abstract concept. Accordingly, applying the guidance in the Memorandum, we conclude that claims 1–15 and 26 each recite a mental process, and thus recite abstract ideas.

Revised Step 2A, Prong Two – Practical Application

Having determined that claims 1–15 and 26 recite the abstract concept of a mental process, we next look to determine whether the claims recite “additional elements that integrate the judicial exception into a practical application.” MPEP § 2106.05(a)–(c), (e)–(h); Memorandum, 84 F.3d at 53–54. Integration into a practical application requires an additional element or a combination of additional elements in the claim to “apply, rely on, or use the judicial exception in a manner that imposes a meaningful limit on the judicial exception, such that the claim is more than a drafting effort designed to monopolize the exception.” Memorandum, 84 Fed. Reg. at 53–54; *see*

also id. at 55 (setting forth exemplary considerations indicative that an additional element or combination of elements may have integrated the judicial exception into a practical application).

Here, we find none. We find that the additional elements claims 1–15 and 26 recite do not integrate the judicial exception into a practical application. Notably, the claims do not recite, and the Specification does not describe, an improvement to the functioning of a computer, or to any other technology or technical field. Nor are the additional elements directed to a particular machine or transformation. The claims do not require any step of actually fabricating the ICE as, for example, shown in Figure 1, based on the final ICE design. Further, we note that Appellant’s design method and system both utilize regression analysis to determine performance factors, which are then summed to arrive at a final performance factor. Regression analysis and summation are abstract mathematical concepts. With regard to the system comprising processing circuitry for implementing Appellant’s design method as recited in claim 26, we note that Appellant merely discloses a general computer processing environment comprising at least one processor, a non-transitory, computer readable storage, a network communication module, and optional I/O devices and display, all interconnected via a system bus (Spec. 7:3–13).⁵ But such disclosure does not integrate the mental processes recited in the claims into a practical application. *See Memorandum*, 84 Fed. Reg. at 55 (setting forth examples in

⁵ Although some of these considerations also may be properly evaluated under Step 2 of *Alice* (Step 2B of Office guidance), consistent with the Memorandum, we evaluate them under Step 1 of *Alice* (Step 2A of Office guidance). *See Memorandum*, 84 Fed. Reg. at 55.

which a judicial exception has not been integrated into a practical application).

Step 2 B—Inventive Concept

Because we determine that claims 1–15 and 26 are directed to an abstract idea and they do not include additional elements that integrate the abstract idea into a practical application, we look to whether each claim provides an inventive concept, i.e., adds a specific limitation beyond the judicial exception that is not “well-understood, routine, conventional” in the field. Memorandum, 84 Fed. Reg. at 56. Again, we find none. Although some of the dependent claims recite the differences between the chemical systems as presented in the spectral data sets, these differences merely exist in the information upon which the mental process is applied. As such, these differences in information are part of the abstract idea and are not limitations beyond the judicial exception. Further, although other dependent claims recite that the performance factor determining steps apply a regression vector to these data sets, such is merely an abstract mathematical concept. Therefore, these steps applying a regression vector to the data sets are also part of the abstract idea and are not limitations beyond the judicial exception. Appellant also discloses that the prior known ICE design process entailed performing a process similar to that of claim 1, albeit only for a single chemical system (Spec. 2:3–15).

As for claim 26, this claim broadly recites any system comprising any processing circuitry for implementing the process of claim 1. Processing circuitry is so well-understood, routine, and conventional that we take Official Notice of this fact. We note, as set forth above, that Appellant merely discloses a general computer processing environment comprising at

least one processor, a non-transitory, computer readable storage, a network communication module, optional I/O devices and display, all interconnected via a system bus (Spec. 7:3–13). Indeed, Appellant describes further that the method may be practiced on a wide variety of computer system configurations (*id.* at 7:20–31), thus recognizing the well-understood, routine, and conventional nature of the system comprising processing circuitry that may implement claim 1’s design method. *See TLI Commc’ns LLC v. AV Auto. LLC*, 823 F.3d 607 (Fed. Cir. 2016). As stated in *Alice*, “the mere recitation of a generic computer cannot transform a patent-ineligible abstract idea into a patent-eligible invention.” *Alice*, 573 U.S. 223.

Accordingly, we conclude that method claims 1–15 and system claim 26 are directed to patent ineligible subject matter under 35 U.S.C. § 101. They ensnare the basic idea of creating a product design based on abstract mental processes and do not recite additional elements that integrate those mental processes into a practical application. Further, implementing the abstract idea on a general purpose computer does not transform it into a patentable apparatus; the idea remains a pre-empted mental process. *Alice*, 573 U.S. 208, 216 (2014) (“We have described the concern that drives this exclusionary principle as one of pre-emption.”) (citing *Bilski v. Kappos*, 561 U.S. 593, 612 (2010) (“[U]pholding the patent ‘would pre-empt use of this approach in all fields, and would effectively grant a monopoly over an abstract idea.’”)). Here, the decision-making processes and design output of the claims are abstract ideas, and the use of a general computer does not transform the nature of the abstract decision-making process design output into something that is patent eligible.

DECISION

Upon consideration of the record, and for the reasons given above and in the Appeal and Reply Briefs, the decision of the Examiner rejecting claims 1–26 under 35 U.S.C. § 102(a)(1) as anticipated by Skinner is *reversed*.

However, for the reasons given above, claims 1–15 and 26 are newly rejected under 35 U.S.C. §101 as being directed to patent ineligible subject matter.

This decision contains a new ground of rejection pursuant to 37 CFR § 41.50(b) (effective September 13, 2004, 69 Fed. Reg. 49960 (August 12, 2004), 1286 Off. Gaz. Pat. Office 21 (September 7, 2004)). 37 CFR § 41.50(b) provides “[a] new ground of rejection pursuant to this paragraph shall not be considered final for judicial review.”

37 CFR § 41.50(b) also provides that Appellant, WITHIN TWO MONTHS FROM THE DATE OF THE DECISION, must exercise one of the following two options with respect to the new ground of rejection to avoid termination of the appeal as to the rejected claims:

(1) *Reopen prosecution*. Submit an appropriate amendment of the claims so rejected or new evidence relating to the claims so rejected, or both, and have the matter reconsidered by the examiner, in which event the proceeding will be remanded to the examiner. . . .

(2) *Request rehearing*. Request that the proceeding be reheard under § 41.52 by the Board upon the same record. . . .

REVERSED
37 C.F.R. § 41.50(b)