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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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Ex parte WEI ZHANG, ADRIAN BARBU, YEFENG ZHENG, and
DORIN COMANICIU

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Appeal 2018-004206
Application 11/856,109
Technology Center 2100

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Before JEFFREY S. SMITH, JOHNNY A. KUMAR, and
CATHERINE SHIANG, *Administrative Patent Judges*.

KUMAR, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants[1] appeal under 35 U.S.C. § 134(a) from the Examiner's
decision to reject claims 10–14, and 24–28.[2] We have jurisdiction under
35 U.S.C. § 6(b). We AFFIRM.

STATEMENT OF THE CASE

Appellants' invention relates to object detection in digital images
using a probability mechanism, including identifying and manipulating a
digital representation of the detected object. Spec. ¶ 23. According to one

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[1] Appellants identify the real party in interest as Siemens Medical Solutions
USA, Inc. App. Br. 1.
[2] Claims 1–9, 15–23, 29, and 30 were previously canceled.

aspect, the probability mechanism is trained to detect lymph nodes depicted in image data. Spec. ¶ 24.

Exemplary Claim

10.   A method for detecting objects in CT volume data using a probabilistic boosting cascade tree (PBCT), comprising:
        receiving an input CT volume;
        processing said input CT volume using a PBCT having a plurality of nodes to detect one or more objects in said input CT volume, wherein said PBCT comprises at least one tree node, at least one cascade node, and a plurality of leaf nodes, wherein each of said at least one tree node, said at least one cascade node, and said plurality of leaf nodes classifies voxels of the input CT volume as positive or negative, wherein said at least one cascade node has a single child node for further classifying voxels classified as positive by said at least one cascade node, wherein voxels classified as negative by said at least one cascade node are discarded without being passed to a leaf node, and wherein said at least one tree node has a first child node for further classifying voxels classified as positive by said at least one tree node and a second child node for further classifying voxels classified as negative by said at least one tree node.

App. Br. 35 (Claims Appendix).

REJECTIONS

Claims 10–14 and 24–28 are rejected under 35 U.S.C. § 112(a) as failing to comply with the enablement requirement. Final Act. 3–6.[3]

Claims 10–14 and 24–28 are rejected under 35 U.S.C. § 112(a) as

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[3] Throughout this Opinion, we refer to (1) the Final Office Action mailed Nov. 21, 2016 ("Final Act."); (2) the Appeal Brief filed Aug. 9, 2017 ("App. Br."); (3) the Examiner's Answer mailed Jan. 11, 2018 ("Ans."); and (4) the Reply Brief filed Mar. 12, 2018 ("Reply Br.").

failing to comply with the written description requirement. Final Act. 6–7.

Claims 10–14 and 24–28 are rejected under 35 U.S.C. § 112(b) as being indefinite. Final Act. 7–8.

Claims 10–14 and 24–28 are rejected under 35 U.S.C. § 101 as being directed to a judicial exception, without significantly more. Final Act. 2.

REJECTION UNDER § 112, FIRST PARAGRAPH, WRITTEN DESCRIPTION

Issue: Under pre-AIA 35 U.S.C. § 112, first paragraph, did the Examiner err in finding that independent claims 10 and 24 fail to comply with the written description requirement?

The Examiner finds the Specification and drawings of the application do not sufficiently support the claim limitations (1) "wherein voxels classified as negative by said at least one cascade node are discarded without being passed to a leaf node"; and (2) "said plurality of leaf nodes classifies voxels of the input CT volume as positive or negative" as recited in independent claims 10 and 24. Final Act. 6–7.

With respect to limitation (1), we agree with Appellants' arguments (App. Br. 28–30) that the limitation complies with the written description requirement. We do not sustain the Examiner's rejection because the Examiner fails to set forth a prima facie case for the rejection of claims 10 and 24 (Final Act. 6–7) pursuant to the requirements of 35 U.S.C. § 132(a). *See In re Warner*, 379 F.2d 1011, 1017 (CCPA 1967). In particular, the Examiner finds that "[f]urther, the specification at no time discusses discarding negative data without passing to a leaf node." Final

Act. 7. However, the Specification discloses a "leaf node" as the endpoint specific to a tree structure rather than a cascade structure. Spec. ¶ 6. Accordingly, a cascade node would not pass negative data to a "leaf node." As correctly pointed out by Appellants, "data classified as negative by each cascade node is not passed to any child node and is thus discarded without being passed to a leaf node." App. Br. 28. Accordingly, the Examiner's identification of the area of discarded negative data in FIG. 2 (Final Act. 7) is inconsistent with the terminology disclosed in the Specification.

However, with respect to limitation (2), we agree with the Examiner that the Specification fails to comply with the written description requirement. Appellants define "nodes 626, 628, 630, 632, 634, 636, and 638" as "leaf nodes" (App. Br. 15) wherein a leaf node has no child nodes (App. Br. 16). We disagree with Appellants' assertion that the Specification supports an interpretation that a leaf node "still performs a classification, but there are no child nodes trained to perform further classifications on the data classified as positive or negative by the leaf nodes." App. Br. 17. Rather, the Specification clarifies that:

> **Each node** in the PBCT **classifies all of the voxels** received at the node as positive or negative. If a node is a cascade node the positively classified voxels **are further classified at a child node**, and the negatively classified voxels are discarded. **If a node is a tree node**, **one child node further classifies** positively classified voxels and **another child node further classifies** negatively classified voxels.

Spec. ¶ 38 (bolding added).

Furthermore, the Specification does not provide any guidance that a "leaf node" is distinct from a "tree node" such that a "leaf node" that

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performs classification is required to send positive or negative classifications to a further child node. *See also* Spec. ¶ 27 (each node is classified as a cascade or tree node, "**each** node is trained it determined how many child nodes must be trained for that node" (emphasis added) wherein a cascade node has one child and a tree node has two). In addition, for cascade nodes that perform classification, "**[a]ll** data classified as positive advances to be classified by the next classifier" Spec. ¶ 5 (emphasis added). As noted above, further classification occurs at a child node. Accordingly, node 630, for example, shown in FIG. 6, under the guidance of the Specification would necessarily have to be trained as a tree node or a cascade node (¶ 27) and perform a classification having at least an additional child node (¶ 38).

The Specification guides that if there are not enough training samples to train a node as a tree node or a cascade node, the node is deemed a "terminal node" which does not perform further classification since no child nodes are generated from it. App. Br. 16–17 (citing Spec. ¶ 34). However, this citation does not resolve the inconsistencies cited by the Examiner (Final Act. 3–4) that a terminal or leaf node cannot both perform classification (which requires a child node, e.g., Spec. ¶ 38) and also not include a further child node.

"[I]t is 'not a question of whether one skilled in the art *might* be able to construct the patentee's device from the teachings of the disclosure. . . . Rather, it is a question whether the application *necessarily discloses* that particular device.' . . . A description which renders obvious the invention for which an earlier filing date is sought is not sufficient." *Lockwood v. Am. Airlines, Inc.*, 107 F.3d 1565, 1572 (Fed. Cir. 1997) (quoting *Jepson v. Coleman*, 314 F.2d 533, 536 (CCPA 1963)) (emphasis added).

This reasoning is applicable here. In reviewing the record, we agree with the Examiner that the Specification is insufficient to demonstrate possession of Appellants' claimed invention and show each of the claimed computations.

Because Appellants fail to direct our attention to sufficient disclosure in the originally-filed Specification that demonstrates possession of the claim limitation "said plurality of leaf nodes classifies voxels of the input CT volume as positive or negative" (independent claims 10 and 24), we find Appellants' contentions do not persuasively rebut the Examiner's findings. Therefore, for the reasons discussed above, and based upon a preponderance of the evidence, we are not persuaded the Examiner erred. Accordingly, with respect to limitation (2), we sustain the Examiner's rejection of claims 10–14 and 24–28, under 35 U.S.C. § 112, first paragraph, for failing to comply with the written description requirement.

REJECTION UNDER § 112, FIRST PARAGRAPH, ENABLEMENT

Issue: Under pre-AIA 35 U.S.C. § 112, first paragraph, did the Examiner err in finding that independent claims 10 and 24 fail to comply with the enablement requirement?

Appellants present similar arguments asserting the § 112, first paragraph enablement rejection should be withdrawn (App. Br. 14–19) that was asserted for § 112, first paragraph written description. Accordingly, we agree with Appellants with respect to limitation (1) but we disagree with Appellants with respect to limitation (2) that the § 112 first paragraph enablement rejection should be withdrawn for the same reasons discussed *supra*. Additionally, Appellants assert the Declaration of Dorin Comaniciu

submitted September 1, 2015 provides evidence one of ordinary skill in the art would understand that in a PBT structure, leaf nodes are trained classifiers and that the leaf nodes do not represent the final decisions of the parent nodes. App. Br. 19. However, assuming arguendo this is true, the declaration provided still does not address the inconsistencies resulting from the definitions and guidance of the claim language, drawings and Specification discussed above, with respect to limitation (2). Accordingly, with respect to limitation (2), we sustain the Examiner's rejection of claims 10–14 and 24–28, under 35 U.S.C. § 112, first paragraph, for failing to comply with the enablement requirement.

<div align="center">REJECTION UNDER § 112, SECOND PARAGRAPH</div>

Issue: Under pre-AIA 35 U.S.C. § 112, second paragraph, did the Examiner err in finding that independent claims 10 and 24 fail to comply with the indefiniteness requirement?

Appellants present similar arguments asserting the § 112, second paragraph rejection should be withdrawn (App. Br. 31–33) that was asserted for § 112(a) written description. Accordingly, we agree with Appellants with respect to limitation (1) and we disagree with Appellants with respect to limitation (2) that the § 112, second paragraph indefiniteness rejection should be withdrawn for the same reasons discussed *supra*. Accordingly, with respect to limitation (2), we sustain the Examiner's rejection of claims 10–14 and 24–28, under 35 U.S.C. § 112, second paragraph, for failing to comply with the indefiniteness requirement.

THE INELIGIBILITY REJECTION

ISSUE

Under § 101, has the Examiner erred in rejecting the claimed invention as directed to ineligible subject matter? This issue turns on whether the claims are directed to an abstract idea and, if so, whether additional elements recited—considered individually and as an ordered combination—transform the nature of the claims into a patent-eligible application of that abstract idea.

PRINCIPLES OF LAW

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. *See, e.g.*, *Alice Corp. v. CLS Bank Int'l*, 573 U.S. 208, 216 (2014) (citation omitted).

In determining whether a claim falls within an excluded category, we are guided by 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. (15 How.) 252, 267–68 (1853))); 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."). That said, 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

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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 (citation 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.* (alterations in original) (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.*

In January 2019, the USPTO published revised guidance on the
application of § 101. *See* 2019 Revised Patent Subject Matter Eligibility
Guidance, 84 Fed. Reg. 50 (Jan. 7, 2019) ("Revised Guidance"). 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* MANUAL OF PATENT EXAMINING PROCEDURE
> (MPEP) §§ 2106.05(a)–(c), (e)–(h) (9th ed. Rev. 08. 2017, Jan.
> 2018)).

Only if a claim (1) recites a judicial exception, and (2) 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, and conventional in the field (*see* MPEP § 2106.05(d)); or
>
> (4) simply appends well-understood, routine, and conventional activities previously known to the industry, specified at a high level of generality, to the judicial exception.

See Revised Guidance, 84 Fed. Reg. at 56.

THE INELIGIBILITY ANALYSIS

Independent claims 10 and 24 recite analogous limitations. Appellants present a unitary argument directed towards independent claims 10 and 24 together. App. Br. 13. Accordingly, we select claim 10 for discussion as representative of the rejected claims. We refer to the rejected independent claims collectively herein as "claim 10." *See* 37 C.F.R. § 41.37(c)(1)(iv); *In re King*, 801 F.2d 1324, 1325 (Fed. Cir. 1986).

We must determine whether the claimed invention is directed to a judicial exception, namely an abstract idea. *See Alice*, 573 U.S. at 217. To this end, we determine (1) whether the claimed invention recites a judicial exception (Revised Guidance Step 2A – Prong 1) and, if so, (2) whether the identified judicial exception is integrated into a practical application (Revised Guidance Step 2A – Prong 2). *See* Revised Guidance, 84 Fed. Reg. at 52–55.

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Revised Guidance Step 2A – Prong 1

In Revised Step 2A — Prong 1, we (1) identify the claim's specific limitations that recite an abstract idea, and (2) determine whether the identified limitations fall within certain subject matter groupings, namely (a) mathematical concepts[4]; (b) certain methods of organizing human activity[5]; or (c) mental processes.[6] We agree with the Examiner (Ans. 3) that claim 10 recites a judicial exception. Here, the claimed invention's recited limitations, which collectively are directed to receiving image data and classifying the image data for the purpose of detecting objects in the image data, fit squarely within at least one of the above categories of the agency's guidelines.

First, the claimed invention recites steps directed to a **mental process,** as a concept related to organizing or analyzing image data that can be performed mentally. *See* MPEP 2106.04(a)(2), III ("an idea of 'itself'").

For example, claim 10 recites (1) "*receiving an input CT volume*"; (2) "*processing* said input CT volume using a PBCT having a plurality of

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[4] Mathematical concepts include mathematical relationships, mathematical formulas or equations, and mathematical calculations. *See* Revised Guidance, 84 Fed. Reg. at 52.
[5] Certain methods of organizing human activity include fundamental economic principles or practices (including hedging, insurance, mitigating risk); commercial or legal interactions (including agreements in the form of contracts; legal obligations; advertising, marketing or sales activities or behaviors; business relations); managing personal behavior or relationships or interactions between people (including social activities, teaching, and following rules or instructions). *See* Revised Guidance, 84 Fed. Reg. at 52.
[6] Mental processes are concepts performed in the human mind including an observation, evaluation, judgment, or opinion. *See* Revised Guidance, 84 Fed. Reg. at 52.

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nodes *to detect one or more objects* in said input CT volume"; (3)
"*wherein said PBCT comprises* at least one tree node, at least one cascade
node, and a plurality of leaf nodes"; "wherein each of said at least one tree
node, said at least one cascade node, and said plurality of leaf nodes
classifies voxels of the input CT volume as positive or negative"; "wherein
said at least one cascade node has a single child node for further
classifying voxels classified as positive by said at least one cascade node";
"and wherein said at least one tree node has a first child node for further
classifying voxels classified as positive by said at least one tree node and
a second child node for further classifying voxels classified as negative by
said at least one tree node." App. Br. 35 (Claims Appendix) (emphasis
added) which recite a mental process, namely, a process that can
alternatively be performed in the human mind with the aid of pen and paper.
Cf. CyberSource Corp. v. Retail Decisions, Inc., 654 F.3d 1366, 1372–73
(Fed. Cir. 2011) (noting that a recited step that constructed a map of credit
card numbers could be performed by merely writing down a list of credit
card transactions made from a particular IP address); *see also FairWarning
IP, LLC. v. Iatric System, Inc.*, 839 F.3d 1089 (Fed. Cir. 2016) (noting that
the patent was drawn to an ineligible idea, the concept of collects
information, analyzes the information according to one of several rules to
make a determination and provide notification based on that determination);
Content Extraction & Transmission LLC v. Wells Fargo Bank, Nat'l Ass'n,
776 F.3d 1343, 1345–49 (Fed. Cir. 2014) (holding ineligible claims reciting
(1) receiving output representing diverse types of hard copy documents from
an automated digitizing unit, and (2) storing information from those
documents into memory).

Specifically, limitation (1) recites data gathering. In *Intellectual Ventures I LLC v. Symantec Corp.*, 838 F.3d 1307 (Fed. Cir. 2016), our reviewing court found claim limitations reciting

> *identifying characteristics of data files* comprising: *receiving*, on a processing system, file content identifiers for data files from a plurality of file content identifier generator agents

(emphasis added) constitute mental process related to retrieving data using data file identifiers. *See id.* at 1313; *see also Content Extraction*, 776 F.3d at 1345–49 (holding ineligible claims reciting (1) receiving output representing diverse types of hard copy documents from an automated digitizing unit, and (2) storing information from those documents into memory); *CyberSource*, 654 F.3d at 1372 (noting that limitations reciting obtaining information about transactions that have used an Internet address identified with a credit card transaction can be performed by a human who simply reads records of Internet credit card transactions from a pre-existing database).

Additionally, steps (2)–(3) recite a classification algorithm for processing the received data that can also be performed as a **mental process** by merely *thinking* about these identifications and determinations, or writing them down—both involving mere observation and logical reasoning. *Cf. CyberSource*, 654 F.3d at 1372 (noting that a recited step that utilized a map of credit card numbers to determine the validity of a credit card transaction could be performed entirely mentally by merely using *logical reasoning* to identify a likely instance of fraud by merely *observing* that numerous transactions using different credit cards all originated from the same IP address). Additionally, mental processes remain unpatentable even when automated to reduce the burden on the user of what once could have been done with pen and paper. *See CyberSource*, 654 F.3d at 1375 ("That purely

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mental processes can be unpatentable, even when performed by a computer, was precisely the holding of the Supreme Court in *Gottschalk v. Benson*.").

Furthermore, steps (2)–(3) recite a method of recognizing certain data in digital images. Our reviewing court in *Content Extraction* has found that recognizing certain data in digital images can be performed mentally by a human being, which is a type of abstract idea. *Content Extraction*, 776 F.3d 1343 at 1358. Furthermore, classification of data from received digital images, as is recited in step (3), has been found to constitute mental processes, which is a type of abstract idea. *See In re TLI Commc'ns LLC v. AV Auto., L.L.C.*, 823 F.3d 607 at 613 ("[T]he claims are not directed to a solution to a 'technological problem' . . . [i]nstead, the claims, as noted, are simply directed to the abstract idea of classifying and storing digital images in an organized manner"); *See also* MPEP 2106.04(a)(2), III ("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").

Therefore, the steps (1)–(3) fall squarely within the mental processes category of the agency's guidelines. *See* Guidance, 84 Fed. Reg. at 52 (listing exemplary mental processes including observation and evaluation).

Revised Guidance Step 2A – Prong 2

Although claim 1 recites a mental process, which is a type of abstract idea, we nevertheless must still determine whether the abstract idea is integrated into a practical application, namely whether the claim applies, relies on, or uses the abstract idea in a manner that imposes a meaningful

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limit on the abstract idea, such that the claim is more than a drafting effort designed to monopolize the abstract idea. *See* Revised Guidance, 84 Fed. Reg. at 54–55. To this end, we (1) identify whether there are any additional recited elements beyond the abstract idea, and (2) evaluate those elements individually and collectively to determine whether they integrate the exception into a practical application. *See id.*

Here, we agree with the Examiner (e.g., Final Act. 3–4) that claim 10 does not include any additional elements outside the abstract idea and that the abstract idea is not integrated into a practical application when reading the claimed invention as a whole.

Appellants argue "[d]etection of objects in a CT volume by processing the CT volume using a PBCT that classifies voxels of the CT volume as positive or negative is not an abstract idea" (App. Br. 4) because "[d]etecting objects in CT volume data using a probabilistic boosting cascade tree (PBCT) is functional and palpable application in the field of computer and medical imaging technology with a concrete and tangible result." (App. Br. 7). However, claim 10 does not require "detecting objects," but merely recites processing image data using a PBCT algorithm for the intended purpose "to detect one or more objects." Furthermore, Appellants' assertion a concrete and tangible result is recited in claim 10 is unpersuasive since information, as such, is intangible, and data analysis and algorithms are also abstract ideas. *See, e.g.*, *Microsoft Corp. v. AT & T Corp.*, 550 U.S. 437, 451 n.12 (2007); *Alice*, 573 U.S. at 217; *Flook*, 437 U.S. at 589 ("Reasoning that an algorithm, or mathematical formula, is like a law of nature, *Benson* applied the established rule that a law of nature cannot be the subject of a patent."); and *Benson*, 409 U.S. at 71–72. "[C]ollecting information,

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including when limited to particular content (which does not change its character as information)," and "analyzing information by steps people go through in their minds, or by mathematical algorithms, without more," are "within the realm of abstract ideas." *Electric Power Group, LLC v. Alstom S.A.*, 830 F.3d 1350, 1353–54 (Fed. Cir. 2016); *see also Internet Patents Corp. v. Active Network, Inc.*, 790 F.3d 1343, 1349 (Fed. Cir. 2015); *Digitech Image Technologies, LLC v. Electronics for Imaging, Inc.*, 758 F.3d 1344, 1351 (Fed. Cir. 2014); *CyberSource*, 654 F.3d at 1370. That is, "[w]ithout additional limitations, a process that employs mathematical algorithms to manipulate existing information to generate additional information is not patent eligible." *Digitech*, 758 F.3d at 1350–51 ("Data in its ethereal, non-physical form is simply information that does not fall under any of the categories of eligible subject matter under section 101.").

We find Appellants conclusory argument (App. Br. 8, 10) that claim 10 recites an improvement to the computer related technology of machine learning based detection of objects in CT Volume data unavailing. Appellants do not specifically delineate what the improvement is. *See generally* App. Br. When a claim directed to an abstract idea contains no restriction on how an asserted improvement is accomplished and the asserted improvement is not described in the claim, then the claim typically is not patent eligible. *See Intellectual Ventures*, 838 F.3d at 1316. To the extent Appellant contends the improvement lies in increased speed using a computer, generally "[u]sing a computer to accelerate an ineligible mental process does not make that process patent-eligible." *Bancorp Servs., L.L.C. v. Sun Life Assur. Co. of Canada (U.S.)*, 687 F.3d 1266, 1279 (Fed. Cir. 2012); *see also CLS Bank Int'l v. Alice Corp. Pty. Ltd.*, 717 F.3d 1269, 1286

(Fed. Cir. 2013) (en banc) ("[S]imply appending generic computer functionality to lend speed or efficiency to the performance of an otherwise abstract concept does not meaningfully limit claim scope for purposes of patent eligibility."), *aff'd*, 573 U.S. 208 (2014).

Additionally, "a claim for a new abstract idea is still an abstract idea." *Synopsys, Inc. v. Mentor Graphics Corp.*, 839 F.3d 1138, 1151 (Fed. Cir. 2016) (emphasis omitted); *see also Intellectual Ventures*, 838 F.3d at 1321 ("A narrow claim directed to an abstract idea, however, is not necessarily patent-eligible."). To the extent Appellants also urge that the purportedly meaningful limitations are not well-understood, routine, and conventional, we address this issue under *Step 2B* (*Inventive Concept*), *infra*. For the reasons discussed further below, and on this record, it is our view that Appellants' claims do not add *meaningful limitations* beyond generally linking the use of the judicial exception to a particular technological environment.

Furthermore, we find Appellants' argument (App. Br. 10–11) that claim 10 recites a transformation of medical image data to a different state of thing unpersuasive. Appellants never indicate what the different state or thing from the asserted transformation actually is. Rather, claim 10 merely recites processing image data using a PBCT algorithm for the intended purpose "to detect one or more objects" such that the claim limitations are devoted to receiving image data and then training a classification algorithm to be able to recognize objects in the data. *See Digitech*, 758 F.3d at 1351 ("[w]ithout additional limitations, a process that employs mathematical algorithms to manipulate existing information to generate additional information is not patent eligible.").

With respect to limitation (1), this image data receiving step is insignificant pre-solution activity and, therefore, does not integrate the exception into a practical application for that additional reason. *See In re Bilski*, 545 F.3d 943, 963 (Fed. Cir. 2008) (en banc), *aff'd on other grounds*, 561 U.S. 593 (2010) (characterizing data gathering steps as insignificant extra-solution activity); *see also CyberSource*, 654 F.3d at 1371–72 (noting that even if some physical steps are required to obtain information from a database (e.g., entering a query via a keyboard, clicking a mouse), such data-gathering steps cannot alone confer patentability). *Accord* Guidance, 84 Fed. Reg. at 55 (citing MPEP § 2106.05(g). Recitations of extra-solution activity, as in limitation (1), weighs against a finding that the claim effects a transformation or reduction of a particular article to a different state or thing. *See* MPEP 2106.05(c). Therefore, we conclude the method of claim 10 fails to satisfy the transformation prong of the *Bilski* machine-or-transformation test. *See id*.

Additionally, dependent claims 11–14 and 25–28 are not argued separately with sufficient particularity. *See generally* App. Br.; *see also* 37 C.F.R. § 41.37(c)(1)(iv). For the above-stated reasons, we determine the additional elements recited in the claimed invention, beyond the judicial exceptions, whether considered alone or in combination, do not integrate the abstract idea into a practical application.

Revised Guidance, Step 2B

Under the Revised Guidance, if a claim: (1) recites a judicial exception, and (2) does not integrate that exception into a practical application, we then look to whether the claim adds a specific limitation

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beyond the judicial exception that is not "well-understood, routine, conventional" in the field (*see* MPEP § 2106.05(d)); or, simply appends well-understood, routine, conventional activities previously known to the industry, specified at a high level of generality, to the judicial exception. *See* Revised Guidance, 84 Fed. Reg. at 56.

On the record before us, we disagree with Appellants that the claims add a specific limitation beyond the judicial exception that is not "well-understood, routine, [and] conventional" in the field (*see* MPEP § 2106.05(d)). We find no reversible error in the Examiner's determination that claim 10 does not contain any additional elements outside of the abstract idea.

Appellants do not argue dependent claims 11–14 and 25–28 separately with particularity. *See generally* App. Br. In light of the foregoing, we conclude that each of claims 10–14 and 24–28, considered as a whole, is directed to a patent-ineligible abstract idea that is not integrated into a practical application, and does not include an inventive concept.

Accordingly, for the reasons discussed above, we sustain the Examiner's rejection under 35 U.S.C. § 101 of claims 10–14 and 24–28.[7]

DECISION

We AFFIRM the Examiner's rejection of claims 10–14 and 24–28 under 35 U.S.C. § 101.

We AFFIRM the Examiner's rejection of claims 10–14 and 24–28

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[7] To the extent Appellants have not advanced separate, substantive arguments for particular claims, or other issues, such arguments are waived. *See* 37 C.F.R. § 41.37(c)(1)(iv).

under 35 U.S.C. § 112, first paragraph.

We AFFIRM the Examiner's rejection of claims 10–14 and 24–28 under 35 U.S.C. § 112, second paragraph.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED