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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte MICHAEL SUEHLING and GRZEGORZ SOZA

Appeal 2016-005164
Application 12/831,392
Technology Center 3600

Before BIBHU R. MOHANTY, CYNTHIA L. MURPHY, and
AMEE A. SHAH, *Administrative Patent Judges*.

MOHANTY, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

The Appellants¹ seek our review under 35 U.S.C. § 134 of the final rejection of claims 1–33 which are all the claims pending in the application. We have jurisdiction under 35 U.S.C. § 6(b).

SUMMARY OF THE DECISION

We AFFIRM.

¹ The Appellants identify the real party in interest as Siemens Aktiengesellschaft (App. Br. 1).

THE INVENTION

The Appellants' claimed invention is directed to lesion detection in 3D medical images (Spec., para. 2). Claim 1, reproduced below, is illustrative of the subject matter on appeal.

1. A method for detecting lesions in a 3D medical image, comprising:
 - defining a plurality of search regions in the 3D medical image based on anatomic landmarks, organs, and bone structures in the 3D medical image; and
 - detecting lesions in each of the plurality of search regions using a respective trained region-specific lesion detector for each of the plurality of search regions.

THE REJECTIONS

The following rejections are before us for review:

1. Claims 1–33 are rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter.
2. Claims 1–25 and 28–31 are rejected under 35 U.S.C. § 103(a) as unpatentable over Unal (US 2008/0260221 A1, pub. Oct. 23, 2008) and Yoshida (US 2005/0152588 A1, pub. July 14, 2005).
3. Claims 26 and 27 are rejected under 35 U.S.C. § 103(a) as unpatentable over Unal, Yoshida, and Schoenberg (US 2009/0089086 A1, pub. Apr. 2, 2009).
4. Claims 32 and 33 are rejected under 35 U.S.C. § 103(a) as unpatentable over Unal, Yoshida, and Chhibber (US 2010/0245823 A1, pub. Sept. 30, 2010).

FINDINGS OF FACT

We have determined that the findings of fact in the Analysis section below are supported at least by a preponderance of the evidence².

ANALYSIS

Rejection under 35 U.S.C. § 101

The Appellants argue that the rejection of claim 1 is improper because the claim is not directed to an abstract idea (Reply Br. 2–4). The Appellants also argue that the claims add “significantly more” to the alleged abstract idea (Reply Br. 4–7).

In contrast, the Examiner has determined that the rejection of record is proper (Ans. 2).

We agree with the Examiner. Under 35 U.S.C. § 101, an invention is patent-eligible if it claims a “new and useful process, machine, manufacture, or composition of matter.” 35 U.S.C. § 101. The Supreme Court, however, has long interpreted § 101 to include an implicit exception: “laws of nature, natural phenomena, and abstract ideas” are not patentable. *See, e.g., Alice Corp. Pty. Ltd. v. CLS Bank Int’l*, 134 S. Ct. 2347, 2354 (2014).

In judging whether claim 1 falls within the excluded category of abstract ideas, we are guided in our analysis by the Supreme Court’s two-step framework, described in *Mayo* and *Alice*. *Id.* at 2355 (citing *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1296–97 (2012)). In accordance with that framework, we first determine whether the

² *See Ethicon, Inc. v. Quigg*, 849 F.2d 1422, 1427 (Fed. Cir. 1988) (explaining the general evidentiary standard for proceedings before the Patent Office).

claim is “directed to” a patent-ineligible abstract idea. *Id.* If so, we then consider the elements of the claim both individually and as “an ordered combination” to determine whether the additional elements “transform the nature of the claim” into a patent-eligible application of the abstract idea. *Id.* This is a search for an “inventive concept” an element or combination of elements sufficient to ensure that the claim amounts to “significantly more” than the abstract idea itself. *Id.* The Court also stated that “the mere recitation of a generic computer cannot transform a patent-ineligible abstract idea into a patent-eligible invention.” *Id.* at 2358.

Here, we determine that the claim is directed to the concept of defining a search area for a medical detection procedure and performing the detection. This is a method of organizing human activities in medical analysis and is an abstract idea beyond the scope of § 101. *See In re Meyer*, 688 F.2d 789, 795–96 (CCPA 1982), which held that “a mental process that a neurologist should follow” when testing a patient for nervous system malfunctions was not patentable. *See also In re Grams*, 888 F.2d 835 (Fed. Cir. 1989), which held that diagnosing an abnormal condition by performing clinical tests and thinking about the results was not patentable. Further, the Specification at paragraph 32 describes that the localization (detection) is performed by mathematical techniques. A system, like the claimed system, “that employs mathematical algorithms to manipulate existing information to generate additional information is not patent eligible.” *See Digitech Image Techs, LLC v. Elecs. for Imaging, Inc.*, 758 F.3d 1344, 1351 (Fed. Cir. 2014).

We next consider whether additional elements of the claim, both individually and as an ordered combination, transform the nature of the

claim into a patent-eligible application of the abstract idea, e.g., whether the claim does more than simply instruct the practitioner to implement the abstract idea using generic computer components. We conclude that it does not.

Considering each of the claim elements in turn, the function performed by the computer based system at each step of the process is purely conventional.

We note the point about pre-emption (Reply Br. 7). While pre-emption “‘might tend to impede innovation more than it would tend to promote it,’ thereby thwarting the primary object of the patent laws” (*Alice*, 134 S. Ct. at 2354 (quoting *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1293 (2012))), “the absence of complete preemption does not demonstrate patent eligibility” (*Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371, 1379 (Fed. Cir. 2015)). *See also OIP Techs., Inc. v. Amazon.com, Inc.*, 788 F.3d 1359, 1362–63 (Fed. Cir.) (“[T]hat the claims do not preempt all price optimization or may be limited to price optimization in the e-commerce setting do not make them any less abstract.”).

For these above reasons, the rejection of claim 1 is sustained. The same arguments have been presented for claims 2–22 and the rejection of these claims is sustained as well.

With regards to claims 23 and 28, the Appellants argue that the claim is similarly not directed to an abstract idea and that the claims each recite significantly more than an abstract idea (Reply Br. 7–16).

We have considered the arguments for claims 23 and 28, but determine that the rejections of record made under 35 U.S.C. § 101 is

proper. While claims 23 and 28 are slightly different in scope than claim 1, they are also both similarly directed to an abstract idea in determining medical detection procedures and performing the detection in medical analysis and using mathematical techniques. Similar to claim 1 addressed above, both claims 23 and 28 are directed to the abstract idea of a method of organizing human activities in medical analysis and using mathematical techniques. Also, similar to claim 1 addressed above, the limitations of claims 23 and 28 fail to transform the abstract nature of each respective claim. For these reasons, the rejection of claims 23 and 28 and their dependent claims, which were not separately argued, is sustained.

Rejections under 35 U.S.C. § 103(a)

Claims 1, 2, 11, 12, 17, and 18

The Appellants argue that the rejection of claim 1 is improper because the prior art does not disclose the claimed limitations for “defining a plurality of search regions in the 3D medical image based on anatomic landmarks, organs, and bone structures in the 3D medical image” and “detecting lesions in each of the plurality of search regions using a respective trained region-specific lesion detector for each of the plurality of search regions” (App. Br. 6–13; Reply Br. 16–18). The Appellants present the same arguments for claims 2, 11, 12, 17, and 18 (App. Br. 13).

In contrast, the Examiner has determined that the argued claim limitations are disclosed by Unal at paras. 7, 11, Figure 2(b); and Yoshida at paras. 104 and 105 (Ans. 4–6).

We agree with the Examiner and adopt those findings. Unal in Figure 2(a) and para. 7 discloses a MRI image with lesions detected. Unal at

para. 12 states it can be used for lesion detection in 3D images as well. Yoshida at para. 105 discloses removing the lungs, bones, and skin from the threshold value in detection. Thus, the prior art has disclosed the argued claim limitations. For these reasons, this rejection is sustained.

Claims 3, 13, and 19

The Appellants argue that the rejection of claim 3 is improper because the prior art does not disclose the claimed limitations for “detecting a plurality of body parts in the 3D medical image” and “detecting the anatomic landmarks, organs, and bone structures in the 3D medical image based on the detected body parts in the 3D medical image” (App. Br. 13, 14; Reply Br. 18, 19). The Appellants make the same arguments for claims 13 and 19 (App. Br. 14).

In contrast, the Examiner has determined that the argued claim limitations are disclosed by Yoshida at para. 105 (Ans. 6).

We agree with the Examiner and adopt those findings. Yoshida at para. 105 discloses removing the lungs, bones, and skin from the threshold value in detection, which means those items must have been originally detected. Thus, the prior art has disclosed the argued claim limitations. For these reasons, the rejection of these claims is sustained.

Claims 4, 5, 7

The Appellants argue that the rejection of claim 4 is improper because the prior art does not disclose the claim limitation for “detecting predetermined slices of the 3D medical image corresponding to the body parts” (App. Br. 15, 16; Reply Br. 19, 20). For claim 5, the Appellants argue

the prior art does not disclose “detecting the anatomic landmarks, organs, and bone structures using a separate trained detector for each of the anatomic landmarks, organs, and bone structures, wherein each trained detector is constrained based on at least one of the predetermined slices” (App. Br. 16, 17; Reply Br. 20, 21). For claim 7, the Appellants argue that the prior art does not disclose the claim limitation for “excluding regions from said at least one search region outside of organs and bone structures based on the organs and the bone structures in the 3D medical image” (App. Br. 19; Reply Br. 22–24).

In contrast, the Examiner has determined that the argued claim limitations are disclosed by Unal at para. 68 (claim 7), para. 96 and Figures 3(b, c), and Yoshida at para. 105 (Ans. 6–8).

We agree with the Examiner and adopt those findings. Unal at Figure 3 shows slices of 3D image, and this is described in para. 96. Unal at para. 68 discloses a marching scheme to achieve an initial estimate of the lesion boundaries. Yoshida at para. 105 discloses removing the lungs, bones, and skin from the threshold value in detection, which means those items must have been originally detected. Thus, the prior art has disclosed the argued claim limitations. For these above reasons, these rejections are sustained.

Claims 6, 14, and 20

The Appellants argue that the rejection of claim 6 is improper because the prior art does not disclose the claim limitations for

defining at least one organ search region in the 3D medical image by segmenting at least one organ in the 3D medical image;

defining at least one bone structure search region in the 3D medical image by segmenting at least one bone structure in the 3D medical image; and
defining at least one search region outside of organs and bone structures based on a location of at least one anatomic landmark

(App. Br. 17–18; Reply Br. 21–22). The same arguments are made for claims 14 and 20 (App. Br. 19).

In contrast, the Examiner has determined that the argued claim limitations are disclosed by Unal Figures 3(b, c), para. 96 and Yoshida at para. 105 (Ans. 7, 8).

We agree with the Examiner. Unal at Figure 3 discloses an imaging procedure and Yoshida at para. 105 discloses removing the lungs, bones, and skin from the threshold value in detection, which means those items must have been originally detected. Thus, the prior art has disclosed the argued claim limitations. For these reasons, these rejections are sustained.

Claims 8, 15, and 21

The Appellants argue that the rejection of claim 8 is improper because the prior art does not disclose the claim limitation for “detecting lesions by each trained region-specific lesion detector based on features extracted from the respective one of the plurality of search regions” (App. Br. 21–22; Reply Br. 24–25). The same argument is made for claims 15 and 21 (App. Br. 22).

In contrast, the Examiner has determined that the argued claim limitation is disclosed by Unal at paras. 7, 11, 59, and Figure 2(b) (Ans. 8–9).

We agree with the Examiner and adopt those findings. Unal at the cited portions discloses the claimed detection of lesions. Thus, the prior art

has disclosed the argued claim limitation. For these reasons, the rejection of these claims is sustained.

Claims 9, 16, and 22

The Appellants argue that the rejection of claim 9 is improper because the prior art does not disclose the claim limitation for “detecting lesions by each trained region-specific lesion detector based on features extracted from the respective one of the plurality of search regions using clustered marginal space learning” (App. Br. 22–24; Reply Br. 26–27). The same argument is presented for claims 16 and 22 (App. Br. 24).

In contrast, the Examiner has determined that the argued claim limitation is disclosed by Unal at paras. 7, 11, 59, and Figure 2(b) (Ans. 9, 10).

We agree with the Appellants. While Unal at para. 7 does disclose the use of an MRI machine, it is not specifically disclosed that it uses “clustered marginal space learning” as recited in the claim. For these reasons, the rejection of these claims is not sustained.

Claim 10

The Appellants argue that the rejection of claim 10 is improper because the prior art does not disclose the claim limitation for “wherein each trained region-specific lesion detector is trained based on training data using a Probabilistic Boosting Tree (PBT)” (App. Br. 24; Reply Br. 27–28).

In contrast, the Examiner has determined that the argued claim limitation is disclosed by Unal at para. 12 (Final Act. 12). The Examiner

also asserts that the “wherein” clause is not a limitation to the claim (Ans. 10).

We agree with the Appellants. Here, the cited limitation is a limitation to the claim. Unal at para. 12 fails to disclose the argued claim limitation and this rejection is therefore not sustained.

Claims 23–27

The Appellants argue that the rejection of claim 23 is improper because the prior art does not disclose the claim limitations for “receiving a 3D medical image and corresponding clinical information,” “detecting a trigger in the clinical information,” and “automatically detecting lesions in the 3D medical image in response to detecting the trigger in the clinical information” (App. Br. 25–27, 28–30).

In contrast, the Examiner has determined that the argued claim limitations are disclosed by Unal at para. 7, and Figures 2(b) and 3(a–c) (Ans. 10, 11).

We agree with the Appellants. Here, the rejection of record cites Unal at para. 7, and Figures 2(b), and 3(a–c), but these portions fail to disclose “detecting a trigger in the clinical information,” and “automatically detecting lesions in the 3D medical image in response to detecting the trigger in the clinical information” as recited. Accordingly, the rejection is of claim 23 and its dependent claims 24–27 is not sustained.

Claims 28 and 31–33

The Appellants argue that the rejection of claim 28 is improper because the prior art does not disclose the claim limitations for

“automatically detecting lesions in a 3D medical image,” “automatically displaying the detected lesions in an interactive display,” and “automatically labeling displayed lesions” (App. Br. 27–29; Reply Br. 31–32). The same arguments are made for claims 31–33 (App. Br. 29).

In contrast, the Examiner has determined that the argued claim limitations are disclosed by Unal at para. 7 and Figure 2(b) (Ans. 12).

We agree with the Examiner. Unal at the cited portions discloses displaying lesions in a medical image. Unal at para. 7 discloses using a “multi-label” approach. Regardless, the use of labeling of the lesions is considered an obvious, predictable, modification to identify the lesions as they are displayed. For these reasons, this rejection of record is sustained.

Claim 29

The Appellants argue that the rejection of claim 29 is improper because the prior art does not disclose the claim limitation for “displaying the detected lesions as a probability map based on probabilities output by detectors used to detect the lesion in the 3D medical image.” (App. Br. 29–30; Reply Br. 32–33).

In contrast, the Examiner has determined that the argued claim limitation is disclosed by Unal at para. 7 and Figure 2(b) (Ans. 12–13).

We agree with the Appellants. Unal at the cited portions does not disclose the argued claim limitation and this rejection is not sustained.

Claim 30

The Appellants argue that the rejection of claim 30 is improper because the prior art does not disclose the claim limitation for “displaying a

fused image of the probability map and the 3D medical image” (App. Br. 30–31; Reply Br. 33–34).

In contrast, the Examiner has determined that the argued claim limitation is disclosed by Unal at paras. 7, 99, and Figure 2(b) (Ans. 13).

We agree with the Appellants. Unal at the cited portions does not disclose the argued claim limitation and this rejection is not sustained.

CONCLUSIONS OF LAW

We conclude that Appellants have not shown that the Examiner erred in rejecting claims 1–33 under 35 U.S.C. § 101.

We conclude that Appellants have not shown that the Examiner erred in rejecting claims 1–8, 11–15, 17–21, 28, and 31–33 under 35 U.S.C. § 103(a).

We conclude that Appellants have shown that the Examiner erred in rejecting claims 9, 10, 16, 22–27, 29, and 30 under 35 U.S.C. § 103(a).

DECISION

The Examiner’s rejection of claims 1–33 is sustained.

AFFIRMED