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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
15/425,748	02/06/2017	JONATHAN WILLIAM PIPER	014716-000017	1059
23380	7590	09/21/2020	EXAMINER	
TUCKER ELLIS LLP 950 MAIN AVENUE SUITE 1100 CLEVELAND, OH 44113-7213			YANG, WEI WEN	
			ART UNIT	PAPER NUMBER
			2667	
			NOTIFICATION DATE	DELIVERY MODE
			09/21/2020	ELECTRONIC

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte JONATHAN WILLIAM PIPER¹

Appeal 2019-001752
Application 15/425,748
Technology Center 2600

Before JEAN R. HOMERE, BRADLEY W. BAUMEISTER, and
JOHN F. HORVATH, *Administrative Patent Judges*.

BAUMEISTER, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant appeals under 35 U.S.C. § 134(a) from the Examiner’s final rejection of claims 21–40, which constitute all claims pending in this application. Appeal Br. 3–9. Claims 1–20 have been canceled. Appeal Br. 11. We have jurisdiction under 35 U.S.C. § 6(b). The Board conducts a limited *de novo* review of the appealed rejections for error based upon the issues identified by Appellant, and in light of the arguments and evidence produced thereon. *Ex parte Frye*, 94 USPQ2d 1072, 1075 (BPAI 2010) (precedential).

We AFFIRM-IN-PART.

¹ Appellant identifies MIM Software Inc. as the real party in interest. Appeal Brief filed July 2, 2018 (“Appeal Br.”), at 2.

CLAIMED SUBJECT MATTER

Appellant describes the present invention as follows:

In accordance with the teachings described herein, systems and methods are provided for generating a seed plan for use in radiation therapy. The system includes an image database, the image database comprising image slices and a seed template database comprising seed templates. A contour engine is configured to generate target contour data to identify one or more objects within each image slice. A reslicer engine is configured to rotate the contoured image about an angle of rotation to produce a resliced contoured image, such that the resliced contoured image is resampled at an angle perpendicular to the angle of rotation and intersecting an isocenter. The system also includes a seed grid engine configured to generate a seed grid perpendicular to the angle of rotation.

Spec. Abstract.²

Independent claim 21, reproduced below, illustrates the subject matter of the appealed claims:

21. A method, comprising:

receiving first contour information that identifies a feature of a first image;

determining a reference orientation relative to the feature in the first image based on a viewpoint and at least one point in the feature in the first image; and

generating second contour information, based on the first contour information, that indicates the feature as viewed from the reference orientation.

² Rather than repeat the Examiner's positions and Appellant's arguments in their entirety, we refer to the above mentioned Appeal Brief, as well as the following documents for their respective details: Appellant's Specification, filed February 6, 2017 ("Spec."); the Final Action mailed November 30, 2017 ("Final Act."); the Examiner's Answer mailed Oct. 17, 2018 ("Ans."); and the Reply Brief filed Dec. 17, 2018 ("Reply Br.").

STATEMENT OF THE REJECTIONS

Claims 21–25 stand rejected under 35 U.S.C. § 101 as being directed to a judicial exception to patent-eligible subject matter (an abstract idea). Final Act. 3–5.

Claims 37–40 stand rejected under 35 U.S.C. § 101 as being directed to patent ineligible subject matter. Final Act. 5.

Claims 21–26, 29–34, and 37–39 stand rejected under 35 U.S.C. § 103 as being unpatentable over Zaider (US 2004/0092786 A1; published May 13, 2004), Lure (US 2005/0084178 A1; published April 21, 2005), and Kaufman (US 2001/0031920 A1; published Oct. 18, 2001). Final Act. 6–13.

Claims 27, 28, 35, 36, and 40 stand rejected under 35 U.S.C. § 103 as being unpatentable over Zaider, Lure, and Kaufman, and Wang (US 61/280278; filed Oct. 30, 2009; subsequently published as US 2011/0107270 A1 on May 5, 2011). Final Act. 13–18.

THE SECTION 101 REJECTIONS

Appellant does not challenge either of the two rejections under 35 U.S.C. § 101. Appeal Br. 3. Accordingly, we summarily affirm these rejections of claims 21–25 and 37–40.

THE SECTION 103 REJECTIONS

Determinations and Contentions

The Examiner finds that Zaider discloses a method including receiving first contour information that identifies a feature of a first image. Final Act. 6–7 (mapping the recited first contour information to Zaider’s prostate contour 138).

The Examiner finds that Zaider discloses the claimed step of “determining a reference orientation relative to the feature in the first image based on a viewpoint and at least one point in the feature in the first image.”

Final Act. 7. Specifically, the Examiner relies on Zaider’s teaching of virtual seeds projected in the x-z plane. *Id.* The Examiner reasons,

the axis of rotation, and .theta. the angle of rotation {Herein, orientation and corresponding “the axis of rotation, and .theta. the angle of rotation” is a reference orientation; and rotation angle and rotation axis are considered as the viewpoint suitable for medical procedure, the angle is the determined reference orientation} [.]

Id. at 7–8 (citing Zaider ¶¶ 97–99) (emphasis omitted).

The Examiner relies on Kaufman for supporting the Examiner’s interpretations of the terms “‘viewpoint’ and the corresponding ‘reference orientation’ in the same technique application.” *Id.* at 8. The Examiner determines,

it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify Zaider’s method using Kaufman’s teachings by including applying “viewpoint” and the corresponding “reference orientation” to Zaider’s rotation transformation in order to adjust both the position and viewing angle to a particular portion of interest in the image and to identify specific image features.

Id. (citing Kaufman ¶¶ 71–75).

The Examiner further finds that Zaider discloses generating second contour information. *Id.* at 9. Specifically, the Examiner interprets the claimed “second contour information” as corresponding to Zaider’s optimized prescription isodose curve 140. Ans. 25.

The Examiner finds that Lure further supports “Zaider’s teaching of generating a second contour based on the transformation applied on the first contour.” *Id.* at 10. According to the Examiner,

Lure discloses generating second contour information, based on the first contour information . . . to compute the optimal unit quaternion rotation parameters. With this method, the translation parameters are found using the difference between the centroids of two images after the rotation. These parameters formed an orthonormal transformation matrix for the next iteration. This process is repeated until the root mean square error between two closest voxels reaches a pre-defined value. Once the iterative matching is completed, *the transformation matrix is then applied to re-slice (or transform) the second CT image according to the first CT image’s geometrical position in 3D.*

Final Act. 11 (citing Lure ¶¶ 28, 30–42).

The Examiner determines,

Zaider (as modified by Kaufman) and Lure are combinable as they are in the same field of endeavor: transformation of medical images. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify Zaider (as modified by Kaufman)’s method for facilitating generation of a plan for a medical procedure using Lure’s teachings by including generating second contour information {of reslicing the 3D volume according to a planning plane to generate a second set of image slices} to Zaider’s slicing to generate planar images in order to identify specific image features.

Final Act. 11 (citing Lure ¶ 11).

Appellant argues, *inter alia*, that Zaider fails to disclose generating second contour information. Appeal Br. 7. According to Appellant, “Zaider merely discloses a single prostate contour outlined by the physician on an ultrasound image.” *Id.*

Appellant further asserts, “the combination of Lure and Zaider cannot teach a transformation of a contour based on a reference orientation [because], in Zaider, no contours are transformed at all.” Appeal Br. 8. In support of this assertion, Appellant argues that the passages of Lure upon which the Examiner relies for teaching second contour information, “merely relate to a volumetric registration of CT images obtained a different times.” *Id.* According to Appellant, paragraph 42 of Lure “merely describes applying a transformation matrix (that results from the volumetric registration . . .) to a second CT image so as to coincide with a first CT image.” *Id.* Appellant reiterates, “in Lure, second contour information is never generated based on the first contour information [because] the volumetric registration requires both CT images to already be respectively contoured.” *Id.* (citing Lure ¶ 40, claim 5).

ANALYSIS

“Before considering the rejections . . . , we must first [determine the scope of] the claims” *In re Geerdes*, 491 F.2d 1260, 1262 (CCPA 1974). We, therefore, start our review by determining the meaning of the claim term “contour information.”

Appellant’s Specification states, “[c]ontouring is the process of identifying an object within an image by outlining or otherwise distinguishing the object from the rest of the image.” Spec. ¶ 3. Appellant’s Specification then further explains what “contouring” means within the context of the present invention:

Medical images, such as CT (computed tomography), MR (magnetic resonance), US (ultrasound), or PET (positron emission tomography) scans, are regularly contoured to identify

certain pieces of anatomy within the image. For example, a radiologist or oncologist may contour a medical image to identify a tumor within the image. Software tools are available to assist in this type of “manual” contouring, in which the physician uses the software to create the contour by tracing the boundary of the object or objects within the image.

Id.

In light of the Specification’s definition and usage of the term “contouring,” the Examiner’s interpretation of Zaider’s optimized prescription isodose curve 140 as corresponding to the claimed “second contour information” is unreasonable. Zaider’s prescription isodose curve is a representation in Zaider’s patent drawings of the radiation dose that is prescribed over the area of the prostate. Zaider ¶¶ 14, 66–70. Unlike Zaider’s contour of the prostate 138, the isodose curve 140 is not a representation of an outline of the prostate or of any other structure that is actually drawn onto a medical image. *Id.* ¶ 67 (“the bold black dotted line 138 outline[s] the contour of the prostate, and the solid curve 140 closer to the prostate contour represents the 100% prescription isodose.”).

For these reasons, Appellant persuades us of error in the Examiner’s obviousness rejection of independent claim 21. Accordingly, we reverse the obviousness rejection of that claim and also of claims 22–26, 29–34, and 37–39, which either depend from claim 21 or otherwise recite substantially similar limitations.

With respect to the remaining rejection of dependent claims 27, 28, 35, 36, and 40, the Examiner does not rely on Wang to cure the deficiency of the obviousness rejection noted above. Final Act. 15. We, therefore, reverse the obviousness rejection of these claims for the reasons we set forth in relation to reversing the rejection of claim 21.

CONCLUSION

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/ Basis	Affirmed	Reversed
21–25, 37–40	101	Eligibility	21–25, 37–40	
21–26, 29–34, 37–39	103	Zaider, Lure, Kaufman		21–26, 29–34, 37–39
27, 28, 35, 36, 40	103	Zaider, Lure, Kaufman, Wang		27, 28, 35, 36, 40
Overall Outcome			21–25, 37–40	26–36

TIME PERIOD FOR RESPONSE

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). *See* 37 C.F.R. § 1.136(a)(1)(iv) (2017).

AFFIRMED-IN-PART