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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte KAZUMASA ARAKITA, YASUHIRO NOSHI, TATSUO MAEDA, GO MUKUMOTO, TAKAHIRO YODA, YOSHIAKI YAOI, and TOMONORI OZAKI

Appeal 2018-006349
Application 13/552,002
Technology Center 2600

Before JEAN R. HOMERE, KARA L. SZPONDOWSKI, and PHILLIP A. BENNETT, *Administrative Patent Judges.*

HOMERE, *Administrative Patent Judge.*

DECISION ON APPEAL

I. STATEMENT OF THE CASE[1]

Pursuant to 35 U.S.C. § 134(a), Appellant appeals from the Examiner's decision to reject claims 1–6, 13, 15–18, 20, and 21.[2] Claims App'x. Claims 7–12, 14, and 19 have been cancelled. *Id.* We have jurisdiction under 35 U.S.C. § 6(b).

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[1] We refer to the Specification, filed July 18, 2012 ("Spec."); the Final Office Action, mailed June 23, 2017 ("Final Act."); the Appeal Brief, filed December 22, 2017 ("Appeal Br."); and the Examiner's Answer, mailed March 22, 2018 ("Ans.").

[2] We use the word "Appellant" to refer to "Applicant" as defined in 37 C.F.R. § 1.42(a). Appellant identifies Toshiba Medical Corp. as the real party-in-interest. Appeal Br. 2.

We reverse.

II. CLAIMED SUBJECT MATTER

According to Appellant, the claimed subject matter relates to a medical image diagnostic device[3] including workstation (130) containing controller (135) for processing three-dimensional (3D) medical images ("volume data"). Spec. 1:11–13, Figs. 1, 4, 7.

Figures 7–9, reproduced below, are useful for understanding the claimed invention:

FIG.7

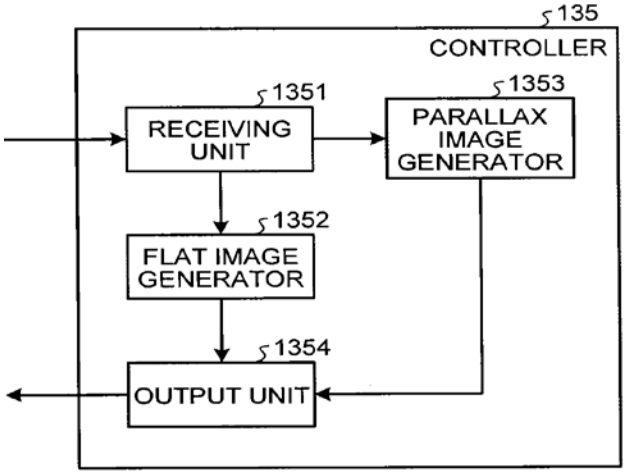

Figure 7 illustrates a controller within workstation (Fig. 4, 130) of image processing system (Fig. 1). *Id.* at 21–22.

[3] Examples of medical image diagnostic device include X-ray, computed tomography (CT) device, magnetic resonance imaging (MRI) device, and ultrasonography device. Spec. 1:25–25

FIG.8

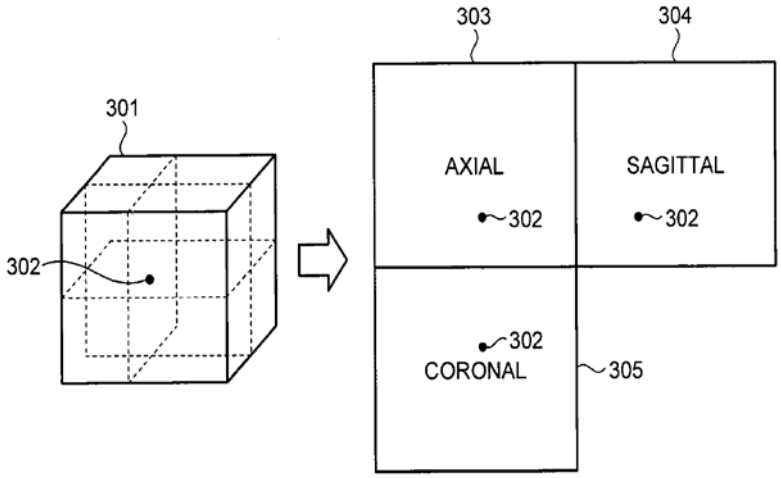

Figure 8 illustrates generated flat image (303, 304, 305) setting arbitrary coordinate point (302) on a stereoscopic 3D image of subject (301). *Id.* at 29: 8–10.

As depicted in Figure 8 above, upon receiving at receiving unit (1351) a stereoscopic 3D image of subject (301) from storage unit (134), flat image generator (1352) within controller (135) cuts subject (301) along a plane corresponding to the region of interest to generate flat image (303, 304, 305) of a cut surface of subject (301) setting arbitrary coordinate point (302), and displays the generated flat image on general-purpose monitor (1354). *Id.* at 29:3–24.

FIG.9

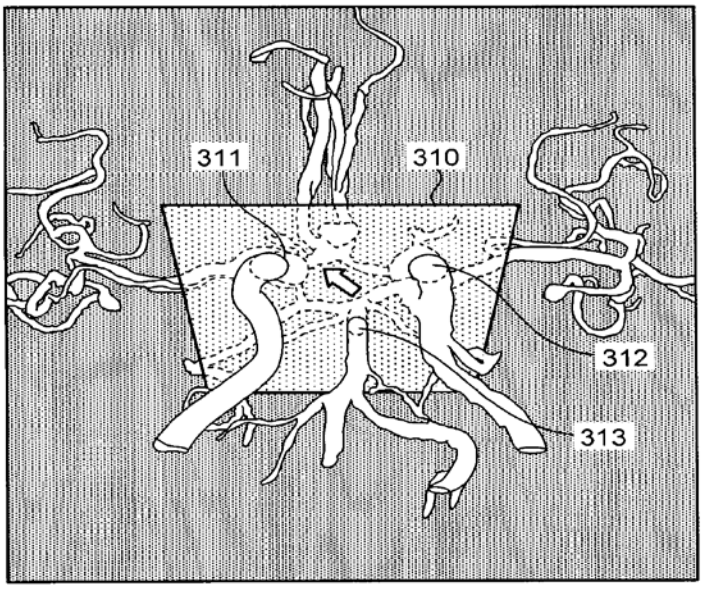

Figure 9 illustrates a generated parallax image displaying a stereoscopic image on which transparent figure (310) is displayed at a position corresponding to a previously generated flat image. *Id.* at 30: 16–25.

As further depicted in Figure 9 above, upon receiving the 3D image, parallax image generator (1353) within controller (135) generates a parallax image including a stereoscopic image on which transparent figure (310) is displayed at a position corresponding to the previously generated flat image, and displays the generated parallax image on general-purpose monitor (1354). *Id.* at 30: 16–25.

Claims 1, 16, and 17 are independent. Claim 1, reproduced below with disputed limitation emphasized in *italics*, is illustrative of the claimed subject matter:

> 1. An image processing device, comprising:
> processing circuitry having a receiving unit, a flat image generator, a parallax image generator, and an output unit,

the receiving unit being configured to receive a setting of a region of interest on parallax images of a subject that are displayed stereoscopically,

the flat image generator being configured to generate a flat image of a cut surface of the subject that is generated by cutting the subject along a plane corresponding to the region of interest received by the receiving unit based on volume data of the subject stored in a predetermined storage device,

the parallax image generator being configured to generate parallax images for displaying a stereoscopic image including a transparent plane figure displayed stereoscopically at a position corresponding to the flat image, wherein the cut surface of the subject intersecting with the transparent plane figure is distinguishable from other portions of the transparent plane figure, based on the volume data of the subject, and

the output unit being configured to output the flat image generated by the flat image generator and to output, using the parallax images, the stereoscopic image including the transparent plane figure displayed stereoscopically at the position corresponding to the flat image, wherein the cut surface of the subject intersecting with the transparent plane figure is distinguishable from other portions of the transparent plane figure.

Appeal Br. 13 (Claims Appendix).

III. REFERENCES

The Examiner relies upon the following references.[4]

Name	**Number**	**Filed**	**Publ'd/Issued**
Tsubaki	US 7,567,648 B2	June 7, 2005	July 28, 2009
Chono	US 2011/0313291 A1	Feb. 2, 2010	Dec. 22, 2011
Hansegard	US 2012/0245465 A1	Mar. 25, 2011	Sept. 27, 2012

[4] All reference citations are to the first named inventor only.

IV. REJECTION

The Examiner rejects claims 1–6, 13, 15–18, 20, and 21 under 35 U.S.C. § 103(a) as being unpatentable over the combination of Hansegard, Tsubaki, and Chono. Final Act. 3–30.

V. ANALYSIS

Appellant argues the Examiner erred in finding that the combination of Hansegard, Tsubaki, and Chono teaches or suggests "generat[ing] parallax images for displaying a stereoscopic image including a transparent plane figure displayed stereoscopically at a position corresponding to the flat image," as recited in independent claim 1. Appeal Br. 6–7. In particular, Appellant argues although Hansegard discloses a symbolic representation of an intersecting plane in a 3D volume, it does not teach displaying the symbolic representation, much less stereoscopically. *Id.* at 7 (citing Hansegard ¶ 40, Fig. 4.) According to Appellant, Hansegard merely discloses displaying intersecting curves/planes of interest along the surface/contour of a rendered 3D ultrasound volume as opposed to displaying transparent plane figures stereoscopically. *Id.* (citing Hansegard ¶ 40, Fig. 5). Further, Appellant argues that Tsubaki's disclosure of converting parallax images for stereoscopic display does not teach a displayed transparent plane figure included in a stereoscopic image corresponding to a generated flat image. *Id.* at 7

Appellant's argument is persuasive of reversible Examiner error. As an initial matter, we agree with the Examiner that Appellant's Specification defines "parallax images" as "images that have been shot from a plurality of

viewpoints and of which parallax angles are different from one another." Ans. 3 (citing Spec. 5:3–5). We also note that the Specification further defines "parallax images" as "images for displaying a stereoscopic image for a user. . . and are generated by performing volume rendering processing on volume data." *Id.* at 5:5–9. Therefore, consistent with Appellant's Specification, we construe "parallax images" as images with different parallax angles shot from multiple viewpoints, and generated by performing volume rendering processing on volume data to display stereoscopic images for a user.

Hansegard discloses processing 3D volume data to display a plurality of intersecting 2D surfaces corresponding to one or more slice planes that are visible along the surface of the rendered 3D such that the color, transparency, and intensity value of the pixels corresponding to the identified intersection may be changed. Hansegard ¶¶ 26, 30, 31. We do not agree with the Examiner that Hansegard's disclosure of processing 3D volume data display 2D images teaches the disputed imitation. Ans. 3–4. Hansegard is silent as to whether the generated 2D images have different angles or are shot from multiple viewpoints. Therefore, we disagree with the Examiner that Hansegard's processing of 3D volume data to produce intersecting 2D graphs teaches the parallax images, as construed above. *Id.* Rather, Hansegard teaches generating flat images including a transparent plane. Hansegard ¶¶ 26, 31.

Further, we agree with Appellant that the Examiner's reliance on Tsubaki and Chono does not cure the noted deficiencies in Hansegard. In particular, Tsubaki discloses an image pickup device processing an electrical signal to generate rear-projected image data captured by gradually moving a

radiation source to output parallax image data corresponding to the position of the radiation source. Tsubaki 5:24–30. Tsubaki further discloses a stereoscopic image processing unit for converting parallax image data supplied from the radiation pickup unit into data appropriate for stereoscopic image. *Id.* at 5:33–38. Although Tsubaki discloses generating parallax images, it is not for displaying "a stereoscopic image with a transparent plane figure displayed stereoscopically at a position corresponding to a flat image," as required by the disputed limitation. Additionally, Chono discloses a 2D section setting section that reads addresses of 3D images from a storage unit and displays a measurement point in the displayed 3D image. Chono ¶ 36.

At best, the proposed combination of Hansegard, Tsubaki, and Chono would result in an image processing system that processes received 3D volume data to generate a parallax image, as well as to generate a flat image including transparent plane displayed at a particular measurement point. However, the proposed combination would still fall short of teaching the claimed parallax image including the transparent plane figure displayed stereoscopically at a position corresponding to a flat image, as required by the disputed limitation. Because Appellant has shown at least one reversible error in the Examiner's obviousness rejection of claim 1, we do not reach Appellant's remaining arguments.

Accordingly, we do not sustain the Examiner's obviousness rejection of independent claims 1, 16, and 17, each of which includes the argued limitation. Likewise, we do not sustain the rejections of claims 2–6, 13, 15, 18, 20, and 21, which also recite the disputed limitation.

VI. CONCLUSION

We reverse the Examiner's obviousness rejection of claims 1–6, 13, 15–18, 20, and 21 under 35 U.S.C. § 103.

DECISION SUMMARY

In summary:

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
1–6, 13, 15–18, 20, 21	103	Hansegard, Tsubaki, Chono		1–6, 13, 15–18, 20, 21

REVERSED