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Table with 5 columns: APPLICATION NO., FILING DATE, FIRST NAMED INVENTOR, ATTORNEY DOCKET NO., CONFIRMATION NO.
13/695,641 11/01/2012 Daniel Simon Anna Ruijters 2010P00409WOUS 3584

24737 7590 12/01/2016
PHILIPS INTELLECTUAL PROPERTY & STANDARDS
465 Columbus Avenue
Suite 340
Valhalla, NY 10595

EXAMINER

RIVERA-MARTINEZ, GUILLERMO M

ART UNIT PAPER NUMBER

2668

NOTIFICATION DATE DELIVERY MODE

12/01/2016

ELECTRONIC

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte DANIEL SIMON ANNA RUIJTERS

Appeal 2016-003700
Application 13/695,641¹
Technology Center 2600

Before HUNG H. BUI, ADAM J. PYONIN, and AMBER L. HAGY,
Administrative Patent Judges.

BUI, *Administrative Patent Judge.*

DECISION ON APPEAL

Appellant seeks our review under 35 U.S.C. § 134(a) of the Examiner's Final Office Action rejecting claims 1–4, 6, 7, 9, and 15–24, 26, 27, and 29. Claims 8 and 10 are cancelled. Claims 5, 11–14, 25, and 28 are conditionally allowed if rewritten in independent form including all limitations of base claims and any intervening claims. Final Act. 10. We have jurisdiction under 35 U.S.C. § 6(b).

¹ According to Appellant, the real party in interest is Koninklijke Philips Electronics N.V. App. Br. 3.

We AFFIRM.²

STATEMENT OF THE CASE

Appellant's invention relates to a medical viewing system for generating an angulated view of an object of interest (patient's anatomy). Spec. 1:7–9. According to Appellant, two different views of an object represented by a 3D image data at two distinct viewing angles are displayed. Spec. 3:5–7. A first view is a 2D projection of a 3D image data based on a selected viewing direction overlaid with live X-ray images. Spec. 9:5–7. A second “angulated” view is a 2D projection of a 3D image data based on an angulated viewing direction at an offset angle (i.e., a constant angle and rotation axis). Spec. 3:6–10. “In this way, a virtual bi-plane view can be created that shows the anatomy of interest from a different fixed angle than the X-ray image” and “[t]his [view] complements the anatomy information in the live X-ray image.” Spec. 3:10–12.

Appellant's Figure 2 shows the two different views of an object at two distinct viewing angles, as reproduced below with additional markings.

² Our Decision refers to Appellant's Appeal Brief filed August 6, 2015 (“App. Br.”); Reply Brief filed February 24, 2016 (“Reply Br.”); Examiner's Answer mailed December 24, 2015 (“Ans.”); Final Office Action mailed April 10, 2015 (“Final Act.”); and original Specification filed November 1, 2012 (“Spec.”).

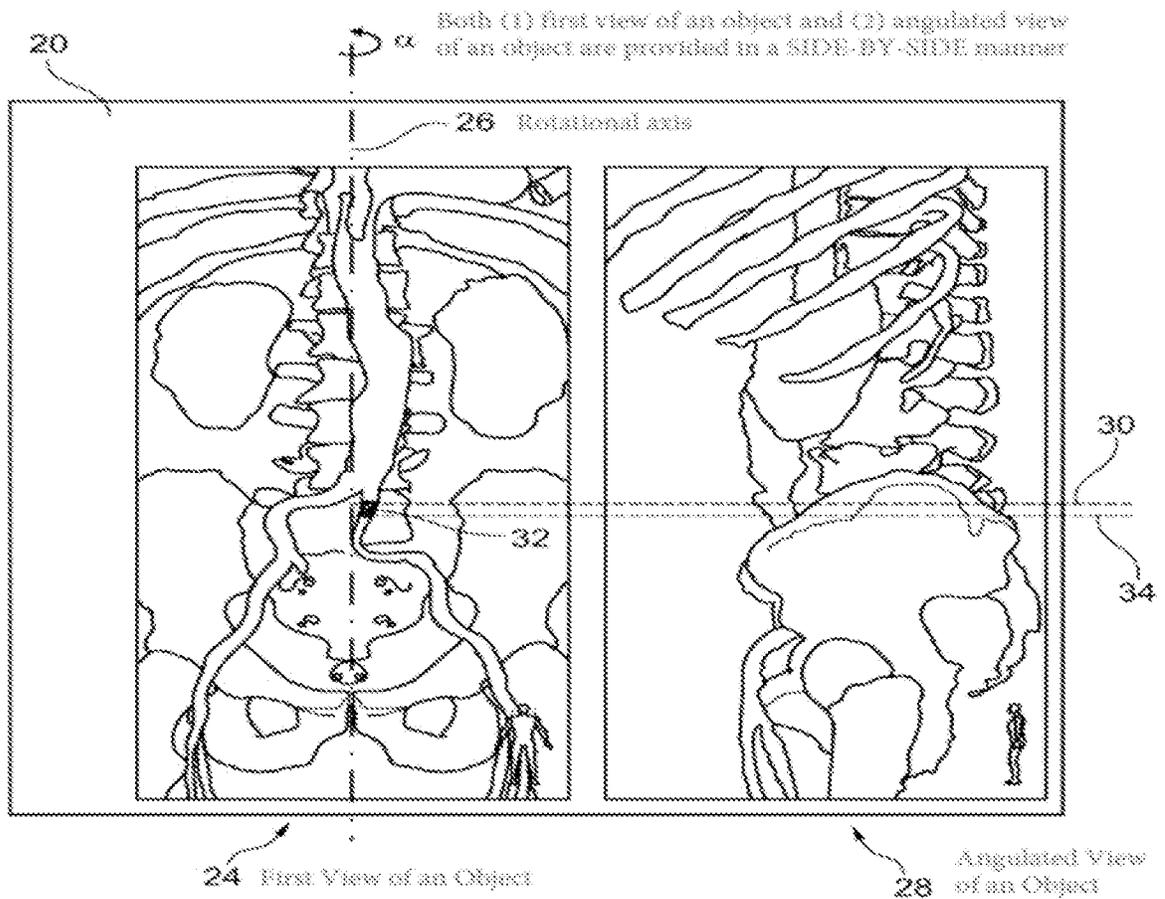


FIG. 2

Claims 1, 6, and 9 are independent. Claim 1 is illustrative of Appellant's invention, as reproduced below with disputed limitations in italics:

1. A medical viewing system comprising:
 - an X-ray image acquisition device with a source of radiation and an X-ray image detection module;
 - an image processor; and
 - a display;wherein the image processor is configured for:
 - retrieving a three-dimensional image data set,
 - generating a first two-dimensional projection of the three-dimensional image data set corresponding to a first viewing direction;* and

overlaying live X-ray images onto the first two-dimensional projection constituting a first view;

wherein the image processor is configured for generating a second two-dimensional projection of the three-dimensional image data set corresponding to a second viewing direction constituting a second view, wherein a first viewing direction vector and a second viewing direction vector enclose an offset angle α ; and

wherein the display is configured for outputting a combination of the first view and the second view with the same scale in a side by side manner.

App. Br. 19 (Claims App'x) (emphasis added).

Examiner's Rejection and References

Claims 1–4, 6, 7, 9, 15–24, 26, 27, and 29 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Frank et al., (US 2009/0290771 A1; published Nov. 26, 2009; “Frank”) and Simon et al., (US 6,470,207 B1; published Oct. 22, 2002). Final Act. 3–9.

ANALYSIS

In support of the rejection of independent claim 1, and similarly claims 6 and 9, the Examiner finds Frank teaches Appellant's claimed “medical viewing system” [shown in Figure 1] including most of the limitations, except for an express disclosure of “live X-ray images” as taught by Simon. Final Act. 2–6 (citing Frank ¶¶ 25, 28, 40, 47, 49, 51, 52, Figs. 1, 16; Simon 8:30–33, 40–46, 14:32–51).

Frank's Figure 1 shows Appellant's claimed “medical viewing system” as reproduced below with additional markings for illustration.

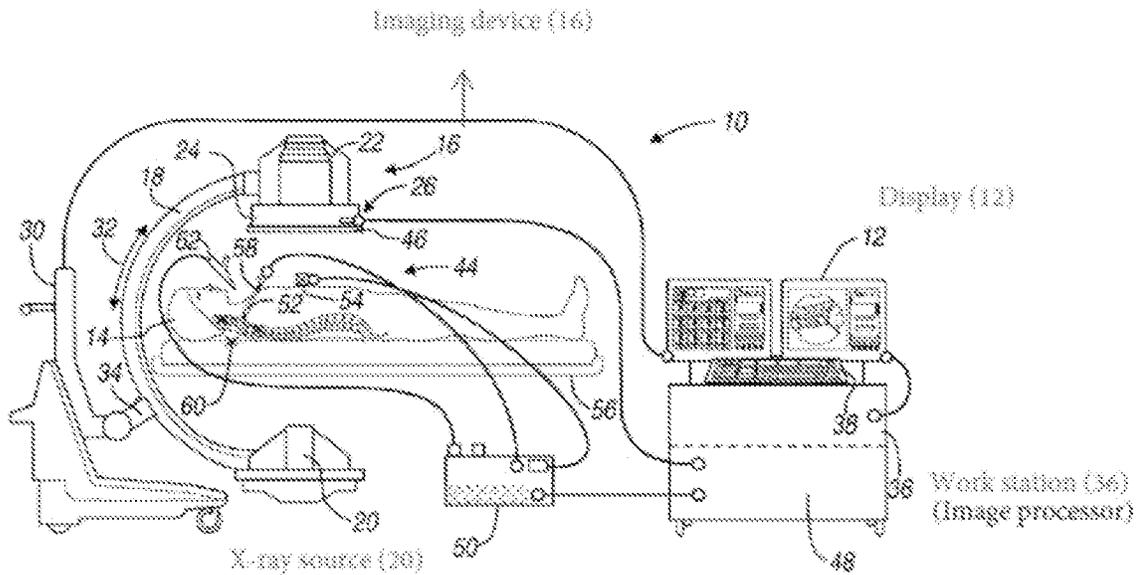
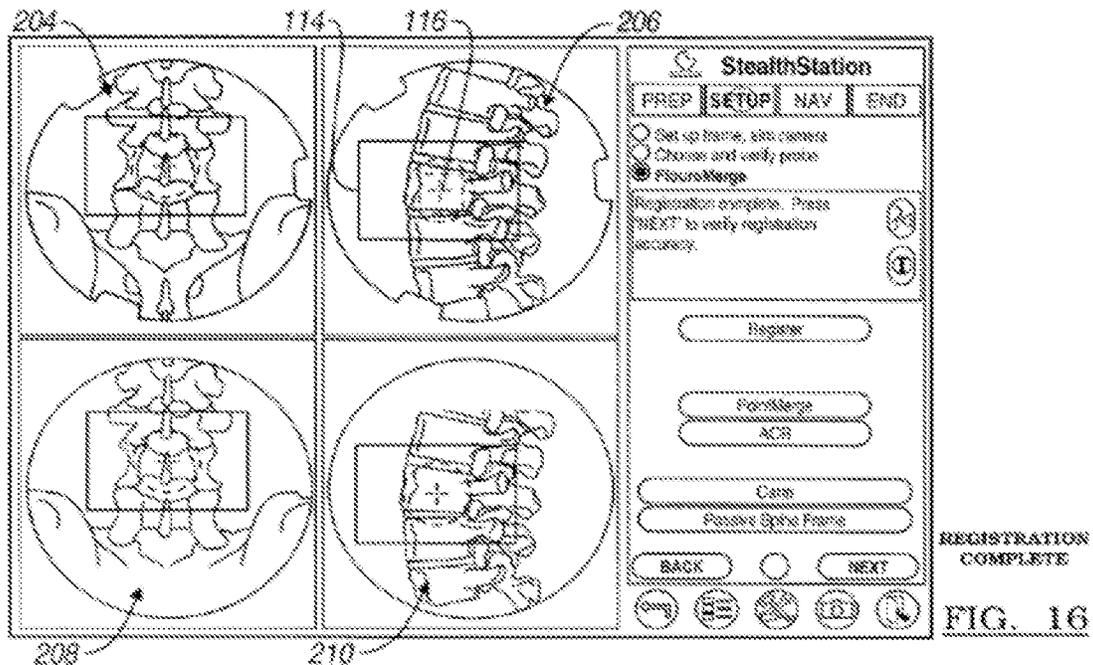


FIG. 1

As shown in Frank's Figure 1, the medical viewing system 10 includes (1) an X-ray image acquisition device 16 equipped with an X-ray source 20 and an image detection module 22; (2) an image processor 36; and (3) a display 12. Frank ¶¶ 25, 28.

Similarly, Frank's Figure 16 shows a visual display of a first view (anterior/posterior "AP" image) and a second view (lateral image) of an object in 3D image data in a side by side manner, via display 12, as reproduced below:



As shown in Frank’s Figure 16, the first image (“AP” image) 204 and the second image (lateral image) 206 of a patient in 3D scan are displayed on display 12. Frank ¶¶ 46, 47, 49, 51–52.

According to the Examiner, Frank also teaches the disputed functions of Appellant’s claimed “image processor,” i.e., (1) “generating a first two-dimensional projection of the three-dimensional image data set corresponding to a first viewing direction” in the context of Frank’s 2D projections of the 3D image data set and (2) “overlaying [live] X-ray images onto the first two-dimensional projection constituting a first view” in the context of Frank’s digitally reconstructed radiographs (DRRs) generated based on combining X-ray images and 2D projections of the 3D image data set. Final Act. 4 (citing Frank ¶¶ 40, 46–47, 49).

Appellant does not challenge the Examiner’s rationale for combining Frank and Simon. Instead, Appellant contends Frank does not teach the disputed functions of Appellant’s claimed “image processor.” App. Br. 6–

14; Reply Br. 6:14. In particular, Appellant presents several confusing arguments against Frank. For example, Appellant initially argues Frank’s digitally reconstructed radiographs (DRRs) are not 2D projections of the 3D image data set, but then argues “DRR is a two-dimensional image.” App. Br. 7, 11. Appellant also argues Frank’s combining of an X-ray image and a 2D projection of the 3D image data set to generate a DRR is not, and cannot be considered, the same as Appellant’s claimed “overlaying [live] X-ray images onto the first two-dimensional projection constituting a first view” as recited in claims 1, 6, and 9. *Id.* According to Appellant, there is “no disclosure or suggestion [from Frank] of any combining of an image with a projection to generate a DRR, much less any disclosure or suggestion of overlaying onto a DRR.” *Id.* at 8. Consequently, “there is no disclosure or suggestion [from Frank] of an X-ray image being overlaid onto a two-dimensional projection.” *Id.* at 9.

We are not persuaded the Examiner erred. Instead, we agree with the Examiner that the cited references teach or suggest all the limitations of claims 1, 6, and 9. Final Act. 3–6; Ans. 11–16 (citing Frank ¶¶ 25, 40, 46, 47, 49). As such, we adopt the Examiner’s findings and explanations provided therein. *Id.* For additional emphasis, we note Frank’s DRR is not relied upon to teach Appellant’s claim requirements of “2D projections of 3D image data set” as Appellant argues. App. Br. 7. Rather,

DRRs are created using the three dimensional data from the CT scan combined with the information from the C-arm localization target. This information includes patient orientation information gathered during the three-dimensional scan and patient orientation gathered during obtaining the radiographs (see Par. [0047]). Examiner believes the aforementioned teachings of Frank correspond to combining an image (e.g. three

dimensional data from the CT scan) with a projection (e.g. patient orientation) to generate a DRR.

Ans. 13.

During examination, claim terms are given their broadest reasonable interpretation consistent with the specification. *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1369 (Fed. Cir. 2004). Under the broadest reasonable interpretation, claim terms are given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the context of the entire disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). The term “overlying” is not defined by Appellant’s Specification. Instead, Appellant’s Specification only describes that term in the context of “overlying” X-ray images onto the first two-dimensional projection [of a 3D image data set]. Spec. 4:28–30, 9:5–7.

Based on Appellant’s Specification, the Examiner has interpreted Appellant’s claimed “overlying [live] X-ray images onto the first two-dimensional projection [of a 3D image data set]” as encompassing Frank’s combining a three-dimensional image (e.g. 3D image data from the CT scan) with a 2D projection (e.g. patient orientation) to generate a DRR. Ans. 13–14 (citing Frank ¶ 47). In the absence of an explicit definition of the term “overlying” from Appellant’s Specification, we find the Examiner’s interpretation is reasonable and consistent with Appellant’s Specification. “[T]he fact that [Appellant] can point to definitions or usages that conform to their interpretation does not make the PTO’s definition unreasonable when the PTO can point to other sources that support its interpretation.” *In re Morris*, 127 F.3d 1048, 1056 (Fed. Cir. 1997) (emphasis added).

Moreover, we further note Frank explicitly suggests “overlaying a three-dimensional image with graphical representations of surgical instruments” as Frank discloses a “three-dimensional patient specific images [3D image data set, such as CT or MRI images corresponding to the same patient] can be registered . . . using multiple two-dimensional image projections.” Frank ¶ 5.

In the Reply, Appellant acknowledges Frank’s reference to the overlaying on a 3D image (i.e., X-ray image) with “graphical representations.” Reply Br. 6 (citing Frank ¶¶ 5, 40). However, Appellant argues Frank’s “graphical representation” refers to “a graphical icon” for intervention instruments and, as such, “is not an X-ray image” as recited in claims 1, 6, and 9. *Id.* at 6–13. We remain unpersuaded. Contrary to Appellant’s arguments, the “icon” as described in paragraph [40] of Frank represents a localized point on a 3D image data from a 3D scan, such as a CT scan. “[G]raphical representations” as described in paragraph [5] of Frank refer to “multiple two-dimensional image projections [of 3D image data set].”

In addition, Frank also describes (1) X-ray images obtained from a patient are “real-time [live] images or image data of the patient,” (2) the medical viewing system 10 “provides a visual bi-plane image using . . . orthogonal plane (i.e., AP and lateral views),” and (3) the first image (“AP” image) 204 and the second image (lateral image) 206, shown in Figure 16, are 2D images or 2D projections of 3D image data set. Frank ¶ 32.

For the foregoing reasons, Appellant has not demonstrated Examiner error. Accordingly, we sustain the Examiner’s obviousness rejections of

independent claims 1, 6, and 9 and their respective dependent claims 2–4, 15–21, 24, and 29, which Appellant does not argue separately. App. Br. 15.

With respect to dependent claims 6, 7, 9, and 27, Appellant argues the cited prior art does not teach that “the X-ray image is live.” App. Br. 16. We disagree. Contrary to Appellant’s argument, Frank explicitly describes X-ray images obtained from a patient are “real-time [live] images or image data of the patient.” See Frank ¶ 32. Likewise, Simon teaches displaying “real-time . . . images, such as fluoroscopic x-ray images, of patient 110 on display 121.” Ans. 14 (citing Simon 8:30–34). For these reasons, we also sustain the Examiner’s obviousness rejections of claims 6, 7, 9, and 27.

With respect to dependent claims 22, 23, and 26, Appellant argues the cited prior art does not teach “an image from among said X-ray images to be overlaid including a depiction of an anatomical structure.” App. Br. 15–17. We also disagree. Frank’s X-ray images depict an anatomical structure of a patient, as shown in Figures 6–19. As such, we also sustain the Examiner’s obviousness rejections of claims 22, 23, and 26.

CONCLUSION

On the record before us, we conclude Appellant has not demonstrated the Examiner erred in rejecting claims 1–4, 6, 7, 9, 15–24, 26, 27, and 29 under 35 U.S.C. § 103(a).

DECISION

As such, we AFFIRM the Examiner’s final rejection of claims 1–4, 6, 7, 9, 15–24, 26, 27, and 29.

Appeal 2016-003700
Application 13/695,641

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