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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte FREDRIK ORDERUD

Appeal 2015-003360
Application 13/314,599
Technology Center 3700

Before DONALD E. ADAMS, JEFFREY N. FREDMAN, and
TIMOTHY G. MAJORS, *Administrative Patent Judges*.

PER CURIAM.

DECISION ON APPEAL

This is an appeal¹ under 35 U.S.C. § 134 involving claims to a method and a system for ultrasound imaging. The Examiner rejected the claims on the ground of obviousness. We have jurisdiction under 35 U.S.C. § 6(b). We affirm.

Statement of the Case

Background

Appellant's invention "relates generally to an ultrasound imaging system and method for displaying a volume-rendered image and a[] planar

¹ Appellant identifies the Real Party in Interest as General Electric Company (*see* Br. 3).

image that are both colorized according to the same depth-dependent scheme” (Spec. ¶ 1).

The Claims

Claims 1–20 are on appeal. Independent claim 1 is representative and reads as follows:

1. A method of ultrasound imaging comprising:
 - generating a volume-rendered image from three-dimensional ultrasound data, wherein the volume-rendered image is colorized with at least two colors according to a depth-dependent color scheme;
 - displaying the volume-rendered image;
 - generating a planar image from the three-dimensional ultrasound data, wherein the planar image is colorized according to the same depth-dependent color scheme as the volume-rendered image; and
 - displaying the planar image.

The Issues

- A. The Examiner rejected claims 1–6, 9–15, 19, and 20 under 35 U.S.C. § 103(a) as obvious over Thiele² and Washburn³ (Ans. 2–7).
- B. The Examiner rejected claims 7, 8, and 16–18 under 35 U.S.C. § 103(a) as obvious over Thiele, Washburn, and Henderson⁴ (Ans. 7–10).

A. 35 U.S.C. § 103(a) over Thiele and Washburn

The Examiner finds that Thiele teaches “generating a volume-rendered image from three-dimensional ultrasound data, wherein the volume-rendered image is colorized [paragraph [0001]] with at least two

² Thiele, US 2009/0184955 A1, published July 23, 2009.

³ Washburn et al., US 2009/0097723 A1, published Apr. 16, 2009.

⁴ Henderson, US 2004/0109014 A1, published June 10, 2004.

colors according to a depth-dependent color scheme [paragraph [0018]],” “displaying the volume-rendered image [paragraph [0016]],” and “generating a planar image from the three-dimensional ultrasound data [paragraph [0016]], wherein the planar image is colorized according to the same depth dependent color scheme as the volume-rendered image [paragraphs [0018] and [0019]]” (Ans. 2).

The Examiner acknowledges that “Thiele does not explicitly disclose displaying the planar image” (*id.* at 3).

The Examiner turns to Washburn and finds that it teaches “displaying the planar image [Figure 3 item 50]” (*id.*). The Examiner concludes that it would have been obvious “to modify Thiele in view of Washburn in displaying the planar image in order to give context regarding the anatomical location being viewed [Washburn, paragraph [0007]]” (*id.*).

The issue with respect to this rejection is: Does the evidence of record support the Examiner’s conclusion that Thiele and Washburn render the claims *prima facie* obvious?

Findings of Fact

1. Thiele teaches

a method for volume rendering using depth weighted colorization according to one embodiment of the present disclosure. The method of volume rendering comprises obtaining data representative of a first composited plane of one or more anatomical structures In one embodiment, the first composited plane comprises an original composited plane. In another embodiment, obtaining data comprises obtaining data from a source using one selected from the group consisting of three-dimensional (3D) ultrasound, matrix arrays and real-time 3D imaging.

(Thiele ¶ 16; *see also* Ans. 2.)

2. Thiele teaches that

[t]he method further includes . . . selecting or interpolating color values between two different colorization palettes as a function of the RMS depths of the second composited plane. In particular, the step includes determining depth weighted color values between two different colorization palettes as a function of the RMS depths of the second composited plane.

(Thiele ¶ 18; *see also* Ans. 2.)

3. Thiele teaches that “[t]he method still further includes . . . applying the selected or interpolated color values to the original composited plane for producing a volume rendering with depth weighted colorization” (Thiele ¶ 19; *see also* Ans. 2).

4. Figure 4 of Washburn is reproduced below:

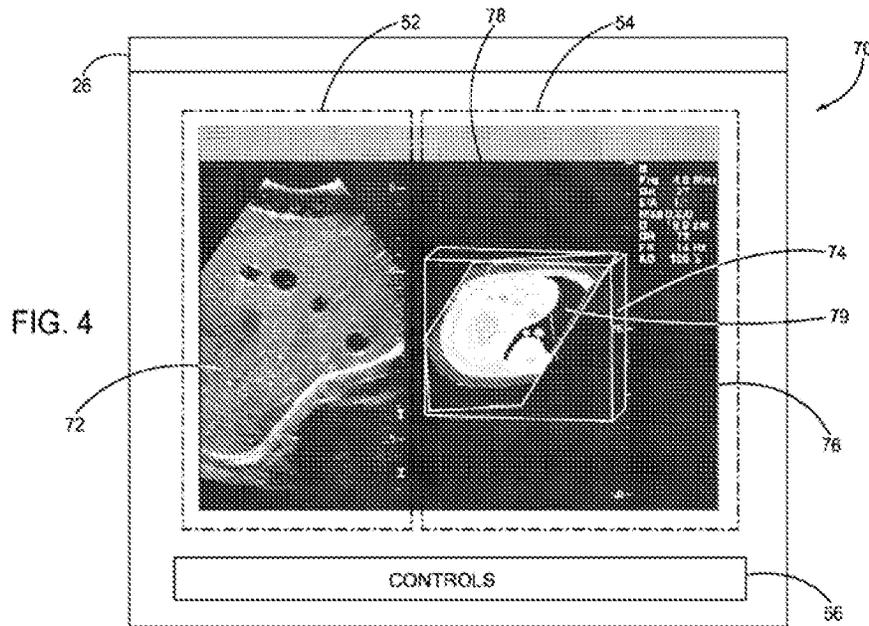


Figure 4 shows “a front view 70 of a display” having an “ultrasound image 72” and a “pre-acquired image volume 74” (Washburn ¶ 42; *see also* Ans. 3).

Principles of Law

“[I]f a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious.” *KSR Int’l. Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007).

Analysis

Claims 1–3, 6, 9–14, 19, and 20:

We adopt the Examiner’s findings of fact and reasoning regarding the scope and content of the prior art (Ans. 2–11; FF 1–6) and agree that claims 1, 11, and 14 would have been obvious over Thiele and Washburn. We address Appellant’s arguments below.

Appellant contends that “[t]he cited art fails to render obvious at least ‘generating a planar image from the three-dimensional ultrasound data, wherein the planar image is colorized according to the same depth-dependent color scheme as the volume-rendered image[.]’” (Br. 9).

We are not persuaded.

Thiele teaches “a method for volume rendering using depth weighted colorization” in which “obtaining data comprises obtaining data from a source using one selected from the group consisting of three-dimensional (3D) ultrasound, matrix arrays and real-time 3D imaging” (FF 1). Thiele also teaches “determining depth weighted color values between two different colorization palettes as a function of the RMS depths of the second composited plane” (FF 2). Thiele further teaches “applying the selected or interpolated color values to the original composited plane for producing a volume rendering with depth weighted colorization” (FF 3).

We thus agree with the Examiner that

the term “generating an image” can be image interpolation, image reconstruction or any process that takes place after the raw data has been captured. In order to obtain 2D data from 3D data - a limitation disclosed in the claims - it would be necessary to perform an image rendering task that occurs after the raw data has been captured.

(Ans. 10.)

Appellant argues that

Thiele relates to “composite planes” that are a type of volume rendering and not planar imaging. Thiele is directed to a method for volume rendering that uses data from composited planes.[] A composited plane, however, is not a planar image. Thiele relates to Levoy compositing, which involves integrating interpolated samples along a ray cast line.

(Br. 9.)

These arguments are unpersuasive. Appellant’s claims do not define “planar image” or “image of a plane” to exclude composite planes or Levoy compositing. “[L]imitations are not to be read into the claims from the specification.” *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993). *See also In re Self*, 671 F.2d 1344, 1348 (CCPA 1982) (“[A]ppellant’s arguments fail from the outset because . . . they are not based on limitations appearing in the claims.”).

Appellant argues that

[w]hile Washburn mentions ultrasound planar images, and may be used to display a planar image, Washburn does not teach displaying a planar image as fully set forth by Claim 1, for example displaying both a planar image and a volume-

rendered image both generated from common dataset (“the three-dimensional ultrasound data”).

(Br. 11.) Appellant also argues that “[a]s Washburn is directed to display of images from data acquired at different times (e.g., one is ‘pre-acquired’) for registration, Washburn does not teach display of a planar image and a volume-rendered image that were acquired from the same imaging data” (*id.* at 12).

We are not persuaded. The Examiner turns to Washburn for its teaching of “displaying the planar image [Figure 3 item 50]” (Ans. 3, FF 4). Applicant’s contention fails to account for Thiel’s teaching in the combination of Thiel and Washburn. “Non-obviousness cannot be established by attacking references individually where the rejection is based upon the teachings of a combination of references []. [The reference] must be read, not in isolation, but for what it fairly teaches in combination with the prior art as a whole.” *In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986).

Claim 4:

Appellant similarly contends that “the displayed items of Washburn are not acquired from the same data (‘the three-dimensional ultrasound data’) and do not teach the display as fully set forth” (Br. 13).

Accordingly, we are not persuaded for the reasons discussed above. *See In re Merck & Co.*, 800 F.2d at 1097.

Claims 5 and 15:

Appellant argues that “[i]n Washburn, there is no mention of a ‘view port[]’” (Br. 14).

This argument is unpersuasive. As the Examiner explains, the term “view port” is not one which is commonly used in the art and that [Appellant] has not defined this term in the specification, but rather shows it in the drawings as a window (Drawings, Figure 3, item 309). The examiner further submits that Washburn cites “a portion of the display” in paragraph [0007], which has been interpreted as a window.

(Ans. 11; *see also* FF 4.) “[C]laims in an application are to be given their broadest reasonable interpretation consistent with the specification and that claim language should be read in light of the specification as it would be interpreted by one of ordinary skill in the art.” *In re Sneed*, 710 F.2d 1544, 1548 (Fed. Cir. 1983) (citations omitted).

B. 35 U.S.C. § 103(a) over Thiele, Washburn, and Henderson

The Examiner acknowledges that “Thiele in view of Washburn discloses [Appellant’s] claimed system, but does not explicitly disclose details regarding adjusting view ports” (Ans. 7).

The Examiner turns to Henderson and finds that it “discloses adjusting the shape of a window through a user interface [paragraph [0013]]” (*id.*).

The Examiner concludes that it would have been obvious

to modify Thiele in view of Washburn, and further in view of Henderson in adjusting the shape of a window, because a window and view port perform the same function. Further it would have been obvious to adjust the shape of the view port in order to concentrate on a particular Region of Interest (ROI).

(*Id.* at 7–8.)

The issue with respect to this rejection is: Does the evidence of record support the Examiner's conclusion that Thiele, Washburn, and Henderson render the claims prima facie obvious?

Findings of Fact

5. Henderson teaches “[a] region window is set on the user interface corresponding to the foreground region. Then a portion of the video frame corresponding to the region window is displayed on the user interface” (Henderson ¶ 14; *see also* Ans. 8).

6. Henderson teaches

Associated with the graphical content, a real-time, or near-real time video image of an object or actor may be also be sent in a streaming video signal to elaborate and explain what is presented in the graphical content. Superimposing only the foreground portion of the video image allows for the video to avoid obliterating underlying graphical information. Moreover, allowing the video to seemingly move independent of any window accentuates the impact of the image.

(Henderson ¶ 15; *see also* Ans. 8.)

Analysis

We agree with the Examiner that claims 7, 8, and 16–18 would have been obvious over Thiele, Washburn, and Henderson. We address Appellant's arguments below.

Appellant contends that

Henderson, however, is not related to medical imaging. Instead, Henderson is directed to display of superimposed motion-video images in a windows user environment, and to presentation of composited video images that enable “an actor to move independently of the underlying application windows, increasing the dramatic effect and allowing

accompanying digital content to be displayed in a complementary fashion.”

(Br. 16.) Appellant thus argues that “Henderson is non-analogous art” (*id.*).

We are not persuaded.

Two criteria have evolved for determining whether prior art is analogous: (1) whether the art is from the same field of endeavor, regardless of the problem addressed, and (2) if the reference is not within the field of the inventor’s endeavor, whether the reference still is reasonably pertinent to the particular problem with which the inventor is involved.

In re Clay, 966 F.2d 656, 658–659 (Fed. Cir. 1992). The devices of Thiele, Washburn, and Henderson are intended for displaying images to a user, among other things. We thus find that the general imaging and user interface techniques of Henderson would have been “reasonably pertinent to the particular problem with which the inventor is involved.” *Id.* And in particular, the imaging techniques would have been pertinent to the display issues faced by Thiele and Washburn, where Washburn recognizes the overlap in medical and video motion arts (*see* Washburn ¶ 2 “Image registration finds wide application in medical imaging, video motion analysis, remote sensing, security and surveillance applications.”) Accordingly, we agree with the Examiner that “the same imaging techniques are used for both medical and non-medical images” (Ans. 11; FF 5–6).

Appellant argues that “the cited portions of Henderson fail to teach adjusting a view port as claimed, or generating and displaying an updated volume-rendered image after adjusting the shape of the view port” (Br. 16).

This argument is unpersuasive for the reasons discussed above. *See In re Merck & Co.*, 800 F.2d at 1097.

SUMMARY

In summary, we affirm the rejection of claims 1, 11, and 14 under 35 U.S.C. § 103(a) as being obvious over Thiele and Washburn. Claims 2–6, 9 and 10 fall with claim 1, claims 12 and 13 fall with claim 11, and claims 15, 19 and 20 fall with claim 14.

We affirm the rejection of claims 7, 8, and 16–18 under 35 U.S.C. § 103(a) as obvious over Thiele, Washburn, and Henderson.

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

AFFIRMED