

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte ERIC LAWRENCE HALE, NATHAN JON SCHARA,
and HANS DAVID HOEG

Appeal 2014-003877
Application 11/049,003
Technology Center 3700

Before LINDA E. HORNER, EDWARD A. BROWN, and
JILL D. HILL, *Administrative Patent Judges*.

BROWN, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Eric Lawrence Hale et al. (Appellants)¹ appeal under 35 U.S.C. § 134(a) from the Examiner's decision rejecting claims 18, 21–29, 38, and 39, which are all of the pending claims. We heard oral argument on August 11, 2016. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

¹ The Appeal Brief identifies Karl Storz Imaging, Inc., as the real party in interest. Appeal Br. 2.

CLAIMED SUBJECT MATTER

Claim 18, reproduced below, is representative of the claimed subject matter:

18. A method for representing an endoscopic view and viewing direction, the method comprising:

- acquiring images with an endoscope having a distal end and a view vector that pivots relative to the distal end, the view vector having an attendant view cone that defines a current image;

- displaying the current image in a first section of a display;
- sensing the attitude of the endoscope using sensors attached to the endoscope;

- displaying, in a second section of the display different from the first section of the display and simultaneously with the current image, a virtual representation of an endoscopic environment comprising a graphical representation of the endoscope, a texture mapped version of the current image defined by the view cone, and a graphical representation of a navigation coordinate system in which said graphical representation of the endoscope and texture mapped image are arranged in positions based on the attitude of the endoscope;

- updating the texture mapped image as the view cone moves through a solid angle as the view vector pivots; and

- updating the positions of the updated texture mapped image and the graphical representation of the endoscope within the graphical representation of the navigation coordinate system as the view cone moves through a solid angle as the view vector pivots.

Appeal Br. 11 (Claims App.).

REJECTIONS

I. Claims 18, 22, 23, and 26–29 are rejected under 35 U.S.C. § 103(a) as unpatentable over Chen (US 2003/0018235 A1, published Jan. 23, 2003) and Hoeg (US 6,371,909 B1, issued Apr. 16, 2002).

II. Claims 21, 24, 25 and 38 are rejected under 35 U.S.C. § 103(a) as unpatentable over Chen, Hoeg, and Fukunaga (US 6,346,940 B1, issued Feb. 12, 2002).

III. Claim 39 is rejected under 35 U.S.C. § 103(a) as unpatentable over Chen, Hoeg, and Shahidi (US 2001/0029333 A1, published Oct. 11, 2001).

ANALYSIS

Rejection I

Claim 18 calls for “displaying the current image in a first section of a display” and

displaying, in a second section of the display different from the first section of the display and simultaneously with the current image, a virtual representation of an endoscopic environment comprising a graphical representation of the endoscope, a texture mapped version of the current image defined by the view cone, and a graphical representation of a navigation coordinate system in which said graphical representation of the endoscope and texture mapped image are arranged in positions based on the attitude of the endoscope.

Appeal Br. 11 (Claims App., emphasis added).

The Examiner finds that Chen discloses all of these claim limitations. Non-Final Act. 2–3. Particularly, the Examiner finds that Chen discloses displaying a current image (i.e., “video image data 330 obtained from endoscope 90”) in a first section of a display, and displaying, in a second section of the display different from the first section, simultaneously with the current image, a graphical representation of the endoscope (i.e., “computer graphic representation 350 of the endoscope’s shaft”), a texture mapped version of the current image (i.e., “video image data 330 obtained from endoscope 90”), and a graphical representation of a navigation

coordinate system (i.e., “markers 30E’ and line segments 30F’ . . . used to plan a surgical procedure”). *Id.* (citing Chen ¶¶ 66, 75; Fig. 9)

Appellants contend that Chen, in contrast, “discloses an overlaid presentation in a single display section.” Appeal Br. 4. Appellants contend that Chen provides “a single composite image combining both live video images derived from endoscope 90 with computer generated images derived from the computer graphics system.” *Id.* at 5 (citing Chen, ¶ 57).

Appellants also contend that Chen’s Figures 5 and 9 show composite images combining video image data and computer model image data. *Id.* (citing Chen ¶¶ 61, 66).

Figure 9 of Chen shows “a composite image **320** which combines video image data **330** obtained from endoscope **90** with computer model image data **340** generated by the system’s computer graphics, and further wherein a computer graphic representation **350** of the endoscope’s shaft appears on the rendered image.” Chen ¶ 66; Fig. 9. Figure 5 of Chen similarly “shows a composite image **200** which combines video image data **210** obtained from endoscope **90** with computer model image data **220** generated by the system’s computer graphics.” *Id.* ¶ 61; Fig. 5.

In response to Appellants’ contentions, the Examiner finds that, in both Figures 5 and 9 of Chen:

there is a *middle first section* in which live video data is provided (“210” and “330”), and an *outer second section* in which computer models of environmental objects (anatomy “220” and “340”, endoscope “350”) are provided in their proper positional context. The *sections* are *separated by a ring-shaped boundary* that represents the outer limit of obtained live video data, beyond which no data is being obtained. Computer model data is used to fill in the area beyond the ring-shaped boundary to provide the operator with context.

Ans. 13 (emphasis added).

Appellants do not provide a definition of the claim term “section,” or otherwise direct us to any disclosure in their Specification, that precludes the Examiner from reading “a first section of a display” and “a second section of the display” in claim 18 on the identified “middle first section” and “outer second section” in Figures 5 and 9 of Chen. Appellants acknowledge that Chen displays the video image data in a circular region in the center of the display. Reply Br. 2.

In Figure 9 of Chen, the computer graphic representation 350 of the endoscope shaft appears to be visible in both the “middle first section” and the “outer second section” of the display identified by the Examiner. The Examiner states, however, that “the claim as drafted does not require that the first section display *image data alone and to the exclusion of model data.*”

Ans. 14. We agree and note that claim 18 does not recite displaying the graphical representation of the endoscope, the texture mapped version of the current image, *or* the graphical representation of a navigation coordinate system *only* in the second section of the display. Appellants have not shown that the Examiner erred in finding that Chen also discloses displaying, in a second section of the display different from the first section, simultaneously with the current image, a graphical representation of the endoscope.

However, the Examiner appears to find that “video image data 330 obtained from endoscope 90” disclosed in Chen corresponds to both “the current image” and “a texture mapped version of the current image defined by the view cone” recited in claim 18. Non-Final Act. 3. A definition of “display” is “**1a**: to put or spread before the view <~ the flag>.” *Merriam-Webster’s Collegiate® Dictionary* 361 (11th ed. 2003). The Examiner does

not explain adequately how, or where, Chen's video image data 330 is also "displayed" in the "outer second section" of Chen's composite image 320 in Figure 9, as video image data 330 appears to be placed before the view only in the "middle first section."

Even if Chen's video image 330 can be considered to meet both claim limitations, Appellants also point out that Chen does not support other findings made by the Examiner. Particularly, Appellants contend that Chen does not disclose displaying "a graphical representation of a navigation coordinate system in conjunction with a graphical representation of the endoscope and a texture mapped version of the current image." Appeal Br. 6-7. Appellants contend that Chen fails to disclose that markers 30E' and line segments 30F' are displayed simultaneously with the current image. *Id.* at 7.

In response, the Examiner states that Chen's "software objects" 30A', 30B', and 30C' are "the building blocks of the aforementioned 'computer model image data 220' and 'computer model image data 340' . . . [which are] displayed separately and simultaneously from live video images '210' and '330'." Ans. 15.

Appellants' contentions are persuasive. Claim 18 requires *displaying* the graphical representation of a navigation coordinate system in the second section of the display with a virtual representation of an endoscope and a texture mapped version of the current image. Claim 18 also requires "said graphical representation of the endoscope and texture mapped image [to be] arranged in positions based on the attitude of the endoscope." We note that Figure 4B of Appellants' Specification illustrates navigation coordinate system 48 in which are arranged a virtual representation of an endoscope 50

and a texture mapped version 60 of the current image. *See* Spec. ¶ 20. Navigation coordinate system 48 is placed before the view in Figure 4B, consistent with the noted definition of “display.”

Appellants point out that Figures 5 and 9 of Chen do not show a separate display of a navigation coordinate system. Appeal Br. 7. Chen discloses that “markers **30E'** and line segments **30F'** may be used to plan a surgical procedure, to determine anatomical lengths or angles, etc.” Chen ¶ 75. The Examiner does not identify any disclosure in Chen pertaining to using markers 30E' and line segments 30F' to form a graphical representation of a navigation coordinate system in composite image 220 or 320 image shown in Figures 5 and 9, respectively, much less where “said graphical representation of the endoscope and texture mapped image are arranged in positions based on the attitude of the endoscope,” as recited in claim 18.

The Examiner applies Hoeg to the limitation in claim 18 of “the texture mapped image or its position are updated *when the view vector pivots* (emphasis added).” Non-Final Act. 5. The Examiner finds that “Hoeg merely discloses a graphical representation of the viewing angle of the view vector ('46' as noted above) relative to the longitudinal axis of the endoscope.” *Id.*

We agree with Appellants that this finding for Hoeg does not cure the deficiencies of Chen as to claim 18. Appeal Br. 8. Accordingly, we do not sustain the rejection of claim 18 and dependent claims 22, 23, and 26–29 as unpatentable over Chen and Hoeg.

Rejection II

The Examiner's application of Fukunaga to dependent claims 21, 24, 25 and 38 does not cure the deficiencies of the rejection of claim 18. *See* Non-Final Act. 7–9. Accordingly, we do not sustain the rejection of claims 21, 24, 25 and 38 as unpatentable over Chen, Hoeg, and Fukunaga.

Rejection III

The Examiner's application of Shahidi to dependent claim 39 does not cure the deficiencies of the rejection of claim 18. *See* Non-Final Act. 9–10. Accordingly, we do not sustain the rejection of claim 39 as unpatentable over Chen, Hoeg, and Shahidi.

DECISION

We reverse the Examiner's decision to reject claims 18, 21–29, 38, and 39.

REVERSED