

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

HOLOGIC, INC., VAREX IMAGING CORP., and
MEVIS MEDICAL SOLUTIONS AG.,
Petitioner,

v.

UNIVERSITY OF SOUTH FLORIDA BOARD OF TRUSTEES,
Patent Owner.

IPR2021-00656
Patent 6,630,937 B2

Before DEBRA K. STEPHENS, ROBERT J. WEINSCHENK, and
KRISTI L. R. SAWERT, *Administrative Patent Judges*.

STEPHENS, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

A. *Background and Summary*

Hologic, Inc., Varex Imaging Corp., and MeVis Medical Solutions AG (collectively, “Petitioner”) filed a petition for *inter partes* review (Paper 4 (“Pet.” or “Petition”)) challenging claims 2–6, 9–11, 16, and 17 of U.S. Patent 6,630,937 B2 (Ex. 1001 (“’937 Patent”)). University of South Florida Board of Trustees (“Patent Owner”) elected to waive its Patent Owner Preliminary Response to the Petition (Paper 9, 2).

The standard for instituting an *inter partes* review is set forth in 35 U.S.C. § 314(a), which provides as follows:

(a) THRESHOLD.—The Director may not authorize an inter partes review to be instituted unless the Director determines that the information presented in the petition filed under section 311 and any response filed under section 313 shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition (35 U.S.C. § 314(a)).

Petitioner challenges claims 2–6, 9–11, 16, and 17 as unpatentable under both 35 U.S.C. § 102 and 35 U.S.C. § 103 (Pet. 3). Based on our review of the record, we conclude that Petitioner is not reasonably likely to prevail in demonstrating that at least one of the challenged claims is not patentable.

B. *Real Parties in Interest*

Petitioner states that Hologic, Inc., Varex Imaging Corp., and MeVis Medical Solutions AG are the real-parties-in-interest (Pet. 73).

Patent Owner states that University of South Florida Board of Trustees and University of South Florida Research Foundation are the real-parties-in-interest (Paper 8, 2).

C. Related Matters

Patent Owner and Petitioner indicate the '937 Patent was asserted in the following district court proceedings:

Univ. of South Florida Board of Trustees et al v. Hologic, Inc., No. 20-cv-352-CFC (D. Del.); and

Univ. of South Florida Board of Trustees et al v. FujiFilm Medical Systems USA, Inc., No. 1:20-cv-4080 (S.D.N.Y.) (Pet. 71; Paper 8, 2).

Further, Petitioner indicates the '937 Patent was asserted in the following district court proceedings:

Univ. of South Florida Board of Trustees et al v. FujiFilm Medical Systems USA, Inc., No. 3:18-cv-215 (D. Conn);

Univ. of South Florida Board of Trustees et al v. FujiFilm Medical Systems USA, Inc., No. 8:16-cv-1194 (M.D. Fla);

Univ. of South Florida Board of Trustees et al v. Brit Systems Inc., No. 3:18-cv-250 (N.D. Tex.);

Univ. of South Florida Board of Trustees et al v. Brit Systems Inc., No. 8:16-cv-3109 (M.D. Fla.);

Univ. of South Florida Board of Trustees et al v. AGFA Healthcare Corp., No. 8:16-cv-3106 (M.D. Fla.);

Univ. of South Florida Board of Trustees et al v. Barco, Inc., No. 8:16-cv-3107 (M.D. Fla.);

Univ. of South Florida Board of Trustees et al v. Aycan Medical Systems, LLC, No. 8:16-cv-3108 (M.D. Fla.); and

Univ. of South Florida Board of Trustees et al v. EIZO Inc., No. 8:16-cv-3110 (M.D. Fla.) (Pet. 73).

Additionally, Patent Owner indicates the '937 Patent is implicated in the following Court of Appeals for the Federal Circuit proceeding: *Univ. of South Florida Research Foundation v. Fujifilm Medical Systems*, No. 20-1872 (Fed. Cir.) (Paper 8, 2).

D. The '937 Patent

The '937 Patent, titled “Workstation Interface For Use In Digital Mammography And Associated Methods,” issued October 7, 2003 (Ex. 1001, codes (45), (54)). The '937 Patent describes a computer workstation user interface which assists in the evaluation of digital

mammography images (*id.* at code (57), 3:10–15, 3:22–23). Such an interface is shown in Figure 4, reproduced below (*id.* at 2:57, 5:16–25).

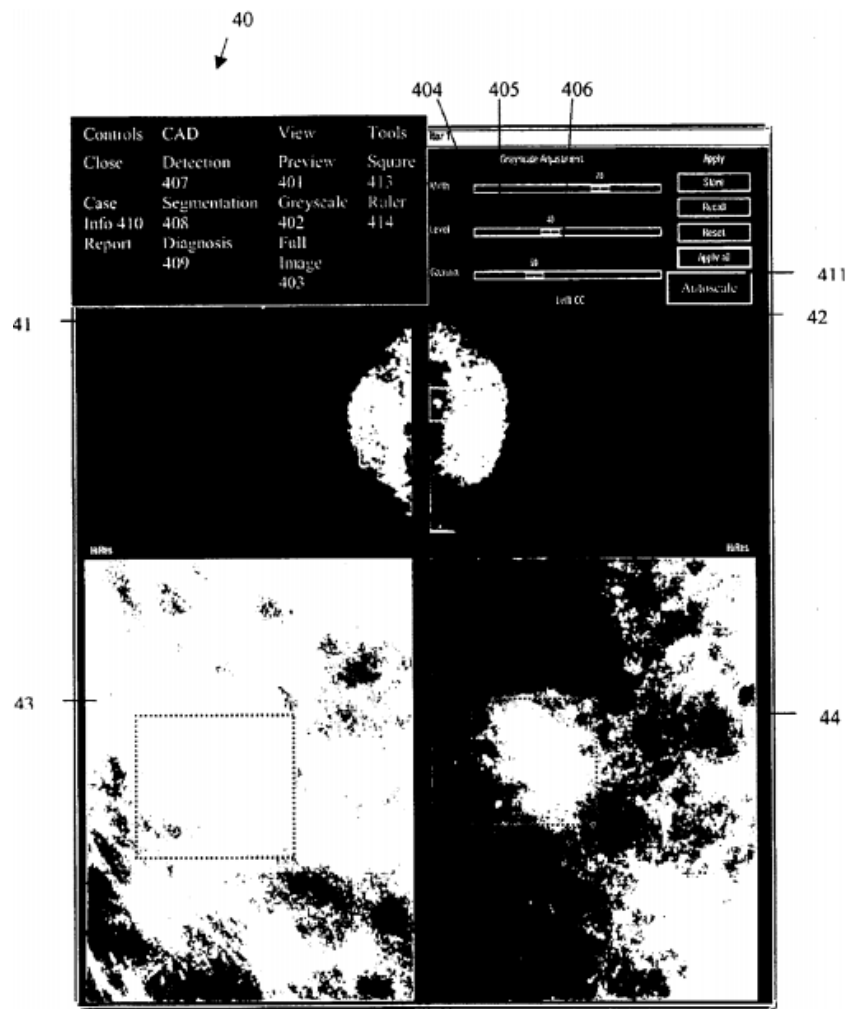


FIG. 4

Figure 4 shows left and right cranio-caudal (“CC”) mammogram images (*id.* at 5:4–5, 5:17–18). In particular, left CC view 41 and right CC view 42 are “decimated views” of “original images” (*id.* at 5:17–23). Original images are, e.g., 16 bit images digitized from an x-ray, whereas decimated views are, e.g., 8 bit conversions of original 16 bit images (*see id.* at 4:37–41, Fig. 3; *see also id.* at 7:6–8).

As further shown in Figure 4, the interface also displays “selected sections” of left and right decimated CC views 41, 42 in windows 43, 44 (*id.* at 5:23–25). Those selected sections, i.e., the “squares in the decimated views,” are shown in windows 43, 44 and are “high resolution” views of the “original data,” i.e., the original left and right CC mammogram images (*id.*).

The interface allows “panning as well as jumping to certain locations in the image” for “easy and fast reading” (*id.* at 5:29–30). “[P]anning can occur in either the decimated or the high-resolution windows” (*id.* at 5:32–34). The ’937 Patent notes that “a common practice is to scan through the image in the decimated view but pan in the high-resolution view for a thorough and slow examination of certain regions of interest” (*id.* at 5:34–38). That is, the ’937 Patent explains that either version of the mammogram image being displayed — e.g., for the left CC mammogram image, decimated left CC view 41 and high resolution left CC view 43 — can be interfaced with during examination of the mammogram image. And, “panning or clicking in a certain region of interest” of an image “also alters the views in the decimated and high resolution windows” of the image (*id.* at 6:10–12). Even further, the interface “can also bring up a full view of either the right or left image and pan in the same way as in the images previously described” (*id.* at 6:12–14).

In addition to the display, and navigation through, mammogram images, another “feature[] of the interface is the real-time grayscale adjustment” button 402 (*id.* at 5:39–40). The user can adjust “[t]hree scales . . . to set, with controls shown on the top right corner of FIG. 4, for example, the window width (button 404) and the level (button 405) and to change the gamma value (button 406)” (*id.* at 5:40–43). Furthermore, “[c]hanges can be made in one of the smaller windows, which is transmitted

to its respective selected section window . . . and then applied to all four of the smaller windows” (*id.* at 5:43–46; *see id.* Fig. 5).

E. Challenged Claims

Challenged claims 2, 3, and 17 are independent and are reproduced below.

2. A system for interfacing a digitized mammogram to a user comprising:

a. a monitor capable of displaying image data in a predetermined format, and in varying grayscale colors, said monitor having a predetermined illumination capability;

b. an electronic storage medium with digitized mammogram image data, said digitized mammogram image data corresponding to a film mammogram image and the digitized mammogram image data having grayscale values corresponding to the optical densities of the film mammogram image;

c. a processor in circuit communication with said monitor and said electronic storage medium; and

d. an input device in circuit communication with said processor;

said processor being adapted to receive input signals from said input device, and being responsive to a signal from said input device to transfer digitized image data from said electronic storage medium to said monitor in a way that causes the monitor to produce a display having a plurality of windows and to display a mammogram image in a different form in each window with grayscale values that, along with the illumination characteristics of said monitor, appears to a user as a mammogram in each window under a predetermined illumination state, thereby interfacing said mammogram image in each window and in a predetermined illumination state to an operator handling said input device;

said processor being adapted to receive further input from said input device related to the mammogram image in a selected window, said further input from said input device including input

that selectively controls the grayscale values of the mammogram image in the selected window, thereby enabling an operator handling said input device to selectively control the illumination state with which the mammogram image in the selected window is displayed to the operator

(Ex. 1001, 9:15–54).

3. A system for providing an interface between a medical image and a user comprising:

means for establishing electronic communications with a processor for receiving a stored digitized medical image comprising data representative of a plurality of greyscale values;

means for communicating with a display means; and

software means loadable into the processor comprising:

means for receiving a signal from a user-operable device;

means controllable by a signal from the user-operable device for transforming the image into a plurality of varying-resolution forms, each form having a different set of greyscale values; and

means for displaying the forms on the display means, each form displayed within a different sector of the display means

(*id.* at 9:55–10:5).

17. A system for analyzing a set of digitized mammography images, the set comprising a plurality of views from a unitary patient, the system comprising:

a first and a second display monitor;

a processor having means for communicating with an image storage device and software means resident thereon, the software means comprising:

means for receiving a signal from a user-operable device;

means controllable by a signal from the user-operable device for transforming the image into a plurality of varying-resolution forms, each form having a different set of greyscale values; and

means for displaying a first form on the first monitor and
a second form on the second monitor

(*id.* at 10:50–65).

F. References Relied Upon

Petitioner relies upon the following prior art references:

Reference	Exhibit
Brent K. Stewart et al., Clinical Utilization of Grayscale Workstations, IEEE Engineering in Medicine and Biology Magazine, Vol. 12, Issue 1, 86 (March 1993) (“Stewart”).	1005
Matthew T. Freedman, MDIS Compatibility: Computer Assisted Quality Control and Telemammography (Breast Cancer), Annual Report for Grant No. DAMD17-93-J-3015 (January 20, 1994) (“Freedman”).	1006
L.D. Cade et al., MDIS: The New Standard in Filmless Imaging, Administrative Radiology, Vol. XII, No. XI, 59 (November 1993) (“Cade”).	1007

(Pet. 2–3).

Petitioner also relies on the Declaration of Dr. Bryan P. Bergeron, M.D., for support of its contentions in the Petition (Ex. 1003).

G. Asserted Grounds

Petitioner asserts that claims 2–6, 9–11, 16, and 17 are unpatentable on the following grounds:

Claim Challenged	35 U.S.C. §	References/Basis
2–6, 9–11, 16, 17	102	Stewart
2–6, 9–11, 16, 17	103	Fredman, Cade

(Pet. 3).¹

¹ The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284, 287–88 (2011), amended 35 U.S.C. § 103, became effective on March 16, 2013. Because the application from which the ’937 Patent issued was filed before this date, the pre-AIA version of § 103 applies.

II. ANALYSIS

A. Level of Ordinary Skill in the Art

The level of skill in the art is a factual determination that provides a primary guarantee of objectivity in an obviousness analysis (*Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 1324 (Fed. Cir. 1999) (citing *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966); *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991))).

Petitioner asserts that a “person of ordinary skill in the art (‘POSITA’) at the time of the alleged invention would have at least three years’ experience developing software for computer workstations, and at least one year of this experience in a clinical environment” (Pet. 8 (citing Ex. 1003 ¶ 27)).

The prior art itself demonstrates the level of ordinary skill in the art at the time of the invention (*see Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (explaining that specific findings regarding ordinary skill level are not required “where the prior art itself reflects an appropriate level and a need for testimony is not shown”) (quoting *Litton Indus. Prods., Inc. v. Solid State Sys. Corp.*, 755 F.2d 158, 163 (Fed. Cir. 1985))).

Based on the present record and the disclosure in the ’937 Patent, we apply Petitioner’s definition of the level of ordinary skill in the art. We determine the definition offered by Petitioner—as interpreted by the panel—comports with the qualifications a person would have needed to understand and implement the teachings of the ’937 Patent and the prior art of record (*cf. Okajima v. Bourdeau*, 261 F.3d at 1355 (the prior art itself may reflect an appropriate level of skill in the art)).

B. Claim Construction

1. Legal Standard

We construe claim terms according to the standard set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–17 (Fed. Cir. 2005) (en banc) (37 C.F.R. § 42.100(b) (2021)). Under *Phillips*, claim terms are afforded “their ordinary and customary meaning” (*Phillips*, 415 F.3d at 1312). “[T]he ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention” (*id.* at 1313). “Importantly, the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification” (*id.*). An inventor may rebut that presumption by providing a definition of the term in the specification “with reasonable clarity, deliberateness, and precision” (*In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994)). In the absence of such a definition, limitations are not to be read from the specification into the claims (*In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993)).

2. Analysis

Petitioner states that it does “not believe any terms in the ’937 patent require construction in this proceeding” (Pet. 9). Petitioner does, however, “address the construction of the means-plus-function limitations of claims 3, 9, 11, 16 and 17” (*id.* at 9–17).

Petitioner also notes “[s]everal terms of the ’937 patent were construed in *Univ. of South Florida Research Foundation, Inc. v. Brit Systems, Inc.*, Case No. 3:18-cv-250 (N.D. Tex.)” (*id.* at 17), but Petitioner further states that it “do[es] not believe it necessary to construe any of the terms construed in the *Brit* case, except applicable means-plus-function

terms” (*id.* at 18–19 (citing Ex. 1014, 54–65)). Petitioner states that the District Court’s remaining claim constructions “do not need to be construed here to decide patentability” (*id.* at 19).

Based on the record before us, we determine that no means-plus-function terms require construction. Instead, only the claim limitation discussed below needs to be expressly construed for purposes of this Decision.

a) “*display a mammogram image in a different form in each window with grayscale values that, along with the illumination characteristics of said monitor, appears to a user as a mammogram in each window under a predetermined illumination state*”

Claim 2 recites “display[ing] a mammogram image in a different form in each window with grayscale values that, along with the illumination characteristics of said monitor, appears to a user as a mammogram in each window under a predetermined illumination state” (Ex. 1001, 9:37–42).

Claim 3 recites “transforming the image into a plurality of varying-resolution forms, each form having a different set of greyscale values; and . . . displaying the forms on the display means, each form displayed within a different sector of the display means” (*id.* at 9:67–10:3). Claim 17 recites “transforming the image into a plurality of varying-resolution forms, each form having a different set of greyscale values; and . . . displaying a first form on the first monitor and a second form on the second monitor” (*id.* at 10:61–65).

In accordance with 37 C.F.R. § 42.100(b), we have considered the District Court’s interpretation of this phrase as set forth in *University of South Florida Research Foundation, Inc. v. Brit Systems, Inc.*, Case No. 3:18-cv-250 (N.D. Tex.) (*see* Ex. 1014, 21–27, 54–55). We note, however, that this District Court case did not include Petitioner as a party (*see id.* at 1).

We look to the Specification in interpreting the limitation. None of the terms in the above limitation is defined expressly in the '937 Patent (*see generally* Ex.1001). The Specification describes, however, “a case may contain single-view or standard four-view mammograms (left and right medio-lateral, ML, left and right cranio-caudal, CC)” (*id.* at 5:2–5). Thus, the '937 Patent distinguishes a “case” from a “mammogram” — a mammogram is one slice of the case, not all the slices of a breast mammography (case). The '937 Patent further describes an “analysis window,” in which “decimated views 41, 42 of the original images are provided in the upper section [and] . . . the lower part two windows 43, 44 display selected sections . . . at high resolution” (*id.* at 5:21–25). Thus, the analysis window provides, on one side, a view of an original image (e.g., left CC) in one form (e.g., decimated view 41), and a view of that original image in another form (e.g., high-resolution view 43) (*id.*; *see also id.* at Fig. 3). On the other side, the analysis window also provides a view of an original image (e.g., right CC) in one form (e.g., decimated view 42), and a view of that original image in another form (e.g., high-resolution view 44). Based on the record before us, “a mammogram image” is an image that is originally taken (“original image”), i.e., the left or right medio-lateral images, etc.

The '937 Patent further describes “[t]his arrangement enables the physician to keep the overview . . . while looking at the high-resolution sections” (*id.* at 5:25–28). “The overview images are lower-resolution, reduced-sized images and are displayed in a short-time period” (*id.* at 7:6–8). “[A] common practice is to scan through the image in the decimated view but pan in the high-resolution view for a thorough and slow examination of certain regions of interest” (*id.* at 5:34–38). Thus, the '937

Patent describes “display[ing] a mammogram image in a different form in each window,” e.g., both a lower-resolution, reduced-size (decimated) view of an original image and a higher-resolution view of that image in a window. Additionally, the ’937 Patent describes real-time grayscale adjustment of the window (*id.* at 5:39–40).

In light of the disclosure of the ’937 Patent, we determine that the limitation “display a mammogram image in a different form in each window with grayscale values, along with the illumination characteristics of said monitor, appears to a user as a mammogram in each window under a predetermined illumination state” means the original mammogram image is displayed in a different form (i.e., different resolution) in each window “with grayscale values that, along with the illumination characteristics of said monitor, appears to a user as a mammogram in each window under a predetermined illumination state.”

For similar reasons, we determine “transforming the image into a plurality of varying-resolution forms, each form having a different set of greyscale values; and . . . displaying the forms on the display means, each form displayed within a different sector of the display means,” as recited in claim 3 (Ex. 1001, 9:67–10:3) means the original mammogram image is displayed in a different form within a different sector of the display means. We further determine, “transforming the image into a plurality of varying-resolution forms, each form having a different set of greyscale values; and . . . displaying a first form on the first monitor and a second form on the second monitor,” as recited in claim 17 (*id.* at 10:61–65) means the original image is transformed into a plurality of varying-resolution forms, having different set of greyscale values, and displaying a first and a second form on a first and a second monitor, respectively.

b) Other terms

We determine we do not need to expressly construe any other terms for purposes of this Decision (*see Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (citing *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (“[O]nly those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy.”))).

C. Asserted Anticipation over Stewart

Petitioner contends Stewart anticipates claims 2–6, 9–11, 16, and 17 (Pet. 20).

1. Stewart (Ex. 1005)

Stewart is an article titled “Clinical Utilization Of Grayscale Workstations,” published March 1993 (Ex. 1005, 86). Stewart describes “high-resolution grayscale display workstations to generate a consultative report” in medical imaging, e.g., mammography (*id.*; *see id.* Table 3). Stewart describes “[p]resentation functions [that] provide for the interactive selection, positioning, and sequencing of image data on the display screen” (*id.* at 95). Stewart describes an example in which a “tile mode allows side-by-side presentation of images of an examination” (*id.*).

One of the “Major Categories of Workstation Operations” is “Case Selection” (*id.* at 92). In the Case Selection operation, image sets are selected by the user, e.g., a radiologist, for a study (*id.* at 95). In an “initial survey phase, the radiologist simultaneously views all images acquired for the study as well as corresponding comparison images from previous examinations” (*id.*). Those images can be presented in a “tile presentation mode [which] maximizes the number of simultaneous images displayed without compromising image quality” or in a “split screen option [which]

allows an image set to span either: (1) two display monitors. (2) one display monitor, (3) one-half display monitor (two image sets per display monitor), or (4) one-quarter display monitor (four image sets per display monitor)” (*id.*). After that initial survey phase, “the radiologist concentrates on a few select images that most clearly show the patient pathology” (*id.*). Relevant “images may span more than one image set and may include pre- and post-contrast studies, various window and level settings, different pulse sequence and/or modality scans, and historical temporal comparisons” (*id.*). Ultimately, “only the most relevant images for the study are displayed” (*id.*).

Additional features of Stewart’s workstations are “[i]nteractive manipulation operations” which “enhance the visibility of anatomical and pathological features” (*id.* at 96). “The basic tools required include intensity transformation tables (automatic pre-set windows, manual independent window and level control, and image reversal) and image enlargement and translation (zoom and pan)” (*id.*). Further, “[i]n all probability, adjustment will be performed on each displayed image” (*id.*).

2. Independent claim 2

Petitioner contends Stewart anticipates independent claim 2 (Pet. 23–33).

- a) *“a monitor to produce a display having a plurality of windows and to display a mammogram image in a different form in each window with grayscale values that, along with the illumination characteristics of said monitor, appears to a user as a mammogram in each window under a predetermined illumination state”*

Petitioner relies on Stewart to disclose “a display having a plurality of windows and to display a mammogram image in a different form in each window” (Pet. 27–31 (citing Ex. 1005, 91–95, Fig. 7; Ex. 1003 ¶¶ 55, 57)).

We determine Petitioner has not shown reasonably that Stewart discloses these features. More specifically, Petitioner asserts Stewart “discloses that the images can be show[n] on the workstation in multiple windows on a single monitor” (*id.* at 28) because Stewart describes a “split screen option [which] allows an image set to span either . . . (2) one display monitor, (3) one-half display monitor (two image sets per display monitor), or (4) one-quarter display monitor (four image sets per display monitor)” (Ex. 1005, 95). Petitioner contends “Stewart displays multiple windows of patient images over two monitors” and “[e]ach of the windows displays the image using a different greyscale value” (Pet. 29). Petitioner further contends Stewart includes a “‘Case Selection’ operation where the radiologist can, for example, select a ‘next case based on a radiologist’s work list’” and, then, in a “tile presentation mode,” “maximize[] the number of simultaneous images displayed without compromising image quality” (*id.* (citing Ex. 1005, 92, 95, Fig. 7)). Petitioner highlights that Stewart describes “once a case is selected, a radiologist may focus in on a ‘few select images’” which “may span more than one image set and may include . . . various window and level settings” (Pet. 30 (citing Ex. 1005, 95)). Thus, Petitioner explains, “not only can the initial presentation of images appear in various grayscale values, but also further displays of images can do the same” (Pet. 30 (citing Ex. 1003 ¶ 55)). Additionally, Petitioner asserts Stewart’s “images are stored with a greater bit depth (12-bits) than they may be displayed (8-bits),” and, therefore, Stewart’s displayed “images are transformed into different forms having varying resolutions” (Pet. 31 (citing Ex. 1005, 95)).

Petitioner, however, has not shown reasonably where, or how, those cited portions of Stewart disclose different *forms* of a mammogram image

are *displayed* in multiple respective windows, i.e., “a plurality of windows . . . display[ing] a mammogram image in a different form in each window,” as recited in claim 2. In particular, Petitioner has not reasonably shown, or explained how, either of Stewart’s split screen option or tile mode displays different *forms* of the original image (*see* generally Pet.). Nor has Petitioner shown Stewart’s split screen option or tile mode displays those different forms of the original image in respective windows. Petitioner points out (Pet. 29) that Stewart describes the “tile presentation mode maximizes the number of simultaneous images displayed without compromising image quality” (Ex. 1005, 95, Fig. 7). That description, however, discloses displaying multiple (i.e., different) images in multiple windows, rather than displaying different *forms* of an image in multiple windows. Further, Petitioner contends that Stewart’s “**split screen option** allows an image set to span either (1) two display monitors, (2) one display monitor, (3) one-half display monitor (two image sets per display monitor), or (4) one-quarter display monitor (four image sets per display monitor)” ((Pet. 28 (quoting Ex. 1005, 95))). That description, however, like the description of tile mode, describes displaying multiple *images* in multiple windows instead of different *forms* of an image in multiple windows. For example, the split screen option displays *one* image split over more than one monitor — not one image in different forms over more than one monitor.

Additionally, although Petitioner contends Stewart describes “images are transformed into different forms having varying resolutions” (Pet. 31 (citing Ex. 1005, 95 (“images are stored with a greater bit depth (12-bits) than they may be displayed (8-bits)”))), that portion of Stewart does not describe that different forms of a mammogram image are *displayed* in multiple windows. Rather, the cited disclosure in Stewart describes a

mammogram image *stored* in a different form. In particular, the cited description of Stewart discloses an image is *stored* with “a greater bit depth” than displayed (Ex. 1005, 95). That portion of Stewart does not describe that images are displayed in a *plurality* of different bit depths, i.e., “a plurality of windows” having “a different form” of a mammogram image “in each window.”

Furthermore, Petitioner’s expert declaration of Dr. Bryan P. Bergeron does not explain reasonably how, or show where, the cited portions of Stewart describe displaying different forms of an image in multiple windows. Dr. Bergeron states that, in Stewart, “not only can the initial presentation of images appear in various grayscale values, but also further displays of images can do the same” (Ex. 1003 ¶ 55). Dr. Bergeron further states that “pursuant to the monitor characteristics and the window and level settings for display, images are transformed into forms, which may be shown in various windows, and each having a predetermined illumination state” (*id.* ¶ 56). Dr. Bergeron’s declaration describes different *images* being displayed in some particular form, i.e., at some display setting. None of Dr. Bergeron’s statements establish or explain how different *forms* of an image are displayed in multiple windows on the same monitor.

Accordingly, based on the record before us, Petitioner has not reasonably shown that Stewart discloses “a monitor to produce a display having a plurality of windows and to display a mammogram image in a different form in each window,” as recited in independent claim 2.

b) Conclusion

Based on the record before us, Petitioner has not reasonably shown that Stewart discloses one of the limitations recited in independent claim 2, i.e., “a monitor to produce a display having a plurality of windows and to

display a mammogram image in a different form in each window.”

Accordingly, we determine that Petitioner has not shown a reasonable likelihood of prevailing on its assertion that Stewart anticipates independent claim 2.

3. *Independent claim 3*

Petitioner contends Stewart anticipates independent claim 3 (Pet. 33–38).

- a) *transforming the image into a plurality of varying-resolution forms . . . displaying the forms on the display means, each form displayed within a different sector of the display means*

Petitioner, referencing its analysis of claim 2, relies on Stewart to disclose “transforming the image into a plurality of varying-resolution forms” (Pet. 36 (citing Ex. 1005, 92, 95)). Petitioner further relies on Stewart to disclose “displaying the forms on the display means, each form displayed within a different sector of the display means” (*id.* at 37–38 (citing Ex. 1003 ¶ 83)). In particular, Petitioner references “the analysis of claim 2 that Stewart discloses a processor with software for displaying forms in separate windows across multiple monitors” (*id.* at 37–38).

As similarly discussed above in regards to claim 2, however, Petitioner does not reasonably show that Stewart describes displaying different forms of an image in different portions of a display screen. The limitation recites “transforming *the image* into a plurality of varying-resolution forms,” and so, requires that the image is transformed into different forms. The claim further recites “displaying the forms on the display means, *each form displayed within a different sector* of the display means,” and so requires that those different forms, transformed from the image, are displayed on different sectors of the display. As discussed above,

Petitioner discusses portions of Stewart which describe displaying various images in respective windows, but has not reasonably shown, or explained how, Stewart describes an image which is transformed into different forms, and those different forms of the image are displayed in respective windows.

Accordingly, Petitioner has not reasonably shown that Stewart discloses “transforming the image into a plurality of varying-resolution forms . . . displaying the forms on the display means, each form displayed within a different sector of the display means,” as recited in independent claim 3.

b) Conclusion

Based on the record before us, Petitioner has not reasonably shown that Stewart discloses one of the limitations — “transforming the image into a plurality of varying-resolution forms . . . displaying the forms on the display means, each form displayed within a different sector of the display means” — recited in independent claim 3. Accordingly, we determine that Petitioner has not shown a reasonable likelihood of prevailing on its assertion that Stewart anticipates independent claim 3.

4. Independent claim 17

Petitioner contends Stewart anticipates independent claim 17 (Pet. 38–40).

- a) transforming the image into a plurality of varying-resolution forms . . . displaying a first form on the first monitor and a second form on the second monitor*

Petitioner, referencing its analysis of claim 3, which in-turn references Petitioner’s analysis of 2, relies on Stewart to disclose “transforming the image into a plurality of varying-resolution forms” (Pet. 39–40). Further, Petitioner, referencing its analysis of claim 2, relies on Stewart to disclose

“displaying a first form on the first monitor and a second form on the second monitor” (*id.* at 40). We determine Petitioner has not reasonably shown that Stewart discloses these features.

As similarly discussed above, these limitations require that an image is transformed into multiple different resolutions (i.e., forms), and that those different resolution images are displayed on different displays, i.e., “displaying a first form on the first monitor and a second form on the second monitor.” Although Petitioner asserts that “Stewart disclose[s] a processor with software for displaying various forms across multiple monitors, including according to a default display protocol” (Pet. 40), Petitioner has not shown where, or explained how, different *resolution* versions of the original image, are displayed on different monitors. Instead, Petitioner has only shown that Stewart displays different images on different monitors.

Accordingly, based on the record before us, Petitioner has not established that it is reasonably likely to prevail in showing that Stewart discloses “transforming the image into a plurality of varying-resolution forms . . . displaying a first form on the first monitor and a second form on the second monitor,” as recited in independent claim 17.

b) Conclusion

Based on the record before us, we determine that Petitioner has not shown a reasonable likelihood of prevailing on its assertion that Stewart anticipates independent claim 17 because Petitioner has not sufficiently shown Stewart discloses “transforming the image into a plurality of varying-resolution forms . . . displaying a first form on the first monitor and a second form on the second monitor,” as recited in claim 17.

5. *Dependent Claims 4–6, 9–11, and 16*

Petitioner asserts Stewart discloses the limitations as recited in claims 4–6, 9–11, and 16 (Pet. 41–45 (citing Ex. 1005, 91, 92, 94, 96, 101; Ex. 1001, 4:18–24; Ex. 1003 ¶¶ 90, 95, 101)²). These claims depend, either directly or indirectly, on independent claim 3. Because Petitioner has not shown a reasonable likelihood of prevailing on its assertion that Stewart anticipates independent claim 3, Petitioner has also not shown a reasonable likelihood of prevailing on its assertion that Stewart anticipates these dependent claims.

D. *Asserted Obviousness over Freedman and Cade*

Petitioner contends the combination of Freedman and Cade renders claims 2–6, 9–11, 16, and 17 obvious (Pet. 45).

1. *Freedman (Ex. 1006)*

Freedman is a report titled “MDIS Compatibility: Computer Assisted Quality Control and Telemammography (Breast Cancer)” (Ex. 1006, 1). Freedman describes a “digital mammography system” which includes “methods for image display” on a computer workstation monitor (*id.* at 5; *see id.* at 6–7). Freedman’s workstation, generally, “provide[s] multiple image manipulation and enhancement functions through use of a graphical user interface (GUI)” (*id.* at 11). Functions include “[a] mouse driven cursor selection/ deselection tool will allow individual images to be selected/ deselected for image manipulation,” e.g., “all images in an exam [can be selected] for image manipulation” (*id.* at 12). Another function displays “multiple images on a single monitor with a rearrangement

² We note in setting forth that Stewart discloses the limitations of claim 4 and claim 6, Petitioner refers generically to “the analysis of claim 2” without any specific cites (Pet. 41–42).

capability” (*id.*). Yet another function is a “Multiformat Image Tool” which “display[s] multiple images across multiple monitors in a 1:1, 2:1, 4:1 and 6:1 option as a minimum” (*id.*). For example, the “4:1 image option will allow all the exams [to] be viewed across four monitors in a minified view, four images of one exam seen on each monitor” (*id.*). A “Next Exam” function “close[s] the exam that was just read and diagnosed” and goes on to display the next exam” using “default display protocols” (*id.* at 13).

Freedman also provides “multiple user-selectable image enhancement defaults for gray scale windowing and leveling” (*id.*). In one instance, the “images of an exam displayed will automatically be window and leveled at a user’s and/or departmental default” (*id.*). In another instance, windowing and leveling can be “dynamic” and applied “for images on all monitors, a single monitor, or a specified region of interest on a single monitor” (*id.* at 14). Windowing and leveling can “be applied only to the images selected . . . which may be all images or only a selected subset of an exam” (*id.*).

2. Cade

Cade is an article titled “MDIS: The New Standard in Filmless Imaging” (Ex. 1007, 59). Cade describes a Medical Diagnostic Imaging Support (MDIS) System which provides diagnostic medical imaging functions (*id.* at 59–60). Those functions:

1. Acquire diagnostic images in a digital format and gate them into the system.
2. Communicate patient demographics and study information into a Radiology Information System (RIS).
3. Archive and manage images and data in a database.
4. Rapidly display images and patient data on workstations.

(*id.* at 60). Cade’s system allows a “physician [using] a viewing workstation to access patient images and exam reports via a high-speed fiber optic network through a centralized Work Storage Unit (WSU)” (*id.*).

Cade states that the “basic platform for the workstation is the Macintosh IIfx computer with 8 MB RAM and 80 MB internal disk drive with special image processing boards inserted by Loral and Siemens” (*id.*). Furthermore, Cade’s “image display subsystem uses high resolution computer video terminals to display diagnostic-quality, soft-copy medical images and data” (*id.*).

3. Independent claim 2

Petitioner contends independent claim 2 is obvious over the combination of Freedman and Cade (Pet. 49–59).

- a) *“display a mammogram image in a different form in each window with grayscale values that, along with the illumination characteristics of said monitor, appears to a user as a mammogram in each window under a predetermined illumination state”*

Petitioner asserts Freedman teaches “a display having a plurality of windows and to display a mammogram image in a different form in each window” (Pet. 55–57). Based on the record before us, we determine Petitioner has not reasonably shown that Freedman teaches these features.

As discussed above, claim 2 requires “a plurality of windows . . . display[ing] a mammogram image in a different form in each window,” i.e., different forms of a mammogram image are displayed in multiple windows. Petitioner highlights portions of Freedman that describe displaying various mammogram images on a display; however, those cited teachings do not describe different *forms* of an image are displayed. In particular, Petitioner contends Freedman “allow[s] display of multiple images on a single monitor,” “multiple images across multiple monitors,” and a display option

in which “four images of one exam [are] seen on each monitor” (Pet. 56 (quoting Ex. 1006, 11)).

Petitioner also asserts that Freedman describes “the images of an exam displayed will automatically be window and [gray scale] leveled” (Pet. 56–57 (quoting Ex. 1006, 11, 13)). Although Freedman describes that multiple images are displayed in different windows on a display, and that those images can be adjusted for gray scale, we determine that, based on the record before us, Petitioner has not shown where, or explained how, Freedman describes that different forms of the original image are displayed in multiple windows of a display.

Additionally, Petitioner asserts Freedman “discloses that images are stored with a greater bit depth (16-bits) than they may be displayed (8-bits)” and, therefore, “images are transformed into different forms having varying resolutions” (Pet. 57). Based on the record before us, Petitioner’s assertion, however, is not supported by Freedman. More specifically, Petitioner relies on § 4.1 of Freedman that describes “Display Monitors” to describe the bit depth (Ex. 1006, 8). Freedman teaches

Data Sets Available to the Monitors. The workstation shall accommodate individual images with a 4k x 5k by 16 bit deep images. (40 Mb of data/ image)

(*id.* at 8);

Gray Scale Display. No fewer than 256 shades of gray (8 bits deep) displayed on each monitor shall be provided

(*id.* at 9);

Frame Buffer. Shall be no less than 16 bits deep

(*id.*); and

Local Storage . . . Each image without compression represents 4k x 6k by 12 bits deep

(*id.* at 10). None of these descriptions teaches that images are stored with a greater bit depth than is displayed, and particularly, not that a 16-bit deep image is displayed in 8-bits. Rather, Freedman’s discussion regards what the bit depth of images may be, or the bit depth display capability of the monitor — but not that an image is transformed from a 16-bit deep image to an 8-bit deep image. Thus, Petitioner has not reasonably shown where Freedman describes displaying, in different windows different forms of the original image. As such, Petitioner has not reasonably shown, or explained how, these portions of Freedman teach “display a mammogram image in a different form in each window with grayscale values that, along with the illumination characteristics of said monitor, appears to a user as a mammogram in each window under a predetermined illumination state,” as recited in independent claim 2.

b) Conclusion

Based on the record before us, Petitioner has not reasonably shown that the combination of Freedman and Cade teaches all the limitations recited in independent claim 2. Accordingly, Petitioner does not establish a reasonable likelihood of prevailing on its assertion that independent claim 2 is obvious over the combination of Freedman and Cade.

4. Independent claim 3

Petitioner contends independent claim 3 is obvious over the combination of Freedman and Cade (Pet. 59–63).

a) transforming the image into a plurality of varying-resolution forms . . . [and] displaying the forms on the display means, each form displayed within a different sector of the display means

Petitioner contends Freedman teaches “transforming the image into a plurality of varying-resolution forms . . . displaying the forms on the display

means, each form displayed within a different sector of the display means” (Pet. 61–63). We determine, based on the record before us, Petitioner has not reasonably shown Freedman teaches these limitations.

More specifically, these limitations require transforming an image into multiple different resolutions, i.e., “transforming the image into a plurality of varying-resolution forms.” The limitations further require that those different resolution images are each displayed on a display, i.e., “each form displayed within a different sector of the display means.” Petitioner relies on its analysis of claim 2 to support its assertion that Freedman teaches those limitations (Pet. 61–63). However, as discussed above, Petitioner fails to show reasonably that those portions describe instances in which an image is displayed in different forms on the display or that the image is transformed into multiple different resolutions and displayed in respective different sectors.

Petitioner also points out “Freedman also describes that a user may control performance of such transformation by selecting the ‘next exam’ option,” the “next exam displayed will follow the default display protocols,” and “the images of an exam displayed will automatically be window and leveled at a user's and/or departmental default” (Pet. 62 (citing Ex. 1006 at 13)). Although those portions of Freedman describe displaying images at a “default” window and level, Petitioner fails to show reasonably that those portions describe an image displayed at different resolutions in respective different sectors, i.e., displaying different forms of varying-resolution of the original image.

As such, Petitioner has not reasonably shown, or explained how, Freedman teaches “transforming the image into a plurality of varying-

resolution forms . . . displaying the forms on the display means, each form displayed within a different sector of the display means.”

b) Conclusion

Upon review of the record, Petitioner has not reasonably shown that the combination of Freedman and Cade teaches all the limitations recited in independent claim 3. Accordingly, based on the record before us, Petitioner does not establish a reasonable likelihood that independent claim 3 is obvious over the combination of Freedman and Cade.

5. Independent claim 17

Petitioner contends independent claim 17 is obvious over the combination of Freedman and Cade (Pet. 63–66).

a) transforming the image into a plurality of varying-resolution forms, each form having a different set of greyscale values; and . . . displaying a first form on the first monitor and a second form on the second monitor

Petitioner relies on Freedman to teach “transforming the image into a plurality of varying-resolution forms, each form having a different set of greyscale values; and . . . displaying a first form on the first monitor and a second form on the second monitor” (Pet. 65–66). We determine Petitioner has not reasonably shown that Freedman teaches these features.

As similarly discussed above, these limitations require that an image is transformed into multiple different resolutions, i.e., “transforming the image into a plurality of varying-resolution forms.” The limitations further require that those different resolution images are displayed on different displays, i.e., “displaying a first form on the first monitor and a second form on the second monitor.” Petitioner relies its analysis of claims 2 and 3 to support its assertion that Freedman teaches those limitations (Pet. 65–66

(citing *id.* at 55–57, 61–63)). However, as discussed above, Petitioner fails to show reasonably that those portions describe that the same image is transformed into multiple different resolutions.

Nor does Petitioner reasonably show that those portions describe that different resolution images, transformed from the same image, are displayed on different displays. Although Petitioner contends that Freedman provides an “interactive option to display multiple images across multiple monitors in a 1:1, 2:1, 4:1 and 6:1 option as a minimum” (Pet. 56 (quoting Ex. 1006 at 12³)), Petitioner has not explained how those multiple images across multiple monitors are different resolution forms of the same image. Indeed, Freeman explains that the “4:1 image option will allow all the exams [to] be viewed across four monitors in a minified view, four images of one exam seen on each monitor,” suggesting that each monitor respectively displays the images of respective, different exams.

As such, Petitioner has not reasonably shown, or explained how, Freedman teaches “transforming the image into a plurality of varying-resolution forms, each form having a different set of greyscale values; and . . . displaying a first form on the first monitor and a second form on the second monitor.”

b) Conclusion

On this record, Petitioner has not reasonably shown that the combination of Freedman and Cade teaches all the limitations recited in independent claim 17. Accordingly, based on the record before us, Petitioner has not shown a reasonable likelihood of prevailing on its

³ We note that Petitioner cites to Exhibit 1006, page 11 for this assertion as well as several following assertions (Pet. 56). However, these quotes are not from page 11 of Exhibit 1006.

assertion that independent claim 17 is obvious over the combination of Freedman and Cade.

6. Dependent claims 4–6, 9–11, and 16

Petitioner asserts the combination of Freedman and Cade teaches the limitations as recited in claims 4–6, 9–11, and 16 (Pet. 66–69 (citing Ex. 1003 ¶¶ 125–126, 166; Ex. 1006, 8, 11, 22; Ex. 1016, 23–34); Ex. 1006, 11, 22; Ex. 1001, 4:15–24; Ex. 1003 ¶¶ 172, 178, 182)). Petitioner has not proffered any additional evidence showing Freedman, Cade, or the combination thereof teaches “transforming the image into a plurality of varying-resolution forms, each form having a different set of greyscale values; and . . . displaying the forms on the display means,” as recited in claim 3, however. Accordingly, based on the record before us, Petitioner has not shown a reasonable likelihood of prevailing on its assertion that any of claims 4–6, 9–11, or 16 is obvious over the combination of Freedman and Cade.

III. CONCLUSION

For the foregoing reasons, on the record before us, we are not persuaded that the Petition establishes a reasonable likelihood that Petitioner would prevail in showing that any of claims 2–6, 9–11, 16, and 17 of the ’937 Patent are unpatentable.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that the Petition is *denied*, and no trial is instituted.

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Patent 6,630,937 B2

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