

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

PIXART IMAGING, INC.,
Petitioner,

v.

SYNCPOINT IMAGING, LLC,
Patent Owner.

Case IPR2015-01347
Patent 6,275,214 B1

Before TRENTON A. WARD, STACEY G. WHITE, and
CHRISTA P. ZADO, *Administrative Patent Judges*.

ZADO, *Administrative Patent Judge*.

FINAL WRITTEN DECISION

35 U.S.C. § 318(a)

37 C.F.R. § 42.73

I. INTRODUCTION

We have authority to hear this *inter partes* review under 35 U.S.C. § 6(c), and this Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons that follow, we determine that Pixart Imaging, Inc. (“Petitioner”) has shown by a preponderance of the evidence that claims 1–4, 6–9, 11, 17–19, and 24–26 of U.S. Patent No. 6,275,214 B1 (Ex. 1001, “the ’214 patent”) are unpatentable. *See* 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d).

A. Procedural History

Petitioner filed a Petition (Paper 4, “Pet.”)¹ to institute *inter partes* review, and SyncPoint Imaging, LLC (“Patent Owner”) filed a Preliminary Response (Paper 8, “Prelim. Resp.”). On December 16, 2015, we instituted an *inter partes* review of claims 1–9, 11, 17–19, and 24–26 of the ’214 patent. Paper 12 (“Dec. to Inst”). Patent Owner filed a Response (Paper 15, “PO Resp.”), and Petitioner filed a Reply (Paper 20, “Reply”). Also, Patent Owner filed a Motion to Stay Co-pending Reexamination (Paper 16), and Petitioner filed an Opposition (Paper 17). A transcript of an oral hearing held on August 17, 2016 (Paper 26, “Tr.”) has been entered into the record.

B. Related Proceedings

The parties inform us that the ’214 patent has been asserted against Petitioner in *SyncPoint Imaging, LLC v. Nintendo of America, Inc.*, No. 2:15-cv-247 (E.D. Tex.). Pet. 2; Paper 7, 1. According to Petitioner, the district court action has been stayed pending the outcome of a bankruptcy

¹ Herein we cite to Petitioner’s Corrected Petition, filed on June 22, 2015.

proceeding, A.P. No. 16-01010-JMD (Bankr. D.N.H.), to resolve the ownership of the '214 patent. Paper 22, 1–2.

In addition, the '214 patent is the subject of an *ex parte* reexamination, Reexamination Control No. 90/020,085. Paper 9, 2.

C. The '214 Patent

The '214 patent is titled “Computer Presentation System and Method with Optical Tracking of Wireless Pointer,” and generally relates to a method or apparatus for remotely controlling a computer using an external cursor on a projected display screen associated with the computer. Ex. 1001, Abstract. Figure 1 of the patent is reproduced below:

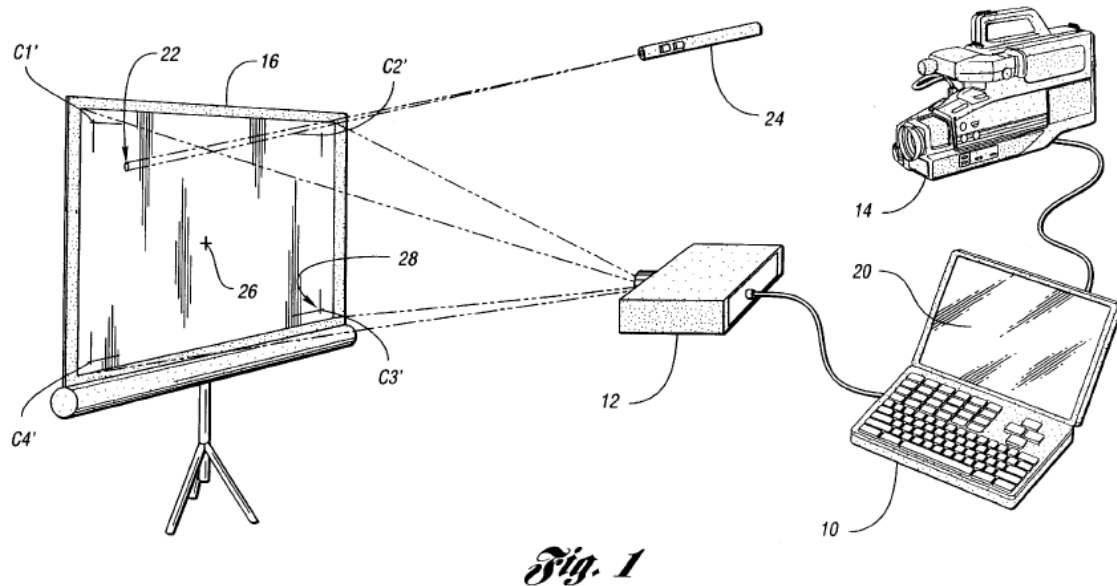


Figure 1 depicts laptop computer 10 connected to video projector 12, which projects image 16 from computer screen 20 onto screen 18. Ex. 1001, 3:5–9, 15–18. “Preferably, screen 18 is . . . a substantially planar surface remotely located from computer 10.” *Id.* at 3:9–11. In one embodiment, an external cursor 22 is generated by pointing hand-held optical pointer 24 at screen 18, thereby superimposing external cursor 22 on to image 16. *Id.* at 3:22–31.

The '214 patent provides that “[a]s used in this application, an external cursor is one which is generated externally relative to computer 10, i.e., generated by some other device which would include another computer, projector, or the like.” *Id.* at 3:24–28. Camera 14 captures image 16 generated by projector 12, and computer 10 processes the captured image to determine the position of external cursor 22 and at least one other property of external cursor 22. *Id.* at 3:41–62. In an embodiment, the at least one property may include intensity, color, shape, size, or a particular pattern of movement. *Id.* at 8:36–40. The detected position, in addition to the other detected property, is used to generate position-dependent commands to control computer 10. *Id.* at 3:41–62, 8:43–50. “Such position or context-dependent commands may emulate a ‘left-click’ or ‘right-click’ command generated by a traditional computer pointing device, such as a mouse, track ball, touch pad, or the like.” *Id.* at 3:56–59.

D. Illustrative Claims

Claims 1, 17, 19, 24, 25, and 26 are independent, and claims 2–9, 11, and 18 depend directly or indirectly from one of claims 1, 17, or 19. Claims 1 and 2 are reproduced below:

1. A method for remotely controlling a computer having an associated screen for displaying output from the computer and having an internal cursor generated by the computer, the method comprising:

- detecting at least one property of an external cursor and position of the external cursor relative to the output from the computer;

- generating a command to move the internal cursor to a position on the screen corresponding to the position of the external cursor;
 - and

- generating a command for the computer based on the at least one detected property of the external cursor.

2. The method of claim 1 wherein the step of detecting comprises:

capturing an image of the screen and the external cursor with a camera; and

processing the image to detect the at least one property of the external cursor.

E. Prosecution of the '214 Patent

During prosecution of the '214 patent, claim 1 was amended to distinguish over Hauck² as follows:

1. (Amended) A method for remotely controlling a computer having an associated screen for displaying output from the computer and having an internal cursor generated by the computer, the method comprising:

detecting at least one property of an external cursor and position of the external cursor relative to the [screen] output from the computer;

generating a command to move the internal cursor to a position on the screen corresponding to the position of the external cursor; and

generating a command for the computer based on the at least one detected property of the external cursor.

Ex. 1002, 56. To distinguish claim 1 over Hauck, Applicant for the '214 patent argued Hauck requires a user to illuminate a menu choice or on screen button to control the computer, in contrast to the claimed invention, which “uses an external cursor having a plurality of properties (such as shape, movement, pattern, color, etc.) to remotely control the computer, and does not rely solely on cursor position (i.e. presence or absence of a cursor within a button) to control the computer.” *Id.* at 60.

² U.S. Patent No. 5,515,079, issued May 7, 1996 (“Hauck”) (Ex. 1003).

Applicant further argued claims 8, 9, and 18, *inter alia*, were distinguishable over Arita³ on grounds that Arita does not disclose using a pointer with “multiple selectable properties to control the computer,” and “[t]o the extent any control to the computer is provided, the control is based on the position of the cursor and not the characteristic or property of the cursor.” *Id.* at 61.

The Examiner noted, in the reasons for allowing claims 1, 4–20, 23, 25, and 26, that neither Hauck nor Arita, either alone or in combination, teaches or suggests:

a method for generating computer commands having a processor in communication with a camera for processing the image in order to detect the position and at least one property of the external optical cursor and convert that position and at least one property of said external optical cursor to corresponding commands to move an internal cursor to a position corresponding to the external optical cursor and control the computer based on detected at least one property of the external optical cursor.

Id. at 72.

F. Art Cited in Petitioner’s Challenges

Petitioner cites the following references in its challenges to patentability:

Reference	Designation	Exhibit No.
WO 97/41502, published Nov. 6	Stove	1005
U.S. Patent No. 5,528,263, issued June 18, 1996	Platzker	1006
European Patent Application Pub. No. 0 484 160 A2, published May 6, 1992	Elrod	1008

³ U.S. Patent No. 5,712,658, issued Jan. 27, 1998 (“Arita”) (Ex. 1004).

Reference	Designation	Exhibit No.
U.S. Patent No. 5,235,363, issued Aug. 10, 1993	Vogeley	1009

G. Grounds of Institution

We previously instituted trial on the following grounds:

Claims 1, 2, 4, 5, 8, 9, 17–19, and 24–26 of the '214 patent under 35 U.S.C. § 102(b) as anticipated by Stove;

Claims 1–4, 6, 7, 9, 11, 17, 18, and 25 of the '214 patent under 35 U.S.C. § 102(b) as anticipated by Platzker;

Claims 1, 2, 4, 6, 8, 9, 11, 19, and 25 of the '214 patent under 35 U.S.C. § 102(b) as anticipated by Elrod; and

Claims 1, 2, 4, 7–9, 19, and 25 of the '214 patent under 35 U.S.C. § 102(b) as anticipated by Vogeley.
Dec. to Inst., 30–31.

H. Patent Owner's Motion to Stay Co-pending Reexamination

On March 1, 2016, Patent Owner filed an authorized Motion to Stay Co-pending Reexamination of the '214 patent, Reexamination Control No. 90/020,085. Paper 16. Petitioner filed an opposition to Patent Owner's motion. Paper 17. At the oral hearing, Patent Owner withdrew its motion. Tr. 74:8–24. At the hearing, Petitioner responded that it has no objection to Patent Owner withdrawing its motion. *Id.* at 75:2–5. Accordingly, Patent Owner's motion is withdrawn.

II. DISCUSSION

A. Claim Construction

In an *inter partes* review, claim terms in an unexpired patent are interpreted according to their “broadest reasonable construction in light of the specification of the patent” in which they appear. 37 C.F.R. § 42.100(b); *see also Cuozzo Speed Techs., LLC, v. Lee*, 136 S. Ct. 2131, 2141–46 (2016). The terms also generally are given their ordinary and customary meaning as would be understood by one of ordinary skill in the art in the context of the disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). We determine that it is unnecessary to construe any claim terms for purposes of this decision. *See Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011) (“[C]laim terms need only be construed ‘to the extent necessary to resolve the controversy.’”) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

B. Principles of Law

To prevail in its challenges to the patentability of the claims, Petitioner must prove its proposition by a preponderance of the evidence. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d). A claim is unpatentable under 35 U.S.C. § 102 if “the prior art reference discloses every element of the claim.” *In re King*, 801 F.2d 1324, 1326 (Fed. Cir. 1986) (citing *Lindemann Maschinenfabrik GMBH v. Am. Hoist & Derrick Co.*, 730 F.2d 1452, 1457 (Fed. Cir. 1984)). “[A]bsence from the reference of any claimed element negates anticipation.” *Kloster Speedsteel AB v. Crucible Inc.*, 793 F.2d 1565, 1571 (Fed. Cir. 1986).

C. Asserted Anticipation Based on Stove

Petitioner asserts that independent claims 1, 17, 19, and 24–26 of the '214 patent, and claims 2, 4, 5, 8, 9, and 18 depending directly or indirectly therefrom, are anticipated by Stove. Pet. 11–21; Reply 6–11. Petitioner proffers a Declaration of Dr. M. Ray Mercer to support its assertions.

Ex. 1010. Patent Owner disputes Petitioner's contentions, arguing that the claims are patentable over Stove. PO Resp. 12–18. We have reviewed the record, and we determine that the record supports Petitioner's contentions with respect to claims 1, 2, 8, 9, 17–19, and 24–26, and we adopt Petitioner's contentions discussed below as our own. For reasons that follow, we determine that Petitioner has shown by a preponderance of the evidence that claims 1, 2, 8, 9, 17–19, and 24–26 are unpatentable over Stove.

1. Overview of Stove

Stove is titled "Position Determination of a Laser Pointer in a Projection Display System," and discloses a projection display system.

Ex. 1005, 1:5. Stove discloses that the projection display system comprises:

[A] projector for projecting a computer generated display on to a screen, a pointer producing a narrow beam of radiation of higher intensity than the projected image, a video camera located in a fixed position relative to the projector and arranged to view the screen, and [a] means for analyzing the video signal produced by the camera to determine the point on the screen illuminated by the pointer.

Id. at 2:5–11. "By these means the computer is provided with information which enables it to determine where the pointer is pointed at on the screen."

Id. at 2:12–13. Stove further discloses the presentation on the screen of soft buttons for controlling the computer, wherein the button is actuated when

the radiation beam is maintained at a position on the button for a specified period of time. *Id.* at 2:23–28. “The computer then performs the appropriate operation in response to the simulated button pressing.” *Id.* at 2:28–29.

2. Analysis

a. Claim 1—Preamble

With respect to claim 1’s recitation of “[a] method for remotely controlling a computer having an associated screen for displaying output from the computer and having an internal cursor generated by the computer,” Petitioner relies on Stove’s disclosure of a projection display system comprising a projector for projecting a computer generated display on to a screen, wherein a user directs a red light laser pointer on the screen, and a cursor (e.g., an internal cursor) is generated and superimposed on to the image on the screen based on the location of the laser pointer on the screen. Pet. 13 (citing Ex. 1005, Abstract, 2:5–6, 3:2–3, 6:17–21, 10:17–18). Petitioner further relies on Stove’s disclosure of determining whether the laser pointer is located over a soft button or menu item on the display screen, and taking appropriate action based on that determination. Pet. 13 (citing Ex. 1005, 10:17–18). Without determining whether and to what extent the preamble of claim 1 is a limitation, we are persuaded by a preponderance of the evidence that Petitioner has shown Stove discloses this recitation.

b. Claim 1—“detecting at least one property”

With respect to claim 1’s recitation of “detecting at least one property of an external cursor,” Petitioner identifies the laser spot on the screen (e.g., the spot where the laser pointer is pointed) as an “external cursor,” and relies

on Stove's description of detecting the amount of time that the laser pointer is held over a particular location on the display screen for "detecting at least one property." Pet. 13 (citing Ex. 1005, 2:26–28, 7:6–7). Patent Owner argues that the amount of time that an external cursor is located at a given location, as disclosed in Stove, is not "a property" of the external cursor as claimed. PO Resp. 13–14. Patent Owner asserts that Petitioner's analysis "fails to understand that time is not a property of an optical cursor. One cannot examine an image, or any series of images, and determine the time of an optical cursor." *Id.* We are not persuaded by this argument. Petitioner does not rely on "time" alone as a property, but instead relies on the amount of time a laser spot (e.g., external cursor) remains at a particular location. Pet. 13, PO Resp. 9. The '214 specification does not expressly define the term "property," but it provides a non-limiting list of examples that include varying color, shape, size, intensity, illumination pattern, motion, and/or position of an external cursor. Ex. 1001, 3:28–33; *see also* Ex. 1001, 8:38–40. Petitioner argues that detecting the amount of time a cursor is at a particular location, as disclosed in Stove, is analogous to the '214 patent specification's disclosure of detecting motion as a property of an external cursor. Reply 9 (citing Ex. 1021 ¶ 11). In particular, Petitioner argues that the property "pattern of movement" in the '214 specification amounts to positions of the external cursor over multiple captured images, just as the time-related property in Stove amounts to positions of the external cursor over multiple captured images. Reply 9 (citing Ex. 1021 ¶ 11). Petitioner's expert, Dr. Mercer, explains that detecting the amount of time that a cursor is at a particular location is determined by looking at the position of the cursor over multiple captured image frames. Ex. 1021 ¶ 11. At the oral

hearing, Patent Owner agreed that looking at the position of a cursor over a series of image frames constitutes detecting a property of the cursor. Tr. 41:22–42:18, 43:10–15. Patent Owner attempted to distinguish Stove at the oral hearing on the grounds that one of the examples of how to determine time involves using a time stamp on an image (Tr. 45:15–46:5), but the claims do not preclude using time stamps, and Patent Owner’s argument overlooks the fact that even if time stamps are used, the position of the cursor over multiple frames (e.g., a property (see Ex. 1001, 3:33 (describing position as a property of an external cursor))) still must be detected. Accordingly, we are persuaded that Petitioner has shown by a preponderance of the evidence that Stove discloses detecting a property of an external cursor.

c. Claim 1—“position of the external cursor”

With respect to the recitation “detecting . . . position of the external cursor relative to the output from the computer,” as recited in claim 1, Petitioner relies on Stove’s disclosure of detection of the absolute X and Y position of a laser spot on the screen. Pet. 13 (citing Ex. 1005, 6:8–9, 7:13–15, 10:8–10). We are persuaded that Petitioner has shown by a preponderance of the evidence that Stove discloses this limitation.

d. Claim 1—“generating a command to move the internal cursor”

Petitioner relies on Stove’s disclosure of generating a mouse cursor (e.g., internal cursor) that follows the red light laser pointer (e.g., external cursor) of the display screen for disclosure of “generating a command to move the internal cursor to a position on the screen corresponding to the position of the external cursor,” as recited in claim 1. Pet. 14 (citing

Ex. 1005, 10:15–18). We are persuaded that Petitioner has shown by a preponderance of the evidence that Stove discloses this limitation.

e. Claim 1—“generating a command for the computer”

With respect to the recitation “generating a command for the computer based on the at least one detected property of the external cursor,” as recited in claim 1, Petitioner relies on Stove’s disclosure of causing a soft button to be operated (e.g., generating a command) when a laser spot is held over a certain position for a given period of time (e.g., when at least one property of the external cursor is detected). Pet. 14 (citing Ex. 1005, 2:26–28). Accordingly, we are persuaded that Petitioner has shown by a preponderance of the evidence that Stove discloses this limitation.

f. Prosecution of the ’214 Patent

In support of its contention that claim 1 is patentable over Stove, Patent Owner argues that during prosecution of the ’214 patent, the applicant distinguished claim 1 in a manner that precludes “pointing the external cursor at displayed command structures such as a ‘soft button’ or a ‘menu item’ in order to generate a command,” as disclosed in Stove. PO Resp. 12–13. For the following reasons, we disagree.

Stove discloses that when the laser beam (e.g., external cursor) is pointed at the position of a soft button on the display screen for a given period of time, the soft button is caused to be operated. Ex 1005, 2:26–29. Operations of the soft button (e.g., the commands generated) include causing a preceding or succeeding image to be displayed, enlarging a portion of an image, and bringing up a menu on the display screen. *Id.* at 2:29–3:1. In particular, Petitioner relies specifically on Stove’s detection of the amount of time that the laser beam is pointed at a location for the limitations “detecting

at least one property,” and “generating a command for the computer based on the at least one detected property,” as recited in claim 1. Pet. 13–14 (citing Ex. 1005, 2:26–28, 7:6–7). Claim 1 does not contain language that would preclude the command for the computer to be based on factors in addition to the detected at least one property, such as detection of the external cursor over a soft button or menu item. At the oral hearing, Patent Owner conceded that claim 1 does not expressly exclude the use of soft buttons and menu items:

JUDGE ZADO: So then do any of the challenged claims expressly preclude the use of soft buttons and menu – popup menus for menu-driven systems []?

MR. DAVIS: No. I don’t believe there’s any in claim 1 which would preclude that type of deployment

....

Tr. 55:19–24. The additional challenged claims similarly do not contain preclusive language.

The ’214 patent specification supports an interpretation that the challenged claims do not exclude methods and systems having soft buttons and menu items. In describing the “Disclosure of Invention,” the ’214 patent specification discloses that “[c]ommands may be used to emulate control of the computer typically provided by a pointing device such as a mouse, track ball, or the like.” Ex. 1001, 2:28–30. Accordingly, the ’214 patent invention contemplates generating computer commands by pointing a cursor over specific locations on a computer display and emulating clicking a mouse button at that location. This is confirmed by the ’214 patent specification’s disclosure that “context-sensitive or position-sensitive commands may be generated by varying one or more properties for

a particular position of the external cursor.” Ex. 1001, 8:64–67. As an example, the ’214 specification discloses an embodiment directed to emulation of “left-click” and “right-click” commands generated by a computer pointing device such as a mouse, track ball, or touch pad. *Id.* at 3:52–62, 9:1–11. With respect to this embodiment, detection of a right or left mouse button click is based on detecting properties of the external cursor including “intensity, color, and pattern (shape) of the external cursor,” and this detection is used to generate corresponding commands to control the computer. *Id.* at 9:11–26. The commands generated as a result of a right or left mouse button click are described as being position-dependent commands. *Id.* at 3:52–62. Accordingly, the ’214 patent specification discloses that commands generated as the result of a left or right mouse button click (e.g., based on a detected property other than position) also are based on the position of the external cursor (e.g., over a soft button or menu item) when the left or right mouse button click occurs.

Patent Owner’s reliance on the ’214 prosecution history does not persuade us of a different result. Prior to amendment, claim 1 recited detecting at least one property of an external cursor. Ex. 1002, 56. According to the ’214 patent specification, the position of the external cursor is a property. Ex. 1001, 3:49–55. It was sufficient, therefore, to detect only the position of the external cursor in order to satisfy this limitation. In order to distinguish claim 1 from Hauck, which discloses detecting the position of an external cursor over a menu item or screen button, applicant amended claim 1 to recite detecting at least one property *and* detecting position. Ex. 1002, 56. Accordingly, claim 1 was amended to require that a property other than position also be detected.

To distinguish claim 1 over Hauck, Applicant for the '214 patent argued Hauck requires a user to illuminate a menu choice or on screen button to control the computer, in contrast to the claimed invention, which “uses an external cursor having a plurality of properties (such as shape, movement, pattern, color, etc.) to remotely control the computer, and does not rely solely on cursor position (i.e. presence or absence of a cursor within a button) to control the computer.” *Id.* at 60. Applicant did not clearly disavow systems that have soft buttons and menu items. Rather, applicant distinguished the claim over a system that does not disclose or teach detecting at least one property in addition to position. Similarly, Applicant argued that claims 8, 9, and 18, *inter alia*, were distinguishable over Arita⁴ on grounds that Arita does not disclose using a pointer with “multiple selectable properties to control the computer,” and “[t]o the extent any control to the computer is provided, the control is based on the position of the cursor and not the characteristic or property of the cursor.” *Id.* at 61.

In the reasons for allowance, the Examiner did not refer to soft buttons or menu items, but instead referred to lack of disclosure or teaching of detecting at least one property in addition to position, noting that neither Hauck nor Arita, either alone or in combination, teaches or suggests:

a method for generating computer commands having a processor in communication with a camera for processing the image in order to detect the position and at least one property of the external optical cursor and *convert that position and at least one property of said external optical cursor to corresponding commands* to move an internal cursor to a position corresponding to the external optical cursor and control the computer based on detected at least one property of the external optical cursor.

⁴ U.S. Patent No. 5,712,658, issued Jan. 27, 1998 (“Arita”) (Ex. 1004).

Id. at 72 (emphasis added). At the oral hearing, Patent Owner admitted that neither Hauck nor Arita teach or suggest detecting a property, other than position, of an external cursor:

JUDGE ZADO: So referring to the prosecution history of the '214 patent, does Hauck or Arita alone or in combination teach or suggest detecting at least one property of an external cursor? And by “at least one property” I mean a property that is not the position of the external cursor?

So does Hauck or Arita teach or suggest detecting at least one property of an external cursor?

MR. DAVIS: No, I think not because that’s – we argued that over the prosecution and we got the claims allowed based on those arguments.

Tr. 53:1–10.

Accordingly, the challenged claims of the '214 patent do not preclude methods and systems that use soft buttons and menu items. We, therefore, are not persuaded by Patent Owner’s argument that Stove’s disclosure falls outside the scope of the challenged claims as a result of its disclosure of soft buttons and menu items.

We have reviewed the parties’ arguments and the evidence of record. Upon review, we determine Petitioner has demonstrated by a preponderance of the evidence that Stove discloses every element of claim 1.

g. Claim 2—“capturing an image” and “processing the image to detect at least one property”

Claim 2 depends from claim 1 and further recites that the step of detecting comprises “capturing an image of the screen and the external cursor with a camera.” With respect to this limitation, Petitioner relies on Stove’s disclosure of video camera 5 viewing and capturing frames (e.g.,

images) of the display screen and laser spot (e.g., external cursor) projected on to it. Pet. 14–15 (citing Ex. 1005, 2:8–11, 10:11–12, 5:23–25). Claim 2 also recites “processing the image to detect the at least one property of the external cursor.” Petitioner relies on Stove’s disclosure of a peak detector that determines the brightest spot on the screen, which is presumed to correspond to the location of the laser spot produced by a laser pointer. Pet. 15; *see also* Ex. 1005, 6:8–19 (describing peak detection). Patent Owner argues that Stove “does not perform image analysis, but rather uses direct processing of the ‘video signal’ and does not perform image capture as the ’214 patent discloses.” PO Resp. 14. For reasons discussed below, we are not persuaded by Patent Owner’s arguments.

Stove discloses a video camera to capture images, explaining that frame grabber 11 captures and stores each frame of video from video camera 5 as a separate frame, or image. Ex. 1005, 5:23–25. The ’214 patent similarly describes using a video camera to capture images, and more specifically, frames captured by the video camera are described as being images. Ex. 1001, 3:3:6, 3:41–42, 4:27–34. Accordingly, Stove discloses “capturing an image of the screen and the external cursor with a camera.” Moreover, we are persuaded that the image captured in Stove is processed to detect the position of the external cursor. In particular, Stove discloses that during normal operation the frame, or image, is input to a distortion correction circuit that corrects distortion in the image (e.g., the circuit processes the image). Ex. 1005, 6:2–6. The corrected image is then fed into peak detector 14, which determines the coordinates of the brightest spot on the screen, which is presumed to correspond to the spot produced by the laser pointer on the screen relative to the projected image. *Id.* at 6:6–21.

Stove discloses that if the laser spot is held over a soft button for a certain amount of time, it is assumed that the button is to be operated. *Id.* 7:5–7. Accordingly, the image captured in Stove is processed, at least by distortion circuit 13, as part of detecting the amount of time a laser spot is held over a position on the display screen (e.g., at least one property).

Patent Owner argues that Stove’s detection of the brightest spot is insufficient because it is “without regard to whether the brightest spot is or is not the projected laser pointer spot.” PO Resp. 14. According to Patent Owner, the ’214 patent “does not require the optical cursor to be the brightest spot because it uses image analysis to detect color, shape, intensity, number of ‘spots’, etc.” *Id.* This argument, however, is not commensurate with the scope of claim 2, which does not require image analysis to detect color, shape intensity, number of “spots,” etc. Claim 2 merely requires processing the image to detect the at least one property of the external cursor.

We have reviewed the parties’ arguments and the evidence of record. Upon review, we determine Petitioner has demonstrated by a preponderance of the evidence that Stove discloses every element of claim 2.

h. Claims 4 and 5—filtering the image

Claims 4 depends from claim 2, which further depends from claim 1. Claim 4 further recites that the step of processing the image comprises “filtering the image to detect the at least one property of the external cursor,” and the “image” refers to “an image of the screen” captured by a camera, as recited in claim 2. Petitioner relies on Stove’s disclosure of using a red light filter placed in front of the lens of video camera 5 to enhance the brightness of the laser spot produced by the laser pointer on the screen, thus enhancing

the spot's detection. Pet. 15 (citing Ex. 1005 6:9–14, 10:11–15). We are not persuaded by Petitioner's evidence and arguments. Claim 4 recites “filtering the image to detect at least one property,” and therefore requires filtering the image captured by video camera 5 in Stove. The filter Petitioner relies on from Stove is an optical filter placed in front of the lens of video camera 5 (Ex. 1005, 6:8–9, 10:11–15 (“a red filter can be placed in front of the lens of video camera 5”)), and thus, it filters light before it enters the camera, and before an image is captured. We, therefore, are not persuaded by a preponderance of the evidence that Stove discloses “filtering the image to detect at least one property,” as recited in claim 4.

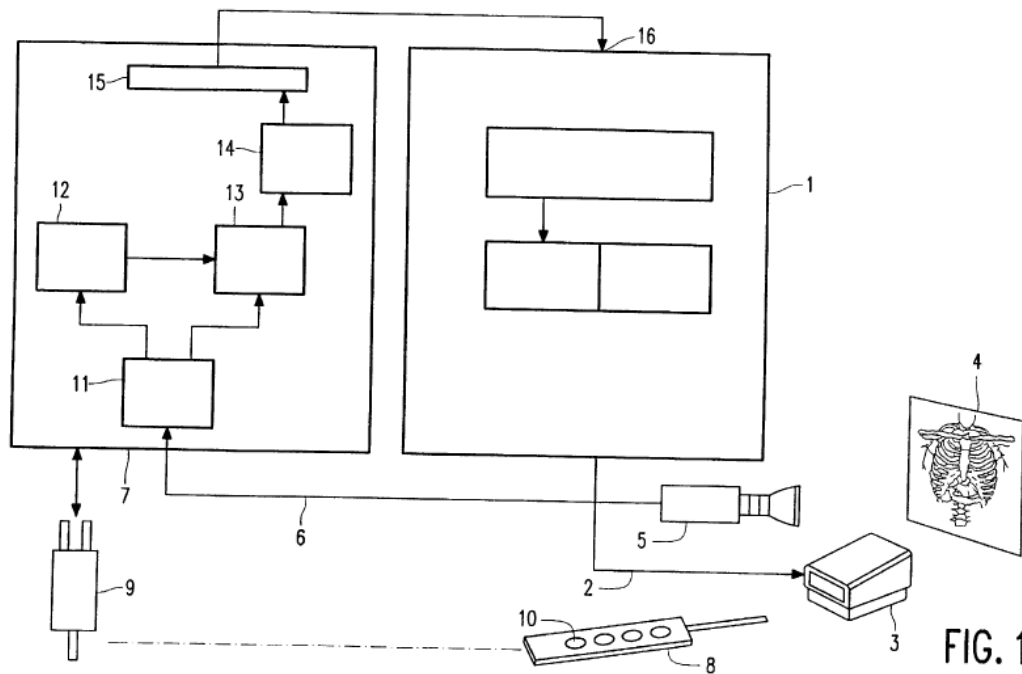
We have reviewed the parties' arguments and the evidence of record. Upon review, we determine Petitioner has not demonstrated by a preponderance of the evidence that Stove discloses every element of either claim 4, or claim 5 due to its dependence on claim 4.

i. Claims 8 and 9

Claim 8 depends from claim 1, and recites that the method further comprises “transmitting the external cursor to the screen using a source of directed optical energy.” Because Stove discloses using a laser pointer, described as “a convenient source of high intensity radiation having a narrow beam width,” Petitioner argues Stove discloses this limitation. Pet. 16 (citing Ex. 1005, 2:20–22). We are persuaded by a preponderance of the evidence that a source of high intensity radiation having a narrow beam width is a source of directed optical energy.

Claim 9 depends from claim 1, and further recites that “the associated screen is a substantially planar surface remotely located external to the computer and any associated monitor, the method further comprising

projecting an image of the output from the computer onto the associated screen.” Petitioner relies on Stove’s disclosure of projecting an image generated by presentation computer 1 onto screen 4, as depicted in Figure 1 of Stove. Pet. 16 (citing Ex. 1005, Fig. 1). Figure 1 of Stove is reproduced below:



Ex. 1005, Figure 1. Figure 1 depicts the output of presentation computer 1 being projected onto and displayed on to screen 4, which is depicted as being a flat screen. *Id.* at 5:12–14.

We have reviewed the parties’ arguments and the evidence of record. Upon review, we determine Petitioner has demonstrated by a preponderance of the evidence that Stove discloses every element of claims 8 and 9.

j. Claims 17–19 and 24–26

Petitioner summarizes its challenge to independent claim 17 as follows: a method for generating computer commands based on position and at least one property of an external cursor (claim 1 analysis), displaying

output from a computer (preamble of claim 1 analysis), displaying the external cursor on the output (claim 8 analysis), capturing an image of the output (analysis with respect to claim 2's recitation of "capturing an image of the screen and the external cursor with a camera"), processing the image to determine position and at least one property of the external cursor (analysis with respect to claim 1's recitation of "detecting at least one property of an external cursor and position of the external cursor" and claim 2's recitation of "processing the image to detect the at least one property of the external cursor"), and converting the position and the at least one property to corresponding computer commands so an internal cursor tracks position of the external cursor (analysis with respect to claim 1's recitation of "generating a command to move the internal cursor to a position on the screen corresponding to the position of the external cursor" and "generating a command for the computer based on the at least one detected property of the external cursor"). Pet. 16–17. For reasons we discussed with respect to claims 1, 2, and 8, we determine that Petitioner has demonstrated by a preponderance of the evidence that Stove discloses these limitations.

Claim 18 depends from claim 17, and further recites that "the step of displaying output from a computer comprises projecting an image of the output on a remotely located screen." Petitioner refers to its analysis with respect to claim 9, in which Petitioner relies on Figure 1 of Stove, which depicts projecting the output of presentation computer 1 on to display screen 4. Pet. 17; *see also* Ex. 1005, 5:12–14, Fig. 1.

We have reviewed the parties' arguments and the evidence of record. Upon review, we determine Petitioner has demonstrated by a preponderance of the evidence that Stove discloses every element of claims 17 and 18.

With respect to independent claim 19, Petitioner refers to its analysis regarding claims 1 and 2. Pet. 17–18. For reasons we discussed with respect to claims 1 and 2, we determine that Petitioner has demonstrated by a preponderance of the evidence that Stove discloses these limitations. Claim 19 also recites “processing the [captured] image to detect . . . at least one user selectable property of the optical cursor.” For this limitation, Petitioner argues that the property (e.g., the amount of time a laser beam is pointed at a soft button on a screen) is selectable because a user selects how long to maintain the laser beam over a soft button. *Id.* at 18.

We have reviewed Petitioner's analysis and supporting evidence regarding the proposed grounds of anticipation based on Stove. Upon review, we determine Petitioner has demonstrated by a preponderance of the evidence that Stove discloses every element of claim 19.

Independent claim 24 recites “a computer presentation system for generating commands to remotely control a computer based on a plurality of user selectable properties of an optical cursor generated by a hand-held pointer and projected on a screen displaying output from the computer.” With respect to this recitation, Petitioner relies on its analysis with respect to claims 1, 2, 8, and 19 of the '214 patent. Petitioner's analysis with respect to those claims refers to Stove's disclosure of generating commands for presentation computer 1 by operating soft buttons based on a user selecting how long to maintain a laser spot generated by a laser pointer over a soft button projected on to screen 4, which displays the output of presentation

computer 1. Pet. 13–17. Claim 24 further recites that the system comprises “a processor” that is “in communication with the camera for processing the image to detect the position of the optical cursor and at least one property of the optical cursor.” Petitioner refers to its analysis with respect to claims 1 and 2, which relies on Stove’s disclosure of video camera 5 and frame grabber 11 for capturing an image and a peak detector for detecting position and a property of an external cursor. Pet. 14–15; Reply 8–10. Claim 24 further recites that the processor convert the position and one property of the optical cursor in to “corresponding commands to control the computer and move an internal cursor to a position corresponding to the optical cursor while the optical cursor remains within the output displayed on the screen.” Petitioner relies on Stove’s disclosure that the computer’s “mouse cursor follows the red light laser pointer [e.g., optical cursor].” Pet. 19.

We have reviewed the parties’ arguments and the evidence of record. Upon review, we determine Petitioner has demonstrated by a preponderance of the evidence that Stove discloses every element of claim 24.

With respect to independent claims 25 and 26, Petitioner refers to its analysis of claims 1, 2, and 19. Pet. 19–21. For reasons we discussed with respect to claims 1, 2, and 19, we determine that Petitioner has demonstrated by a preponderance of the evidence that Stove discloses the limitations of claims 25 and 26. In addition, claim 25 is directed to a computer readable storage medium having computer executable instructions for generating commands to control a cursor. Petitioner argues it is inherent that the computer in Stove includes storage such as memory, for storing the instructions for generating the commands. Pet. 20 (citing Ex. 1010 ¶ 47 (Dr. Mercer testifying that “[a] computer readable storage medium (or

memory) is one of three architectural elements introduced as part of the Von Neuman Computer Architecture in 1945.”)).

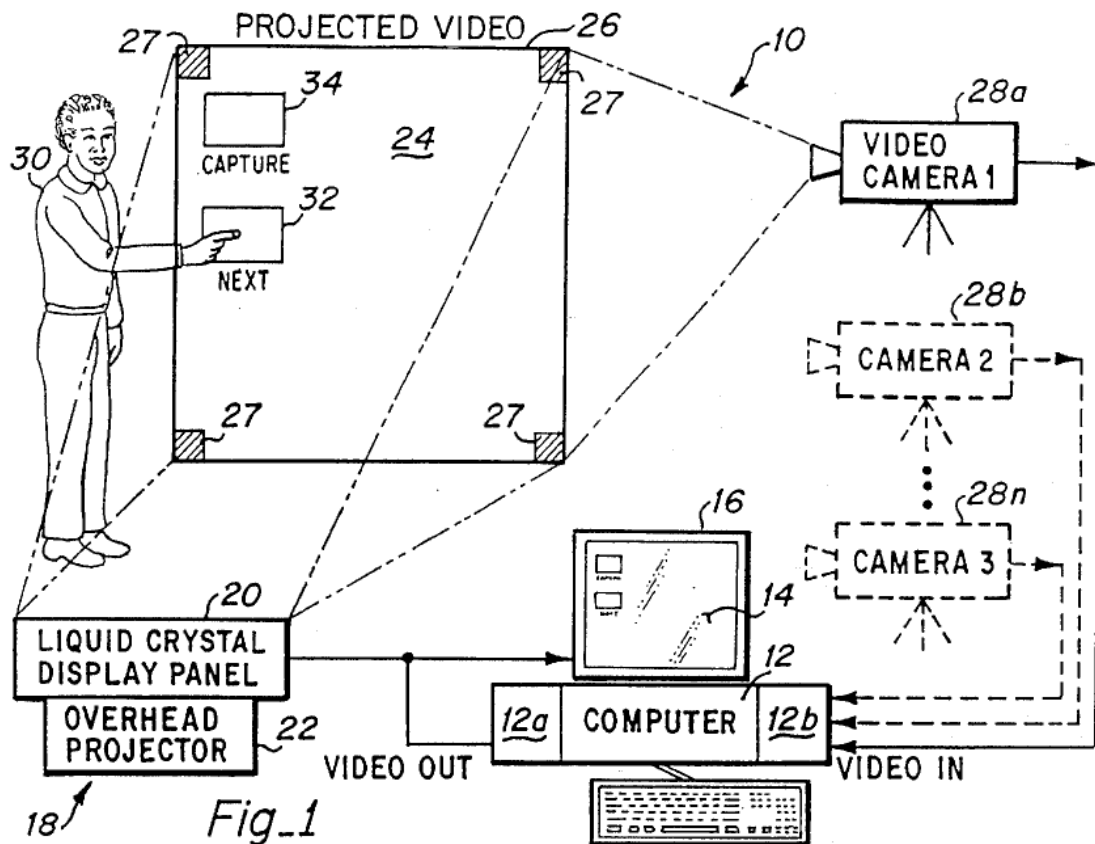
We have reviewed the parties’ arguments and the evidence of record. Upon review, we determine Petitioner has demonstrated by a preponderance of the evidence that Stove discloses every element of claims 25 and 26.

D. Asserted Anticipation Based on Platzker

Petitioner asserts that independent claims 1, 17, and 25 of the ’214 patent, and claims 2–4, 6, 7, 9, 11, and 18 depending directly or indirectly therefrom, are anticipated by Platzker. Pet. 21–30; Reply 11–15. Petitioner proffers a Declaration of Dr. Mercer to support its assertions. Ex. 1010. Patent Owner disputes Petitioner’s contentions, arguing that the claims are patentable over Platzker. PO Resp. 18–27. We have reviewed the record, and we determine that the record supports Petitioner’s contentions with respect to claims 1–4, 6, 7, 9, 11, 17, 18, and 25, and we adopt Petitioner’s contentions discussed below as our own. For reasons that follow, we determine that Petitioner has shown by a preponderance of the evidence that claims 1–4, 6, 7, 9, 11, 17, 18, and 25 are unpatentable over Platzker.

1. Overview of Platzker

Platzker is titled “Interactive Projected Video Image Display System,” and discloses a system comprising a computer for generating video images, a projection apparatus for projecting computer-generated images onto a projection screen, and at least one video camera for visually recording the projected image. Ex. 1006, Abstract. Figure 1 of Platzker is reproduced below:



Ex. 1006, Fig. 1. Figure 1 depicts video output port 12a coupled to liquid crystal display panel 20, and overhead projector 18 for projecting computer generated images on to projection screen 26. *Id.* at 4:55–67, Fig. 1. User 30 introduces objects (i.e., pointing finger) over projection screen 26. *Id.*

Fig. 1. Video camera 28a visually records projection screen 26. *Id.* 5:10–12, Fig. 1. Video input port 12b of computer 12 is coupled to video camera 28a, wherein computer 12 includes a conventional frame grabber for grabbing frames of the projected image as recorded by video camera 28a. *Id.* at 5:10–17, Fig. 1.

Platzker discloses that:

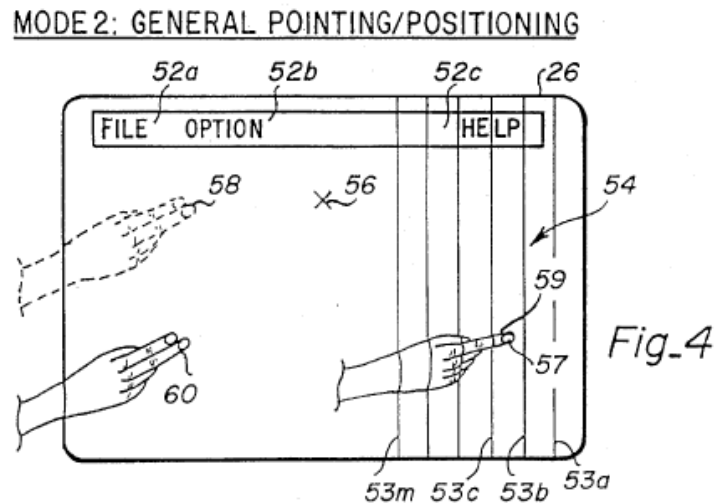
The computer 12 is programmed to compare the captured images with the original video image. Upon detection of certain recognized objects having a particular feature which are present in the captured image or upon detection of a recognizable pattern

which has been formed by the combination of an introduced object and an existing feature contained in the projected image, a signal is generated to activate the computer to perform a specific instruction, such as for example, modify the video image, save a captured image to memory, etc.

Id. at 5:23–32. In detecting features or patterns, Platzker discloses computer 10:

[M]ay be programmed in accordance with more advanced image processing techniques, such as feature extraction or pattern correlation . . . [t]he computer may also be programmed to look for other special features such as profile, size, color, etc., or special movement of the introduced object, such as, for example, a hand movement corresponding to making a check mark.

Id. at 3:14–25. Detection of a particular feature, pattern, or movement causes computer 10 to perform certain tasks. For example, a user may “click” (i.e., select) a button projected on the screen by holding her hand over the button for a predetermined length of time. *Id.* at 3:3–12. More advanced methods of button selection may involve detection of special patterns such as a cross formed by a pen being laid over a projected line contained in a projected button on the screen, or may involve detection of profile, size, color, or special movements of an object in front of the display screen. *Id.* at 3:13–25. In one mode of operation “the computer searches the entire grabbed image to detect the presence of an object anywhere on the image.” *Id.* at 7:27–29. If the object is detected in a general positioning and pointing field 54 “the computer will generate a point or position cursor at the location corresponding to where the user has placed the object.” *Id.* at 7:33–36. Figure 4 is reproduced below, and depicts positioning and pointing field 54:



Id. at Fig. 4.

2. Analysis

a. Claim 1

With respect to claim 1 of the '214 patent, Petitioner relies on Platzker's disclosure of "an interactive projected image video display system" that includes a computer, a projector coupled to the video output port of the computer for projecting computer-generated images onto a projection screen, and generation of a cursor corresponding to a location where a user has placed an object over the projection screen. Pet. 22–23 (citing Ex. 1006 2:27–31, 7:33–36).

With respect to claim 1's limitation of "detecting at least one property of an external cursor," Petitioner relies on Platzker's disclosure of detecting special features of the object (i.e., external cursor), including "profile, size, color, etc., or special movements." Pet. 23 (citing Ex. 1006 3:14–25). We are persuaded Petitioner has shown by a preponderance of the evidence that Platzker discloses this limitation.

With respect to detecting "position of the external cursor relative to the output from the computer," as recited in claim 1, Petitioner relies on

Platzker's disclosure that when the object is located in general positioning and pointing field 54, the computer generates a cursor at the location corresponding to where the user placed the object. Pet. 23 (citing Ex. 1006, 7:33–36; *see also id.* at 8:60–65, 9:2–6. We are persuaded Petitioner has shown by a preponderance of the evidence that Platzker discloses this limitation.

For the limitation “generating a command to move the internal cursor to a position on the screen corresponding to the position of the external cursor,” as recited in claim 1, Petitioner relies on Platzker's disclosure of generating a cursor at a location corresponding to where a user placed an object (i.e., external cursor). Pet. 24 (citing Ex. 1006, 7:33–36, 9:66–10:5). We are persuaded Petitioner has shown by a preponderance of the evidence that Platzker discloses this limitation.

With respect to claim 1's recitation of “generating a command for the computer based on the at least one detected property of the external cursor,” Petitioner relies on Platzker's disclosure that when an object is detected (i.e., a profile, shape, size, such as “two fingers,” or a predetermined amount of time an object hovers above a menu item) over a menu item, the computer will perform a task associated with the selected menu item. Pet. 24 (citing Ex. 1006, 3:3–12, 7:30–36). We are persuaded Petitioner has shown by a preponderance of the evidence that Platzker discloses this limitation.

Patent Owner asserts, as it did with respect to Stove, that the '214 patent claims were distinguished during prosecution from systems and methods that involve positioning an external cursor over a particular region of a screen (i.e., a menu item). PO Resp. 19–20. For reasons we discussed above, however, we determine that the '214 patent claims do not preclude

use of information, in addition to detection of a property of an external cursor, in order to generate a computer command. As we discussed above, Petitioner has demonstrated sufficiently that Platzker detects a property of an external cursor, and that computer commands are generated based on this detection. *See, e.g.,* Ex. 1006, 5:23–32 (“[u]pon detection of certain recognized objects having a particular feature . . . a signal is generated to activate the computer to perform a specific instruction, such as for example, modify the video image, save a captured image to memory, etc.”).

Patent Owner also attempts to impose a requirement that, prior to detecting a property and the position of an external cursor, the cursor must first be detected. *Id.* at 20–25. In particular, Patent Owner argues that the ’214 patent discloses that “first the cursor must be detected, followed by detection of at least one property of the detected cursor and the position of the detected cursor.” *Id.* at 21 (emphasis omitted). Nothing in the language of claim 1 imposes this requirement. Patent Owner attempts to bolster its argument by pointing out that, in Platzker, position is not determined if an “object having a particular feature” is not found. Pet. 21. As we discussed above, however, Petitioner has shown by a preponderance of the evidence that when an object having a particular feature is found, position is detected. In addition, the process of finding an object having a particular feature described in Platzker involves detecting at least one property of the object. This is sufficient to satisfy claim 1.

We have reviewed the parties’ arguments and the evidence of record. Upon review, we determine Petitioner has demonstrated by a preponderance of the evidence that Platzker discloses every element of claim 1.

b. Claims 2–4, 6, 7, 9 and 11

Claim 2 of the '214 patent depends directly from claim 1, and further recites that the step of detecting comprises “capturing an image of the screen and the external cursor with a camera.” Petitioner relies on Platzker’s disclosure of video camera 28a, which records the projection screen including objects (e.g., an external cursor) in front of the projection screen, and a frame grabber for grabbing individual frames of video recorded with video camera 28a. Pet. 24–35 (citing Ex. 1006, 5:10–20, 5:24–27). The '214 patent specification similarly describes image capture in terms of frames of video captured by a video camera, and we are persuaded for purposes of this decision that Platzker discloses capturing an image of a screen and an external cursor. *See* Ex. 1001, 4:27–30.

With respect to claim 2’s recitation of “processing the image to detect the at least one property of the external cursor,” Platzker discloses detecting objects (e.g., an external cursor) having a particular feature. Pet. 24 (citing Ex. 5:24–27). According to Petitioner, Platzker discloses that such object detection is accomplished by processing captured images using feature extraction or pattern correlation. Pet. 24 (citing Ex. 2–12). Patent Owner argues that Platzker is deficient because it detects a feature in order to determine whether an object (e.g., external cursor) is present, and as such, it does not detect an object, and then detect a feature of the object. PO Resp. 20–25. Patent Owner’s argument is not commensurate with the scope of claim 2. Claim 2 requires “detecting at least one property of an external cursor” using image processing. Using feature extraction or pattern correlation to detect the presence of an object in an image having a particular property (e.g., profile, size, color or movement), as disclosed in Platzker, also

involves detecting the property of the object. This is sufficient to satisfy the claimed requirement of detecting a property of the object.

Claim 3 further recites the method of claim 2 wherein the step of image processing further comprises “comparing the image to a previously captured image to detect differences between the image and the previously captured image.” Petitioner argues that Platzker discloses comparing an image to a previously captured image, relying on Platzker’s disclosure of using a gray scale comparison technique to identify shadowing in a region of the image caused by the presence of an object “by comparison with the level of shadowing previously measured at the same button region.” Pet. 25 (citing Ex. 1006, 3:3–8). Accordingly, Platzker discloses comparing an image to a previously captured image in order to detect the presence of an object (e.g., an external cursor).

Patent Owner argues that the “’214 patent is a significant advancement over Platzker” because the ’214 patent, unlike Platzker does not require “comparing a captured image with the original computer generated image.” PO Resp. 20. Patent Owner does not identify, nor do we find, language in the challenged claims that precludes the previously captured image from being an original computer generated image. Moreover, the embodiment in Platzker upon which Petitioner relies does not describe comparison with an original computer generated image.

Claim 4 depends from claim 2, and further recites that the step of processing the image comprises “filtering the image to detect the at least one property of the external cursor.” Petitioner relies on Platzker’s disclosure of using feature extraction or pattern correlation, and argues that these techniques are forms of filtering. Pet. 26 (citing Ex. 1006, 3:14–25). In

support of its argument, Petitioner relies on the testimony of Dr. Mercer, who opines that filtering is a technique using hardware or software that selectively passes certain elements of a signal and eliminates or minimizes others. Pet. 26; Ex. 1010 ¶ 26. Dr. Mercer further testifies that feature extraction and pattern correlation are filtering techniques. Ex. 1010 ¶ 26. Patent Owner does not dispute this.

Claims 6 and 7 each further recite the method of claim 4 wherein filtering is performed to detect the color of an external cursor (claim 6), and wherein filtering is performed to detect the shape of the external cursor (claim 7). Petitioner relies on Platzker's disclosure of detecting features of an object (e.g., external cursor) such as "profile, size, color, etc." and detecting patterns such as "a cross formed by a pen being laid over a projected line." Pet. 26–27, 23 (citing Ex. 1006, 3:14–25). Accordingly, Platzker discloses detecting color, and we are persuaded that a cross formed by a pen is a shape, and that profile as disclosed in Platzker is also a shape.

Claim 9 depends from claim 1, and further recites that "the associated screen is a substantially planar surface remotely located external to the computer and any associated monitor, the method further comprising projecting an image of the output from the computer onto the associated screen." Petitioner argues that the surface upon which images output from a computer are projected in Platzker is described as a planar surface remotely located external to the computer as required by claim 9. Pet. 27 (citing Ex. 1006, 4:67–5:3).

Claim 11 further recites the method of claim 1 wherein the step of detecting the at least one property of the external cursor comprises "detecting a pattern of movement of the external cursor." Petitioner relies

on Platzker's disclosure of detecting "special movements of the introduced object" as satisfying this limitation. Pet. 27, 23 (citing Ex. 1006, 4:67–5:3).

We have reviewed the parties' arguments and the evidence of record. Upon review, we determine that Petitioner has demonstrated by a preponderance of the evidence that Platzker discloses every element of claims 2–4, 6, 7, 9, and 11.

c. Claims 17 and 18

With respect to independent claim 17, Petitioner relies on Platzker's disclosure of introducing an object (e.g., external cursor) over a projected image, wherein the object may be any "convenient pointing element having a recognizable feature, such as for example, a user's hand or fingers held in a particular orientation or angle, a pointer, a pen, etc." Pet. 27–29 (citing Ex. 1006, 2:45–49). With respect to claim 17's recitation of displaying output from a computer, Petitioner relies on Platzker's disclosure of "an interactive projected image video display system which includes . . . a projection apparatus . . . for projecting computer-generated video images onto a projection screen." Pet. 28, 22 (citing Ex. 1006, 2:27–31). As to claim 17's recitation of "displaying the external cursor on the output," Petitioner relies on Platzker's disclosure of superimposing an object onto the projected image. Pet. 28 (citing Ex. 1006, 2:10–15). With respect to "capturing an image of the output," as recited in claim 17, Petitioner relies on Platzker's disclosure of a frame grabber for grabbing images recorded by video camera 28a, and also relies on its analysis with respect to claim 2's recitation of "capturing an image of the screen and the external cursor with a camera." Pet. 28. Claim 17 also requires "processing the image to determine position and at least one property of the external cursor," for

which Petitioner relies on its analysis with respect to claim 1’s recitation of detecting at least one property of an external cursor and the position of the external cursor and claim 2’s recitation of processing the image to detect the at least one property of the external cursor. *Id.*

With respect to claim 17’s recitation of “converting the position and the at least one property to corresponding computer commands so an internal cursor tracks the position of the external cursor,” Petitioner relies on its analysis with respect to claim 1. *Pet. Id.* In its analysis, for claim 1, Petitioner argues that Platzker discloses moving an internal cursor to a position on the screen corresponding to the position of the external cursor, relying on Platzker’s disclosure that “[i]f an object [e.g., external cursor] is detected in the general positioning and pointing field, the computer will generate a point or position cursor at the location corresponding to where the user has placed the object.” *Pet.* 23–24 (citing *Ex. 1006*, 7:33–36). With respect to claim 1, Petitioner also argues that Platzker generates a command such as a button click function based on the detected at least one external property, relying on Platzker’s disclosure that if an object is detected over a menu item, “the computer will perform the task associated with the selected menu item.” *Pet.* 24 (citing *Ex. 1006*, 7:30–36).

We have reviewed the parties’ arguments and the evidence of record. Upon review, we determine that Petitioner has demonstrated by a preponderance of the evidence that Platzker discloses every element of claim 17.

Claim 18 depends from claim 17, and further requires that the displayed output be a projection on a remotely located screen. With respect to claim 18, Petitioner relies on its analysis with respect to claim 9, namely

that Platzker discloses projecting the output of computer 12 on to projection screen 26 using an overhead projector, wherein projection screen is depicted as being remotely located. Pet 29, 27 (citing Ex. 1006, 4:67–5:3); *see also* Ex. 1006, Figs. 1 and 2.

We have reviewed the parties’ arguments and the evidence of record. Upon review, we determine that Petitioner has demonstrated by a preponderance of the evidence that Platzker discloses every element of claim 18.

d. Claim 25

Claim 25 is directed to a computer readable storage medium having computer executable instructions for generating commands to control a cursor. Platzker discloses a computer generating commands to control a cursor, and Petitioner argues it is inherent that the computer includes storage such as memory, for storing the instructions for generating the commands. Pet. 30 (citing Ex. 1010 ¶ 47 (Dr. Mercer testifying that “[a] computer readable storage medium (or memory) is one of three architectural elements introduced as part of the Von Neuman Computer Architecture in 1945.”)). With respect to claim 25’s recitations relating to instructions for detecting a user selectable property of an external cursor and for generating a command for the computer based on the detected property, Petitioner refers to its analysis with respect to claim 1’s recitations relating to detecting at least one property of an external cursor and generating a command based on the detected property. Pet. 30.

We have reviewed the parties’ arguments and the evidence of record. Upon review, we determine that Petitioner has demonstrated by a

preponderance of the evidence that Platzker discloses every element of claim 25.

E. Asserted Anticipation Based on Elrod

Petitioner asserts that independent claims 1, 19, and 25 of the '214 patent, and claims 2, 4, 6, 8, 9, and 11 depending directly or indirectly therefrom, are anticipated by Elrod. Pet. 43–50; Reply 15–18. Petitioner proffers a Declaration of Dr. Mercer to support its assertions. Ex. 1010. Patent Owner disputes Petitioner's contentions, arguing that the claims are patentable over Elrod. PO Resp. 28–35. We have reviewed the record, and we determine that the record supports Petitioner's contentions with respect to claims 1, 8, and 25, and we adopt Petitioner's contentions discussed below as our own. For reasons that follow, we determine that Petitioner has shown by a preponderance of the evidence that claims 1, 8, 11 and 25 are unpatentable over Elrod.

1. Overview of Elrod

Elrod is titled "Position and function input system for a large area display," and discloses light pen 22 for projecting a light spot onto a viewing surface for indicating position of a location marker and for indicating a function to be performed. Ex. 1008, Abstract. Elrod discloses that light pen 22 projects a beam of infrared light (IR) onto the front surface of screen 20 at a location where the user desires to indicate an input. *Id.* at 3:18–20. Elrod further discloses three function selection buttons 42, 44, and 46 (front, middle, and rear) that are comparable to mouse buttons. *Id.* at 3:57–58. The output signal representative of each function (front, middle, and rear) is differentiated by frequency. *Id.* at 4:6–11. The Figure disclosed in Elrod, reproduced below, depicts different frequencies associated with

different light pens (Pen #'s 1–3), wherein a particular frequency is associated with the selection of front, middle and rear:

	PEN#1	PEN#2	PEN#3
Track	4539 Hz	5907 Hz	7752 Hz
Middle	4500	5856	7684
Rear	4461	5805	7617
Front	4422	5755	7551

Id. at 4. The location where the light pen is directed onto screen 20 is determined as follows. Lens 24 is used to focus light reflected off viewing surface screen 20 on to position sensing photodiode 28. *Id.* at 3:35–37. Photodiode 28 is described as a “dual axis position sensor that provides both X and Y axis position information” by sensing the centroid of a light spot. *Id.* at 3:35–40. In particular, position sensing photodiode 28 includes four electrodes, X+, X-, Y+, and Y-, “each of which generates a current signal as a function of the light intensity and position of the centroid of the light spot projected thereon.” *Id.* at 5:9–11. X and Y position is determined by converting X+ and X-, and Y+ and Y-, square wave current signals generated by photodiode 28 into voltage signals. *Id.* at 5:16–18. The X+ and X-, and Y+ and Y-, voltage signals are passed through sum and difference amplifiers in order to determine X and Y position. *Id.* at 5:19–20. Elrod does not describe how detection of frequency, and therefore whether front, middle, or rear has been selected, is determined if only one light pen is directed at screen 20 at a particular time. Where more than one light pen is directed at screen 20 at a particular time, Elrod describes circuitry for band

pass filtering to separate the signals in order to determine frequency of each pen. *Id.* at 5:7–6:30.

2. *Analysis*

a. *Claim 1*

With respect to claim 1 of the '214 patent, Petitioner relies on Elrod's disclosure of a "projection-type computer display" that incorporates a display unit and a location marker that a user may move to any part of the display in order to locate a cursor. Pet. 44 (citing Ex. 1008 2:5–7, 2:24–26, 3:33–43, 6:31–33).

With respect to "detecting at least one property of an external cursor," as recited in claim 1, Petitioner relies on Elrod's disclosure of detecting the frequency of a light spot projected by a light pen on a display surface, arguing the light spot is an external cursor and that its frequency is at least one property of the light spot. Pet. 44–45. With respect to claim 1's recitation of "detecting . . . the position of the external cursor relative to the output from the computer," Petitioner relies on Elrod's disclosure of detecting illumination of the light spot by a sensor (e.g., photodiode 28), wherein the signals generated from the detection are passed through discrimination electronics to determine the location of the centroid of the light spot relative to a viewing surface, wherein the centroid indicates the position of an external cursor. Pet. 45 (citing Ex. 1008, 2:48–53).

For claim 1's recitation of "generating a command to move the internal cursor to a position on the screen corresponding to the position of the external cursor," Petitioner relies on Elrod's disclosure of controlling a pointer or cursor on a display screen (e.g., an internal cursor) by tracking the

movement of a light spot projected onto the display by a light pen. Pet. 45 (citing Ex. 1008, 2:26–26, 4:8–9).

With respect to claim 1’s recitation of “generating a command for the computer based on the at least one property of the external cursor,” Petitioner relies on Elrod’s disclosure of invoking and performing standard computer functions (e.g., generating a command for a computer) based on the function, or frequency of the light pen, selected (e.g., property of the external cursor). Pet. 45–46 (citing Ex. 1008, 2:50–53, 4:11–12, 4:44–45).

Patent Owner argues that one deficiency with respect to Elrod in view of claim 1 is that in order for a function to be generated, the light pen must be pointed at a structure on a screen when a button mouse click is simulated. PO Resp. 28–30. As we discussed above with respect to claim 1 of Stove, however, claim 1 does not preclude an external cursor from pointing at a structure such as a soft button or menu item on a display screen when a function is invoked. For purposes of meeting the requirements of claim 1, it is sufficient to show that a property other than position, in this instance frequency, is detected and that the generated computer command is based on the detected frequency. In Elrod the computer function that is invoked (e.g., the computer command that is generated) is based on the detected frequency (e.g., the at least one property). Pet. 45–46 (citing Ex. 1008, 2:50–53, 4:11–12, 4:44–45).

Patent Owner further argues that Elrod is deficient because it does not “disclose a system that uses machine vision imaging to generate commands based upon the optically detected properties of the external cursor but rather uses an analog signal processing system.” *Id.* at 30. Patent Owner does not identify, nor do we find, any language in claim 1 that would impose

requirements such as machine vision imaging to generate commands, nor does claim 1 preclude using an analog signal processing system.

Patent Owner also argues that “different frequencies” of a projected spot is not a property of an external cursor. *Id.* at 31–32. According to Patent Owner, the different frequencies of the illumination from Elrod’s light pen are “a property of which frequency of amplitude-shift-key modulation is selected by a user keypress,” and that type of modulation (e.g., amplitude-shift-key modulation) could tenuously be considered a property of projected light, but that “frequency” of modulation is a property of modulation rather than a property of light. *Id.* at 31. This argument is not persuasive because claim 1 is not directed to a property of *light*, but rather to a property of an *external cursor*. Petitioner identifies the illumination spot on a screen in Elrod as the external cursor. Pet. 4–45. We are not persuaded that the modulation frequency of an illumination spot on a screen is not a property of that illumination spot.

We have reviewed the parties’ arguments and the evidence of record. Upon review, we determine that Petitioner has demonstrated by a preponderance of the evidence that Elrod discloses every element of claim 1.

b. Claims 8, 9, 11, and 25

Claim 8 depends from claim 1, and recites that the method further comprises “transmitting the external cursor to the screen using a source of directed optical energy.” Petitioner relies on Elrod’s disclosure that the light pen that provides the illumination spot on screen 20 projects a beam of infrared light. Pet. 47 (citing Ex. 1008, 3:18–20). We are persuaded by Petitioner’s argument that infrared light emanating from a light pen is a source of directed optical energy.

Claim 9 depends from claim 1, and further recites that “the associated screen is a substantially planar surface remotely located external to the computer and any associated monitor, the method further comprising projecting an image of the output from the computer onto the associated screen.” Petitioner relies on Elrod’s disclosure of display screen 20. Pet. 47 (citing Ex. 1008, 3:10–13). Elrod discloses, however, that display screen 20 is “a slightly convex curved (as viewed) display screen 20 having an area of about three feet by five feet.” Ex. 1008, 3:14–15. Petitioner does not address Elrod’s disclosure that the screen is slightly convex and curved, or demonstrate why such a screen is “substantially planar” as claimed.

Claim 11 further recites the method of claim 1 wherein the step of detecting the at least one property of the external cursor comprises “detecting a pattern of movement of the external cursor.” Petitioner relies on Elrod’s disclosure of “trac[ing] the locus of points as in drawing alphanumeric characters or other patterns” in order to invoke and manipulate a functional command such as paint or erase. Pet. 48 (citing Ex. 1008, 2:6–9). We are persuaded that tracing a locus of points as in a drawing of alphanumeric characters is a pattern of movement and that the pattern is detected in order to invoke functional commands.

Independent claim 25 is directed to a computer readable storage medium having stored data representing instructions executable by a computer. For a computer readable storage medium as recited in the preamble of claim 25, Petitioner relies on Elrod’s Figure 7, which Petitioner argues depicts code for identifying the source and function of light pens used to project external cursors onto screen 20, wherein the code is executable by a computer. Pet. 49–50. Claim 25 recites that the computer readable storage

medium comprises “instructions for detecting at least one of the user selectable properties of the external cursor” and “instructions for generating a command for computer based on the at least one detected property of the external cursor.” Petitioner refers to its analysis with respect to claim 1’s recitations of detecting at least one property (e.g., frequency) of an external cursor and generating a command (e.g., identified function to be performed) for the computer based on the at least one detected property of the external cursor. *Id.* at 49. With respect to claim 25’s requirement that the property be “user selectable,” Petitioner refers to its analysis with respect to claim 19, in which Petitioner argued that Elrod discloses “signals (e.g., frequencies) representative of the identified functions to be performed.” Pet. 48–49. With respect to the functions referred to by Petitioner, Elrod discloses that a user can access and manipulate three function selection buttons (e.g., front, middle, and rear), wherein frequency is used to differentiate which button a user has invoked. Ex. 1008, 3:57–4:10.

We have reviewed the parties’ arguments and the evidence of record. Upon review, we determine that Petitioner has demonstrated by a preponderance of the evidence that Elrod discloses every element of claims 8, 11, and 25. We also determine that Petitioner has not demonstrated by a preponderance of the evidence that Elrod discloses every element of claim 9.

c. Claims 2, 4, 6, and 19

Claims 2, 4, and 6 depend from claim 1, and require “capturing an image of the screen and the external cursor with a camera,” and “processing the image to detect at least one property of the external cursor.” Independent claim 19 recites “capturing an image of at least a portion of the remotely located screen,” and processing the image to detect position of the

optical cursor and at least one user selectable property of the optical cursor.” For reasons we discuss below, Petitioner has not demonstrated by a preponderance of the evidence that Elrod discloses capturing an image of the screen with a camera or capturing a portion of a remotely located screen.

Elrod describes using photodiode 28 to detect the location of a centroid of a light spot. Ex. 1008, 3:35–40. In particular, position sensing photodiode 28 includes four electrodes, X+, X-, Y+, and Y-, “each of which generates a current signal as a function of the light intensity and position of the centroid of the light spot projected thereon.” *Id.* at 5:9–11. Petitioner argues that Elrod’s photodiode 28, in combination with lenses and filters disclosed in Elrod, is “functionally equivalent to a camera,” and therefore satisfies the requirement that an image be captured. Reply 16 (citing Ex. 1021 ¶¶ 24–27). Petitioner also relies on disclosure in Elrod that “several sensors having the same panchromatic response could be used with color filters,” arguing that a person of ordinary skill in the art understands that if the sensors described in Elrod were to be assembled in a two dimensional array, they could be a basic model for a CCD image sensor such as those used in cameras for capturing images. Reply 16 (citing Ex. 1008, 6:36–38, Ex. 1021 ¶¶ 24, 27). Unpatentability under 35 U.S.C. § 102 requires, however, that every element set forth in the claim be expressly or inherently disclosed in a single prior art reference. *Verdegaal Bros., Inc. v. Union Oil Co. of Cal.*, 814 F.2d 628, 631 (Fed. Cir. 1987). Petitioner has not identified any authority under which disclosure of a functional equivalent or teachings of how to build a required element of a claim is sufficient under § 102.

In addition, the signals detected by photodiode 28 in Elrod are passed through circuitry to determine the centroids of light spots. Even if this were tantamount to capturing an image of the external cursor, claims 2, 4, and 6 also require “capturing an image of the screen” with a camera, and claim 19 requires capturing an image of at least a portion of a screen. Petitioner has not explained sufficiently how the signals detected by photodiode 28 amount to capturing an image of screen 20.

We have reviewed the parties’ arguments and the evidence of record. Upon review, we determine that Petitioner has not demonstrated by a preponderance of the evidence that Elrod discloses every element of claims 2, 4, 6, and 19.

F. Asserted Anticipation Based on Vogeley

Petitioner asserts that independent claims 1, 19, and 25 of the ’214 patent, and claims 2, 4, and 7–9 depending directly or indirectly therefrom, are anticipated by Vogeley. Pet. 50–56; Reply 19–22. Petitioner proffers a Declaration of Dr. Mercer to support its assertions. Ex. 1010. Patent Owner disputes Petitioner’s contentions, arguing that the claims are patentable over Vogeley. PO Resp. 35–41. We have reviewed the record, and we determine that the record supports Petitioner’s contentions with respect to claims 1, 2, 4, 7–9, 19, and 25, and we adopt Petitioner’s contentions discussed below as our own. For reasons that follow, we determine that Petitioner has shown by a preponderance of the evidence that claims 1, 2, 4, 7–9, 19, and 25 are unpatentable over Vogeley.

1. Overview of Vogeley

Vogeley is titled “Method and Apparatus for Interacting with a Computer Generated Projected Image,” and discloses an operator-controlled

radiation projector for projecting a beam of radiation on an image created by a computer-controlled image projection system, and determining the position of the radiation relative to the projected image. Ex. 1009, Abstract.

Vogeley further discloses that the radiation is detected by sensor means 14 that is “either analog (area diode, vidicon tube, etc.) or digital (charge coupled diode (CCD), area or linear) in nature” (*id.* at 3:35–37), and in an embodiment, is made of a “charge coupled diode (CCD) type sensor, such as those found in portable video cameras” (*id.* at 5:25–28). Vogeley also discloses that the radiation could be a point or small ball of light, or any desired symbol including a circle, rectangle, etc., and in an embodiment, the radiation is of a particular geometric shape such that movement of the shape over a portion of the computer-controlled image projected on the screen is erased. *Id.* at 10:11–17.

2. Analysis

a. Claims 1, 19, and 25

With respect to claims 1, 19, and 25 of the '214 patent, Petitioner relies on Vogeley's disclosure of using a beam of infrared radiation to interact with a computer image projected onto a screen, wherein the computer uses position information of the infrared beam to generate an image (e.g., internal cursor) to be projected on the screen. Pet. 51, 54–55. Petitioner argues that radiation spot 10 projected onto a projected image is the claimed external cursor of claims 1 and 25 and the optical cursor of claim 19. Vogeley discloses that radiation spot 10 can be given a specific geometric shape or symbol, including a circle or rectangle, to indicate that it generate a function to erase the portions of the projected image over which it is located. Ex. 1009, 6:39–41, 10:11–17. According to Petitioner, the

geometric shape of radiation spot 10 satisfies the “detecting at least one property” limitation of claim 1, and the detecting “at least one” “user selectable propert[y/ies]” limitations of claims 19 and 25. Pet. 51–52, 55–56. Vogeley also discloses that the computer uses the position information of radiation spot 10 (e.g., the external cursor or optical cursor) to generate a corresponding image (e.g., internal cursor) at radiation spot 10. *Id.* at 52, 55 (citing Ex. 1009, 3:63–65). Petitioner argues that this disclosure satisfies claim 1’s recitation relating to generating a command to move an internal cursor to a position on a screen corresponding to the position of the external cursor and claim 19’s recitation relating to generating a command to control position of a cursor generated by a computer based on position of the optical cursor. Pet. 52, 55. Vogeley also discloses erasing portions of an image that are encountered by radiation spot 10 when the spot is detected as having a particular geometric shape. *Id.* at 52, 55–56 (citing Ex. 1009, 10:11–17). Petitioner argues that this disclosure satisfies claim 1’s recitation of generating a computer command based on the at least one detected property of the external cursor, generating a command to control functioning of the computer based on the at least one property of the optical cursor as recited in claim 19, and claim 25’s recitation of generating a computer command based on the at least one detected property of the external cursor. Pet. 52, 55–56.

Claim 19 additionally recites “displaying output from the computer on a remotely located screen.” Petitioner relies on its analysis with respect to the preamble of claim 1 in which it argues that Vogeley discloses “projecting a computer-controlled image (*i.e.*, output) onto an associated screen (*e.g.*, image surface 22). Pet. 54, 51 (citing Ex. 1009, 4:4–6).

Claim 19 also recites “projecting an optical cursor generated by a hand-held pointer on the remotely located screen.” Petitioner relies on disclosure in Vogeley of operator-controlled radiation projector 36. Pet. 54–55 (citing Ex. 1009, 4:20–23).

Claim 19 also requires “capturing an image of at least a portion of the remotely located screen” and “processing the image to detect position of the optical cursor and at least one user selectable property of the optical cursor.” Petitioner relies on Vogeley’s disclosure that reflected or refracted light from radiation spot 10 is focused through lens 12 onto sensor means “capable of outputting a signal for processing and interpretation to define the radiation position on the focused image area.” Pet. 53 (citing Ex. 1009, 3:28–34). In particular, Vogeley discloses that the sensor means may be a “charge coupled diode (CCD) type sensor, such as those found in portable video cameras.” Ex. 1009, 5:25–28. Petitioner argues that in this example in which a CCD type sensor is used, it is used to capture images for processing. PO Resp. 20 (citing Ex. 1009, 5:14–17, 5:25–30). Patent Owner argues that the CCD sensor disclosed in Vogeley could not have been used to capture images for processing because video cameras at that time “did not generate two-dimensional pixel arrays, but rather digitized forms of the analog video signal.” PO Resp. 39. This argument is not persuasive because claim 19 does not require a video camera to record digitally, and the claim language does not preclude capturing an image by capturing digitized frames of an analog video signal. In support of its argument, Patent Owner argues that digital video streams did not become available until 1988 when H.261 become available, followed by MPEG-1 in 1991. Patent Owner argues that both video standards supported resolutions of 352 x 288 pixels,

too low to perform useful image processing in Vogeley's system. PO Resp. 39. Patent Owner does not support with evidence its argument that a video resolution of 352 x 288 pixels would have been too low to perform image processing in Vogeley's system. Moreover, Petitioner provides contrary evidence showing that pixel resolutions of at least 1024 x 512, which Petitioner argues was sufficient for image processing, were commercially available in 1989, two years before the Vogeley patent was filed. PO Resp. 21 (citing Ex. 1021, ¶ 36 (citing Ex. 1020 (Texas Instruments Reference Sheet for a 1024x512 pixel CCD sensor))). Accordingly, we are persuaded by a preponderance of the evidence that Vogeley's disclosure satisfies claim 19.

With respect to claim 25's recitation in its preamble of a computer readable storage medium having instructions that are executable by a computer to generate commands, Petitioner argues that the computer in Vogeley that generates commands necessarily has a memory or other storage facility for storing instructions executed by the computer to generate commands. Pet. 56 (citing Ex. 1010 ¶ 47 (Dr. Mercer testifying that "[a] computer readable storage medium (or memory) is one of three architectural elements introduced as part of the Von Neuman Computer Architecture in 1945.")).

We have reviewed the parties' arguments and the evidence of record. Upon review, we determine that Petitioner has demonstrated by a preponderance of the evidence that Vogeley discloses every element of claims 1, 19, and 25.

b. Claims 2, 4, and 7–9

Claim 2 of the '214 patent depends from claim 1, and further recites that the step of detecting comprises “capturing an image of the screen and the external cursor with a camera.” Petitioner relies on Vogeley’s disclosure of sensor means 14 “capable of outputting a signal for processing and interpretation to define the radiation position [e.g., position of the external cursor] on the focused image area.” Pet. 53 (citing Ex. 1009, 3:28–34, 4:32–35). Claim 2 further recites “processing the image to detect the at least one property of the external cursor.” Petitioner relies on Vogeley’s disclosure of detecting the geometric shape of the radiation spot (e.g., external cursor) as a property, and argues that the shape is detected using image processing. Pet. 53. For reasons we discussed above with respect to Vogeley and claim 19, we are persuaded by Petitioner’s evidence and arguments.

Claim 4 depends from claim 2, and further recites that the step of processing the image comprises “filtering the image to detect the at least one property of the external cursor.” Petitioner relies on Vogeley’s disclosure of using digital filters to separate signals from the image projected on the screen (range of 100 Hertz or less) from signals from the radiation spot (range of up to 35 Kilohertz). Pet. 53 (citing Ex. 1009, 8:39–42); *see also* Ex. 1009, 8:7–38. The detected radiation spot, if a particular geometric shape (e.g., the property of the external cursor), invokes an eraser function. Pet. 53 (citing Ex. 1009, 10:11–13). Because separating the projected image signal from the radiation spot signal is necessary in order to determine the geometric shape (e.g., property) of the radiation spot, it is part of detecting the property of the radiation spot. For reasons we discussed above with respect to claim 19, we are persuaded that Vogeley discloses using a CCD

array to capture the image signals. Accordingly, we are persuaded by a preponderance of the evidence that Vogeley discloses “filtering the image to detect the at least one property of the external cursor.”

Claim 7 depends from claim 4, and further recites that the step of filtering comprises “filtering the image to detect shape of the external cursor.” As discussed above and argued by Petitioner, Vogeley discloses detecting a geometric shape of an external cursor. Pet. 53. Accordingly, we are persuaded by Petitioner’s arguments and evidence.

Claim 8 depends from claim 1, and further requires that the external cursor be transmitted using a “source of directed optical energy.” Petitioner relies on Vogeley’s disclosure that radiation projector 36 supplies a beam of radiation that contacts image surface 22 and radiation spot 10, wherein the radiation is, in an embodiment, a laser light beam. Pet. 54 (citing Ex. 1009, 4:20–23). We are persuaded that a laser light beam is a source of directed optical energy.

Claim 9 depends from claim 1, and further recites that the screen is “a substantially planar surface remotely located external to the computer” and any associated computer monitor, and that the method further comprises “projecting an image of the output from the computer onto the associated screen.” Petitioner relies on Vogeley’s disclosure of projecting a computer controller image onto image surface 22. Pet. 54 (citing Ex. 1009, claim 1). Petitioner argues that surface 22 is depicted in Figure 2 of Vogeley as being substantially planar and located external to Figure 2. Pet. 54 (citing Ex. 1009, Fig. 2). We are persuaded by Petitioner’s evidence and arguments.

We have reviewed the parties' arguments and the evidence of record. Upon review, we determine that Petitioner has demonstrated by a preponderance of the evidence that Vogeley discloses every element of claims 2, 4, and 7–9.

III. SUMMARY

For the foregoing reasons, we determine that Petitioner has demonstrated, by a preponderance of the evidence, that claims 1, 2, 8, 9, 17–19, and 24–26 are unpatentable under 35 U.S.C. § 102(b) as anticipated by Stove; that claims 1–4, 6, 7, 9, 11, 17, 18, and 25 are unpatentable under 35 U.S.C. § 102(b) as anticipated by Platzker; that claims 1, 8, 11 and 25 are unpatentable under 35 U.S.C. § 102(b) as anticipated by Elrod; and that claims 1, 2, 4, 7–9, 19, and 25 are unpatentable under 35 U.S.C. § 102(b) as anticipated by Vogeley.

IV. ORDER

Accordingly, it is

ORDERED that claims 1–4, 6–9, 11, 17–19, and 24–26 of U.S. Patent No. 6,275,214 B1 are held *unpatentable*; and

FURTHER ORDERED that, because this is a Final Written Decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

IPR2015-01347
Patent 6,275,214 B1

PETITIONER:

Duane H. Mathiowetz
Rick C. Chang
LECLAIRRYAN LLP
duane.mathiowetz@leclairryan.com
rick.chang@leclairryan.com

PATENT OWNER:

Brett Davis
Joseph Shapiro
SYNCPOINT IMAGING, LLC
bdavis@padrm.com
jshapiro@padrm.com