

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SONY COMPUTER ENTERTAINMENT AMERICA LLC,
Petitioner,

v.

GAME CONTROLLER TECHNOLOGY LLC,
Patent Owner.

Case IPR2013-00634
Patent 8,094,885 B2

Before KEVIN F. TURNER, MITCHELL G. WEATHERLY,
and JENNIFER M. MEYER, *Administrative Patent Judges*.

MEYER, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. INTRODUCTION

We have jurisdiction to hear this *inter partes* review under 35 U.S.C. § 6(c). This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons discussed herein, we determine that Petitioner has shown by a preponderance of the evidence that claims 1–11 of U.S. Patent No. 8,094,885 B2 (Ex. 1001, “the ’885 patent”) are unpatentable.

A. *Procedural History*

Sony Computer Entertainment America LLC (“Petitioner”)¹ filed a Petition (Paper 6, “Pet.”) seeking *inter partes* review of claims 1–11 of the ’885 patent. Game Controller Technology LLC (“Patent Owner”) filed a Preliminary Response. Paper 10. On April 16, 2014, we instituted *inter partes* review of claims 1–11 on the following grounds of unpatentability: claims 1, 3, 4, 6, 7, 10, and 11 under 35 U.S.C. § 102 as anticipated by Hashimoto;² claims 2 and 9 under 35 U.S.C. § 103 as obvious over

¹ Sony Corporation of America also is listed as a real party-in-interest. Pet. 50.

² JP Pub. No. H07-244557, published Sept. 19, 1995 (Ex. 1002). A certified English translation of Hashimoto was submitted as Ex. 1003. Patent Owner also submitted an English translation of Hashimoto (Ex. 1001 (“EXHIBIT A”)). During oral hearing, Patent Owner indicated its translation did not differ materially from Petitioner’s translation, and further agreed that the use of either translation was acceptable to Patent Owner. Tr. 33:1–16. All references to Hashimoto are to Petitioner’s English translation thereof.

Hashimoto and Marks '859;³ claims 1, 3, 4, 6, 7, 10, and 11 under 35 U.S.C. § 103 as obvious over Wang⁴ and Hashimoto; and claims 5 and 8 under 35 U.S.C. § 103 as obvious over Hashimoto and Marks '126.⁵ Paper 11 (“Inst. Dec.”).

Subsequent to institution, Patent Owner filed a Patent Owner Response (Paper 15, “PO Resp.”)⁶, and Petitioner filed a Reply (Paper 16, “Reply”).

Also before us is Patent Owner’s Motion to Exclude (Paper 18, “Mot. to Excl.”), Petitioner’s Opposition to the Motion (Paper 22), and Patent Owner’s Reply (Paper 24); as well as Patent Owner’s Motion for Observations (Paper 17) and Petitioner’s Response to the Motion for Observations (Paper 23).

An oral hearing was held on December 11, 2014. A transcript of the hearing is included in the record. Paper 27 (“Tr.”).

³ U.S. Patent No. 7,965,859 B2, filed Jan. 19, 2007, issued June 21, 2011 (Ex. 1004).

⁴ EP Pub. No. 1 402 929 A1, published Mar. 31, 2004 (Ex. 1006).

⁵ U.S. Patent No. 8,062,126 B2, filed Oct. 26, 2006, issued Nov. 22, 2011 (Ex. 1007).

⁶ We note that several exhibits filed with the Patent Owner Response were labeled in the 1000 series. Pursuant to 37 C.F.R. § 42.63(c), exhibits should be numbered uniquely and sequentially in the appropriate range (1001–1999 for a petitioner and 2001–2999 for a patent owner). In the case of duplicate exhibit numbers present in this proceeding, we refer to Patent Owner’s exhibits by both exhibit number and title, to avoid confusion.

B. Related Proceedings

Patent Owner has asserted the '885 patent against Petitioner in *Game Controller Technology LLC v. Sony Computer Entertainment America LLC*, No. 1:13-cv-22795-CMA (S.D. Fla.). *See* Pet. 50; PO Resp. 6.

C. The '885 Patent

The '885 patent relates to a system and method of tracking a spatially manipulated controlling object/controller. Ex. 1001, Abstract. The controller has a light emitting area. *Id.* at 2:65–3:2. As a user moves the controller, light from the light emitting area is picked up by a camera. *Id.* at 3:2. The camera is connected to a computer, which analyzes the video frames from the camera and tracks the light emitting area. *Id.* at 3:3–4. Thus, by moving the controller, the user can provide input to the computer and can control, for example, an on-screen cursor. *Id.* at 3:4–6.

D. Illustrative Claim

Of the challenged claims, claims 1, 2, and 3 are independent. Claims 4–11 depend, directly or indirectly, from claim 3. Claim 1 is illustrative of the claimed subject matter, and is reproduced as follows:

1. A data processing system for tracking a spatially manipulated controlling object, said system comprising:

a camera;

a processor operatively coupled to said camera;

a controlling object designated as an object to be tracked by said processor and arranged to emit light at a specific color such that the specific color is selected from a plurality of alternative colors;

wherein said camera is arranged to receive said colored light and to further transfer the respective data to the processor,

wherein said processor is arranged to receive said data from the camera, and

wherein the selected color of the emitted light is a least represented color in the scene, out of said at least two alternative colors.

Ex. 1001, 8:6–21.

II. ANALYSIS

A. *Claim Construction*

In an *inter partes* review, a “claim in an unexpired patent shall be given its broadest reasonable construction in light of the specification of the patent in which it appears.” 37 C.F.R. § 42.100(b); *accord In re Cuozzo Speed Tech., LLC*, 778 F.3d 1271, 1278–82 (Fed. Cir. 2015). Under this standard, we construe claim terms using “the broadest reasonable meaning of the words in their ordinary usage as they would be understood by one of ordinary skill in the art, taking into account whatever enlightenment by way of definitions or otherwise that may be afforded by the written description contained in the applicant’s specification.” *In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997).

We presume that claim terms have their ordinary and customary meaning. *See In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). This presumption, however, may be rebutted when the patentee acts as his own lexicographer, giving the term a particular meaning in the specification with “reasonable clarity, deliberateness, and precision.” *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994).

1. “*controlling object*”

In the Institution Decision, we construed the term “controlling object,” as the term is defined explicitly in the Specification of the ’885

patent,⁷ as a “user manipulated electronic device which serves to communicate with a computer.” Inst. Dec. 6 (quoting Ex. 1001, 5:54–56). Patent Owner argues that “communication” requires “electronic communication.” PO Resp. 15–20; Tr. 39:22–40:10. In this regard, Patent Owner argues that a “controlling object” must be more than a light on a stick, and “must include both a light *and* a ‘user interface.’” PO Resp. 15, 17. Patent Owner argues that the examples of a controlling object given in the Specification “uniformly refer to devices that include or incorporate a light and *also* have some additional electronics for communication with a computer.” *Id.* at 18 (citing Ex. 1001, 2:64–3:6 (remote control provided with a light), 3:6–10 (cell phone), 5:54–62 (“remote controls, mice, wands, steering wheels, joysticks, electronic pens, game pads, wearable devices, etc.”)). We must, however, be careful not to import limitations from the Specification into the claims. *See In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1369 (Fed. Cir. 2004) (cautioning against reading limitations into a claim from preferred embodiments described in the specification). If Patent Owner intended such features to be a part of the claim, these features should have been claimed expressly therein.

Patent Owner further attempts to distinguish between a “controlling object” and a “prop.” PO Resp. 20–21. Patent Owner points to U.S. Patent No. 7,113,193 (“the ’193 patent”),⁸ which is incorporated by reference into

⁷ The explicit definition is for the term “controller.” Throughout the Specification, however, the terms “controlling object,” “remote control,” and “controller” are used interchangeably. *See, e.g.*, Ex. 1001, 2:66–67, 3:16–20, 5:54–62.

⁸ U.S. Patent No. 7,113,193, issued Sept. 26, 2006 (Ex. 3001).

the '885 patent (*see* Ex. 1001, 1:43–62), as defining a “prop” as “objects that are to be tracked by reference to their geometry, edge detection, color, etc.” PO Resp. 20 (citing Ex. 3001, 5:29–32). Patent Owner argues this evinces that “when the inventor of the subject matter of the '885 patent wished to indicate a passive object that did not have control circuitry or a means to communicate to the processor (other than to signal its position with a light) such was referred to as a ‘prop’ rather than a ‘controlling object’.” *Id.* at 21. However, none of the examples of “props” discussed in the '193 patent includes a light. *See, e.g.*, Ex. 3001, 5:29–32 (prop is a “stick-like object which is made up of a [typically black] handle . . . and a brightly colored cylinder (i.e. having a saturated color)”), 9:2–5 (prop is a “cylindrical stick-shaped object [with] . . . a spherical object . . . of a different color [that] is rigidly affixed to one end of the cylinder”), 9:63–64 (prop further includes “three stripes . . . having a different color than the cylinder itself are provided on the cylindrical body”), 11:13–14 (prop is “further equipp[ed] . . . with a helical stripe”). In fact, all of these “props” discussed in the '193 patent are merely objects tracked based on the particular shape and color thereof. *Id.* None of these “props” could be said to be an “electronic device,” as included in our construction of controlling object. We are not persuaded that the '193 patent’s discussion of “props,” referenced in the Specification of the '885 patent, provides a clear indication that the inventors of the '885 patent intended to exclude an object signaling its position with a light from the claimed “controlling object.”

Contrary to Patent Owner’s arguments, the Specification of the '885 patent supports our broader definition for “controlling object.” The explicit definition provided therein does not require any “user controls” beyond

“user manipulation.” In the simplest disclosed embodiments, the user’s manipulation of the controlling object controls an on-screen cursor. The light on the controlling object communicates the location of the controlling object to the computer (e.g., light emitted from the controlling object is picked up by a camera and incoming video frames are analyzed by the computer), and the computer moves the on-screen cursor in response to the sensed location of the controlling object. Ex. 1001, 2:64–3:6. Thus, simply “[b]y moving the remote control [(i.e., the “controlling object”)], the user can control the on-screen cursor.” *Id.* at 3:4–6; *see also id.* at 5:15–17 (“The controller can then be used as an input device, as its movements are tracked by the computer.”), 5:45–49 (The “virtual device manager” . . . receives the tracking data of the different controllers in real time, and is responsible [for] using this data as an input means, allowing convenient man-machine interaction.”).

We, thus, are not persuaded by Patent Owner’s argument that “controlling object” should be construed any more narrowly than our construction in the Institution Decision, and we maintain our previous construction for purposes of this Final Written Decision.

2. *Other Construed Claim Terms*

We also construed the following claim terms as part of our Decision on Institution. Inst. Dec. 4–10. Based on the complete record before us as developed during trial, we see no reason to change the interpretations set forth below.

Claim Term	Construction
a controlling object designated as an object to be tracked by said processor and arranged to emit light at a specific color	does not require a processor to perform any “designating” or “arranging” functions, but only requires that the controlling object be designated as an object for the processor to track and be arranged to emit light of a specific color
a least represented color in the scene, out of said at least two alternative colors	includes either the one of the at least two alternative colors that is least represented in the background scene (when all of the alternative colors are present in the scene) or any of the at least two alternative colors that does not exist in the background scene (when at least one of the alternative colors is not present in the scene)
wherein the [color] selection complies with data received by the controlling object and pertaining to the optical characteristics of the background surrounding the controlling object	requires (1) the controlling object receives data which are in agreement with the color selection, and (2) the data pertain to the optical characteristics of the background surrounding the controlling object

B. Anticipation by Hashimoto

Petitioner asserts that claims 1, 3, 4, 6, 7, 10, and 11 are anticipated by Hashimoto. Pet. 11–24. In support of the asserted ground of unpatentability, Petitioner sets forth teachings of Hashimoto, and provides detailed claim charts, explaining how each claim limitation is disclosed in the cited reference. Upon review of the arguments and evidence, we determine that Petitioner has demonstrated, by a preponderance of the evidence, that claims 1, 3, 4, 6, 7, 10, and 11 are anticipated by Hashimoto.

1. Hashimoto

Hashimoto relates to an input device that “provides practical input of body motion” into a computer. Ex. 1003, Abstract, ¶ 1. Figure 1 of Hashimoto (with translation) is reproduced below.

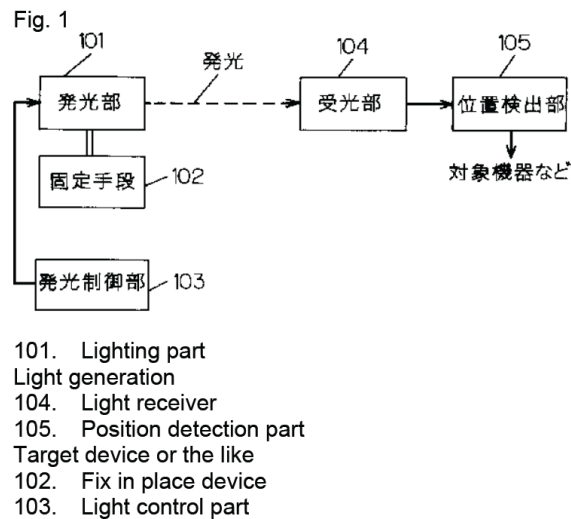


Figure 1 shows a diagram of an input device of one embodiment of Hashimoto, including lighting part 101, which includes a light emitting element; light control part 103, which controls lighting part 101; imaging device 104, which receives light from lighting part 101; and position detection part 105, which includes means to communicate information from light receiver 104 and detect a position of lighting part 101 based on the information received. *Id.* ¶ 24. During operation of the input device, a lighting part is attached to an operator, and the movement of the lighting part by the operator is captured by the imaging device. *Id.* ¶¶ 25, 41. The captured information is transferred from the imaging device to the position detection part. *Id.* ¶ 26. The position detection part detects the position of the lighting part through detection of, for example, a color of the light emitted from the lighting part that “differ[s] greatly with the image captured.” *Id.* ¶¶ 26–28. In another embodiment, which is the same as that

of Figure 1, but additionally includes multiple lighting parts, each emitting a different color of light, a correspondence table ties the position of the lighting part to the color of light generated by each lighting part. *Id.* ¶¶ 38, 40, 51. The movement of each lighting part is tracked, based on the distinct color thereof. *Id.* ¶¶ 41–43.

One stated benefit of the input device of Hashimoto is that “light generated from the lighting part can be uniquely detected by the position detection part, which not only enables high detection performance but also increases identification performance of the input itself.” *Id.* ¶ 33. In order to ensure the light generated from the lighting part can be detected uniquely, the light control part analyzes the color spectrum of the background and “makes a selection of a color, which does not exist in the background, and even if the color exists in the background, the color is very rare.” *Id.* ¶ 53. The selected color is communicated to the lighting part(s). *Id.* The lighting part emits the selected color, thus eliminating any influence from the background on position detection thereof. *Id.*

2. *Petitioner’s Arguments and Evidence*

We find persuasive Petitioner’s analysis of how each of the elements of claims 1, 3, 4, 6, 7, 10, and 11 arranged as in the claims is disclosed in Hashimoto. *See* Pet. 11–24. For example, with respect to claim 1, we are persuaded that Hashimoto’s disclosure of a “position detection part” that “detects [a] position of lighting part (101) based on information from light receiver (104)” corresponds to the claimed “data processing system for tracking a spatially manipulated controlling object.” Pet. 14–15 (citing Ex. 1003 ¶ 24, Fig. 1) (emphasis omitted); Ex. 1001, 8:6–7. We are persuaded further that Hashimoto’s light receiver 104, position detecting part 105, and

lighting part 101 disclose the claimed camera, “processor operatively coupled to said camera,” and “controlling object designated as an object to be tracked by said processor and arranged to emit light at a specific color such that the specific color is selected from a plurality of alternative colors,” respectively. Pet. 15–17 (citing Ex. 1003 ¶¶ 4, 6, 24–28, 39–40, 45–46, 50–51, Figs. 1, 2, Tables 1–3); Ex. 1001, 8:8–13.

We are persuaded further that the transfer of information captured as an image by light receiver 104 via a communication means in position detection part 105 discloses the claim limitations “said camera is arranged to receive said colored light and to further transfer the respective data to the processor” and “said processor is arranged to receive said data from the camera.” Pet. 17–18 (citing Ex. 1003 ¶¶ 24, 26–28); Ex. 1001, 8:14–18; *see* Ex. 1003, Fig. 1. We are persuaded further that Hashimoto’s disclosure of a “color-of-light control part [that] makes a selection of a color, which does not exist in the background, and even if the color exists in the background, the color is very rare” corresponds to the claimed “selected color of the emitted light is a least represented color in the scene, out of said at least two alternative colors.” Pet. 18–19 (citing Ex. 1003 ¶¶ 53–54) (emphasis omitted); Ex. 1001, 8:19–21.

3. *Patent Owner’s Arguments and Evidence*

Patent Owner argues that Hashimoto is not an enabling reference. PO Resp. 7–10. Patent Owner also argues that several claim elements are not disclosed by Hashimoto. *Id.* at 10–24. We address each of Patent Owner’s arguments in turn.

Whether Hashimoto is an Enabling Reference

Patent Owner argues that “Hashimoto does not provide an enabling disclosure of a system that is capable of performing all of the functions that are indicated.” PO Resp. 7. Patent Owner asserts “there are substantial gaps in the disclosed structures that call into serious question whether or not the reference is operable without undue experimentation.” *Id.* at 8.

For example, Patent Owner argues “there is no teaching or suggestion of any means for getting image data to the light emission control part 204, which would be necessary for use in calculating the ‘spectrum’ of the background.” *Id.* at 8. According to Patent Owner, “Hashimoto’s Fig. 2 shows no connection from the single identified light receiving part 205 to the light emission control part 204.” *Id.* Patent Owner also argues that “Hashimoto does not explain how the light emission control part 204 is connected to the light emitting parts 207–209 or how the lights are instructed to change colors.” *Id.* at 8–9. Patent Owner further argues that “the nature of the correspondence table 210 is never explained.” *Id.* at 9.

Although we agree with Patent Owner’s assertion that a prior art reference must include enabling disclosure in order to anticipate a claim (PO Resp. 7 (citing *In re Hoeksema*, 399 F.2d 269 (CCPA 1968)); *see also Symbol Techs., Inc. v. Opticon, Inc.*, 935 F.2d 1569, 1578 (Fed. Cir. 1991) (“a reference must enable someone to practice the invention in order to anticipate under § 102(b)”), as noted by Petitioner, “a prior art reference need not enable its full disclosure; it only needs to enable the portions of its disclosure alleged to anticipate the claimed invention” (Reply 4 (quoting *In re Antor Media Corp.*, 689 F.3d 1282, 1290–91 (Fed. Cir. 2012))). We further agree with Petitioner that Patent Owner’s “conclusion that

Hashimoto itself could not be implemented does not inform the question of whether a PHOSITA could have combined the description of Hashimoto with his [or her] own knowledge to make the *[claimed] invention*.” Reply 4–5 (citing *Antor*, 689 F.3d at 1290–91; *In re Donohue*, 766 F.2d 531, 533 (Fed. Cir. 1985)) (emphases added).

Patent Owner’s enablement arguments appear to be premised primarily on the specific arrows (or lack thereof) included in the functional block diagram of Figure 2 of Hashimoto. *See, e.g.*, Tr. 36:3–15, 47:23–48:9. In this regard, we agree with Petitioner that a “PHOSITA would recognize that the figures in Hashimoto are functional block diagrams, and that many illustrated blocks are logical components (i.e., software) that would not necessarily correspond to specific physical components.” Reply 7 (citing Ex. 1025 ¶¶ 3–17). Patent Owner’s arguments regarding Hashimoto’s lack of enablement are not persuasive.

“controlling object”

Patent Owner argues that Hashimoto does not disclose a “controlling object,” as recited in each of independent claims 1 and 3. PO Resp. 10–22. In particular, Patent Owner asserts that Hashimoto “merely tracks an appropriately colored light in accordance with a correspondence table.” *Id.* at 10. Patent Owner further argues that “Hashimoto’s tracked objects are only lights *without any other disclosed operability or function*.” *Id.* at 11 (emphasis added). Patent Owner asserts that the “lights [of Hashimoto] themselves are not controlling objects because they also do not communicate with any computer: they transmit light to the light receiving part.” *Id.* at 21. As discussed above, however, the position detection part (processor) includes communication means to communicate information from the light

receiver. Ex. 1003 ¶ 24. Patent Owner also asserts that “[t]here is no communication from the tracking computer to Hashimoto’s light emitting part.” PO Resp. 21. The claims, however, do not require such two-way communication—i.e., from the processor to the light emitting part.

As discussed above, the broadest reasonable interpretation of controlling object is a “user manipulated electronic device which serves to communicate with a computer” and does not require any additional user interface, as asserted by Patent Owner. The lighting part of Hashimoto is electronic (e.g., a light), is user manipulated (via operator movement), and communicates with a computer (via the light emitted from the lighting part). See Ex. 1003 ¶¶ 24–29; Reply 12 (citing Ex. 1024, 78:1–4 (Patent Owner’s expert Mr. Daniel Mooney agreeing that an LED is an electronic device), 79:15–80:1 (Mr. Mooney discussing “electronic”), 78:5–11 (Mr. Mooney agreeing that a user can manipulate an LED), 78:12–80:9 (Mr. Mooney agreeing that motion of an LED can be input on a computer)). This is all that is required of the claimed controlling object.

Patent Owner’s arguments regarding the claimed “controlling object” are not commensurate with the scope of the claims, as construed above. We, thus, are not persuaded by Patent Owner’s arguments that the lighting part of Hashimoto does not disclose a controlling object, as claimed.

“a controlling object designated as an object to be tracked by said processor and arranged to emit light at a specific color” and the “processor is arranged to receive said data from the camera”

Patent Owner asserts that “Hashimoto fails to disclose that the tracking camera be used both to follow the movement of the controlling object(s) as well as determine the colors in the scene,” and that the claims require that “[t]he same processor, then, analyzes the scene, assigns colors,

and communicates that information to the controlling object(s).” PO Resp. 15.

As noted above, the broadest reasonable interpretation of the claim language “a controlling object designated as an object to be tracked by said processor and arranged to emit light at a specific color” requires only that the controlling object be designated as an object for the processor to track and be arranged to emit light of a specific color, but does not require the processor to perform any “designating,” “arranging,” or “communicating” functions, as asserted by Patent Owner. Further, although the claim recites the processor must “receive said data from the camera,” nothing in the claim requires a single processor to analyze the scene, assign colors, and communicate this information to the controlling object. As discussed above, the lighting part of Hashimoto is designated to be tracked by the position detection part and emits light of a specific color, selected by the light control part. The position detection part (processor) of Hashimoto receives data from the light receiver (camera).

Patent Owner’s arguments are not commensurate with the scope of the claims. We, thus, are not persuaded by Patent Owner’s arguments that Hashimoto does not disclose these claim features.

“the [color] selection . . . pertain[s] to the optical characteristics of the background surrounding the controlling object”

Patent Owner argues, with respect to method claim 3, that the background in question must be something that surrounds the controlling object. Hashimoto never indicates that his light emission control part 204 “sees” this background relative to light emitting part 207-209. Indeed, Hashimoto never describes where the light emission control part 204 obtains its image data or what the field of view of that device is.

PO Resp. 23. In this regard, we understand Patent Owner’s argument to be that Hashimoto does not disclose the camera processor determining the color of the light emitting part. *See, e.g.*, Tr. 27:3–29:19. Claim 3, however, does not require the step of “configuring the controlling object to emit a light with specific color” to be done by a processor, let alone by a particular processor. Accordingly, Patent Owner’s argument in this regard is not commensurate with the scope of the claim, and we do not find it persuasive.

“the color of the light emitted by the controlling object is automatically selected”

Patent Owner argues that Hashimoto also does not disclose that the “color of the light emitted by the controlling object is automatically selected,” as recited in dependent claim 4. PO Resp. 24. Patent Owner’s arguments in this regard are premised on the arguments made with respect to independent claim 3, that color selection must be made by the processor, which we do not find persuasive for the reasons discussed above. Further, we are persuaded by Petitioner’s showing that Hashimoto discloses the color-of-light control part automatically selecting the color of light emitted. Pet. 22–23 (citing Ex. 1003 ¶¶ 20, 44, 53).

Dependent Claims 6, 7, 10, and 11

Patent Owner does not argue the patentability of claims 6, 7, 10, and 11 based on any limitations other than those discussed above. As indicated above, we are persuaded by Petitioner’s argument and evidence in connection with the limitations introduced in each of these dependent claims.

4. *Conclusion*

For the reasons discussed, Petitioner has demonstrated, by a preponderance of the evidence, that claims 1, 3, 4, 6, 7, 10, and 11 are unpatentable as anticipated by Hashimoto.

C. *Obviousness over Hashimoto and Marks '859*

Petitioner asserts that claims 2 and 9 are unpatentable under 35 U.S.C. § 103 as obvious over Hashimoto and Marks '859. Pet. 25–33. In support of the asserted ground of unpatentability, Petitioner sets forth teachings of Hashimoto and Marks '859, provides detailed claim charts, and cites to the Declaration of Gregory F. Welch, Ph.D. (Ex. 1010) (“Welch Declaration”), explaining how each claim limitation is disclosed in, or rendered obvious by, the cited references. Upon review of the arguments and evidence, we determine that Petitioner has demonstrated, by a preponderance of the evidence, that claims 2 and 9 are unpatentable as obvious over Hashimoto and Marks '859.

1. *Marks '859*

Marks '859 discloses an optical tracking system in which user movement is translated into input to “allow user control of or interaction with objects on a graphical display.” Ex. 1004, 1:26–35. Marks '859 further recognizes that these background conditions can change over time, which may diminish object-tracking performance. *Id.* at 1:51–64, 7:60–8:1, 8:27–35. Marks '859 solves this problem by re-sampling the scene periodically to detect such changes and adjusting the system accordingly. *Id.* at 8:32–58, 9:45–10:51, 11:8–24, 11:35–50.

2. *Petitioner's Arguments and Evidence*

With respect to independent claim 2, several limitations are identical to, or closely track, limitations of claim 1 or 3. We find persuasive Petitioner's analysis of how Hashimoto discloses these limitations, for similar reasons as discussed above with respect to claims 1 and 3. *See* Pet. 28–29.

With respect to the limitation “wherein the processor is configured to reselect and track light of a new color as a result of a change in color representation in a scene,” appearing in claim 2, Petitioner admits that “Hashimoto is silent with regard to reselecting a new color for the LED of the input device based on a change in color representation in the background scene.” Pet. 30 (emphasis omitted). Claim 9, which depends indirectly from claim 3, includes a similar limitation. *See* Ex. 1001, 9:1–3. Petitioner relies on Marks '859 as disclosing a “re-sampling” process to detect changes in the background. Pet. 25–28, 30–33.

As noted by Petitioner, Marks '859, like Hashimoto, “recognizes that conditions in the background environment can affect object-tracking performance.” Pet. 25 (citing Ex. 1004, 1:49–51). Citing the Welch Declaration, Petitioner asserts that one of skill in the art

would have recognized that the calibration process described by Hashimoto for selecting the color of the LED on the input device could be combined with the “re-sampling” process described by Marks '859 to arrive at the purported invention of claim 2 wherein the Hashimoto system would “re-sample” the background image and dynamically adjust the LED input light in response to color changes in the background scene

in order to provide a “further reduction in processing requirements and an increase in position tracking performance.” Pet. 27 (citing Ex. 1010 ¶¶ 13, 16, 17).

We are persuaded that the “re-sampling” disclosed in Marks ’859, combined with the above-described disclosure of Hashimoto, teaches a “processor [that] is configured to reselect and track light of a new color as a result of a change in color representation in a scene,” as recited in claim 2. *See id.* at 25–28, 30–33 (citing Ex. 1004, 1:51–2:8, 7:60–8:58, 9:45–10:51, 11:8–24, 11:35–50, 13:24–56, Fig. 5).

3. *Patent Owner’s Arguments and Evidence*

Patent Owner argues that several claim elements are not taught by Hashimoto or Marks ’859. PO Resp. 25, 27–36. Patent Owner also argues that one of skill in the art would not have been motivated to combine the references, and even if the references were combined, the combination would not result in the claimed invention. *Id.* at 25–26, 37–39. Patent Owner also submits evidence of alleged long-felt need and copying. *Id.* at 29–41. We address each of Patent Owner’s arguments in turn.

“controlling object”

Patent Owner again argues that Hashimoto does not disclose a “controlling object” as recited in claim 2. PO Resp. 34. For the same reasons discussed above, this argument is not persuasive.

Whether a Single Processor is Required

Patent Owner asserts that the

claims are directed to the novel aspect of having a processor determine from an operatively coupled camera an appropriate color for the controller it is tracking, communicate that color to the controlling object, and, in the case of Claim 2, reselect,

transmit, and track light of a new color as a result of a change in color presentation in a scene.

PO Resp. 27. Patent Owner also asserts that the combination of Hashimoto and Marks '859 does not include any way of communicating a color determination by the camera's processor back to Hashimoto's color-of-light control part. *Id.* at 37.

Patent Owner's arguments are premised on the assertion that claim 2 "clearly and unambiguously requires that the single processor *both* track the controlling object and analyze the scene to determine which color of light the controlling object should emit." *Id.* at 29; *see id.* at 30–34. Nothing in the claim language, however, requires a single processor to perform the claimed functions. Patent Owner argues that, because the claim recites "a processor," and all subsequent references to the processor recite "said processor," this necessarily indicates that a single processor is required. *Id.* at 31–32. This argument is not persuasive.

We agree with Petitioner that "a perfectly reasonable construction of claim 2 . . . could include one or more processors, and any antecedent basis in the claims would be referring back to those one or more processors." Reply 13 (citing *KCJ Corp. v. Kinetic Concepts, Inc.*, 223 F.3d 1351, 1355–56 (Fed. Cir. 2000) ("This court has repeatedly emphasized that an indefinite article 'a' or 'an' in patent parlance carries the meaning of 'one or more' in open-ended claims containing the transitional phrase 'comprising.'")). Further, even if a single processor were required by claim 2, it would have been obvious to one of skill in the art that the described functions could be performed on a single processor. *Id.* at 13–14 (citing Ex. 1025 ¶¶ 9–10).

We, however, are not persuaded that a single processor is required. As previously discussed, the system of Hashimoto tracks a controlling

object—the position detection part tracks the lighting part based on information received from the light receiver (camera)—as well as determines which color of light the controlling object should emit based on an analysis of the scene—the color-of-light control part selects a color based on the background and communicates it to the lighting parts. Ex. 1003 ¶ 53. Further, the “re-sampling” disclosed in Marks ’859, combined with the disclosure of Hashimoto, teaches a “processor [that] is configured to reselect and track light of a new color as a result of a change in color representation in a scene,” as recited in claim 2. See Pet. 25–28, 30–33 (citing Ex. 1004, 1:51–2:8, 7:60–8:58, 9:45–10:51, 11:8–24, 11:35–50, 13:24–56, Fig. 5).

Reasons to Combine

Patent Owner argues that Hashimoto and Marks ’859 are not combinable to arrive at the claimed invention. PO Resp. 25–26, 34–41. Specifically, Patent Owner argues that Marks ’859 “teaches an improved type of frame-by-frame tracking system of the sort that Hashimoto rejects.” *Id.* at 26. Patent Owner, thus, argues that because Marks ’859 “embraces and seeks to improve a methodology decisively rejected by Hashimoto, the combination of these two reference is inappropriate.” *Id.* Patent Owner argues that Hashimoto and Marks ’859 are not analogous art. *Id.* at 35–36 (citing Ex. 1031 (“EXHIBIT D”) ¶¶ 41–42). We, however, agree with Petitioner that both Hashimoto and Marks ’859, as well as the ’885 patent, relate to “tracking the position of specific objects . . . using color data extracted for each pixel in the image of the background environment,” and, thus, the references are analogous art. Pet. 25.

Patent Owner further asserts that Marks ’859 “simply does not teach altering the color emitted by a tracked controlling object.” PO Resp. 34.

Petitioner, however, does not rely on Marks '859 as teaching anything about the color emitted by the controlling object, but instead relies on Marks '859 solely for the disclosure of how to deal with changes in the background of the scene that may have adverse effects on object tracking. *See* Pet. 25–28.

In Hashimoto, the selected color is based on an observation of the background of the scene and is a least represented color therein. Ex. 1003 ¶ 53. As previously discussed, Marks '859 solves a problem of changing conditions in the scene by re-sampling the scene periodically in order to allow for adjustments for improved object tracking. Ex. 1004, 8:32–58, 9:45–10:51, 11:8–24, 11:35–50. Petitioner asserts that one of skill in the art would have recognized that the Hashimoto system could be improved “by simply configuring the system to perform the already disclosed background color spectrum analysis and LED color update process when environmental lighting/color conditions change as taught by Marks ‘859.” Pet. 27–28. Petitioner has set forth sufficient articulated reasoning with rational underpinning to support the combination of the prior art teachings identified above. *See KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007). We are not persuaded by Patent Owner’s arguments to the contrary.

Secondary Considerations

Patent Owner also submits evidence allegedly establishing secondary considerations precluding a conclusion of obviousness, in the form of an article relating to Sony’s PlayStation 3 controllers. PO Resp. 39–41 (citing Ex. 1028 (“EXHIBIT C”); Ex. 1031 (“EXHIBIT D”) ¶ 28). Specifically, Patent Owner asserts that this article evinces long-felt need in the industry, as well as potential copying. *Id.* at 40. Patent Owner, however, fails to discuss a nexus to the claims at issue in this proceeding. *See In re GPAC*

Inc., 57 F.3d 1573, 1580 (Fed. Cir. 1995) (There must be a nexus between the merits of the claimed invention and the evidence of secondary considerations.). Accordingly, Patent Owner has not submitted persuasive evidence regarding a long-felt need, or copying germane to claims at issue.

4. *Conclusion*

For the reasons discussed, Petitioner has demonstrated, by a preponderance of the evidence, that claims 2 and 9 are unpatentable as obvious over Hashimoto and Marks '859.

D. *Obviousness over Wang and Hashimoto*

Petitioner asserts that claims 1, 3, 4, 6, 7, 10, and 11 are unpatentable under 35 U.S.C. § 103 as obvious over Wang and Hashimoto. Pet. 33–46. In support of the asserted ground of unpatentability, Petitioner sets forth teachings of Wang and Hashimoto, provides detailed claim charts, and cites to the Welch Declaration, explaining how each claim limitation is disclosed in, or rendered obvious by, the cited references. Upon review of the arguments and evidence, we determine that Petitioner has demonstrated, by a preponderance of the evidence, that claims 1, 3, 4, 6, 7, 10, and 11 are unpatentable as obvious over Wang and Hashimoto.

1. *Wang*

Wang relates to an interactive video game system in which input corresponds to user movements. Ex. 1006, Abstract, ¶¶ 1, 5–7. Figure 1 of Wang is reproduced below.

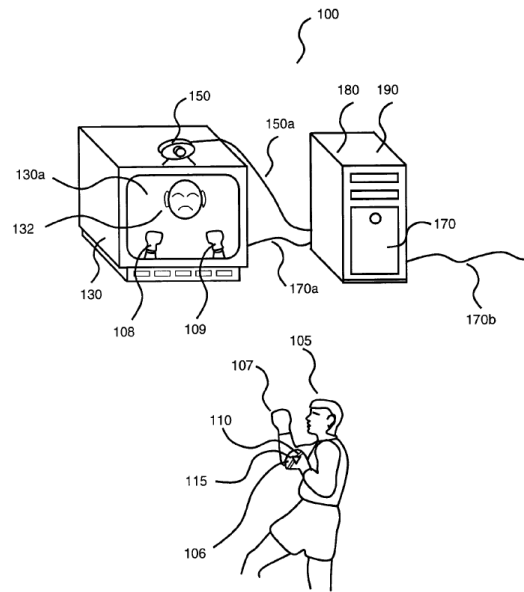


Figure 1 shows an embodiment of the video game system of Wang, including video camera 150, computing device 170 connected to the video camera by communications line 150a, and marking device 110 with lighting device 115 attached to user 105. *Id.* ¶¶ 21–22. Lights of different colors can be used to distinguish between multiple marking devices, e.g., those attached to left and right hands. *Id.* ¶ 8. During operation of the video game, the video camera captures images from the marking device with the lighting device turned on. *Id.* ¶ 22. These video images are sent through the communications line to the computing device. *Id.* ¶ 24. The lighting device may be a single color, or may include multiple colors (e.g., a point light source of one color surrounded by a polygonal-shaped light source of another color), in order to distinguish the lighting device from the background of the scene more easily. *Id.* ¶ 35. The computing device determines the position and orientation of the lighting device/marketing device based on the color thereof, and this information is used as input to the video game. *Id.* ¶¶ 22, 39.

2. *Petitioner's Arguments and Evidence*

We find persuasive Petitioner's analysis of how each of the elements of claims 1, 3, 4, 6, 7, 10, and 11 is taught or suggested by the combination of Wang and Hashimoto. *See* Pet. 33–45.

For example, with respect to claim 1, we are persuaded that Wang's disclosure of "us[ing] active markers with different colors . . . for tracking the movement of different body parts" teaches the claimed "data processing system for tracking a spatially manipulated controlling object." Pet. 36 (citing Ex. 1006 ¶¶ 5, 8, Figs. 1, 6); Ex. 1001, 8:6–7. We are persuaded further that Wang's video camera 150, computing device 170, and marking device 110 with lighting device 115 disclose the claimed camera, "processor operatively coupled to said camera," and "controlling object designated as an object to be tracked by said processor and arranged to emit light at a specific color such that the specific color is selected from a plurality of alternative colors," respectively. Pet. 37–40 (citing Ex. 1006 ¶¶ 8, 10, 16, 18–25, 27–35, 38–41, 45, Figs. 1, 3A–3H, 4, 5, 6, 7A, 9A, 10); Ex. 1001, 8:8–13.

We are persuaded further that Wang's capture of video images from lighting device 115 by video camera 150, and sending of the images to computing device 170 through communications line 150a discloses the claim limitations "said camera is arranged to receive said colored light and to further transfer the respective data to the processor" and "said processor is arranged to receive said data from the camera." Pet. 40–41 (citing Ex. 1006 ¶¶ 20, 22, 24, 38, Figs. 4, 5); Ex. 1001, 8:14–18. We are persuaded further that Wang's disclosure of using a unique combination of colored light to distinguish the marking device from the background, combined with

Hashimoto’s disclosure of a “color-of-light control part [that] makes a selection of a color, which does not exist in the background, and even if the color exists in the background, the color is very rare,” teaches the claimed “selected color of the emitted light is a least represented color in the scene, out of said at least two alternative colors.” Pet. 41–42 (citing Ex. 1003 ¶¶ 53–54; Ex. 1006 ¶ 25) (emphasis omitted); Ex. 1001, 8:19–21.

As indicated, Petitioner relies on Hashimoto as disclosing the feature that the light emitted by the controlling object is a selected color that is a “least represented color in the scene, out of said at least two alternative colors,” as recited in claim 1, or “pertain[s] to the optical characteristics of the background surrounding the controlling object,” as recited in claim 3. Pet. 35–36, 39–40, 44. Citing the Welch Declaration, Petitioner asserts that a “skilled artisan would have recognized that the system taught by Wang would further benefit from the color configuration process taught by Hashimoto . . . in order to achieve increased object tracking performance and reduced processing requirements.” *Id.* at 35 (citing Ex. 1010 ¶¶ 15, 16, 18). We are persuaded that Petitioner has set forth sufficient articulated reasoning with rational underpinning to support the combination of the prior art teachings identified above. *See KSR*, 550 U.S. at 418.

3. *Patent Owner’s Arguments and Evidence*

Patent Owner argues that several claim elements are not taught by Wang or Hashimoto. PO Resp. 41–47. Patent Owner also argues that one of skill in the art would not have been motivated to combine the cited references. *Id.* at 47–48. We address each of these arguments in turn.

“controlling object”

Patent Owner argues that Wang does not disclose a “controlling object,” as recited in each of independent claims 1 and 3. PO Resp. 41–43. Patent Owner’s arguments in this regard closely track those discussed above with respect to Hashimoto. As discussed, the marking device/lighting device of Wang is user manipulated (via body movement during game play) and communicates with a computer (via the light emitted from the lighting part). See Ex. 1006 ¶¶ 21–24, 39. We, thus, are not persuaded by Patent Owner’s arguments that the marking device/lighting device of Wang does not disclose a controlling object, as claimed.

“the [color] selection . . . pertain[s] to the optical characteristics of the background surrounding the controlling object”

Similar to its argument with respect to the ground based on anticipation by Hashimoto, Patent Owner again argues that Hashimoto does not disclose that the color of the controlling object is selected based on characteristics of the background surrounding the controlling object, as recited in claim 3. PO Resp. 43–46. As discussed above, however, Patent Owner’s arguments in this regard are not commensurate with the scope of claim 3, which does not require a particular processor perform this function, and we do not find Patent Owner’s argument persuasive.

“the color of the light emitted by the controlling object is automatically selected”

Patent Owner argues that Hashimoto also does not disclose that the “color of the light emitted by the controlling object is automatically selected,” as recited in dependent claim 4. PO Resp. 46–47. Patent Owner’s arguments in this regard reference arguments made with respect to independent claim 3—that color selection must be made by the processor

associated with the camera (*see id.*)—which we do not find persuasive for the reasons discussed above. Further, we are persuaded by Petitioner’s showing that Hashimoto discloses the color-of-light control part automatically selecting the color of light emitted. Pet. 22–23, 45 (citing Ex. 1003 ¶¶ 20, 44, 53).

Reasons to Combine

Patent Owner argues that Wang and Hashimoto are not combinable to arrive at the claimed invention. PO Resp. 47–48. Specifically, Patent Owner argues that “Wang unambiguously teaches away from any incorporation of solutions to [the ‘object and background separation problem’] . . . into its system.” *Id.* at 47 (citing Ex. 1006 ¶¶ 16, 25). Petitioner, however, has provided evidence that “Wang recognizes that conditions in the background environment can . . . negatively impact object-tracking performance.” Pet. 34 (citing Ex. 1006 ¶ 4). We agree with Petitioner that “a skilled artisan would have recognized that the system taught by Wang would further benefit from the color configuration process taught by Hashimoto.” Pet. 35. Patent Owner’s arguments to the contrary are not persuasive.

Dependent Claims 6, 7, 10, and 11

Patent Owner does not argue the patentability of claims 6, 7, 10, and 11 based on any additional limitations than those discussed above. As indicated above, we are persuaded by Petitioner’s argument and evidence in connection with the limitations introduced in each of these dependent claims.

4. *Conclusion*

For the reasons discussed, Petitioner has demonstrated, by a preponderance of the evidence, that claims 1, 3, 4, 6, 7, 10, and 11 are unpatentable as obvious over Wang and Hashimoto.

E. Obviousness over Hashimoto and Marks '126

Petitioner asserts that claims 5 and 8 are unpatentable under 35 U.S.C. § 103 as obvious over Hashimoto and Marks '126. Pet. 46–50. In support of the asserted ground of unpatentability, Petitioner sets forth teachings of Hashimoto and Marks '126, provides detailed claim charts, and cites to the Welch Declaration, explaining how each claim limitation is disclosed in or rendered obvious by the cited references. Upon review of the arguments and evidence, we determine that Petitioner has demonstrated, by a preponderance of the evidence, that claims 5 and 8 are unpatentable as obvious over Hashimoto and Marks '126.

1. *Marks '126*

Marks '126 discloses a system in which user movement of an interface object allows the user to manipulate objects of a computer program. Ex. 1007, 5:45–49. In Marks '126, the interface object includes a colored light source, which is detected by an image capture device as an input to the program. *Id.* at 5:54–6:8. The color of the interface object can be changed by pressing a button thereon. *Id.* at 10:13–20.

2. *Petitioner's Arguments and Evidence*

Claim 5, which depends from claim 3, requires “the color of the light emitted by the controlling object is manually selected by a user,” and claim 8, which depends from claim 4, requires the “controlling object is manually configure[d] to emit light of a selected color.” Ex. 1001, 8:56–58, 8:65–67.

Petitioner relies on Marks '126 as disclosing the manual selection/configuration of the color of light emitted by the controlling object. *See* Pet. 46–50.

Citing the Welch Declaration, Petitioner asserts that one of skill in the art would have recognized automatic configuration and manual configuration as “two distinct design choices for selecting and configuring the . . . controller in optical tracking systems,” and it “would have been obvious to try to implement a manual controller configuration for the system taught by Hashimoto to predictably reduce system complexity and cost[.]” Pet. 47 (citing Ex. 1010 ¶¶ 16, 19). We are persuaded Petitioner has set forth sufficient articulated reasoning with rational underpinning to support the combination of the prior art teachings identified above. *See KSR*, 550 U.S. at 418.

3. *Patent Owner’s Arguments and Evidence*

Patent Owner does not argue separately the patentability of claims 5 and 8, but rather relies on previously discussed arguments with respect to claim 3, from which they ultimately depend. *See* PO Resp. 48.

4. *Conclusion*

For the reasons discussed, Petitioner has demonstrated, by a preponderance of the evidence, that claims 5 and 8 are unpatentable as obvious over Hashimoto and Marks '126. We are persuaded by Petitioner’s argument and evidence in connection with the limitations introduced in each of these dependent claims.

F. *Motion to Exclude*

Patent Owner’s Motion to Exclude seeks to exclude “certain deposition and other testimony offered by [Petitioner’s] expert, Dr. Gregory

Welch as it pertains to a person of ordinary skill in the art,” asserting that Dr. Welch is not, in fact, a person of ordinary skill. Mot. to Excl. 1. Patent Owner further asserts that “any attorney argument offered by Petitioner that relies on such testimony should be disregarded and/or struck entirely.” *Id.* Specifically, Patent Owner requests that paragraphs 9 and 15–19 of Ex. 1010 and paragraphs 2, 3, 5, 6, 8–14, 16, 17, and 19 of Ex. 1025 be excluded.

The Board, sitting as a non-jury tribunal with administrative expertise, is well-positioned to determine and assign appropriate weight to evidence presented. *Gnosis S.p.A. v. S. Alabama Med. Sci. Found.*, Case IPR2013-00118, slip op. at 43 (PTAB June 20, 2014) (Paper 64); *see also Donnelly Garment Co. v. NLRB*, 123 F.2d 215, 224 (8th Cir. 1941) (“One who is capable of ruling accurately upon the admissibility of evidence is equally capable of sifting it accurately after it has been received.”). In an *inter partes* review, we regard it as the better course to have a complete record of the evidence to facilitate public access, as well as appellate review. *See Donnelly Garment Co.*, 123 F.2d at 244 (“If the record on review contains not only all evidence which was clearly admissible, but also all evidence of doubtful admissibility, the court which is called upon to review the case can usually make an end of it, whereas if evidence was excluded which that court regards as having been admissible, a new trial or rehearing cannot be avoided.”).

We have considered Patent Owner’s arguments for excluding the above-mentioned evidence, including the information set forth in Patent Owner’s Motion for Observations and Petitioner’s Response thereto, but either do not rely on the specific portions of evidence in our Decision, or

assign weight to the evidence as appropriate in view of the entire record before us. Patent Owner's Motion to Exclude is *denied*.

III. CONCLUSION

Based on the evidence and arguments, Petitioner has demonstrated, by a preponderance of the evidence, that claims 1–11 of the '885 patent are unpatentable for the following reasons: claims 1, 3, 4, 6, 7, 10, and 11 under 35 U.S.C. § 102 as anticipated by Hashimoto; claims 2 and 9 under 35 U.S.C. § 103 as obvious over Hashimoto and Marks '859; claims 1, 3, 4, 6, 7, 10, and 11 under 35 U.S.C. § 103 as obvious over Wang and Hashimoto; and claims 5 and 8 under 35 U.S.C. § 103 as obvious over Hashimoto and Marks '126.

IV. ORDER

Accordingly, it is

ORDERED that claims 1–11 of U.S. Patent No. 8,094,885 B2 are unpatentable; and

FURTHER ORDERED that Patent Owner's Motion to Exclude is *denied*.

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.

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