

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

VALVE CORPORATION,
Petitioner,

v.

IMMERSION CORPORATION,
Patent Owner.

IPR2024-00508
Patent 9,116,546 B2

Before MICHAEL R. ZECHER, CHRISTOPHER L. OGDEN, and
MATTHEW J. McNEILL, *Administrative Patent Judges*.

OGDEN, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

Valve Corporation (“Petitioner”) filed a Petition (Paper 2, “Pet.”) under 35 U.S.C. §§ 311–319 requesting *inter partes* review (“IPR”) of claims 1–18, 21–24, and 26–29 of U.S. Patent No. 9,116,546 B2 (Ex. 1001, “the ’546 patent”). Immersion Corporation (“Patent Owner”) did not file a Preliminary Response. Based on the uncontested arguments and evidence presented in the Petition, we instituted trial on all claims and grounds raised in the Petition. Paper 6.

After institution, Patent Owner did not file a Response to the Petition and thus there has been no further briefing on the merits of the case, and no oral hearing. Petitioner’s arguments and evidence remain unrebutted.

This is a final written decision under 35 U.S.C. § 318(a) as to whether the claims challenged in the *inter partes* review are unpatentable. For the reasons below, we hold that Petitioner has shown by a preponderance of the evidence that all challenged claims are unpatentable.

II. BACKGROUND

A. THE ’546 PATENT (EX. 1001)

The ’546 patent describes “[a] haptic representation system . . . that generates a haptic effect in response to sensor input.” Ex. 1001, code (57). As background, it explains that “[h]aptics is a tactile and force feedback technology that takes advantage of a user’s sense of touch by applying haptic feedback effects (i.e., ‘haptic effects’), such as forces, vibrations, and deformations, to the user.” *Id.* at 1:11–14.

The '546 patent describes an embodiment in which “the received input includes extra-sensory information, where extra-sensory information is information that cannot normally be perceived by a human being, such as an electromagnetic field, infra-red light, ultraviolet light, radiation, or subtle changes in temperature.” Ex. 1001, 2:16–20. When such extrasensory information is conveyed to the user via a haptic effect, “a user’s senses can be augmented, as the user can perceive attributes of an environment that would normally be difficult or impossible to perceive.” *Id.* at 8:60–63.

B. CHALLENGED CLAIMS AND GROUNDS

Independent claim 1 is as follows:

- 1PRE 1. A non-transitory computer-readable medium having instructions stored thereon that, when executed by a processor, cause the processor to generate a haptic effect, the generating the haptic effect comprising:
- 1A receiving input from a sensor, wherein the input comprises extra-sensory information, wherein the input further comprises one or more interaction parameters, and wherein each interaction parameter comprises a value;
 - 1B mapping the received input to a haptic signal; and
 - 1C sending the haptic signal to an actuator to generate the haptic effect;
 - 1D the mapping the received input to the haptic signal further comprising modulating the haptic signal when new input is received, wherein the new received input comprises an update of at least one value of at least one interaction parameter of the received input; and
 - 1E the sending the haptic signal to the actuator to generate the haptic effect further comprising sending the modulated haptic signal to the actuator to modulate the generated haptic effect.

Ex. 1001, 17:11–30; *accord* Pet. 77 (Petitioner’s reference numbers added).

Petitioner argues four grounds for IPR, as summarized in the following table (*see* Pet. 3):

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1–18, 21–24, 26–29	102(b) ¹	Rosenberg ²
1–18, 21–24, 26–29	103(a)	Rosenberg
1–3, 5–7, 9–11, 13–16, 21–23, 26–28	102(b)	Brock ³
1–3, 5–7, 9–11, 13–16, 21–23, 26–28	103(a)	Brock

C. DECLARATORY TESTIMONY

Petitioner submits a declaration by Gregory Welch, Ph.D. Ex. 1003; *see also* Ex. 1004 (Dr. Welch’s curriculum vitae).

D. RELATED PROCEEDINGS

As a related matter, the parties identify *Immersion Corporation v. Valve Corp.*, No. 23-cv-00712 (W.D. Wash. filed May 15, 2023). Pet. xi; Paper 4 (Patent Owner’s Mandatory Notices), 1.

¹ 35 U.S.C. §§ 102, 103 (2006), *amended by* Leahy–Smith America Invents Act (“AIA”), Pub. L. No. 112-29 §§ 102, 103, sec. (n)(1), 125 Stat. 284, 287, 293 (2011) (effective Mar. 16, 2013). Petitioner applies the pre-AIA version of the statute. *See* Pet. 3.

² Rosenberg, US 2007/0106457 A1, published May 10, 2007 (Ex. 1009).

³ Brock et al., US 2002/0120188 A1, published August 29, 2002 (Ex. 1008).

III. ANALYSIS

A. LEVEL OF ORDINARY SKILL IN THE ART

The level of ordinary skill in the pertinent art at the time of the invention is a factor in how we construe patent claims. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (en banc). It is also one of the factors we consider when determining whether a patent claim is obvious over the prior art. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

To assess the level of ordinary skill, we construct a hypothetical “person of ordinary skill in the art,” from whose vantage point we assess obviousness and claim interpretation. *See In re Rouffet*, 149 F.3d 1350, 1357 (Fed. Cir. 1998). This legal construct “presumes that all prior art references in the field of the invention are available to this hypothetical skilled artisan.” *Id.* (citing *In re Carlson*, 983 F.2d 1032, 1038 (Fed. Cir. 1993)).

Petitioner argues that a person of ordinary skill in the art “would have a bachelor’s degree in electrical engineering, computer science, or a related field, plus at least two years of industry experience or graduate-level academic experience with human-computer interaction.” Pet. 7 (citing Ex. 1003 ¶¶ 40–45). This level of skill appears reasonable in view of the disclosures in the ’546 patent and asserted prior art. We adopt Petitioner’s proposed level of ordinary skill for this Decision.

B. CLAIM CONSTRUCTION

In an IPR, we construe a patent claim “using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b).” 37 C.F.R. § 42.100(b). This generally includes “construing the claim in accordance with the ordinary and

customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” *Id.* The ordinary and customary meaning of a claim term “is its meaning to the ordinary artisan after reading the entire patent” and “as of the effective filing date of the patent application.” *Phillips*, 415 F.3d at 1313, 1321.

Petitioner argues that we need not construe any claim terms explicitly because “the Petition’s prior art discloses each element of the challenged claims under any plausible construction.” Pet. 8.

We agree with Petitioner that, for this Decision, we do not need to construe any of the terms explicitly. *See Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (“The Board is required to construe ‘only those terms . . . that are in controversy, and only 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))). To the extent that we discuss specific claim language, we do so below in the context of the prior art. *See, e.g., infra* Section III.C.2(e).

C. ALLEGED ANTICIPATION OR OBVIOUSNESS OVER ROSENBERG
(CLAIMS 1–18, 21–24, AND 26–29)

In its first two grounds, Petitioner argues that claims 1–18, 21–24, and 26–29 are unpatentable under § 102(b) as anticipated by Rosenberg or under § 103(a) as obvious over Rosenberg. Pet. 3, 8–43.

To show anticipation under § 102, a petitioner must locate every element in a claim, arranged as recited in the claim, in a single prior art reference. *See Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1369 (Fed. Cir. 2008). The limitations may be present in the reference “either explicitly or inherently.” *In re Schreiber*, 128 F.3d 1473, 1477 (Fed. Cir. 1997). In

making this determination, we consider the reference “together with the knowledge of one of ordinary skill in the pertinent art.” *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994) (citing *In re Samour*, 571 F.2d 559, 562 (CCPA 1978)).

A claim is unpatentable for obviousness under § 103(a) if the differences between the claimed subject matter and the prior art are “such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). When a ground in a petition is based on a combination of references, we consider “whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *Id.* at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

We base our obviousness inquiry on factual considerations including (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, (3) the level of skill in the art, and (4) any objective indicia of obviousness or non-obviousness that may be in evidence.⁴ *See Graham*, 383 U.S. at 17–18.

Based on the above principles, we determine that Petitioner has shown by a preponderance of the evidence that claims 1–18, 21–24, and 26–29 are unpatentable for the reasons explained below.

⁴ Neither party argues that there are objective indicia of obviousness or non-obviousness, so this factor is not part of our analysis.

1. *Overview of Rosenberg*

Petitioner’s grounds rely on Rosenberg, which is a portable navigation device for enabling users to find geospatial orientations within the physical world using their tactile senses. Ex. 1009, code (57). The device provides tactile sensations as the device passes through the earth’s magnetic field. *See, e.g., id.* ¶ 8. For example, the magnitude of the tactile sensation varies depending on the degree of alignment between the device’s orientation and a target orientation (e.g., magnetic north). *See, e.g., id.* ¶ 68. Another embodiment provides “tick-mark” sensations as the device is rotated, so that the user feels the difference between cardinal directions (i.e., north, south, east, or west) and the other directions between them. *Id.* at ¶¶ 7, 50–52.

2. *Claim 1*

(a) Preamble (1PRE)

The preamble of claim 1 recites “[a] non-transitory computer-readable medium having instructions stored thereon that, when executed by a processor, cause the processor to generate a haptic effect” via certain steps outlined in the remainder of the claim. Ex. 1001, 17:11–14.

Petitioner argues that Rosenberg’s device has local memory coupled to a microprocessor to store instructions for execution, and that these instructions cause an actuator to generate “haptic sensations” (i.e., haptic effects). Pet. 12–14 (citing Ex. 1009 ¶¶ 6, 12–13, 28, 33–34, 43, 46, 50–51, 60, 62, 64, 73–79, 76–78, 85, Figs. 3, 5, claim 22; Ex. 1003 ¶¶ 82–87).

We agree that Rosenberg discloses the preamble for the reasons given in the Petition, and because of this, we need not decide whether the preamble is limiting.

(b) Limitation 1A

Limitation 1A recites “receiving input from a sensor, wherein the input comprises extra-sensory information, wherein the input further comprises one or more interaction parameters, and wherein each interaction parameter comprises a value.” Ex. 1001, 17:15–18.

Petitioner argues that Rosenberg discloses receiving extra-sensory input signals from a sensor, such as magnetic-field measurements from a magnetometer reflecting the sensor’s orientation in Earth’s magnetic field. Pet. 14–15 (citing Ex. 1009 ¶¶ 23–26, 39, 43, 46, 76, Fig. 5, claim 2; Ex. 1003 ¶¶ 88–90). According to Petitioner, this magnetic orientation data includes “interaction parameters” in the form of values such as angles (in degrees, for example) relative to geographic north. Pet. 15–16 (citing Ex. 1009 code (57), ¶¶ 13, 76, claim 17; Exs. 1015–1016 (dictionaries defining “parameter”); Ex. 1017 (a prior Board decision relating to another of Patent Owner’s patents (Ex. 1028) construing “dynamic interaction parameter”), 7; Ex. 1003 ¶¶ 91–94).

For the reasons given in the Petition, we agree with Petitioner that Rosenberg discloses limitation 1A. As Petitioner correctly notes, Rosenberg’s input conveys extra-sensory information about magnetic fields, in the form of numerical values like angles.

(c) Limitation 1B

Limitation 1B recites “mapping the received input to a haptic signal.” Ex. 1001, 17:19.

Petitioner argues that the instructions in Rosenberg’s device generate haptic signals to impart haptic sensations associated with the sensor input.

Pet. 16–17 (citing Ex. 1009 ¶¶ 32–38, 43, 46, 50–52, 54, 60, 62, Fig. 3; Ex. 1003 ¶¶ 95–97). For example, the magnitude or frequency of a haptic sensation can correspond to how close the device’s magnetometer-derived orientation aligns with a particular geospatial reference orientation (e.g., north). Pet. 18–19 (citing Ex. 1009 ¶¶ 60, 62, 64, 69, 71; Ex. 1003 ¶¶ 98–102).

For the reasons given in the Petition, we agree with Petitioner that Rosenberg discloses limitation 1B.

(d) Limitation 1C

Limitation 1C recites “sending the haptic signal to an actuator to generate the haptic effect.” Ex. 1001, 17:20–21.

Petitioner argues that Rosenberg’s haptic signals are sent to an actuator to generate haptic effects in the form of tactical sensations. Pet. 20 (citing Ex. 1009 ¶¶ 6, 32–38, 43, 46, 50–52, 54–55, 58, 62, 64; Ex. 1003 ¶¶ 103–106).

For the reasons given in the Petition, we agree with Petitioner that Rosenberg discloses limitation 1C.

(e) Limitation 1D

Limitation 1D states that “the mapping the received input to the haptic signal”—i.e., limitation 1B—further comprises “modulating the haptic signal when new input is received, wherein the new received input

comprises an update of at least one value of at least one interaction parameter of the received input.” Ex. 1001, 17:22–26.⁵

Petitioner argues that there are two potential constructions of this limitation, but that Rosenberg discloses the limitation either way. Pet. 21.

Petitioner’s first potential construction effectively adds the word “continuous” or “continuously” to limitation 1D, requiring “continuously modulating the haptic signal based on a continuous updating of the value of at least one interaction parameter.” *Id.* at 21 (emphasis omitted). In support of this, Petitioner argues that the term “continuously” appears before the word “modulating” in the ’546 patent’s specification, and that in the only embodiments in which modulating occurs, the modulation is continuous. *Id.* at 21 (citing Ex. 1001, 7:62–8:3, 9:32–35, 15:41–44).

Petitioner’s second potential construction is that limitation 1D “would not require the ‘new input’ mapping to the modulated haptic signal to be received immediately after earlier input that was mapped to a haptic signal.” Pet. 22. In support of this, Petitioner argues that, during prosecution, the phrase “continuously modulating” originally appeared in a dependent claim that was later incorporated into claim 1, but the word “continuously” was left out. *Id.* at 22 (citing Ex. 1002, 44, 141–142, 152).

Because we determine that Rosenberg discloses limitation 1D under both proposed constructions (including the narrower first construction) as well as the plain claim language, we need not adopt either of these proposed

⁵ Petitioner contends that, during prosecution, the applicant added this limitation with the intent to overcome the prior art. Pet. 5 (citing Ex. 1002, 138–157).

constructions. We agree with Petitioner that Rosenberg discloses modulating or controlling either the magnitude or frequency of the haptic signal as the interaction parameters of the magnetic orientation input are updated over time. Pet. 23–27 (citing Ex. 1009 ¶¶ 33, 62, 64, 68–71, 76, 80, 86; Ex. 1003 ¶¶ 108–116).

For the reasons given in the Petition, we agree with Petitioner that Rosenberg discloses limitation 1D under either of Petitioner’s proposed constructions or under the plain claim language.

(f) Limitation 1E

Limitation 1E states that “the sending the haptic signal to the actuator to generate the haptic effect”—i.e., limitation 1C—further comprises “sending the modulated haptic signal to the actuator to modulate the generated haptic effect.” Ex. 1001, 17:27–30.

Petitioner argues that, as it discussed in the context of limitations 1C and 1D, Rosenberg’s modulated haptic signals are sent to the actuator to generate a haptic effect. Pet. 28 (citing Ex. 1009 ¶¶ 33, 43, 46, 50–52, 54–55, 58, 62, 64; Ex. 1003 ¶¶ 117–118).

For the reasons given in the Petition, and as discussed above in the context of limitations 1C and 1D, we agree with Petitioner that Rosenberg discloses limitation 1E.

(g) Conclusion for Claim 1

For the above reasons, we find that Petitioner has shown by a preponderance of the evidence that Rosenberg discloses every limitation of claim 1. Alternatively, we determine that each of the limitations would have been obvious in view of Rosenberg.

3. *Claims 2–18, 21–24, and 26–29*

Of the remaining challenged claims, claims 5, 9, 13, 21, and 26 are independent and include limitations generally similar to those of claim 1; claims 2–4 further limit independent claim 1; claims 6–8 further limit independent claim 5; claims 10–12 further limit independent claim 9; claims 14–18 further limit independent claim 13; claims 22–24 further limit independent claim 21; and claims 27–29 further limit independent claim 26. Ex. 1001, 17:31–20:56. Petitioner presents arguments addressing each of the limitations in claims 2–18, 21–24, and 26–29, with support from the record and the testimony of Dr. Welch. *See* Pet. 29–43.

As one example, claim 2 depends from claim 1 and further recites “the mapping the received input to the haptic signal further comprising generating the haptic signal when the value of at least one interaction parameter exceeds a specified value.” Ex. 1001, 17:31–36. Dependent claims 6 and 10 include similar limitations. *See* Ex. 1001, 17:63–67, 18:34–38. Petitioner argues that Rosenberg teaches that a haptic signal is only produced when the magnetic orientation angle is within 10° of a reference orientation; thus, if the orientation angle is 360°, a haptic signal is only generated when the orientation angle exceeds 350°. Pet. 29–30 (citing Ex. 1009 ¶¶ 64, 69–71, 76; Ex. 1003 ¶¶ 119–121, 125).

As we note above, Petitioner’s arguments and evidence presented in the Petition remain unrebutted. Having reviewed Petitioner’s uncontested arguments and evidence explaining how Rosenberg discloses or teaches each of the limitations of claims 2–18, 21–24, and 26–29, we agree with and adopt Petitioner’s analysis. *See* Pet. 29–43.

4. Conclusion

For the above reasons, we determine that claims 1–18, 21–24, and 26–29 are unpatentable under § 102(b) as anticipated by Rosenberg. Likewise, and alternatively, we determine that the same claims are unpatentable under § 103(a) as obvious over Rosenberg.

D. ALLEGED ANTICIPATION OR OBVIOUSNESS OVER BROCK (CLAIMS 1–3, 5–7, 9–11, 13–16, 21–23, AND 26–28)

In its third and fourth grounds, Petitioner argues that claims 1–3, 5–7, 9–11, 13–16, 21–23, and 26–28 are unpatentable under § 102(b) as anticipated by Brock, or under § 103(a) as obvious over Brock. Pet. 3, 44–71.

As we discuss above, we hold that each of the above claims is unpatentable as anticipated or obvious based on Rosenberg. *See supra* Section III.C. Thus, we need not decide whether these claims are also unpatentable based on Brock. *Cf. In re Gleave*, 560 F.3d 1331, 1338 (Fed. Cir. 2009) (not reaching other grounds of unpatentability after affirming a ground based on anticipation); *see also Beloit Corp. v. Valmet Oy*, 742 F.2d 1421, 1423 (Fed. Cir. 1984) (explaining that an administrative agency is at liberty to reach a decision based on a dispositive issue because doing so “can not only save the parties, the [agency], and [the reviewing] court unnecessary cost and effort,” but “can greatly ease the burden on [an agency] commonly faced with a . . . proceeding involving numerous complex issues and required by statute to reach its conclusion within rigid time limits”).

IV. CONCLUSION⁶

For the reasons above, Petitioner has shown by a preponderance of the evidence that claims 1–18, 21–24, and 26–29 of the '546 patent are unpatentable under § 102(b) and § 103(a).

In summary:

Claim(s)	35 U.S.C. §	Reference(s)/ Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–18, 21–24, 26–29	102(b)	Rosenberg	1–18, 21–24, 26–29	
1–18, 21–24, 26–29	103(a)	Rosenberg	1–18, 21–24, 26–29	
1–3, 5–7, 9– 11, 13–16, 21–23, 26–28	102(b)	Brock ⁷		
1–3, 5–7, 9– 11, 13–16, 21–23, 26–28	103(a)	Brock ⁷		
Overall Outcome			1–18, 21–24, 26–29	

⁶ Should Patent Owner wish to pursue amendment of claims in a reissue or reexamination proceeding after this decision, we draw attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. § 42.8(a)(3), (b)(2).

⁷ As discussed above, we do not reach the alternative grounds based on Brock. See *supra* Section III.D.

V. ORDER

It is

ORDERED that claims 1–18, 21–24, 26–29 of the '546 patent are unpatentable; and

FURTHER ORDERED that parties to this proceeding seeking judicial review of our Decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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