

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

META PLATFORMS, INC.,
Petitioner,

v.

IMMERSION CORPORATION,
Patent Owner.

IPR2023-00945
Patent 10,664,143 B2

Before PATRICK R. SCANLON, CHRISTOPHER L. OGDEN, and
IFTIKHAR AHMED, *Administrative Patent Judges*.

OGDEN, *Administrative Patent Judge*.

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

I. INTRODUCTION

Petitioner Meta Platforms, Inc. (“Meta”) filed a Petition (Paper 2, “Pet.”) under 35 U.S.C. §§ 311–319 requesting *inter partes* review (“IPR”) of claims 1–3, 7–10, 14–17, and 20 of U.S. Patent No. 10,664,143 B2 (Ex. 1001, “the ’143 patent”). Patent Owner Immersion Corporation (“Immersion”) filed a Preliminary Response (Paper 10, “Prelim. Resp.”).¹

Under the authority delegated to us by the Director of the USPTO under 37 C.F.R. § 42.4(a), we may institute an *inter partes* review when “the information presented in the petition . . . and any response . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a); *see also* 37 C.F.R. § 42.108(c) (2023). Applying that standard, we institute an *inter partes* review of the challenged claims of the ’143 patent for the reasons explained below. This is a preliminary decision, and we will base our final written decision on the full trial record.

II. BACKGROUND

A. THE ’143 PATENT (EX. 1001)

The ’143 patent describes “a system configured to present interactive content to a user that is manipulating a peripheral.” Ex. 1001, 1:54–56. The system can adjust the interactive content, as well as haptic feedback to the

¹ The parties identify themselves as the real parties in interest, and this is not contested on the preliminary record. *See* Pet. 1; Paper 8, 1.

user, based in part on the sensed position of the peripheral. *See id.* at 1:61–2:5. Haptic feedback, according to the ’143 patent, “may include tactile and/or kinesthetic (force) feedback technology that takes advantage of a user’s sense of touch by applying forces, vibrations, motions, and/or other touch feedback to the user” to create “a more compelling and complete user experience while interacting with interactive content.” Ex. 1001, 3:9–14. A “peripheral” can include a device or physical object, including a body part, that can be manipulated by a user. *See id.* at 3:29–56.

Sensing the position of a peripheral may involve the use of a “position sensor” that is “configured to generate an output signal that conveys information related to the position of the peripheral.” Ex. 1001, 5:48–50; *accord id.* at 5:56–58. The position sensors may be used for “remote sensing,” such as by using an imaging device, triangulation with wireless signals, or other types of motion tracking. Ex. 1001, 5:35–45. Remote sensing may also include “access to data from device-embedded sensors such as magnetometer, accelerometer/gyroscope, and/or other remote sensing techniques.” *Id.* at 5:45–48. Also, “[i]n some implementations, the position sensor . . . may include one or more sensors carried by [the] peripheral,” such as “an accelerometer, a gyroscope, [or] a digital compass.” *Id.* at 5:53–56.

B. CHALLENGED CLAIMS AND GROUNDS

Representative claim 1 is as follows:

1. A system comprising:
 - 1[a] a position sensor;
 - 1[b] a processor; and

- 1[c] a non-transitory computer-readable medium comprising program code that is executable by the processor to cause the processor to:
- 1[d] output first interactive content to a display, the first interactive content comprising a virtual environment;
- 1[e] receive one or more sensor signals from the position sensor;
- 1[f] determine a position of a peripheral in real space based on the one or more sensor signals, the peripheral configured to be worn on a user's head;
- 1[g] output second interactive content to the display based on the position of the peripheral in real space, the second interactive content being different from the first interactive content;
- 1[h] determine a haptic signal based on the position of the peripheral in real space and the second interactive content; and
- 1[i] transmit the haptic signal to a haptic output device, the haptic output device being configured to receive the haptic signal and output haptic feedback.

Ex. 1001, 12:57–13:13 (Meta's reference numbers added).

Meta argues a single grounds for *inter partes* review, as summarized in the following table:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1–3, 7–10, 14–17, 20	103(a) ²	Nogami ³

Pet. 3.

C. DECLARATORY TESTIMONY

Meta submits a declaration by Dr. Jeremy Cooperstock. Ex. 1002.
Immersion submits a declaration by Dr. Gregory Abowd. Ex. 2002.

D. RELATED PROCEEDING

As related matters, the parties identify *Immersion Corp. v. Meta Platforms, Inc.*, No. 22-cv-00541 (W.D. Tex. filed May 27, 2022),
transferred within district, No. 23-cv-00623 (W.D. Tex. effective June 1, 2023) (“related district court case”). Pet. 1; Paper 8, 1.

III. DISCRETIONARY GROUND FOR DENYING INSTITUTION

Institution of *inter partes* review is at the Director’s discretion, which has been delegated to the Board under her guidance. *See* 35 U.S.C. § 314(a); *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1367 (Fed. Cir. 2016)

² 35 U.S.C. § 103(a) (2006), *amended by* Leahy–Smith America Invents Act (“AIA”), Pub. L. No. 112-29 § 103, sec. (n)(1), 125 Stat. 284, 287, 293 (2011) (effective Mar. 16, 2013). This pre-AIA version of § 103 applies because the ’143 patent issued from a chain of continuation applications reaching back to September 30, 2010, which is before the effective date of the AIA amendments. *See* Ex. 1001, code (63).

³ Nogami et al., US 2009/0066725 A1 (published Mar. 12, 2009) (Ex. 1003).

(“[T]he [USPTO] is permitted, but never compelled, to institute an IPR proceeding.”); 37 C.F.R. § 42.4(a) (“The Board institutes the trial on behalf of the Director.”).

Under Board precedent, one of the considerations that may weigh in favor of denying a petition under § 314(a) is the advanced state of a parallel district court action. *See NHK Spring Co. v. Intrix-Plex Techs., Inc.*, IPR2018-00752, Paper 8 at 20 (PTAB Sept. 12, 2018) (precedential); Patent Trial and Appeal Board, Consolidated Trial Practice Guide, 58 & n.2 (Nov. 2019), *available at* <https://www.uspto.gov/sites/default/files/documents/tpgnov.pdf>. In *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (PTAB Mar. 20, 2020) (precedential), the Board explained that “cases addressing earlier trial dates as a basis for denial under *NHK* have sought to balance considerations such as system efficiency, fairness, and patent quality.” *Fintiv*, Paper 11 at 5. *Fintiv* sets forth six non-exclusive factors for determining “whether efficiency, fairness, and the merits support the exercise of authority to deny institution in view of an earlier trial date in the parallel proceeding.” *Id.* at 6. The Director has also issued interim guidance to the Board on applying these factors. *See* Katherine K. Vidal, Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation (June 21, 2022) 9, *available at* https://www.uspto.gov/sites/default/files/documents/interim_proc_discretionary_denials_aia_parallel_district_court_litigation_memo_20220621_.pdf (“Director Memo”).

The Director Memo explains that, “[c]onsistent with *Sotera Wireless, Inc.*, the PTAB will not discretionarily deny institution in view of parallel district court litigation where a petitioner presents a stipulation not to pursue in a parallel proceeding the same grounds or any grounds that could have

reasonably been raised before the PTAB.” Director Memo 3 (footnote omitted) (citing *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 (PTAB Dec. 1, 2020) (precedential as to § II.A)). The Director Memo explains that such a *Sotera* stipulation “mitigates concerns of potentially conflicting decisions and duplicative efforts between the district court and the PTAB . . . and allows the PTAB to review grounds that the parallel district court litigation will not resolve.” *Id.* at 7–8.

Meta acknowledges that in the related district court case, the court has set a trial date for February 20, 2024. Pet. 4.⁴ But to address any concerns regarding duplication of efforts between the related district court case and this proceeding, Meta provides a stipulation that it “will not pursue in the district court any grounds of invalidity against the challenged claims that were raised or reasonably could have been raised in IPR.” *Id.*

In response, Immersion acknowledges that Meta offers a *Sotera* stipulation, and that under these circumstances “a petition should not ordinarily be denied in accordance with the *Fintiv* factors.” Prelim. Resp. 33. But Immersion contends that we should still exercise our discretion to deny the Petition under § 314(a) based on the advanced state of the district court case and the duplication of invalidity grounds asserted in this proceeding. *Id.* at 33–34 (citing *Cisco Sys., Inc. v. Estech Sys., Inc.*, IPR2021-00329, Paper 13 (PTAB July 6, 2021)).

⁴ Meta argues that it filed a motion to transfer the case to the U.S. District Court for the Northern District of California that remained pending at the time of filing the Petition. Pet. 4. Immersion informs us that this motion was unsuccessful. *See* PO Resp. 36.

We do not agree that we can effectively ignore the Director Memo under these circumstances. Immersion cites *Cisco*, a non-precedential Board decision decided prior to the Director Memo in which the panel weighed the *Fintiv* factors and determined that a *Sotera* stipulation did not overcome a trial date scheduled significantly before the projected date of a final written decision. *See* Prelim. Resp. 34. The Director Memo issued after this decision as “binding agency guidance.” Director Memo at 3. Thus, the Director Memo abrogates any prior inconsistent holdings by Board panels, including the *Cisco* decision. Because Meta has provided a *Sotera* stipulation, the Director Memo is controlling and the *Fintiv* factors are not a basis for denying institution.

IV. GROUND OF THE PETITION

A claim is unpatentable 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).

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. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

Considering these factors,⁵ we determine that Meta has demonstrated a reasonable likelihood that it would prevail in showing that at least one of claims 1–3, 7–10, 14–17, and 20 of the ’143 patent is unpatentable as obvious over Nogami. We begin by addressing two issues underlying our analysis: the level of ordinary skill in the art and the construction we will apply to the claim terms.

A. LEVEL OF ORDINARY SKILL IN THE ART

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

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)).

Meta argues that a person of ordinary skill in the art would have had a bachelor’s degree in electrical engineering or computer science (or an equivalent degree), and two years of practical or

⁵ Because neither party argues that there are objective indicia of obviousness or non-obviousness at this stage, this does not factor into our decision. *See* Ex. 1002 ¶ 100 (Dr. Cooperstock stating that he is not aware of any objective indicia of nonobviousness); *see generally* Prelim. Resp. (omitting any discussion of objective indicia).

industry experience in the field of human computer interaction, including implementation of computer-based systems and software for providing haptic feedback effects to a user and determining the position and/or orientation of a device used by a user (such as a device worn on the human body).

Pet. 4–5 (citing Ex. 1002 ¶¶ 8–9).

Immersion argues that a person of ordinary skill “would have had a bachelor’s degree in electrical engineering or computer science (or an equivalent degree), and two years of practical or industry experience in the field of human computer interaction (HCI), including implementation of computer-based systems and software for providing haptic feedback effects to a user.” Prelim. Resp. 9 (citing Ex. 2002 ¶ 11).

The only substantial difference between the two proposals is that Meta includes experience in “determining the position and/or orientation of a device used by a user (such as a device worn on the human body),” whereas Immersion does not. *Compare* Pet. 4–5, *with* Prelim. Resp. 9. At this stage, Immersion and its expert Dr. Abowd do not say if, or why, it disagrees with this part of Meta’s articulation. *See* Prelim. Resp. 8–9; Ex. 2002 ¶¶ 8–12. We preliminarily determine that this part of Meta’s proposal is consistent with the types of technical problems that the ’143 patent assumes the reader would have been able to solve without detailed disclosure. *See, e.g.*, Ex. 1001, 5:35–58, 6:48–60. And because the remainder of Meta’s proposal is substantially undisputed, we adopt Meta’s articulation of the level of ordinary skill in the art for this decision. Because this is a preliminary determination, Immersion may provide additional arguments or evidence supporting a different level of ordinary skill at trial.

B. CLAIM CONSTRUCTION

In an *inter partes* review, 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) (2023). 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.

Meta notes that in the related district court case, the parties have proposed constructions for the term “real space.” Pet. 6 (citing Ex. 1006, 2). But Meta “does not believe any term requires express construction at this time” for purposes of this proceeding. *Id.*

Immersion informs us that the district court construed the term “real space” as having its plain and ordinary meaning. Prelim. Resp. 9 n.2 (citing Ex. 2005, 4). At this preliminary stage, Immersion contends that “all claim terms should be afforded their ordinary and customary meaning, as understood by a [person of ordinary skill in the art], in the context of the patent specification.” *Id.* at 9–10 (citing Ex. 2002 ¶ 36).

Based on the preliminary record, we have not identified any claim terms, including “real space,” that clearly depart from their ordinary and customary meanings, and our decision to institute trial does not require us to construe any 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)). Accordingly, we analyze the claim language below in the context of the prior art.

C. OVERVIEW OF NOGAMI

Nogami generally relates to “an information-processing apparatus configured to implement an interaction between a virtual space and a user who observes the virtual space.” Ex. 1003 ¶ 2. Figure 1 of Nogami illustrates “an exemplary state of a system, which is being used by the user.” *Id.* ¶¶ 30, 47.

FIG.1

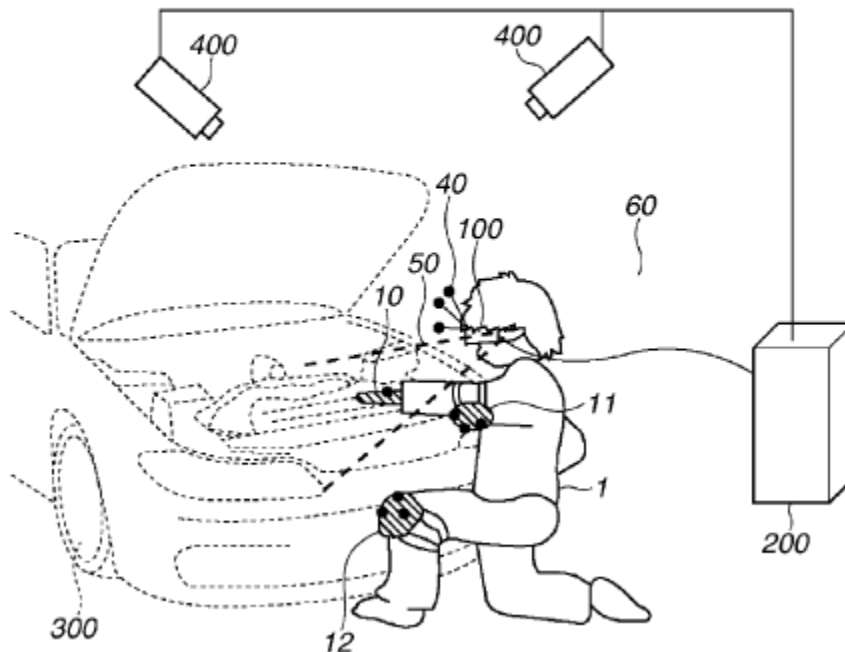


Figure 1, above, depicts user 1, on whose hand, elbow, and knee are mounted stimulation generation units 10, 11, and 12, respectively. Ex. 1003

¶ 51. Head-mounted display (“HMD”) 100 is also mounted on user 1’s head. *Id.* ¶ 49. Each of these devices allows the user to experience a virtual space including virtual object 300, which in this example is a full-scale automobile. *Id.* ¶¶ 49–50. Position and orientation sensors 400 (depicted as cameras) also acquire the position of markers 40 attached to stimulation generation units 10–12 and HMD 100, and then calculation processing apparatus 200 uses this position information to output a combined image that includes a virtual image and real space image to HMD 100. *Id.* ¶ 52.

Nogami divides the space around user 1 into “attention range” 50 (the volume in which user 1 can perceive virtual objects visually) and “non-attention range” 60 (the remaining volume). Ex. 1003 ¶¶ 100–101. In both ranges, user 1 may make virtual tactile contact with virtual objects; for example, user 1’s hand (wearing simulation generation unit 10) might contact virtual object 300 within attention range 50, while user 1’s knee (wearing simulation generation unit 12) might contact virtual object 300 in non-attention range 60. *Id.* ¶¶ 102–03. In this example, calculation processing apparatus 200 might generate different haptic stimulations to units 10 and 12, based on whether the contact is in attention range 50 or non-attention range 60. *Id.* ¶¶ 103, 120, 174, 279–280, Fig. 4.

D. CLAIM 1

Meta’s arguments in the Petition include a limitation-by-limitation comparison of claim 1 with the disclosures in Nogami. Pet. 8–41. Below, we address Meta’s arguments and Immersion’s preliminary arguments in response.

Preamble

The preamble of claim 1 recites “[a] system comprising” certain hardware set forth in the remainder of the claim. Ex. 1001, 12:57.

Meta argues that Nogami discloses a system with hardware as recited. Pet. 8–11 (citing Ex. 1003 ¶¶ 46–59, 74, 77, 82–86, Figs. 1, 2).

Immersion does not specifically contest these arguments at this stage. *See generally* Prelim. Resp. Because the preliminary evidence suggests that Nogami discloses a system as recited in the preamble, we need not decide whether the preamble is limiting.

1. Limitation 1[a]

Limitation 1[a] recites “a position sensor.” Ex. 1001, 12:58. Meta argues that Nogami discloses this in the form of a magnetic sensor included as part of HMD 100. Pet. 11–12 (citing Ex. 1003 ¶¶ 77–78, Fig. 1).⁶ According to Meta, the magnetic sensor in HMD 100 “senses a magnetic field generated by a transmitter” and “detects a change in the magnetic field as HMD 100 changes its position and orientation within the magnetic field.” Pet. 12–13 (citing Ex. 1003 ¶ 77, Fig. 1). According to Meta, interpreting the magnetic sensor as the recited “position sensor” is consistent with the ’143 patent’s disclosure of a magnetometer as an example of a position sensor. Pet. 13 (citing Ex. 1001, 5:35–38; Ex. 1002 ¶ 54).

⁶ Meta states that it does not rely on position and orientation sensor 400 (shown in Figure 1, *supra* Section IV.C.1) as the recited “position sensor” for claim 1 because dependent claim 2 requires that the position sensor be “positioned on the peripheral.” Pet. 13 n.2 (emphasis omitted) (citing Ex. 1003 ¶ 44, Fig. 1).

Immersion disagrees that Nogami discloses a “position sensor” as recited in claim 1. *See* Prelim. Resp. 15–26.⁷ According to Immersion, the ’143 patent discloses two distinct embodiments, one a “remote sensing” embodiment, “where the position sensor is physically separate from the peripheral” (*id.* at 15 (citing Ex. 1001, 3:15–28, 3:64–4:5, 5:35–48, Fig. 1)) and the other embodiment “where the position sensor is mounted on the peripheral” (*id.* at 15 (citing Ex. 1001, 5:52–58, 13:14–15, 13:56–57, 14:37–39)). Immersion contends that Meta’s arguments rely solely on the magnetic sensor in HMD 100, which falls within this latter embodiment where the sensor is mounted on the peripheral. *Id.* at 15–16.

Immersion acknowledges Nogami’s disclosure that “a magnetic sensor can be *used* for acquiring the position and orientation information about the HMD 100.” Prelim. Resp. 20 (quoting Ex. 1003 ¶ 77). But according to Immersion, the magnetic sensor is not a “position sensor” as recited in limitation 1[a], but “is merely a building block component that provides rudimentary signals relied upon by Nogami’s position and orientation sensor 400—remote from HMD 100—in order to determine the peripheral’s position.” *Id.* at 16. Immersion contends that sensor 400 is a camera that is physically separated from HMD 100, and which uses markers 40 to track the orientation and location of HMD 100 remotely. *Id.* at 16–18, 20–21 (citing Ex. 1003 ¶¶ 73–74, 77–79, Figs. 1, 2, 5; Ex. 2002 ¶¶ 48–50). According to Immersion, in Meta’s scenario “the only thing mounted on HMD 100 is marker 40, which is not a position sensor.” *Id.* at 18 (citing

⁷ Immersion’s arguments addressing claim 1 also apply to corresponding limitations in independent claims 8 and 15. *See* Prelim. Resp. 15–32.

Ex. 1003 ¶¶ 73–76, 138). Immersion argues that the magnetic receiver in HMD 100 “does not qualify as the position sensor because it does not directly provide position and orientation information. All it provides is raw magnetic field detection signals to the separate position and orientation sensor 400 unit, which derives the position and orientation information.” *Id.* at 19 (citing Ex. 2002 ¶¶ 41–50).

Notwithstanding Immersion’s preliminary contentions, we find Meta’s arguments sufficiently persuasive at this stage as to limitation 1[a]. We find nothing in claim 1, or the ’143 patent disclosure as a whole, requiring the recited “position sensor” to output complete position or orientation information. *See* Ex. 1001, 5:35–58, 12:57–13:13. And we find no suggestion that “remote sensing” is a distinct embodiment from the use of attached sensors. *See id.*

Rather, the ’143 patent contemplates that the position and orientation of a peripheral may involve the fusion of data from multiple sensors, such as wireless antennas, capacitive field sensors, optical sensors, magnetometers, accelerometers, gyroscopes, or digital compasses. *See* Ex. 1001, 5:35–58. Some of the sensors may be remote (e.g., radio receivers, cameras, or capacitive field sensors) and some may be directly attached to the peripheral (e.g., magnetometers, accelerometers, gyroscopes, or digital compasses). *Id.* Each sensor, whether remote or directly attached, “may be configured to generate an output signal that conveys information related to the position of the peripheral Such an output signal may be provided to the processor . . . or other components of the system.” *Id.* at 5:48–52; *see also id.* at 5:54–58 (directly-attached sensors may be “configured to generate output signals

conveying information related to the position and/or motion of [a] peripheral”).

In other words, the ’143 patent appears to suggest that any single position sensors need only “convey[] *information related to* the position of the peripheral” to a processing unit. Ex. 1001, 5:49–50 (emphasis added); *accord id.* at 5:57–58. We find nothing in the ’143 patent suggesting that this information must be complete, or that it cannot be combined with other information to obtain the position and orientation of a peripheral. This is consistent with other claim language requiring the *processor* to “determine a position of a peripheral in real space *based on* the one or more sensor signals.” *Id.* at 13:1–2 (emphasis added) (limitation 1[f], discussed *infra* Section IV.D.3). Thus, in claim 1 it is the processor, not the position sensor acting alone, that must determine the peripheral’s position. Ex. 1000, 13:1–2; *see also id.* at 13:24–25 (unchallenged claim 5, which depends from claim 1 and requires a processor to “determine the position of the peripheral *based on* one or more images” from an imaging device (emphasis added)).

For the above reasons, we find that Meta has sufficiently shown, at this stage, that Nogami discloses limitation 1[a].

2. Limitations 1[b]–[c]

Limitations 1[b] and 1[c] recite “a processor; and a non-transitory computer-readable medium comprising program code that is executable by the processor to cause the processor to” perform certain steps. Ex. 1001, 12:59–62.

Meta argues that Nogami discloses the recited processor (a CPU) and medium (a data recording unit or random-access memory). Pet. 13–16

(citing Ex. 1002 ¶¶ 56, 59, 68, 70, 72, 74, 84, 88; Ex. 1003 ¶¶ 83, 88–91, 284–287, Fig. 2).

Immersion does not specifically contest these arguments at this stage. *See generally* Prelim. Resp. We find sufficiently persuasive Meta’s argument that Nogami discloses limitations 1[b] and 1[c]. *See, e.g.*, Ex. 1003, Fig. 2 (items 201, 202, and 205).

3. *Limitations 1[d]–[g]*

Limitations 1[d]–[g] recite steps within program code to be performed by the processor. In particular, limitation 1[d] recites code causing the processor to “output first interactive content to a display, the first interactive content comprising a virtual environment.” Ex. 1001, 12:63–65. Meta argues that Nogami discloses presenting a virtual environment comprising background virtual objects on HMD 100 such as virtual car 300 and other background objects. Pet. 16–24 (citing Ex. 1001, 1:38–43, 3:2–6, 4:51–52, 13:18–19; Ex. 1002 ¶¶ 55, 58, 61–64, 67–68; Ex. 1003 ¶¶ 5, 8, 27, 49–50, 52–53, 56, 83, 91–93, 97–103, 111–114, 117–123, 137, 140–147, 268–270, 272–273, 284–287, Figs. 1, 4–6).

Limitation 1[e] recites code causing the processor to “receive one or more sensor signals from the position sensor.” Ex. 1001, 12:66–67. Meta argues that in Nogami, the processor receives signals from the magnetic sensor in HMD 100. Pet. 24–25 (citing Ex. 1002 ¶¶ 69–70; Ex. 1003 ¶¶ 76–78, 83–84, 91, 93–94, 96, 105–106, 108, 284–287, Fig. 4).

Limitation 1[f] recites code causing the processor to “determine a position of a peripheral in real space based on the one or more sensor signals, the peripheral configured to be worn on a user’s head.” Ex. 1001, 13:1–3. Meta argues that in Nogami, the processor determines the position

of HMD 100 (which is worn on the user's head) based at least in part on the signals sent from HMD 100's magnetic sensor. Pet. 25–28 (citing Ex. 1001, 3:43–53; Ex. 1002 ¶¶ 69–74; Ex. 1003 ¶¶ 49, 56, 76–78, 82, 108–109, Figs. 1, 4; Ex. 1004, 24 (dictionary definition of “peripheral”); Ex. 1006, 2 (Immersion's proposed construction for “real space” in the related district court case)).

Limitation 1[g] recites code causing the processor to “output second interactive content to the display based on the position of the peripheral in real space, the second interactive content being different from the first interactive content.” Ex. 1001, 13:4–7. Meta argues that Nogami discloses “region virtual objects” within the background space, such as virtual work tools, and that these are different from the “background virtual objects” (first interactive content) corresponding to limitation 1[d]. Pet. 29–33 (citing Ex. 1002 ¶¶ 61–64, 75–78; Ex. 1003 ¶¶ 5, 27, 97–103, 109, 111–114, 117–123, 139–147, 159, 270–273, Figs. 4, 6).

At this stage, Immersion does not specifically contest Meta's arguments for limitations 1[d]–[g]. *See generally* Prelim. Resp. We find the arguments sufficiently persuasive at this stage.

4. *Limitation 1[h]*

Limitation 1[h] recites code causing the processor to “determine a haptic signal based on the position of the peripheral in real space and the second interactive content.” Ex. 1001, 13:8–10. Meta argues that the processor in Nogami's system determines a particular haptic signal based on whether contact with a virtual object occurs inside or outside the view volume (i.e., whether the contact occurs in attention range 50 or non-attention range 60). Pet. 34–38.

For example, Meta argues that Nogami’s system can generate a haptic signal, defined as part of “operation setting information” when a virtual work tool contacts a background virtual object (e.g., automobile 300), and the CPU “can generate *different* operation setting information based on whether the virtual work tool has contacted the virtual background object *inside* or *outside* the view volume.” Pet. 34–35 (citing Ex. 1002 ¶¶ 81–82; Ex. 1003 ¶¶ 53, 97, 123, 148–154, 270, Fig. 4). The haptic signal would be less intense if the contact occurs inside the view volume, to “reflect[] the fact that, when the virtual work tool is *within* the view volume/attention range of the user, it is visible to the user via HMD 100 and thus a lower intensity is warranted.” Pet. 35–36 (citing Ex. 1002 ¶ 81; Ex. 1003 ¶¶ 152–154, 179–181, Fig. 6).

According to Meta, this choice of haptic intensity is “based on the position of the peripheral in real space and the second interactive content,” as recited in limitation 1[h], because the haptic signal depends both on the virtual location of the virtual work tool and the real-space position and orientation of HMD 100, which defines the view volume. Pet. 36–38 (citing Ex. 1002 ¶¶ 70, 79–84; Ex. 1003 ¶¶ 123, 139–145, Fig. 4).

In response, Immersion argues that “Nogami does not determine a haptic signal based on the position of the peripheral,” but rather “based on whether the contact point between the user’s body part and a virtual object is *inside* or *outside* the attention range of the user that is viewable through HMD 100.” Prelim. Resp. 29. Immersion contends that this is not the same as “determining haptic feedback to the user based on the position of the peripheral in free space,” because Nogami’s method “does not confer the same results or benefits” as the claimed invention. *Id.* at 30. One difference,

according to Immersion, is that “the possible variation of haptic feedback is strictly binary relative to the bounds of the *view volume* space,” rather than being based on the “fine-grained movement of the head-worn peripheral,” and thus is not “based on the particular position of the peripheral in real space, as required by the claims.” *Id.* at 30–31.

Immersion also contends that Nogami’s disclosure is “directed to a different problem [than claim 1], and thus [a] different solution.” Prelim. Resp. 29. According to Immersion, “Nogami sought to improve shortcomings of the prior art in which the user may not recognize the haptic stimulation if the intensity of the stimulation on a part of the user’s body that unconsciously contacted the virtual object is not high enough,” and solved this problem by boosting the haptic signal if the contact was unintentional. *Id.* at 31–32 (citing Ex. 1003 ¶ 26). Immersion contrasts this to the objective of the ’143 patent, which “was to provide a richer interactive experience for a user’s interaction with the virtual world and its interactive content.” *Id.* at 32 (citing Ex. 1001, 2:66–3:14, 7:25–44, 11:23–47; Ex. 2002 ¶ 64). According to Immersion, “[a]ny benefit or enhancement of the interactive experience derived from Nogami’s coarse-grained approach to haptic feedback would have been grossly limited, at best.” *Id.*

On the preliminary record, we disagree with Immersion that claim 1 requires fine-grained control of a haptic signal based on the peripheral’s position. It only requires the processor to “determine a haptic signal *based on* the position of the peripheral in real space” and other factors. *See* Ex. 1001, 13:8–10 (emphasis added). This would appear to encompass a simple binary determination of whether a virtual work tool contacts an

object inside or outside the view volume defined by the position of Nogami's HMD 100 (the peripheral).

Thus, at this stage, we find Meta's arguments sufficiently persuasive that Nogami discloses limitation 1[h].

5. *Limitation 1[i]*

Limitation 1[i] recites code causing the processor to “transmit the haptic signal to a haptic output device, the haptic output device being configured to receive the haptic signal and output haptic feedback.” Ex. 1001, 13:11–13. Meta argues that the processor in Nogami's system transmits haptic signals to one of the haptic devices 10–12 that a user is wearing. Pet. 38–41 (citing Ex. 1001, 3:9–12, 4:61–67, 8:7–10; Ex. 1002 ¶¶ 86, 88; Ex. 1003 ¶¶ 13, 32, 60–72, 83, 91, 122–123, 233, 284–287, Figs. 3, 4).

Immersion does not contest these arguments at this stage. *See generally* Prelim. Resp. We find Meta's argument sufficiently persuasive that Nogami discloses limitation 1[i]. *See, e.g.*, Ex. 1003, Fig. 4 (item S4007).

6. *Conclusion as to Claim 1*

For the above reasons, we determine that Meta has shown sufficiently that Nogami teaches all the limitations of claim 1, and that based on Nogami's teachings, a person of ordinary skill in the art would have had reason to make a system as recited in claim 1. We therefore determine that Meta is reasonably likely to prevail in showing that claim 1 is unpatentable under § 103(a) as obvious over Nogami.

E. INDEPENDENT CLAIMS 8 AND 15

Independent claims 8 and 15 are essentially the same as claim 1, except that whereas claim 1 is directed to a “system,” claim 8 is directed to a “method” and claim 15 is directed to a “non-transitory computer-readable medium.” *Compare* Ex. 1001, 12:57–13:13, *with id.* at 13:36–55, *and id.* at 14:18–36. Meta relies, for these claims, on its arguments for claim 1. *See* Pet. 43–45.

For the reasons given above in the context of claim 1, we determine that Meta is reasonably likely to prevail in showing that claims 8 and 15 are unpatentable under § 103(a) as obvious over Nogami.

F. CLAIMS 2, 9, AND 16

Claim 2 depends from claim 1 and further recites “wherein the position sensor is positioned on the peripheral.” Ex. 1001, 13:14–15. Claims 9 and 16 add substantially the same limitation to their parent claims 8 and 15, respectively. *See id.* at 13:56–57, 14:37–39. For its arguments in the Petition, Meta relies on the “position sensor” being a magnetic sensor located in HMD 100, which is “positioned on the peripheral” as recited in the claim. Pet. 41–42 (citing Ex. 1002 ¶ 90; Ex. 1003 ¶¶ 77–78); *see also* Pet. 43, 45 (citing Ex. 1002 ¶¶ 89–90, 99) (claims 9 and 16, relying on arguments for claim 2).

In response, Immersion largely reiterates its arguments, made in the context of limitation 1[a], that Nogami’s magnetic sensor is not a “position sensor” because it does not directly provide complete position information. Prelim. Resp. 21–26. In particular, Immersion argues that Nogami only “employs remote sensing, which is the opposite of on-peripheral position

sensing as described in the '143 patent.” Prelim. Resp. 25–26 (citing Ex. 1001, 5:11–14, 5:35–39; Ex. 2002 ¶ 55). According to Immersion, “[t]here is no disclosure at all in Nogami for an entirely self-sufficient position sensor unit mounted on the peripheral.” *Id.* at 26.

As we explain above, we do not agree with Immersion that a “position sensor,” as that term is used in the claims, requires a sensor that provides the peripheral’s position independently of any other component. *See supra* Section IV.D.1. Based on the literal terms of parent claims 1, 8, and 15, it is the *processor* that determines the position of the peripheral “*based on* the one or more sensor signals”, and there is no explicit requirement in the claims or the '143 patent disclosure that a sensor signal independently convey the complete position of the peripheral. Ex. 1001, 13:1–2, 13:43, 14:24–25 (emphasis added); *see also* Ex. 1001, 5:49–50 (position sensors “generate an output signal that conveys *information related to* the position of the peripheral” to a processing unit (emphasis added)); *accord id.* at 5:57–58.

For the reasons given above in the context of claim 1, we determine that Meta is reasonably likely to prevail in showing that claims 2, 9, and 16 are unpatentable under § 103(a) as obvious over Nogami.

G. OTHER CLAIMS

Meta presents additional arguments addressing dependent claims 3, 7, 10, 14, 17, and 20. *See* Pet. 42–45. Immersion does not contest these arguments at this stage. *See generally* Prelim. Resp.

Because Meta has shown a reasonable likelihood of prevailing with respect to claims 1, 2, 8, 9, 15, and 16, we need not specifically address

claims 3, 7, 10, 14, 17, or 20. *See* 37 C.F.R. § 42.108(a) (2023) (“When instituting *inter partes* review, the Board will authorize the review to proceed on all of the challenged claims . . .”).

V. CONCLUSION

For the reasons above, Meta has shown that there is a reasonable likelihood it would prevail with respect to at least one of the claims challenged in the Petition. Thus, we institute trial on each of the challenged claims of the ’143 patent.

VI. ORDER

It is

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of claims 1–3, 7–10, 14–17, and 20 of the ’143 patent is instituted with respect to all the grounds set forth in the Petition; and

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, *inter partes* review of the ’143 patent commences on the entry date of this Order, and the Board hereby gives notice of the institution of a trial.

IPR2023-00945
Patent 10,664,143 B2

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