

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

METAPLATFORMS, INC.,
Petitioner,

v.

THALES VISIONIX, INC.,
Patent Owner.

IPR2022-01302
Patent 6,757,068 B2

Before HYUN J. JUNG, BART A. GERSTENBLITH, and
ARTHUR M. PESLAK, *Administrative Patent Judges*.

GERSTENBLITH, *Administrative Patent Judge*.

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

I. INTRODUCTION

A. Background

Meta Platforms, Inc. (“Petitioner”) filed a Petition (Paper 2, “Pet.”) requesting institution of *inter partes* review of claims 1, 14–20, 23–33, 35, and 41–44 (“the Challenged Claims”) of U.S. Patent No. 6,757,068 B2 (Ex. 1001, “the ’068 patent”). Petitioner also filed a Notice Regarding Multiple Petitions (Paper 3, “Notice”) because Petitioner filed a second petition challenging claims of the ’068 patent in IPR2022-01303. Thales Visionix, Inc. (“Thales”) and its licensee Gentex Corporation (“Gentex”) (collectively, “Patent Owner”) filed a Preliminary Response (Paper 8, “Prelim. Resp.”). With our prior authorization, Petitioner filed a limited¹ Reply to Patent Owner’s Preliminary Response (Paper 9, “Prelim. Reply”), and Patent Owner filed a Sur-reply (Paper 10, “Prelim. Sur-reply”).

An *inter partes* review may be instituted only if “the information presented in the petition . . . and any [preliminary] 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) (2018). For the reasons below, Petitioner has established a reasonable likelihood that it would prevail in showing the unpatentability of at least one of the Challenged Claims. Accordingly, we institute an *inter partes* review of the Challenged Claims on all grounds raised in the Petition.

¹ Petitioner’s Preliminary Reply is limited to the issue of discretionary denial pursuant to *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (PTAB Mar. 20, 2020) (precedential).

B. Related Proceedings

The parties identify *Gentex Corp. v. Meta Platforms, Inc.*, No. 4:22-cv-03892 (N.D. Cal.), as a related matter.² Pet. 2; Paper 4, 1. Petitioner also challenges claims of the '068 patent in IPR2022-01303, and challenges claims of a related patent in IPR2022-01298 and IPR2022-01301. Paper 4, 1.

C. Real Parties in Interest

Petitioner identifies Meta Platforms, Inc. and Meta Platforms Technologies, LLC as real parties in interest. Pet. 2. Patent Owner identifies Thales and Gentex as real parties in interest. Paper 4, 1.

D. The Asserted Grounds of Unpatentability and Declaration Evidence

Petitioner challenges the patentability of claims 1, 14–20, 23–33, 35, and 41–44 of the '068 patent on the following grounds:

² The case was originally filed in the U.S. District Court for the Western District of Texas (No. 6:21-cv-00755-ADA) and was subsequently transferred to the U.S. District Court for the Northern District of California. Pet. 2. The parties incorrectly identify the case number in the Northern District of California as “5:22-cv-03892.” *Compare* Pet. 2; Paper 4 (Patent Owner’s Mandatory Notices), 1, *with* Ex. 2001 (Joint Order Regarding Claim Construction and Discovery).

Claim(s) Challenged	35 U.S.C. § ³	Reference(s)/Basis
1, 14	102(a), (b)	Gottschalk ⁴
1, 14	103(a)	Gottschalk, Kramer ⁵
14–20, 26–33, 35, 41	103(a)	Gottschalk, Kramer, Kalawsky ⁶
1, 14–16, 23–27, 41–44	103(a)	Gottschalk, Kramer, Mine ⁷

Pet. 6. Petitioner supports its challenge with a Declaration of Dr. Ulrich Neumann (Ex. 1005).⁸

E. The '068 Patent

The '068 patent is titled “Self-Referenced Tracking.” Ex. 1001, code (54). The '068 patent is directed to “[a] new tracking technique” that “is essentially ‘sourceless’ in that it can be used anywhere with no set-up,

³ The Leahy-Smith America Invents Act (“AIA”) included revisions to 35 U.S.C. § 103 that became effective on March 16, 2013. The '068 patent was filed on January 26, 2001, and claims priority to a provisional application filed on January 28, 2000. Ex. 1001, codes (22) (60). Thus, we apply the pre-AIA version of the statutes in our consideration of the issues before us.

⁴ Stefan Gottschalk & John F. Hughes, *Autocalibration for Virtual Environments Tracking Hardware*, SIGGRAPH93: 20th Annual Conference and Exhibition on Computer Graphics and Interactive Techniques (Sept. 1993) (Ex. 1008, “Gottschalk”).

⁵ U.S. Patent No. 5,592,401, issued January 7, 1997 (Ex. 1010, “Kramer”).

⁶ Roy S. Kalawsky, *The Science of Virtual Reality and Virtual Environments* (Addison-West Publishing Co.) (1993) (Ex. 1015, “Kalawsky”).

⁷ Mark R. Mine et al., *Moving Objects in Space: Exploiting Proprioception In Virtual-Environment Interaction*, SIGGRAPH97: 24th Annual Conference and Exhibition on Computer Graphics and Interactive Techniques (Aug. 1997) (Ex. 1013, “Mine”).

⁸ Petitioner also includes several declarations directed toward the public availability of several references. *See, e.g.*, Exs. 1009, 1014, 1017, 1032, 1033.

yet it enables a much wider range of virtual environment-style navigation and interaction techniques than does a simple head-orientation tracker.”

Id. at code (57); *see also id.* at 1:35–41. As background, the ’068 patent explains that “[v]irtual reality (VR) systems require tracking of the orientation and position of a user’s head and hands with respect to a world coordinate frame in order to control view parameters for head mounted devices (HMDs) and allow manual interactions with the virtual world.” *Id.* at 1:11–15. According to the ’068 patent:

In laboratory VR setups, this tracking has been achieved with a variety of mechanical, acoustic, magnetic, and optical systems. These systems require propagation of a signal between a fixed “source” and the tracked “sensor” and therefore limit the range of operation. . . .

The emerging fields of wearable computing and augmented reality (AR) require tracking systems to be wearable and capable of operating essentially immediately in arbitrary environments. “Sourceless” orientation trackers have been developed based on geomagnetic and/or inertial sensors. They allow enough control to look around the virtual environment and fly through it, but they don’t enable the “reach-out-and-grab” interactions that make virtual environments so intuitive and which are needed to facilitate computer interaction.

Id. at 1:15–32. The ’068 patent purports to overcome such problems and provides “a new tracking technique” using equipment that “can be produced at only slightly more than the cost of a sourceless orientation tracker and can be used by novice end users without any knowledge of tracking technology, because there is nothing to set up or configure.” *Id.* at 1:35–45. In another aspect, the ’068 patent discloses “mounting a tracker on a user’s head and using the tracker to track a position of a localized feature associated with a limb of the user relative to the user’s head” in which the localized feature

includes a hand-held object, a hand-mounted object, or a point on a hand.
Id. at 1:46–51.

Figure 1 of the '068 patent is reproduced below.

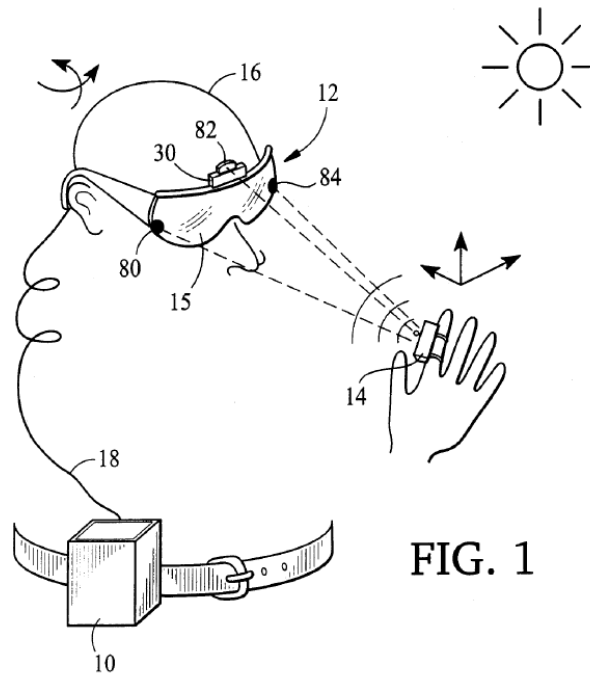


FIG. 1

Figure 1 “is a perspective view of a self-referenced tracking device mounted on a head.” Ex. 1001, 4:60–61. A fully integrated wearable VR system, shown in Figure 1, includes wearable computer 10, headset or head-worn display 15, hand-mounted beacon 14, and cable connection 18. *Id.* at 5:13–18. Headset 15 includes an integrated tracking system such as sourceless head orientation tracker 30 with head-worn tracking device 12 that tracks hand-mounted 3D beacon 14 relative to head 16. *Id.* at 5:5–8, 5:13–18. Head-worn tracking device 12 uses a wireless ultrasonic tracker or an ultrasonic receiver system for tracking the beacon that “can be reduced to a few small signal-conditioning circuits and integrated with the sourceless orientation tracker 30 in the head-worn display 15.” *Id.* at 5:8–9, 5:18–22.

Figure 5 of the '068 patent is reproduced below.

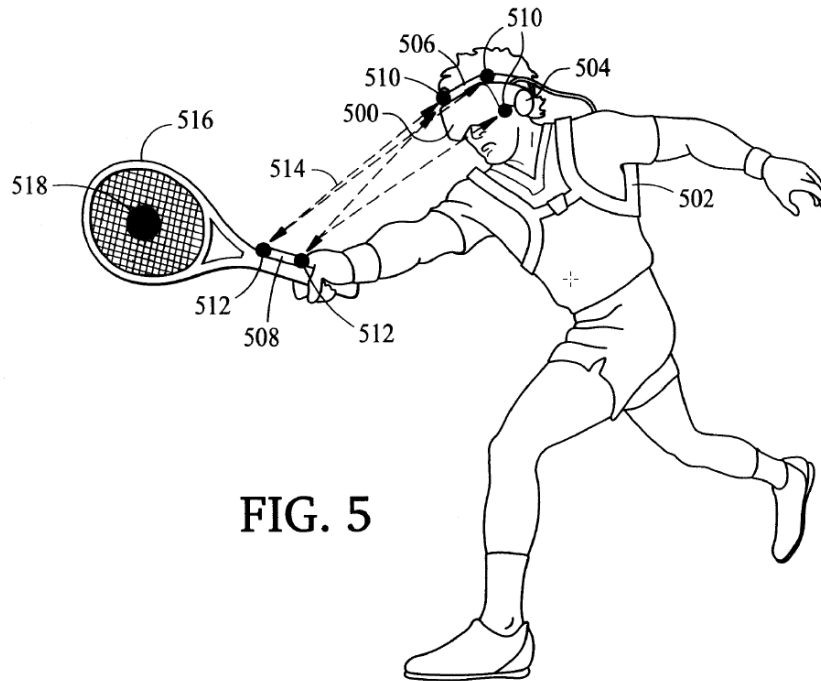


FIG. 5

Figure 5 “shows a user using a virtual reality game.” Ex. 1001, 4:67. A user wears a portable VR tennis game or training system that includes backpack 502. *Id.* at 14:5–9. Backpack 502 contains a computer and batteries and is cabled to HMD 500. *Id.* at 14:6–7. HMD 500 includes inertial sensors 506 and ultrasonic transducers 510. *Id.* at 14:7–9. Inertial sensors 508 and ultrasonic transducers 512 are attached to hand-held object 516, in this case, a tennis racket. *Id.* at 14:9–11. The '068 patent discloses:

The signals from inertial sensors 506 are processed by a first algorithm, preferably a drift-corrected inertial orientation tracking algorithm such as described in U.S. Pat. No. 5,645,077 to obtain a sourceless measurement of the head orientation. In addition, the signals from the hand-mounted inertial sensors 508 and the head mounted inertial sensors 506 are jointly processed to track both the position and orientation of the hand relative to the head, preferably using an algorithm

such as described in Foxlin (2000) and co-pending U.S. patent application Ser. No. 09/556,135.

Id. at 14:14–24. According to the '068 patent, inertial position and orientation trackers provide “low latency and low jitter, but they require drift correction, especially if tracking position and not just orientation is desired.”

Id. at 13:34–37. Drift correction can be accomplished by “making measurements with an ultrasonic, optical or magnetic tracking reference device mounted in the environment.” *Id.* at 13:42–44. However, “the drift and latency issues can be addressed without the requirement of a reference device mounted in the environment,” by using techniques that “require that inertial sensors be attached to the moving body being used as the reference frame . . . as well as to the object being tracked (here, e.g., the user’s hand).” *Id.* at 13:45–64. “The techniques utilize angular rate and linear acceleration signals from the sourceless orientation trackers on the reference frame and on the tracked object to derive a differential inertial signal representative of the motion of the object relative to the frame” and such techniques “may be used to derive a differential inertial signal representative of the motion of the hand relative to the head.” *Id.* at 13:64–14:4.

In regard to portable VR application and object selection and manipulation exploiting proprioception, the '068 patent discloses that Mine et al. (Ex. 1013) “have discussed the benefits of designing virtual environment interaction techniques that exploit our proprioceptive sense of the relative pose of our head, hands and body” in which “[a] variety of techniques were presented, such as direct manipulation of objects within arms reach, scaled-world grab, hiding tools and menus on the users [sic] body, and body-relative gestures.” Ex. 1001, 7:49–61. Thus, the

'068 patent navigation interface device can include “fly-through virtual environments” and can use “the scaled-world grab method to reach out to a distant object and pull oneself to it in one motion.” *Id.* at 8:10–24. In one embodiment, the '068 patent discloses a “Wearable Computing Information Cockpit Interface” that allows a user to look at instruments but prevents the user from being disoriented. *Id.* at 9:6, 9:63–10:9.

F. Illustrative Claim

Claim 1, the sole independent claim challenged in this proceeding, is illustrative of the claimed subject matter and is reproduced below.

1. A method comprising[:]
 mounting a sourceless orientation tracker on a user's head, and
 using a position tracker to track a position of a first localized feature associated with a limb of the user relative to the user's head.

Ex. 1001, 15:4–9.

G. Level of Ordinary Skill in the Art

Petitioner, supported by Dr. Neumann's testimony, proposes that a person of ordinary skill in the art at the time of the invention would have had “a bachelor's degree in computer science, or an equivalent field, and three to five years of experience working with computer implemented tracking systems. Additional education might compensate for less experience and vice-versa.” Pet. 25 (citing Ex. 1005 ¶ 48).

Patent Owner states that “[f]or purposes of responding to Petitioner's Petition for [*inter partes* review], Patent Owner accepts Petitioner's proposed person of ordinary skill in the art.” Prelim. Resp. 6. Patent Owner further states, “[h]owever, for any other purpose, Patent Owner disagrees

with Petitioner at least that such [person of ordinary skill in the art] would be limited to a maximum of five years of experience.” *Id.* at 7. And, Patent Owner further “reserves the right to offer an alternative definition based on expert evidence in the event the Petition is instituted.” *Id.*

At this stage of the proceeding and on the present record, we find that Petitioner’s uncontested level of ordinary skill in the art is consistent with the level of ordinary skill in the art reflected by the ’068 patent and the prior art of record. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001); *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995); *In re Oelrich*, 579 F.2d 86, 91 (CCPA 1978). Therefore, we adopt Petitioner’s level of ordinary skill in the art in our consideration of the issues presently before us.

II. CLAIM CONSTRUCTION

In this *inter partes* review, claims are construed using the same claim construction standard that would be used to construe the claims in a civil action under 35 U.S.C. § 282(b). *See* 37 C.F.R. § 42.100(b) (2021). The claim construction standard includes construing claims in accordance with the ordinary and customary meaning of such claims as understood by one of ordinary skill in the art at the time of the invention. *See id.*; *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–14 (Fed. Cir. 2005) (en banc). In construing claims in accordance with their ordinary and customary meaning, we take into account the specification and prosecution history. *Phillips*, 415 F.3d at 1315–17.

Additionally, only terms that are in controversy need to be construed, and these need be construed only to the extent necessary to resolve the controversy. *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)).

A. “*sourceless orientation tracker*”

Petitioner contends that we should interpret the term “sourceless orientation tracker,” which is expressly recited in claim 1. Pet. 25–27. Petitioner directs us to two alleged constructions used by Patent Owner in the co-pending district court litigation—one derived from Gentex’s complaint and preliminary infringement contentions, the other expressly stated in Gentex’s claim construction briefing. *Id.*

Petitioner contends that “Gentex construed a ‘sourceless’ tracker in its complaint as one that ‘can be used anywhere with no set-up of an external source that is not on the user’s body.’” Pet. 25 (citing Ex. 1026 ¶ 32). Petitioner asserts that, in its infringement contentions, Gentex argued a similar construction when contending that Petitioner’s accused headset is “sourceless” because “it is marketed as ‘without external sensors.’” *Id.* at 25–26 (citing Ex. 1027, Ex. 2 at 6). Petitioner further contends that, “in its opening claim construction brief, Gentex inconsistently, argued that ‘sourceless orientation tracker’ should be construed to mean ‘an orientation tracker that does not require setup of a fixed source that propagates a signal to the tracked sensor.’” *Id.* at 26 (citing Ex. 1031, 3). And, Petitioner asserts that “Gentex identified magnetic trackers as an example of **non**-sourceless trackers because ‘[t]hey require a magnetic-field producing “source” to be placed somewhere in the environment in order to work.’” *Id.* (alteration in original) (citing Ex. 1031, 3).

Petitioner contends that “Gentex’s interpretation of ‘sourceless’ in its complaint and infringement contentions is more consistent with the ’068 Patent, which characterizes the alleged invention as ‘*essentially*’ “sourceless” in that it can be used anywhere with no set-up of a source.” Pet. 26 (citing Ex. 1001, 1:35–37). Beyond this statement, however, Petitioner does not take a position as to which of the constructions is correct or otherwise offer a construction of its own. *See id.* at 25–27. Instead, as discussed further below, Petitioner’s first two grounds are alternative grounds, which Petitioner identifies as “Ground 1A” and “Ground 1B,” where each is based on one of the two constructions Petitioner identifies from the co-pending litigation. *Id.* at 26–27 (discussing “Ground 1A” and “Ground 1B”).

Patent Owner contends that “[t]he term ‘sourceless orientation tracker’ should be given its plain and ordinary meaning in view of the specification: an orientation tracker that does not require setup of a fixed source that propagates a signal to the tracked sensor.” Prelim. Resp. 9. Patent Owner also contends that, “[a]s the plain meaning implies, a ‘sourceless’ orientation tracker is an orientation tracker that does not include a source.” *Id.* Patent Owner argues that, by contrast, “the specification’s use of ‘essentially sourceless’ refers to the whole invention, not just the orientation tracker” and that the term “‘essentially sourceless’ does not appear in the claims.” *Id.* at 8–9 (citing Ex. 1001, 1:35–57).

Patent Owner further contends that the ’068 patent distinguishes sourceless “trackers from non-sourceless trackers, which ‘require propagation of a signal between a fixed “source” and the tracked “sensor.”’” Prelim. Resp. 9 (citing Ex. 1001, 1:17–18). Patent Owner additionally

contends that the '068 patent describes magnetic trackers as one example of non-sourceless trackers because “such trackers require a magnetic-field-producing ‘source’ in order to work.” *Id.* (citing Ex. 1003, 1:24, 2:8–9, 14:58–60). According to Patent Owner, the '068 patent describes “geomagnetic and/or inertial sensors” as examples of sourceless orientation trackers because such sensors “operate in reference to properties of the physical world around them, not to a source that is sensed by a sensor.” *Id.* (citing Ex. 1001, 1:26–27).

For the following reasons, we determine, based on the present record, that the term “sourceless orientation tracker” should be given its plain and ordinary meaning, i.e., an orientation tracker that does not require a source.

Under the claim construction procedures articulated in *Phillips*, claim construction begins with the language of the claims. *Phillips*, 415 F.3d at 1312–14. The “words of a claim ‘are generally given their ordinary and customary meaning,’” which is “the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application.” *Id.* at 1312–13. The specification is “‘the single best guide to the meaning of a disputed term’ and . . . acts as a dictionary when it expressly defines terms used in the claims or when it defines terms by implication.” *Id.* at 1321. Although the prosecution history “often lacks the clarity of the specification and thus is less useful for claim construction purposes,” it is another source of intrinsic evidence that can “inform the meaning of the claim language by demonstrating how the inventor understood the invention and whether the inventor limited the invention in the course of prosecution, making the claim scope narrower than it would otherwise be.” *Id.* at 1317. Extrinsic

evidence, such as expert testimony and dictionaries, may be useful in educating the court regarding the field of the invention or helping determine what a person of ordinary skill in the art would understand claim terms to mean. *Id.* at 1318–19. However, extrinsic evidence in general is viewed as less reliable than intrinsic evidence. *Id.*

In this case, claim 1 recites mounting “a sourceless orientation tracker on a user’s head.” Ex. 1001, 15:5–6. There is no further reference to “sourceless orientation tracker” in claim 1. *Id.* Claim 11 recites “[t]he method of claim 1 in which the sourceless orientation tracker comprises an inertial sensor”; claim 12 recites “[t]he method of claim 1 in which the sourceless orientation tracker comprises a tilt-sensor”; and claim 13 recites “[t]he method of claim 1 in which the sourceless orientation tracker comprises a magnetic compass sensor.” *Id.* at 15:35–40. The parties have not identified and we do not discern anything in the language of the claims that suggests we should deviate from the plain and ordinary meaning of “sourceless orientation tracker.”

We now turn to the Specification of the ’068 patent. The Specification states that “[v]irtual reality (VR) systems require tracking of the orientation and position of a user’s head and hands with respect to a world coordinate frame.” Ex. 1001, 1:11–13. The Specification also describes “a variety of mechanical, acoustic, magnetic, and optical systems” used for such tracking and states that “[t]hese systems require propagation of a signal between a fixed ‘source’ and the tracked ‘sensor,’” which “limit[s] the range of operation.” *Id.* at 1:15–20. The Specification describes that “[s]ourceless’ orientation trackers have been developed based on geomagnetic and/or inertial sensors.” *Id.* at 1:26–27. And, the Specification

explains that “the invention features a sourceless orientation tracker including an inertial sensor, a tilt-sensor, or a magnetic compass sensor.” *Id.* at 2:6–8.

Figure 1 of the ’068 patent is a perspective view of a self-referenced tracking device mounted on a head and includes “sourceless head orientation tracker 30.” Ex. 1001, 4:60–61, 5:6, Fig. 1. The ’068 patent describes tracker 30 as a commercially available “inertial head orientation module called InterTrax 2.” *Id.* at 6:35–36. Figure 5 of the ’068 patent illustrates another embodiment where inertial sensors 506 are mounted to HMD 500. *Id.* at 14:5–8. “The signal from inertial sensors 506 are processed by a first algorithm . . . to obtain a sourceless measurement of the head orientation.” *Id.* at 14:19–23. The ’068 patent also provides that “[t]he implementation described above use inertial sourceless orientation trackers. Other implementations may use other forms of head orientation trackers, including trackers based on tilt-sensing or magnetic compass sensors, or any other form of head orientation tracker.” *Id.* at 14:56–60.

The parties do not direct us to any part of the prosecution history of the ’068 patent in support of their claim construction contentions. Our review of the prosecution history, Exhibit 1002, does not reveal any information material to the construction of the term “sourceless orientation tracker.”

Patent Owner argues for the plain and ordinary meaning of “sourceless orientation tracker” as “an orientation tracker that does not include a source.” Prelim. Resp. 9. But, Patent Owner also advocates that the term should be construed as “an orientation tracker that does not require set up of a fixed source that propagates a signal to the tracked sensor.” *Id.*

Although Patent Owner criticizes Petitioner for cherry picking “a sentence from the specification that describes one *benefit* of a sourceless tracking system” and including that benefit in its proposed claim construction, Patent Owner does the same thing by including the “benefit” that a sourceless orientation tracker “does not require setup of a fixed source” in its proposed construction. *Id.* at 10 (citing Ex. 1001, 1:35–45). Based on the present record, we are not persuaded that one of ordinary skill in the art would deem this purported benefit of a sourceless orientation tracker to be part of the plain and ordinary meaning of “sourceless orientation tracker.”

Based on the foregoing, we analyze Petitioner’s challenges using the plain and ordinary meaning of the term “sourceless orientation tracker,” i.e., an orientation tracker that does not require a source.⁹

The parties are not precluded from arguing proposed constructions of “sourceless orientation tracker” or any other claim terms in subsequent briefing during trial. Claim construction, in general, is an issue to be addressed at trial. Our final claim construction, if any, will be determined at the close of all the evidence.

⁹ The only exceptions to this plain and ordinary meaning construction of “sourceless orientation tracker” are “geomagnetic” and “magnetic compass” sensors. The ’068 patent provides both as examples of a “sourceless orientation tracker” although we understand that each relies on the earth’s magnetism as a source. *See, e.g.*, Ex. 1001, 1:27 (“geomagnetic . . . sensors”), 2:8 (“magnetic compass sensor”). The parties are invited to address this potential contradiction in their further briefing to the extent they challenge our construction of the term.

B. Additional Terms

At this stage of the proceeding, we need not construe any other claim terms expressly because none are in dispute. *Realtime Data*, 912 F.3d at 1375 (quoting *Vivid Techs.*, 200 F.3d at 803).

III. 35 U.S.C. § 314(a)

A. Parallel Litigation

Patent Owner argues that we should deny institution under *Fintiv* on account of the parallel litigation between the parties. Prelim. Resp. 56–57 (citing *Apple, Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 at 6 (PTAB Mar. 20, 2020) (precedential)). *Fintiv* instructs us to consider whether to deny institution in certain circumstances when there is parallel district court litigation, upon consideration of six factors:

1. whether the court granted a stay or evidence exists that one may be granted if a proceeding is instituted;
2. proximity of the court’s trial date to the Board’s projected statutory deadline for a final written decision;
3. investment in the parallel proceeding by the court and the parties;
4. overlap between issues raised in the petition and in the parallel proceeding;
5. whether the petitioner and the defendant in the parallel proceeding are the same party; and
6. other circumstances that impact the Board’s exercise of discretion, including the merits.

Fintiv, Paper 11 at 6.

Our analysis of *Fintiv* is guided by the USPTO Director’s Memorandum issued on June 21, 2022, titled “Interim Procedure for

Discretionary Denials in AIA Post Grant Proceedings with Parallel District Court Litigation” (“Director’s Memo”). We turn to the *Fintiv* factors.

1. *Factor 1: Stay*

Neither party has moved for a stay of the district court proceeding. Prelim. Reply 2. This factor is, thus, neutral.

2. *Factor 2: Proximity to Trial Date*

The parallel litigation began in the U.S. District Court for the Western District of Texas, but was transferred to the U.S. District Court for the Northern District of California. Pet. 2; Prelim. Resp. 3, 56–57. No trial date has been set. Pet. 8. Patent Owner argues that we should deny institution based on the median trial date in the Northern District of California, if we were to start counting time when the case was filed in the Western District of Texas. *See, e.g.*, Prelim. Resp. 56–57; Prelim. Sur-reply 2–3.

Fintiv factor 2 discusses consideration of a *trial date*. The Director’s Memo states that it may be useful to compare a trial date with evidence of a median time to trial. Director’s Memo 8. The purpose of doing so is to ascertain the likelihood of the scheduled trial date actually occurring on or around that date. *Id.* at 8 (“Stakeholders correctly noted that scheduled trial dates are unreliable and often change[,]” and a “scheduled trial date . . . is not by itself a good indicator of [when] the district court trial will occur.”). The Director’s Memo does not state that median time-to-trial statistics are themselves a trial date, or otherwise replace consideration of a trial date under *Fintiv* factor 2. And, in the circumstances here, where the case was transferred from the Western District of Texas, the usefulness of the median time to trial statistics is less clear. Ultimately, though, we will not speculate

on when a trial may be scheduled. Accordingly, factor 2 favors not exercising our discretion to deny institution.

3. *Factor 3: Investment in Parallel Proceeding*

Patent Owner argues that “[t]he parties have fully briefed claim construction and exchanged infringement and invalidity contentions, and are almost eight months into general fact discovery.” Prelim. Resp. 56.

Petitioner argues that “the most burdensome parts of the case still remain,” for example fact discovery does not close for several months, and expert discovery has yet to begin. Prelim. Reply 3. Petitioner also notes that there have not been any claim construction rulings. *Id.* Patent Owner responds that “Petitioner has proposed that all document production be substantially complete by March 16, 2023.” Prelim. Sur-reply 4 (citing Ex. 2002, 1).

We determine that factor 3 does not favor exercising our discretion to deny institution. Although there has been work completed, as Petitioner points out, “the most burdensome parts of the case still remain.” Prelim. Reply 3.

4. *Factor 4: Overlap with Parallel Proceeding*

Petitioner offers to file a *Sand Revolution*-type of stipulation, indicating that it will not pursue the grounds raised in this proceeding in the parallel litigation if we institute trial. Prelim. Reply 3–4; *Sand Revolution II, LLC v. Cont’l Intermodal Grp. Trucking LLC*, No. IPR2019-01393, Paper 24 at 11–12 (PTAB June 16, 2020) (informative) (finding that a stipulation not to pursue the same grounds in the parallel litigation “mitigates to some degree the concerns of duplicative efforts”). Patent Owner argues that such a narrow stipulation does not mitigate the concerns of overlap. Prelim. Sur-reply 4–5.

We are not aware of any precedent that *Sand Revolution*-type stipulations are no longer valid or not entitled to weight in the *Fintiv* analysis. We recognize that *Sand Revolution* stipulations are narrower in scope than *Sotera*-type stipulations, and perhaps may require a different result in a case with different facts. *See Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 at 18–19 (PTAB Dec. 1, 2020) (precedential as to § II.A) (finding that a broad stipulation not to pursue any ground raised or that could have been reasonably raised in the parallel litigation weighs strongly toward institution). Here, Petitioner’s stipulation still eliminates specific overlap with the parallel proceeding. As in *Sand Revolution*, we weigh this factor as marginally favoring not exercising our discretion to deny institution. *Sand Revolution*, Paper 24 at 12.

5. *Factor 5: Whether Petitioner and Defendant are the Same Party*

“If a petitioner is unrelated to a defendant in an earlier court proceeding, the Board has weighed this fact against exercising discretion to deny institution” *Fintiv*, Paper 11 at 13. Petitioner is also a defendant in the related district court litigation. *See* Pet. 2; Prelim. Resp. 57. Thus, this factor weighs marginally in favor of exercising our discretion to deny institution. *Sotera*, Paper 12 at 19.

6. *Factor 6: Merits and Other Considerations*

Patent Owner argues that Petitioner does not make out a compelling case on the merits. Prelim. Resp. 57. As specified in the Director’s Memo, “compelling, meritorious challenges will be allowed to proceed at the PTAB even where district court litigation is proceeding in parallel.” Director’s Memo 4. Accordingly, the Director’s Memo states that the *Fintiv* analysis

will not lead to discretionary denial if it can be established that a case presents compelling merits. *Id.* at 4–5. But, the Director’s Memo does not require a Petitioner to establish compelling merits to avoid discretionary denial.

Additionally, the Director recently clarified the Interim Procedure, stating that “[t]he Board should first assess *Fintiv* factors 1–5; if that analysis supports discretionary denial, the Board should engage the compelling merits question.” *CommScope Techs. LLC v. Dali Wireless, Inc.*, IPR2022-01242, Paper 23 at 6 (PTAB Feb. 27, 2023) (precedential). Here, we determine that, on balance, *Fintiv* factors 1–5 do not favor exercising our discretion to deny institution and, therefore, there is no need to determine whether the Petition establishes compelling merits.

7. *Conclusion on Fintiv Factors*

Upon consideration of the *Fintiv* factors, we determine not to exercise our discretion to deny institution.

B. *Multiple Petitions*

Petitioner contends that “[m]ore than one petition is . . . necessary to sufficiently address all the challenged claims” of the ’068 patent. Notice 1. According to Petitioner, Gentex asserted a large number of claims in the parallel litigation “that are distinct from one another, that collectively comprise several thousand words of claim language.” *Id.* Petitioner ranks this Petition as “A” and the Petition in IPR2022-01303 as “B.” *Id.* at 1–2. Petitioner also explains its reasoning for the grouping of the claims challenged in each petition and that the only overlap between the two petitions is claim 1, from which a large number of claims depend. *Id.* at 3–4.

Patent Owner did not file a response to the Notice. Nor did Patent Owner otherwise dispute Petitioner’s contentions that two petitions are necessary. *See generally* Prelim. Resp.

On the present record, we see no reason to exercise our discretion to deny institution of either petition on the basis of Petitioner filing two petitions to address the large number of claims asserted in the related litigation. *See* PTAB Consolidated Trial Practice Guide, 59 (Nov. 2019)¹⁰ (recognizing that one circumstance in which more than one petition may be necessary is when a patent owner asserts a large number of claims in related litigation).

IV. ANALYSIS

A. Legal Standards

1. Anticipation

“[A] claim is anticipated ‘if each and every limitation is found expressly or inherently in a single prior art reference.’” *King Pharm., Inc. v. Eon Labs., Inc.*, 616 F.3d 1267, 1274 (Fed. Cir. 2010) (quoting *Celeritas Techs., Ltd. v. Rockwell Int’l Corp.*, 150 F.3d 1354, 1360 (Fed. Cir. 1998)). Anticipation is a question of fact, *In re Gleave*, 560 F.3d 1331, 1334–35 (Fed. Cir. 2009), assessed from the perspective of one of ordinary skill in the art, *see Dayco Prods., Inc. v. Total Containment, Inc.*, 329 F.3d 1358, 1368 (Fed. Cir. 2003) (“the dispositive question regarding anticipation [i]s whether one skilled in the art would reasonably understand or infer from the [prior art reference’s] teaching that every claim element was disclosed in that single reference” (alteration in original) (quotation omitted)).

¹⁰ Available at <https://www.uspto.gov/TrialPracticeGuideConsolidated>.

2. *Obviousness*

The U.S. Supreme Court set forth the framework for applying the statutory language of 35 U.S.C. § 103 in *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966):

Under § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved. Against this background, the obviousness or nonobviousness of the subject matter is determined. Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented.

The Supreme Court explained in *KSR International Co. v. Teleflex Inc.* that

[o]ften, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue. To facilitate review, this analysis should be made explicit.

550 U.S. 398, 418 (2007) (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (“[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” (alteration in original))).

“Whether an ordinarily skilled artisan would have been motivated to modify the teachings of a reference is a question of fact.” *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1327 (Fed. Cir. 2016) (citations omitted).

“[W]here a party argues a skilled artisan would have been motivated to

combine references, it must show the artisan ‘would have had a reasonable expectation of success from doing so.’” *Arctic Cat Inc. v. Bombardier Recreational Prods. Inc.*, 876 F.3d 1350, 1360–61 (Fed. Cir. 2017) (quoting *In re Cyclobenzaprine Hydrochloride Extended-Release Capsule Patent Litig.*, 676 F.3d 1063, 1068–69 (Fed. Cir. 2012)).

B. Ground 1A: Anticipation by Gottschalk

Petitioner contends that Gottschalk anticipates claims 1 and 14. Pet. 32–34.

1. Gottschalk

Gottschalk is titled “Autocalibration for Virtual Environments Tracking Hardware.” Ex. 1008, 65.¹¹ Gottschalk “describe[s] a back-projection system for adjusting the assumed locations of beacons in a head-mounted display tracking system.” *Id.* Gottschalk addresses an obstacle in Virtual Reality systems with “a low-latency, high accuracy system for head tracking in unprepared, possibly-noisy environments.” *Id.*

Gottschalk discloses “an optoelectronic tracking system capable of tracking head motion with precision of approximately 0.2 degrees orientation and 1 mm translation.” Ex. 1008, 66. The optoelectronic tracker uses a method “similar to celestial navigation” by “observ[ing] a number of ceiling mounted LEDs and knowing their position, [it] compute[s] the location (and orientation) of the head-tracking unit.” *Id.* A camera is mounted on a helmet and “reports the photocoordinates of LED image on its image plane.” *Id.* Gottschalk then “compute[s] the line, in head space,

¹¹ Citations to Exhibit 1008 are to the native page numbers of the reference and not the page numbers added to the exhibit.

along which the LED must lie.” *Id.* Using a collinearity algorithm, “a best estimate of headmount position and orientation” is computed. *Id.*

A headmounted magnetic source is used for handtracking. Ex. 1008, 68. Gottschalk discloses:

Since one’s hands never get farther than a few feet from one’s head, we decided to place a magnetic source on the headmount and track hand motion from there.

Ultimately, however, we want to know the hand’s location in the ceiling coordinate system. The optical tracker reports the head location in ceiling space, the magnetic source lies at some fixed location in head space, and the Polhemus tracking system reports the hand’s location in source space. We compose the change-of-coordinate transformations among these three systems to get the hand’s location in ceiling space.

Id.

2. *Claim 1*

a. *“mounting a sourceless orientation tracker on a user’s head, and”*

Claim 1 recites “[a] method comprising mounting a sourceless orientation tracker on a user’s head.” Ex. 1001, 15:5–6. Petitioner contends that, “[i]f the Board construes ‘sourceless orientation tracker’ as one [that] can be used anywhere with no set-up of an external source that is not on the user’s body, Gottschalk anticipates this element.” Pet. 32. Petitioner asserts that Gottschalk “discloses using a head-mounted magnetic tracker to track hand motion relative to the head” and that Gottschalk’s “magnetic tracker was the well-known Polhemus tracker, which tracked both position and orientation.” *Id.* (citing Ex. 1008, 68; Ex. 1005 ¶ 60). Petitioner argues that, “[b]ecause the ‘magnetic source’ is mounted to a headmount . . . and does *not* require setup by the user in the external environment, Gottschalk’s

head-mounted magnetic tracker is a ‘sourceless orientation tracker’ consistent with Gentex’s use of the term ‘sourceless’ in its complaint and infringement contentions.” *Id.* at 32–33 (footnote omitted) (citing Ex. 1008, 68; Ex. 1005 ¶ 60; Pet. § IX.A (Petitioner’s claim construction arguments for “sourceless orientation tracker”)).

Patent Owner contends that Gottschalk does not teach a “sourceless orientation tracker” because “its magnetic tracker requires a ‘source.’” Prelim. Resp. 26.

We agree with Patent Owner that Gottschalk does not disclose a “sourceless orientation tracker.” As discussed above, we construe “sourceless orientation tracker” to mean “an orientation tracker that does not require a source.” Gottschalk discloses a “magnetic tracker” and explains that “[s]ince one’s hands never get farther than a few feet from one’s head, we decided to place a magnetic source on the headmount and track hand motion from there.” Ex. 1008, 68. Thus, Gottschalk’s magnetic tracker requires a source and therefore is not a “sourceless orientation tracker” as recited in claim 1.¹²

Accordingly, because Petitioner has not shown that Gottschalk discloses “mounting a sourceless orientation tracker on a user’s head,” Petitioner has not established a reasonable likelihood of demonstrating that Gottschalk anticipates claim 1 of the ’068 patent.

¹² Petitioner implicitly acknowledges that if “sourceless orientation tracker” is construed as not including any source, Gottschalk does not anticipate the claims. *See* Pet. 26–27 (recognizing that, if this construction were adopted by the Board, Gottschalk alone would not disclose a “sourceless orientation tracker”).

3. *Dependent Claim 14*

Claim 14 depends from claim 1. Ex. 1001, 15:41. Because Petitioner has not established a reasonable likelihood of demonstrating that Gottschalk anticipates claim 1, Petitioner also has not established a reasonable likelihood of demonstrating that Gottschalk anticipates claim 14. *See* 37 C.F.R. § 1.75(c) (2021) (“Claims in dependent form shall be construed to include all the limitations of the claim incorporated by reference into the dependent claim.”).

C. *Ground 1B: Obviousness over Gottschalk and Kramer*

Petitioner asserts that the combination of Gottschalk and Kramer would have rendered the subject matter of claims 1 and 14 obvious to one of ordinary skill in the art at the time of the invention. Pet. 34–37.

1. *Level of Ordinary Skill in the Art*

The level of ordinary skill in the art at the time of the invention is discussed above. *See supra* § I.G.

2. *Scope and Content of the Prior Art*

a. *Gottschalk*

Gottschalk is described above. *See supra* § IV.B.1.

b. *Kramer*

Kramer is titled “Accurate, Rapid, Reliable Position Sensing Using Multiple Sensing Technologies.” Ex. 1010, code (54). Kramer discloses that by using a combination of sensors, “accurate, reliable position information is rapidly obtained to allow high-resolution and/or real-time analysis and depictions of movement” in which the information may be “used to analyze the movement, for instruction for improvement, for repeating the activity in a virtual setting and the like.” *Id.* at code (57).

According to Kramer, “[o]ptical tracking can provide a high sample rate which is required to capture rapid movement with high resolution,” but “[o]ne disadvantage of optical tracking is the potential for obscuring the light sources to the degree that no position solution can be determined.” Ex. 1010, 1:21–26. Thus, there is a need for a system that overcomes this disadvantage “while providing a high rate of orientation and position data in real-time.” *Id.* at 1:51–54. Kramer discloses combinations of sensing devices. *Id.* at 3:1–6, 3:15–20. In one combination, Kramer uses “a very accurate but unreliable device which may be fast or slow (‘unreliable device’ or ‘unreliable position sensor’) with a moderately accurate but slow device (‘slow device’) and a device (‘fast device’) which is even less accurate but faster than the slow device.” *Id.* at 3:15–20. Further, by employing a combination of position-sensing technologies, Kramer states that “position information from the combination provides a more reliable, accurate, and/or less delayed measurement system than any of the devices comprising the combination when taken separately.” *Id.* at 3:58–62. “Fast devices” that measure translational and/or angular movement rapidly can include “accelerometers, gyroscopes, and the like.” *Id.* at 6:24–26. “Slow devices” can include “position sensors, such as electromagnetic sensors, as supplied by Polhemus, Inc., Colchester, Vt. and Ascension Technology Corp., Burlington, Vt.” *Id.* at 7:36–39. Kramer further discloses that “[v]arious sensors may be used in conjunction with the optical tracker to correct the faults of the optical tracker” and that “[t]he accelerometer can provide a rapid signal which will not be subject to the blind spots of the optical tracker.” *Id.* at 8:61–64.

3. *Differences Between the Prior Art and the Claims;
Motivation to Modify*

a. *Claim 1*

i. *“mounting a sourceless orientation tracker
on a user’s head, and”*

Petitioner contends that “Gottschalk combined with Kramer renders this element obvious.” Pet. 36. In particular, Petitioner asserts that “Kramer discloses attaching an accelerometer (6-DOF-A) 503 to a user’s body part to track its position and orientation.” *Id.* (citing Ex. 1010, 18:35–39, Fig. 5). Additionally, Petitioner contends that an angular accelerometer is an inertial sensor.¹³ *Id.* at 35 (citing Ex. 1005 ¶ 67). Petitioner further asserts that one of ordinary skill in the art would have understood that “Kramer’s six degree of freedom accelerometer constitutes a ‘sourceless orientation tracker’” because the ’068 patent “acknowledges that ‘sourceless’ orientation trackers had been developed based on geomagnetic and/or inertial sensors.” *Id.* at 36 (citing Ex. 1005 ¶ 68; Ex. 1001, 1:25–27). And, Petitioner contends that one of ordinary skill in the art would have understood that “Kramer’s accelerometer should be attached to Gottschalk’s headmount (much as it was attached to Kramer’s forearm), to determine the orientation and position of the user’s head as a complement to, or replacement for, Gottschalk’s optical tracker, which had the shortcomings described in Kramer (*e.g.*, potential light source occlusion).” *Id.* (citing Ex. 1005 ¶ 68).

Patent Owner first contends that “Kramer teaches a fanciful assortment of sensors all over a user’s body . . . to measure ‘an athletic swing,’” but “nowhere describes using a sourceless tracker *on a user’s head*

¹³ Petitioner also asserts that a gyroscope is an inertial sensor. Pet. 35 (citing Ex. 1005 ¶ 67).

to measure orientation.” Prelim. Resp. 32 (citing Ex. 1010, 11:58–59, Fig. 2). Patent Owner thus contends that Petitioner’s reliance on Kramer rests entirely on hindsight. *Id.* at 33. Patent Owner further contends that “[w]hile Petitioner asserts that it ‘would have been routine and widely known’ to add a sourceless orientation tracker to a user’s head, it is telling that Petitioner cites *no reference* actually doing so.” *Id.* Thus, Patent Owner contends that, because “[n]either reference teaches a sourceless orientation tracker mounted on a user’s head,” this challenge fails. *Id.*

Patent Owner’s contention does not undercut Petitioner’s showing based on the present record. In particular, as discussed in detail below, Petitioner provides a reason with rational underpinning as to why one of ordinary skill in the art would have been motivated to modify Gottschalk by adding Kramer’s sensors to Gottschalk’s head mounted device. *See* Pet. 34–36. Additionally, on the present record, we find that one of ordinary skill in the art would have understood, based at least on Kramer’s extensive use of such sensors “all over a user’s body” (as Patent Owner acknowledges), *see* Prelim. Resp. 32, that Kramer’s sensors could be placed on a body part for which position and/or orientation were to be determined. *See, e.g.,* Ex. 1005 ¶¶ 66–68 (opining, *inter alia*, that one of ordinary skill in the art “would have also understood that Kramer’s accelerometer should be attached to Gottschalk’s headmount (much as it was attached to Kramer’s forearm), to determine the orientation and position of the user’s head”). Thus, Petitioner’s argument is supported by Dr. Neumann’s testimony as to motivation to combine and that testimony also provides support for Petitioner’s argument that one of ordinary skill in the art would have had a reasonable expectation of success in making the modifications proposed.

See Pet. 34–36 (addressing motivation to combine and reasonable expectation of success).

Patent Owner next contends that, even assuming Petitioner is correct that Kramer discloses that “six accelerometers (three angular accelerometers and three translational accelerometers) function as a six-degree-of-freedom accelerometer and constitute a sourceless orientation tracker,” “adding six accelerometers from Kramer to the headmount of Gottschalk would be opposed to the teachings of Gottschalk, which is directed to making a ‘lightweight’ tracking system.” Prelim. Resp. 34 (citing Ex. 1010, 11:26–32; Ex. 1008, 65). Patent Owner further contends that “Kramer explains that accelerometers provide ‘fast but slowly drifting data,’” and “Gottschalk had already addressed the issue of measurement latency by using ‘lateral-effect photodiodes’ that provided a ‘timing advantage over CCD technologies.” *Id.* (citing Pet. 35; Ex. 1008, 71). According to Patent Owner, “Petitioner’s combination would (1) add to the weight of the already ‘heavy’ system of Gottschalk, contrary to one object of Gottschalk . . . [;] (2) address a concern that Gottschalk’s system already addressed (measurement latency); and (3) add further to the cost of the system.” *Id.*

The analysis of Patent Owner’s contentions requires a fact-specific inquiry of various trade-offs. In such a case, the U.S. Court of Appeals for the Federal Circuit teaches that “a given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine.” *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006). As discussed above and reiterated in more detail below when addressing motivation to combine, Petitioner, relying on Dr. Neumann’s testimony, presents several advantages of the combination

proposed and reasons as to why one of ordinary skill in the art would have modified Gottschalk with the teachings of Kramer. *See* Pet. 34–36 (citing Ex. 1005 ¶¶ 64–68). Consequently, we determine, based on the current record at this stage of the proceeding, that Petitioner’s showing is sufficiently supported.

Patent Owner next contends that, “although Petitioner purports to combine Gottschalk and Kramer only to ‘track the position and orientation of the user’s head,’ . . . Petitioner cites *no evidence* that obscuring a user’s *head* was ever an issue in the art.” Prelim. Resp. 35 (citing Pet. 34–35). This argument is directed to Petitioner’s motivation to combine, which we address below.

Based on the present record and after considering Patent Owner’s contentions, Petitioner demonstrates sufficiently that the combination of Gottschalk and Kramer satisfies this claim limitation.

- ii. *“using a position tracker to track a position of a first localized feature associated with a limb of the user relative to the user’s head.”*

Petitioner relies on its contentions from Ground 1A for this limitation. Pet. 36 (citing Pet. § XI.A.1.b; Ex. 1005 ¶ 69). Specifically, Petitioner contends that “Gottschalk teaches hand-tracking, *i.e.*, position tracking, relative to the user’s head via its magnetic-source-on-the-headmount system.” *Id.* at 33. Petitioner further contends that a person of ordinary skill in the art “would have understood that in Gottschalk, the magnetic receiver and the user’s tracked hand are ‘a first localized feature associated with a body part of the user.’” *Id.* (citing Ex. 1005 ¶ 61). Petitioner asserts that “Gottschalk teaches using the head-mounted tracker having an active magnetic source (‘position tracker’) to track a target, *i.e.*, user’s hand motion

(‘position of a first localized feature associated with a body part . . . relative to the user’s head’).” *Id.* (citing Ex. 1008, 68). Petitioner argues that Gottschalk achieves this by “‘plac[ing] a magnetic source on the headmount and track[ing] hand motion from there.’” *Id.* (alterations in original) (quoting Ex. 1008, 68).

Patent Owner, in turn, relies on its contentions from Ground 1A for this limitation. Prelim. Resp. 35 (citing Prelim. Resp. § IX.A.2.b). In particular, Patent Owner contends that claim 1 requires two separate trackers—(1) a sourceless orientation tracker and (2) a position tracker. *Id.* at 28–29. Patent Owner asserts that “Petitioner improperly collapses the two claim limitations together and relies on the single magnetic tracker of Gottschalk to attempt to describe two different trackers—the orientation tracker and the position tracker of claim 1.” *Id.* at 29.

Patent Owner’s argument does not undercut Petitioner’s showing because it fails to account for Petitioner’s reliance on Kramer as disclosing the sourceless orientation tracker in this ground (Ground 1B) based on the combination of Gottschalk and Kramer as compared to where Patent Owner originally raised in this argument—in response to Petitioner’s challenge based on Gottschalk alone, as an anticipatory reference (Ground 1A).

Based on the present record and after considering Patent Owner’s contentions, Petitioner demonstrates sufficiently that Gottschalk teaches this claim limitation.

iii. Motivation to Combine

Petitioner contends that “Gottschalk teaches tracking the location of the user’s hand **relative to** the user’s head, enabling hand selection techniques” and “[b]y placing a magnetic source on a[n] HMD, Gottschalk’s

tracking system reports the hand's location in source space (*i.e.*, relative to the head)." Pet. 34 (citing Ex. 1008, 68). Petitioner further contends that "Gottschalk's magnetic hand tracker provides full six degrees of freedom ('6DOF')—hand orientation **and** hand position relative to the head." *Id.* (citing Ex. 1005 ¶ 64).

Petitioner asserts that "Kramer identified a need for a tracking system that does not suffer from shortcomings attributable to optical trackers, which risk being obscured to the degree that no position can be determined." Pet. 34 (citing Ex. 1010, 1:23–25, 1:51–53). Petitioner further asserts that Kramer also "recognized that inertial sensors such as accelerometers (referred to as '6-DOF-A' in Kramer) complement the tracking capabilities of optical sensors such as those in Gottschalk to track the position and orientation of the user's head." *Id.* at 34–35 (citing Ex. 1005 ¶ 66; Ex. 1010, 6:32–33). Petitioner also contends that Kramer "explains that an accelerometer may be used to provide fast but slowly drifting data" and that, "due to economic constraints, inertial sensors such as accelerometers could be used alone (in lieu) of an optical tracker to track the position and orientation of a body part." *Id.* at 35 (citing Ex. 1010, 19:13–21).

Additionally, Petitioner contends that one of ordinary skill in the art "would have had a reasonable expectation of success in complementing Gottschalk's head-and-hand tracking system by adding an inertial sensor such as an accelerometer as taught by Kramer to track the orientation of the user's head using both Gottschalk's optical tracker and the inertial sensor." Pet. 35. Petitioner points to Kramer's disclosure that "[v]arious sensors may be used in conjunction with the optical tracker to correct the faults of the optical tracker. The accelerometer can provide a rapid signal which will not

be subject to the blind spots of the optical tracker.” *Id.* (citing Ex. 1010, 8:61–64). Petitioner also contends that “[h]ybrid tracking systems using two or more distinct tracking modalities were well-known and readily implemented at the relevant time.” *Id.* (citing Ex. 1005 ¶ 67). And, according to Petitioner, “such modification (adding an angular accelerometer or gyroscope, *i.e.*, an inertial sensor, to Gottschalk’s HMD) would have been routine and widely known.” *Id.* at 35–36 (citing Ex. 1005 ¶ 67). Further, Petitioner asserts that, “in scenarios where economic constraints existed,” one of ordinary skill in the art “would have understood that Kramer’s inertial sensor could have been used in lieu of Gottschalk’s optical tracker to track the orientation of the user’s head.” *Id.* at 36.

Patent Owner contends that Petitioner “does not explain why a [person of ordinary skill in the art] would start with the room-based system of Gottschalk and combine it with Kramer, which is directed to a body-worn motion capture system that emphasizes the disadvantages of optical tracking.” Prelim. Resp. 36 (citing Ex. 1010, 1:8–28, Fig. 2). Patent Owner further contends that “Kramer describes (1) [using a] light source on [an] entity with receivers (sensors) in fixed positions, and (2) using reflectors.” *Id.* (citing Ex. 1010, 7:54–59). Patent Owner contrasts Kramer with Gottschalk, which according to Patent Owner, “describe[s] optical tracking that ‘observe[s] a number of ceiling-mounted infrared LEDs and knowing their positions.” *Id.* (citing Ex. 1008, 66). Based on these alleged differences, Patent Owner contends that “[t]he two cases of optical tracking of Kramer are completely different and teach away from the approach of Gottschalk,” which “negates motivation to combine.” *Id.* at 36–37 (citing *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006)).

Patent Owner further contends that “Petitioner’s expert fails to explain why a [person of ordinary skill in the art] would look to the different discrete types of hybrid systems described in Gottschalk and Kramer, as well as Kramer’s criticisms of Gottschalk’s systems, and combine them.” *Id.* at 37.

For the following reasons, we determine that Patent Owner’s contentions do not undercut Petitioner’s showing at this stage of the proceeding.

Gottschalk begins with a discussion of an optical tracker using head-mounted cameras to capture photocoordinates of ceiling mounted LEDs. Ex. 1008, 66. Gottschalk further discloses that “[a]lthough the optical tracker gives satisfactory accuracy over a large working volume, its design does not lend itself to hand tracking.” *Id.* at 68. Gottschalk further discloses using a magnetic tracking system to supplement the optical tracker. *Id.* (“[W]e decided to place a magnetic source on the headmount and track hand motion from there.”); *id.* (“We take simultaneous optical tracker and magnetic tracker readings and use them to recover the placement of the source within head space.”).

Kramer points to certain deficiencies with optical tracking. Ex. 1010, 1:21–26. Kramer discloses using various sensors “in conjunction with the optical tracker to correct the faults of the optical tracker.” *Id.* at 8:61–62. Kramer discloses that an “accelerometer can provide a rapid signal which will not be subject to the blind spots of the optical tracker.” *Id.* at 8:62–64.

Assuming that Patent Owner is correct that Kramer and Gottschalk teach different types of systems, that fact does not necessarily lead to a conclusion that Kramer teaches away from Gottschalk. Rather, “[a] reference may be said to teach away when a person of ordinary skill, upon

reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant.” *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 567 F.3d 1314, 1327 (Fed. Cir. 2009) (quoting *Ricoh Co. v. Quanta Comput. Inc.*, 550 F.3d 1325, 1332 (Fed. Cir. 2008)). A reference does not teach away, if it merely expresses a general preference for an alternative invention but does not “criticize, discredit, or otherwise discourage” investigation into the invention claimed. *In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004). In this case, at best, Kramer describes an alternative solution to Gottschalk, i.e., supplementing an optical tracker with an accelerometer (whereas Gottschalk supplemented its optical tracker with a magnetic tracker), and does not teach away.

[M]otivation to combine may be found explicitly or implicitly in market forces; design incentives; the “interrelated teachings of multiple patents”; “any need or problem known in the field of endeavor at the time of invention and addressed by the patent”; and the background knowledge, creativity, and common sense of the person of ordinary skill.

Zup, LLC v. Nash Mfg., Inc., 896 F.3d 1365, 1371 (Fed. Cir. 2018) (citations omitted). The interrelated teachings of Gottschalk and Kramer concerning issues with optical trackers provide sufficient motivation to combine based on the current evidentiary record.

b. Dependent Claim 14

Claim 14 recites “[t]he method of claim 1 further comprising: mounting a display device on the user’s head; and displaying a first object at a first position on the display device.” Ex. 1001, 15:41–45. Petitioner relies on its contentions for claim 14 from Ground 1A. Pet. 37 (citing Pet. § XI.B.1; Ex. 1005 ¶ 72). Specifically, Petitioner contends that

“Gottschalk’s tracking hardware is designed for a head-mounted display tracking system.” *Id.* at 34 (citing Ex. 1008, Abs.). Petitioner further contends that “Gottschalk’s tracking system is described as being sufficiently accurate for HMD applications.” *Id.* (citing Ex. 1008, 66). Based on this, Petitioner asserts that a person of ordinary skill in the art “would have understood that HMD applications involve a user donning a head-mounted VR display, and that VR display would necessarily contain one or more objects.” *Id.* (citing Ex. 1005 ¶ 62). Dr. Neumann’s testimony supports Petitioner’s arguments. *See* Ex. 1005 ¶ 62.

Patent Owner, in turn, relies on its contentions for claim 14 from Ground 1A. Prelim. Resp. 35 (citing Prelim. Resp. § IX.A.3). In particular, Patent Owner first contends that Petitioner’s argument is improper to show anticipation. *Id.* at 30. In the context of Ground 1B here, Patent Owner’s argument does not undercut Petitioner’s showing, which is based on obviousness not anticipation.

Second, although Patent Owner concedes that “Gottschalk refers to ‘head-mounted display (HMD) applications,’” Prelim. Resp. 30 (citing Ex. 1008, 65), Patent Owner contends that Gottschalk does not describe mounting a display on a user’s head because “the display in Gottschalk is ‘on a nearby workstation,’ not a head-mounted display.” *Id.* at 30–32 (citing Ex. 1008, 68).

We agree with Patent Owner that, on the present record, Petitioner has not shown that Gottschalk expressly describes the two steps recited in claim 14—(1) mounting a display device on the user’s head and (2) displaying a first object at a first position on the display device. Gottschalk discloses “a back-projection system for adjusting the assumed

locations of beacons in a head-mounted display tracking system.” Ex. 1008, 65 (Abs.). And, Gottschalk expressly recites a “head-mounted display tracking system.” *Id.* Additionally, we agree with Petitioner’s argument and Dr. Neumann’s testimony that one of ordinary skill in the art “would have understood head-mounted display applications to involve a user donning a head-mounted VR display” and that the “display would necessarily contain one or more objects to be displayed to the user.” Ex. 1005 ¶ 62; *see* Pet. 34. But, Gottschalk is directed to autocalibration for virtual environments tracking hardware and although it describes many features of such environments, as discussed above, Petitioner has not identified any description in Gottschalk of a user actually donning such a display and such display being used to display a first object as recited by method claim 14.

Accordingly, on the present record, we do not determine that Petitioner has shown a reasonable likelihood that claim 14 would have been obvious over the combined teachings of Gottschalk and Kramer.

4. *Objective Indicia of Nonobviousness*

Patent Owner contends that the references relied on by Petitioner describe the failure of others and an unmet need to which the ’068 patent is specifically directed (i.e., developing a tracking system that is lightweight and works in unprepared environments and in large spaces). Prelim. Resp. 55–56.

In order for us to accord substantial weight to objective indicia of nonobviousness, Patent Owner must establish “a ‘nexus’ to the claims, i.e., there must be ‘a legally and factually sufficient connection’ between the evidence and the patented invention.” *Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366, 1373 (Fed. Cir. 2019) (citations omitted). At this point in

the proceeding, Patent Owner has offered no evidence or analysis of any alleged nexus to any of the Challenged Claims. *See id.* Based on the present record, we do not assign substantial weight to Patent Owner's evidence of objective indicia of nonobviousness.

5. *Weighing the Graham Factors*

“Once all relevant facts are found, the ultimate legal determination [of obviousness] involves the weighing of the fact findings to conclude whether the claimed combination would have been obvious to an ordinary artisan.” *Arctic Cat*, 876 F.3d at 1361. On balance, considering the record presently before us, which includes Petitioner's strong showing regarding claim 1 and Patent Owner's weaker evidence of nonobviousness, we determine that Petitioner has established a reasonable likelihood that it would prevail in showing that the combination of Gottschalk and Kramer would have rendered the subject matter of claim 1 of the '068 patent obvious to one of ordinary skill in the art at the time of the invention.

D. *Ground 2: Obviousness over Gottschalk, Kramer, and Kalawsky;*

Ground 3: Obviousness over Gottschalk, Kramer, and Mine

Petitioner contends that (a) the combination of Gottschalk, Kramer, and Kalawsky would have rendered the subject matter of claims 14–20, 26–33, 35, and 41 obvious to one of ordinary skill in the art and (b) the combination of Gottschalk, Kramer, and Mine would have rendered the subject matter of claims 1, 14–16, 23–27, and 41–44 obvious to one of ordinary skill in the art at the time of the invention. Pet. 6, 37–77. Patent

Owner contests many of Petitioner’s assertions. *See* Prelim. Resp. 38–54.¹⁴ Because we have determined above that, at this stage of the proceeding and on the present record, the information presented in the Petition and Preliminary Response shows that there is a reasonable likelihood that Petitioner will prevail with respect to its challenge to claim 1 based on Gottschalk and Kramer, we need not address, in this Decision, Petitioner’s additional challenges and Patent Owner’s preliminary arguments. *See* 35 U.S.C. § 314(a); *SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348, 1356 (2018)

¹⁴ Apart from its substantive arguments, Patent Owner argues that Petitioner’s challenge based on Gottschalk, Kramer, and Kalawsky (Ground 2) fails to meet the particularity requirement of 35 U.S.C. § 312(a)(3) because Petitioner fails to address the elements of independent claim 1. Prelim. Resp. 17–22. Although Petitioner could have and should have more clearly identified the basis for meeting the elements of claim 1 when addressing the dependent claims challenged in Ground 2, we do not find that any lack of clarity rises to a level where it violates § 312(a)(3). In particular, Petitioner’s Ground 2 builds on Petitioner’s challenges under Grounds 1A and 1B by challenging claims that depend from claim 1. And, the Petition is clear that Grounds 1A and 1B raise alternative arguments based on the different claim constructions of “sourceless orientation tracker.” Additionally, in addressing claim 14 as part of Ground 2, Petitioner begins by stating, “[i]f the Board concludes that Gottschalk fails to disclose that its HMD displays one or more objects (*see* §XI.B.3), Kalawsky clearly teaches this feature.” Pet. 39 (citing Ex. 1005 ¶ 77). Section XI.B.3 of the Petition is Petitioner’s discussion of claim 14 in the context of Ground 1B. *See id.* at 37. And, in that section when addressing claim 14, Petitioner references its discussion of claim 14 in the context of Ground 1A. *See id.* (citing “*See supra* §XI.A.2; Ex-1005, ¶70”). Thus, based on (1) Petitioner’s alternative claim constructions as forming the basis for Grounds 1A and 1B, and (2) Petitioner’s cross-reference to Ground 1B and corresponding cross-reference to Ground 1A, we find that Ground 2 relies, alternatively, on each of Petitioner’s previously expressed positions from Grounds 1A and 1B (i.e., that Gottschalk (Ground 1A) or Kramer (Ground 1B) discloses a “sourceless orientation tracker”).

(“Section 314(a) does not require the Director to evaluate every claim individually. Instead, it simply requires him to decide whether the petitioner is likely to succeed on “at least 1” claim. Once that single claim threshold is satisfied, it doesn’t matter whether the petitioner is likely to prevail on any additional claims; the Director need not even consider any other claim before instituting review.”).

V. CONCLUSION

For the foregoing reasons, Petitioner has demonstrated a reasonable likelihood that it would prevail in showing that at least one claim of the ’068 patent is unpatentable. Our analysis is based on the preliminary record developed thus far and may change after the record is developed fully, during trial.¹⁵

VI. ORDER

Accordingly, it is:

ORDERED that, pursuant to 35 U.S.C. § 314(a), *inter partes* review is instituted as to claims 1, 14–20, 23–33, 35, and 41–44 of the ’068 patent on all of 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(b), *inter partes* review of the ’068 patent shall commence on the entry date of this Decision, and notice is hereby given of the institution of a trial.

¹⁵ Patent Owner is cautioned that any arguments not raised in the Patent Owner Response may be deemed waived. *See In re NuVasive, Inc.*, 842 F.3d 1376, 1379–82 (Fed. Cir. 2016) (holding that a patent owner waived an argument addressed in a preliminary response by not raising the same argument in its patent owner response).

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