

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

META PLATFORMS, INC.,
Petitioner,

v.

MULLEN INDUSTRIES LLC,
Patent Owner.

IPR2025-00703
Patent 11,033,821 B2

Before KEN B. BARRETT, JEFFREY S. SMITH, and
STEVEN M. AMUNDSON, *Administrative Patent Judges*.

BARRETT, *Administrative Patent Judge*.

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

I. INTRODUCTION

A. *Background and Summary*

Meta Platforms, Inc. (“Petitioner”)¹ filed a Petition requesting *inter partes* review of U.S. Patent No. 11,033,821 B2 (“the ’821 patent,” Ex. 1001). Paper 1 (“Pet.”). The Petition challenges the patentability of claims 1, 4, 11, 16, 30, and 102 of the ’821 patent. Mullen Industries LLC (“Patent Owner”)² filed a Preliminary Response to the Petition. Paper 10 (“Prelim. Resp.”). With our authorization, Petitioner filed a Preliminary Reply (Paper 11, “Prelim. Reply”) and Patent Owner filed a Preliminary Sur-reply (Paper 12, “Prelim. Sur-reply”) directed to Patent Owner’s proposed construction of the term “physical playfield.”

An *inter partes* review may not be instituted “unless . . . the information presented in the petition . . . 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) (2023). Having considered the arguments and evidence presented by Petitioner and Patent Owner, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing on at least one of the challenged claims of the ’821 patent. Accordingly, we institute an *inter partes* review as to all the challenged claims of the ’821 patent on all the grounds of unpatentability set forth in the Petition.

¹ Petitioner identifies Meta Platforms, Inc. as the real party in interest. Pet. 84.

² Patent Owner identifies Mullen Industries LLC as the real party in interest. Paper 3, 1; Paper 8, 1.

B. Related Proceedings

Both parties identify, as a matter involving or related to the '821 patent, *Mullen Industries LLC v. Meta Platforms, Inc.*, No. 1:24-cv-00354-DAE (W.D. Tex.). Pet. 84; Paper 3, 1; Paper 8, 1.

Petitioner states that it “will file petitions for *inter partes* review against U.S. Patent No. 10,967,270, U.S. Patent No. 8,585,476, U.S. Patent No. 9,744,448, U.S. Patent No. 10,179,277, U.S. Patent No. 10,828,559, U.S. Patent No. 11,376,493, U.S. Patent No. 11,904,243, U.S. Patent No. 11,947,716, U.S. Patent No. 12,019,791, U.S. Patent No. 9,662,582, and U.S. Patent No. 10,974,151.” Pet. 85.

C. The '821 Patent

The '821 patent is titled “Systems and Methods for Location Based Games and Employment of the Same on Location Enabled Devices.” Ex. 1001, code (54). According to the '821 patent:

The present invention provides an actual, reality-based video game in which a user's physical (actual) location on a playfield, reflects a virtual game character's virtual location in a video game environment. In this manner, an actual-reality (hereinafter “actuality”) video game system may be provided. Generally, an actuality game is a location-based game where a user's location on a physical playfield corresponds to a video game character's location on a virtual video game playfield.

Id. at 2:27–35.

D. Illustrative Claim

Of the challenged claims of the '821 patent, claims 1 and 102 are independent claims. The remaining challenged claims depend directly from claim 1. Claim 1, reproduced below with bracketed annotations inserted, is illustrative.

1. [1.Pre] A system comprising:
 - [1.a] a wireless communication device, wherein said wireless communication device comprises:
 - [1.a.1] a display;
 - [1.a.2] a locating device operable to determine the physical location of said locating device on a physical playfield; and
 - [1.a.3] a processor coupled to said display and said locating device, wherein said processor is operable to provide a video game comprising a virtual character with a virtual location on a virtual playfield, said virtual character is displayed on said display, said virtual location on said virtual playfield corresponds to said physical location on said physical playfield, and a direction of gameplay of said videogame is operable to be established by recording a manually provided direction in response to a prompt requesting said manually provided direction.

Ex. 1001, 23:59–24:9.

E. Evidence

Petitioner relies on the following references:

Name	Reference	Exhibit No.
Cheok	A.D. Cheok et al., <i>Human Pacman: A Sensing-based Mobile Entertainment System with Ubiquitous Computing and Tangible Interaction</i> (May 2003)	1006
Nakamura	JP 2001070658A, published Mar. 21, 2001	1007, 1038 ³
Foxlin077	US 5,645,077, issued July 8, 1997	1008
Benini	L. Benini et al., <i>Palmtop Computers for Managing Interaction with Immersive Virtual Heritage</i> (2002)	1009
Rallison	US 5,991,085, issued November 23, 1999	1014

³ Exhibit 1038 is the English translation of Nakamura (Ex. 1007), which is in Japanese. Petitioner cites to Exhibit 1007. *See, e.g.*, Pet. 12.

Petitioner also relies on the declaration of Gregory Welch, Ph.D. (Ex. 1003, “Welch Decl.”) in support of its arguments. The parties also rely on other exhibits as discussed below.

F. Asserted Grounds of Unpatentability

Petitioner asserts that the challenged claims are unpatentable on the following grounds:

Claim(s) Challenged	35 U.S.C. §⁴	Reference(s)/Basis
1, 11 ⁵	103(a)	Cheok, Foxlin077
16, 30	103(a)	Cheok, Foxlin077, Rallison
102	103(a)	Cheok, Nakamura
1, 4, 11, 16, 30	103(a)	Nakamura, Benini
102	103(a)	Nakamura

II. ANALYSIS

A. Principles of Law

Petitioner bears the burden of persuasion to prove unpatentability of the claims challenged in the Petition, and that burden never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015).

A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that

⁴ The application that issued as the ’821 patent was filed before the effective date of the Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), and we apply the pre-AIA version of 35 U.S.C. § 103.

⁵ The heading for Ground 1, based on Cheok and Foxlin077, lists dependent claim 4 as being challenged, but the corresponding section of the Petition lacks a discussion of claim 4. *See* Pet. 18 (section heading); *id.* at 37 (transitioning from independent claim 1 directly to dependent claim 11).

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). The question of obviousness is resolved on the basis of underlying factual determinations 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) if present, any objective evidence of obviousness or non-obviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

B. The Level of Ordinary Skill in the Art

In determining the level of ordinary skill in the art, various factors may be considered, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field.” *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (quoting *Custom Accessories, Inc. v. Jeffrey–Allan Indus., Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986)).

Petitioner contends that:

A person of ordinary skill in the art (“POSITA”) in 2004 would have had at least a bachelor’s degree in electrical engineering, computer science, or similar field, with at least two years of relevant experience working with VR [Virtual Reality] and AR [Augmented Reality] systems. Additional experience could substitute for less education, and additional education could likewise substitute for less experience. Welch ¶¶95; see also ¶¶94.

Pet. 17. Patent Owner, at this stage, does not disagree or propose a different definition of the person of ordinary skill in the art.

Petitioner's definition is consistent with the level of ordinary skill reflected in the prior art references of record. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (recognizing that the prior art itself may reflect an appropriate level of skill in the art). For purposes of this decision, we apply Petitioner's definition of the person of ordinary skill in the art.

C. Claim Construction

We apply the same claim construction standard used in district court actions under 35 U.S.C. § 282(b), namely that articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). *See* 37 C.F.R. § 42.100(b) (2025). In applying that standard, claim terms generally are given their ordinary and customary meaning as would have been understood by a person of ordinary skill in the art at the time of the invention and in the context of the entire patent disclosure. *Phillips*, 415 F.3d at 1312–13. “In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence.” *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17). “[W]hile extrinsic evidence can shed useful light on the relevant art, . . . it is less significant than the intrinsic record in determining the legally operative meaning of claim language.” *Phillips*, 415 F.3d at 1317 (internal quotation marks omitted). We construe expressly only those claim terms that require analysis to determine whether to institute *inter partes* review. *See Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (holding that “only those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy”).

Petitioner, in the Petition, contends that “[t]his Petition establishes the prior art meets each of the claim limitations under any reasonable construction,” and that “no express construction is required.” Pet. 17–18 (footnote omitted). Patent Owner proposes a construction of “physical playfield” recited in independent claims 1 and 102. Prelim. Resp. 15–17; Prelim. Sur-Reply 1–3. Specifically, Patent Owner argues that “physical playfield” “should be construed to be a ‘bounded physical play space.’” Prelim. Resp. 15. Petitioner, in the authorized reply, contends that “[t]he ‘bounded’ limitation is unsupported, and it is contradicted by the specification which specifically teaches embodiments that are not bounded,” and, “[i]f construction is needed, the term encompasses both a defined physical playfield and the physical world.” Prelim. Reply 1.

Patent Owner argues that “[t]he ’821 patent specification consistently describes a ‘physical playfield’ as having a boundary.” Prelim. Resp. 15 (citing Section III.A of the Preliminary Response; Ex. 1001, 6:15–40, 9:11–16, 15:51–55, 18:21–28). Patent Owner further argues that “[t]he usage of physical dimensions information to scale location-based inputs is reflected in Claims 1 and 102, which both recite that ‘said virtual location on said virtual playfield corresponds to said physical location on said physical playfield . . . [t]hus, within the context of the claims, a ‘physical playfield’ must have defined boundaries such that the claimed system can translate virtual locations to physical locations.” *Id.* at 16–17. Patent Owner also cites to dictionary definitions of “playing field” and “playfield” that purportedly support its proposed construction. *Id.* at 17 (citing Ex. 2001, 3; Ex. 2002, 3; Ex. 2003, 3; Ex. 2004, 3).

At this stage, we do not find Patent Owner’s proposed construction persuasive for several reasons. As an initial matter, the claim does not recite “a bounded physical play space.” Rather, the claim recites “a physical playfield.”

In response to Petitioner’s assertion that the Specification indicates that the playfield could be the entire world, Patent Owner argues that the Specification contrasts and distinguishes the two. *See* Prelim. Sur-reply 1–3 (citing Ex. 1001, 6:7–7:20, 8:8–12, 8:40–45, 19:42–44, Fig. 1). We do not agree that the portions of the Specification cited by Patent Owner support its position. For example, the Specification states, “[g]enerally, flow chart 200 may be utilized in a location-based game where the location of a user on a *defined physical playfield*, or that user’s latitude/longitude information *in the world*, is utilized as a control signal to a location-based game.” Ex. 1001, 8:8–12. This, at most, distinguishes a *defined* physical playfield from the world; it does not indicate that an unbounded world cannot be a playfield. And, the drafter’s use of a modifier such as “defined” in the Specification but not in independent claim 1 or independent claim 102 suggests the intention for the independent claims to be broader. On this preliminary record, we decline to read into the claim the requirement that the “physical playfield” be limited to a “bounded physical playfield.”

Additionally, the Specification includes an embodiment associating a “virtual video game playfield” with “a ‘perimeterless’ game of pong.” *See* Ex. 1001, 13:57–63. We are not persuaded, at this preliminary stage, by Patent Owner’s argument that the Specification’s disclosure of “a ‘perimeterless’ game of pong” is referring to a playfield having boundaries. *See* Prelim. Sur-reply 3 (“The specification also uses quotations to refer to a

‘perimeterless’ game of pong; but even then it has boundaries, albeit larger ones (“1,000 feet” wide)”) (alterations in original; citing Ex. 1001, 13:57–63). The embodiment is not, as Patent Owner argues, identifying 1,000 feet as playfield boundaries, but rather that is an example of a distance that a player may move, which yields the benefit of a large amount of exercise. *See* Ex. 1001, 13:57–63 (“[A] user may move 1,000 feet to the left to block an incoming pong-ball Such a perimeterless [sic] game, or any location-based game, may provide great a [sic] large amount of exercise to a user.”). Limiting the claim term to only “bounded” playfields would read out this broader perimeterless embodiment from the claim scope. *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1583 (Fed. Cir. 1996) (holding that interpreting a claim to exclude an embodiment disclosed in the written description “is rarely, if ever, correct and would require highly persuasive evidentiary support, which is wholly absent in this case.”). And, even if every embodiment in the Specification disclosed a bounded playfield, that does not necessarily justify narrowing the claims by reading in the limiting term “bounded.” *Phillips*, 415 F.3d at 1323 (“[A]lthough the specification often describes very specific embodiments of the invention, we have repeatedly warned against confining the claims to those embodiments.”).

We, therefore, agree at this juncture with Petitioner’s claim construction analysis, and note that the alleged goal of improving the safety in virtual reality gaming does not support Patent Owner’s construction. *See* Prelim. Reply 2 (Petitioner arguing that by describing a location-based game where a user can view the physical surroundings, a “bounded” physical playfield is not necessary (citing Prelim. Resp. 4–9)). Further, we find unpersuasive, at this juncture, Patent Owner’s arguments related to

embodiments of how the dimension information about the playfield is used to construct the playfield and perform scaling. Prelim. Resp. 16–17. This scaling is not recited in the independent claims. *But see id.* at 16 (Patent Owner arguing that “[t]he usage of physical dimensions information to scale location-based inputs is reflected in Claims 1 and 102, which both recite that ‘said virtual location on said virtual playfield corresponds to said physical location on said physical playfield.’”).

Finally, the extrinsic dictionary definitions cited by Patent Owner are “less significant than the intrinsic record in determining the legally operative meaning of claim language.” *Phillips*, 415 F.3d at 1317. And in any event, we may not rely on dictionary definitions that contradict what the patent documents describe. *See Advanced Fiber Tech. (AFT) Trust v. J & L Fiber Servs., Inc.*, 674 F.3d 1365, 1374–75 (Fed. Cir. 2012) (holding erroneous a construction informed by a dictionary definition but in disagreement with one sentence of the written description).

D. Ground 1: Obviousness Based on Cheok and Foxlin077

Petitioner asserts that independent claim 1 and dependent claim 11 would have been obvious over Cheok⁶ and Foxlin077. *See* Pet. 18–38. In doing so, Petitioner explains how the combination satisfies each claim limitation and provides supporting testimony from its expert. *See id.* Because the arguments presented by Patent Owner focus on independent claim 1, our analysis likewise focuses on that claim. *See, e.g.*, Prelim. Resp. 2–3 (summarizing the arguments for “Claim 1 Grounds.” (emphasis omitted)); *id.* at 25 (“The only challenged dependent claims 4, 11, 16, and 30

⁶ For Cheok, we, like Petitioner, cite to the page numbers of the underlying document rather than the page numbers of the exhibit.

all depend from claim 1. . . . Thus, all challenged claims require a ‘physical playfield.’”).

For the reasons that follow, we determine that Petitioner has demonstrated a reasonable likelihood of showing at least independent claim 1 is unpatentable as obvious over Cheok and Foxlin077.

1. A physical playfield

Patent Owner argues that Petitioner fails to show that Cheok discloses the recited “physical playfield” because “[t]he Petition never identifies any disclosure in Cheok of boundaries in the physical world that would constitute a ‘physical playfield’ as required by the challenged claims.” Prelim. Resp. 26. According to Patent Owner, “[i]nstead, Cheok teaches simply ‘embedding the natural physical world . . . with a fantasy virtual playground.’” *Id.* (citing Ex. 1006, Abstract).

Patent Owner’s argument is not persuasive as it is premised on the proposed claim construction with which we do not agree for the reasons set forth above in the claim construction section. *See supra* Section III.C. Petitioner contends that “the user moves through the physical world (*on a physical playfield*).” Pet. 22 (citing Ex. 1006, 108). As Patent Owner notes, Cheok refers to “the selected game play area in our university campus.” *Id.* at 27 (citing Ex. 1006, 5 (page 110 of the underlying document)).

At this stage, and on this record, we determine that Petitioner has shown sufficiently for institution that Cheok discloses “a physical playfield,” as recited in independent claim 1.

2. A manually provided direction in response to a prompt

Limitation 1.a.3 recites, in part, “a direction of gameplay of said videogame is operable to be established by recording a manually provided

direction in response to a prompt requesting said manually provided direction.” Ex. 1001, 24:6–9.

Petitioner contends that, in Cheok, “[t]he inertial sensor and digital compass of the dead-reckoning module . . . help[s] establish a user’s direction during gameplay,” and the system “establish[es] the direction/orientation of a user’s Ghost or Pacman virtual character based on the direction the user is facing on the physical field.” Pet. 28–29 (citing Ex. 1006, 108–109 (“By placing the [InertiaCube2] sensor on the cap of each player, her **head movement and orientation is tracked** to high accuracy.” (alterations and emphasis by Petitioner))); Welch Decl. ¶144). Petitioner asserts that Cheok does not explicitly disclose that the direction of gameplay is established “by recording a manually provided direction in response to a prompt requesting said manually provided direction,” as recited in claim 1. *Id.* at 29. Petitioner turns to Foxlin077 for that aspect of the claim.

Petitioner contends that “Foxlin077 relates to motion tracking in VR and AR applications and discloses an ‘inertial angular orientation tracking apparatus’ to track motions of parts of a human body.” *Id.* at 29 (citing Welch Decl. ¶ 146; Ex. 1008, 6:20–22). Petitioner further contends that Foxlin077 teaches the initialization of the sensor’s orientation in response to a prompt. *See id.* at 32. In this regard, Petitioner asserts that “[t]he initialization steps ‘establish the rest position, from which orientation is measured and measure biases for the rate sensors,’” and “[a] ‘user is instructed 432 to place the sensor assembly in such a position by a message delivered to the apparatus input/output devices or implicitly by the fact of starting the tracker.’” *Id.* (citing Ex. 1008, 9:67–10:7, 10:29–35; Welch

Decl. ¶ 150). Petitioner further contends that both Cheok and Foxlin077 involve the InertiaCube2 inertial sensor and that:

Because Cheok discloses tracking movement with respect to an “initialization” point, Cheok suggests that the sensors must be initialized prior to use. However, Cheok does not specifically disclose any particular initialization processes for the inertial sensors. A POSITA would have thus found it beneficial to modify Cheok with Foxlin077’s inertial sensor initialization/reinitialization that allows a user to manually set an orientation in response to a prompt.

Id. at 34–35 (citing Ex. 1006, 109, 116; Ex. 1013, 2; Welch Decl. ¶¶ 154–155).

Patent Owner argues that Foxlin077 “does not describe or suggest any application of the sensor for a video game,” and “[t]herefore, Foxlin077 does not establish anything about a game, much less a direction of gameplay.” Prelim. Resp. 34. Even if Patent Owner’s characterization is correct, we do not find this argument persuasive. “Non-obviousness cannot be established by attacking references individually where the rejection is based upon the teachings of a combination of references.” *In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986) (citing *In re Keller*, 642 F.2d 413, 425 (CCPA 1981)). Petitioner contends that Cheok discloses a direction of gameplay. *See, e.g.*, Pet. 28–29.

Patent Owner appears to agree that the proposed combination would improve Cheok, asserting that “Foxlin077’s initialization process only provides for more accurate movement detection of that very same movement in Cheok, by providing an initial configuration step to better measure physical movement.” Prelim. Resp. 34; *see id.* (Patent Owner asserting that Foxlin077’s “initialization steps merely provide better physical measurement”). Patent Owner argues, however, that “[e]ven if Foxlin077’s

initialization process was implemented in Cheok, it would not cause Cheok to establish a direction of gameplay with manual input,” and “even in the combination, the establishment of a ‘direction of gameplay’, under Petitioner’s theory, is still done via movement of the user as he or she is playing the game, rather than by recording a manually provided direction in response to a prompt.” *Id.* at 34.

At this preliminary stage of the proceeding, we do not find Patent Owner’s argument persuasive. We understand Petitioner to contend that the proposed combination utilizes Foxlin077’s initialization process, involving a manual input in response to a prompt, to set the orientation of Cheok’s sensor at the beginning of gameplay and when there is a need to “adjust and then restore the direction of gameplay.” Pet. 36 (citing Welch Decl. ¶ 158); *see also id.* at 35 (“A POSITA would have . . . found it beneficial to modify Cheok with Foxlin077’s inertial sensor initialization/reinitialization that allows a user to manually set an orientation in response to a prompt.”). Patent Owner does not explain adequately how this is excluded from the claim’s recitation that “a direction of gameplay of said videogame is operable to be established by recording a manually provided direction in response to a prompt requesting said manually provided direction.”

Patent Owner next argues that “Foxlin077’s baseline position—which is the alleged ‘manually provided direction’—is not manually provided.” Prelim. Resp. 35. Patent Owner argues that the system provides the direction and, therefore, it is not manually provided by the user. *See id.* We do not find these arguments persuasive at this preliminary stage. Even if the Foxlin077 user’s manual positioning of the sensor is not manually providing a direction within the meaning of the claim language, we understand

Petitioner's proposed combination with Cheok to involve the user manually setting an initial position. *See, e.g.,* Pet. 32 ("A POSITA would have understood that in such a process [as Foxlin077's], the user is establishing a reference orientation (*a direction of gameplay of said videogame is operable to be established*) by providing a manual orientation (e.g., by holding the sensor assembly stationary in a certain direction) (*by recording a manually provided direction*) in response to a message delivered to the apparatus (*in response to a prompt requesting said manually provided direction*).").

Patent Owner next argues that there is no motivation to combine the references' teachings. Prelim. Resp. 36–38. Patent Owner specifically argues that "[t]here is no motivation to modify Cheok's method for allegedly determining the direction of gameplay to include a prompt requesting a manually provided direction; it already allegedly determines direction by the user's simple movement, which the user will already do while playing the game, a much more efficient process." *Id.* at 36 (citing Pet., 29–36).

According to Patent Owner, "[a]dding a prompt requesting manual user input for a direction of gameplay has drawbacks to user experience; it slows down the beginning of gameplay and complicates the overall system, removing the natural feel of playing without having to set up the game, when Cheok already works for its intended purpose." *Id.* at 36–37. We do not find these arguments persuasive at this stage. Even if Patent Owner is correct that the proposed combination would be less efficient or slow down the beginning of play, that there may be drawbacks from the proffered combination of teachings does not necessarily show a lack of motivation to combine teachings. *Winner Int'l Royalty Corp. v. Wang*, 202 F.3d 1340, 1349 (Fed. Cir. 2000). And, even if the proposed combination would not

have been the best choice, that does not necessarily mean that it was non-obvious. *See Intel Corp. v. Qualcomm Inc.*, 21 F.4th 784, 800 (Fed. Cir. 2021) (“It’s not necessary to show that a combination is ‘the *best* option, only that it be a *suitable* option.’” (quoting *PAR Pharm., Inc. v. TWI Pharms., Inc.*, 773 F.3d 1186, 1197–98 (Fed. Cir. 2014))). Dr. Welch testifies, for example, that “[a] POSITA would have . . . recognized it would be beneficial to improve the Cheok system by implementing a similar inertial sensor initialization/reinitialization process [as in Foxlin077] to address any potential accuracy or user experience issues associated with drift.” Welch Decl. ¶ 156. Dr. Welch also testifies that, “in a virtual environment application like the Cheok system, in which a user must interact with the real environment, a POSITA would have understood that Foxlin077’s manual reinitialization process would be beneficial to address accumulated drift when an automatic drift compensator component is not sufficiently removing drift.” *Id.* ¶ 157. At this stage, that testimony is un rebutted with evidence, as opposed to mere attorney argument.

Patent Owner also argues that “[t]he Petition’s rationale regarding ‘drift’ and sensor accuracy likewise does not establish a reason to prompt the user a manually provided direction,” and asserts that “Cheok does not have an accuracy problem.” Prelim. Resp. 37 (citing Pet. 35). However, Patent Owner concedes that “Foxlin077’s initialization process . . . provides for more accurate movement detection of that very same movement in Cheok, by providing an initial configuration step to better measure physical movement.” Prelim. Resp. 34; *see also id.* (“[E]ven if Foxlin077 is or could be used in conjunction with a game, its initialization steps merely provide better physical measurement.”).

We determine that Petitioner has shown adequately for purposes of institution that a person of ordinary skill in the art would have had a motivation to make the proposed combination and that the proposed combination would result in the claimed subject matter.

3. A virtual character displayed on a display

Limitation 1.a.1 recites a display, and limitation 1.a.3 recites, in part: “a processor coupled to said display . . . , wherein said processor is operable to provide a video game comprising a virtual character . . . , said virtual character is displayed on said display.” Ex. 1001, 23:66–24:3.

Patent Owner argues that “the Petition . . . points to two different things for ‘a display’ and ‘said display.’” Prelim. Resp. 44. Patent Owner asserts that Petitioner maps Cheek’s head-mounted display (HMD) worn by the Pac-Man player as “a display,” but maps the computer used by the helper to “said display” on which the virtual character appears. *See id.* at 44–45. Patent Owner appears to argue that the virtual characters appear in the virtual “Pac-World View” that only can be viewed on the helper’s computer, and not on the head-mounted display. *See id.*

We do not find Patent Owner’s argument persuasive. We understand Petitioner to consistently map the recited “display” to the head-mounted display. For limitation 1.a.1, Petitioner contends that the Cy-Visor Head Mounted Display is the recited “device having a display.” Pet. 20. Petitioner contends that Pacmen and Ghosts are “virtual character[s]” and Pac-World is the recited “virtual playfield.” Pet. 25 (citing Ex. 1006, 110; Welch Decl. ¶ 140). For limitation 1.a.3, Petitioner contends that “a player’s *virtual character* (e.g., a Pacman) *is displayed on said display* of the HMD in the virtual world (i.e., Pac-world) view.” *Id.* at 26 (citing Ex. 1006, Fig. 10; Welch Decl. ¶ 142). Thus, for both pertinent limitations, Petitioner

contends that the head-mounted display is the recited display, and contends that is where the virtual character is displayed.

Petitioner additionally contends that “[t]he wearable computer [of Cheok] also incorporates a HMD which enables users to switch between AR and VR modes.” Pet. 6 (citing Ex. 1006, Fig. 11; Welch Decl. ¶ 101).

Petitioner’s contention is consistent with Cheok’s disclosure, which explains:

Pac-World is a fantasy world existing dualistically in both Augmented Reality (AR) and Virtual Reality (VR) mode. Pacmen and Ghosts, who are walking around in the real world with their networked wearable computers and head mounted displays (HMD), are allowed to switch between the two viewing mode. Helpers, on the other hand, can only view in VR mode since they are stationed in front of networked computers. Most importantly there is a direct and real time link between the wide-area physical world and the virtual Pac-World at all times, thus providing the users with a ubiquitous and seamless merging of the fantasy digital world and the realistic physical world.

Ex. 1006, 110 (emphasis added); *see also id.* at 109 (“The position of other mobile players obtained from the server is used to update *the 2-D virtual map in the HMD view of the player.*” (emphasis added)); *id.* at 111 (“It must be noted that when Pacman or Ghost switches to VR mode, she is completely immersed in virtual Pac-world.”). Thus, there is a real physical world and a virtual Pac-World, and we understand that the Pacman virtual character is displayed in the virtual Pac-World on the Head-Mounted Display when the Pacman player switches to VR mode.

E. Remaining Challenges

Because we find Petitioner has demonstrated a reasonable likelihood of showing at least one challenged claim is unpatentable as obvious over

Cheek and Foxlin⁰⁷⁷, we need not review all of Petitioner’s challenges. *See* 35 U.S.C. § 314(a) (“The Director may not authorize an inter partes review to be instituted unless . . . there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.”).

III. CONCLUSION

Petitioner has demonstrated a reasonable likelihood of prevailing in showing the unpatentability of at least one of the challenged claims of the ’821 patent. At this stage of the proceeding, we have not made a final determination with respect to the patentability of any of the challenged claims.

IV. ORDER

For the foregoing reasons, it is

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of claims 1, 4, 11, 16, 30, and 102 of the ’821 patent is instituted with respect to all grounds of unpatentability 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 ’821 patent shall commence on the entry date of this Order, and notice is hereby given of the institution of a trial.

IPR2025-00703
Patent 11,033,821 B2

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