

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

META PLATFORMS, INC.,
Petitioner,

v.

MULLEN INDUSTRIES LLC,
Patent Owner.

IPR2025-00744
Patent 12,019,791 B2

Before KEN B. BARRETT, JEFFREY S. SMITH, and
MIRIAM, L. QUINN, *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. 12,019,791 B2 (“the ’791 patent,” Ex. 1001). Paper 2 (“Pet.”). The Petition challenges the patentability of claims 21, 23, 31, 37, 41, and 42 of the ’791 patent. Mullen Industries LLC (“Patent Owner”)² filed a Preliminary Response to the Petition. Paper 9 (“Prelim. Resp.”).

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). 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 ’791 patent. Accordingly, we institute an *inter partes* review as to all the challenged claims of the ’791 patent on all the grounds of unpatentability set forth in the Petition.

B. *Related Proceedings*

The parties identify, as a matter involving or related to the ’791 patent, *Mullen Industries LLC v. Meta Platforms, Inc.*, Case No. 1:24-cv-

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

² Patent Owner identifies Mullen Industries LLC as the real party in interest. Paper 3, 1; Paper 7, 1.

00354-DAE (W.D. Tex.). Pet. 1; Paper 3, 1; Paper 7, 1. The Petition identifies twelve *inter partes* reviews challenging related patents. Pet. 1.

C. The '791 Patent

The '791 patent is titled “Augmented Reality Video Game Systems.” Ex. 1001, code (54). According to the Abstract of the '791 patent, “[u]sers can wear head-mounted displays with transparent screens and can control video game indicia that are perceived as being augmented over a user’s environment by displaying video game indicia onto the transparent displays.” *Id.* at code (57) (Abstr.). One embodiment is described as a basketball game.

Virtual indicia may be augmented on top of a user’s hand. Accordingly, for example, a user may be perceived as holding a virtual object such as a virtual basketball. A user may, gripping a controller, shoot the virtual basketball towards a virtual basketball hoop the user installed in his/her living room. Furthermore, for example, the virtual basketball may react with a user’s physical environment. For example, a user’s head-mounted display may include cameras that are operable to view more of a user's environment than the user can perceive. The augmented reality system may determine, for example, the location of walls, floors, and other objects. In or near real time, for example, the augmented system may determine that a virtual basketball that was thrown by a user at a trajectory has hit a physical surface (e.g., a ceiling) and the augmented system may utilize this information to change the course of the virtual ball (e.g., by causing the ball to be perceived by the user to bounce off the user's ceiling).

Id. at 14:44–61.

D. Illustrative Claim

Of the challenged claims of the '791 patent, claim 21 is an independent claim. The remaining challenged claims depend directly from

claim 21. Claim 21, reproduced below with bracketed annotations inserted, is illustrative.

21. [21Pre] A system comprising:

[21.a] a head-mounted display comprising a camera for obtaining images in view of said head-mounted display and utilizing said images to detect a surface of a physical object included in said images, wherein said head-mounted display is operable to display a virtual object associated with an application; and

[21.b] a hand-held controller for providing a first three-dimensional control signal to move said virtual object and a second three-dimensional control signal to change the movement of said virtual object from the movement provided from said first three-dimensional control signal, wherein said first three-dimensional control signal moves said virtual object three-dimensionally over at least three axes of movement in a first manner and said second three-dimensional control signal moves said virtual object three-dimensionally over at least three axes of movement in a second manner.

Ex. 1001, 18:20–37.

E. Evidence

Petitioner relies on the following references:

Name	Reference	Exhibit No.
Fager	US 2004/0104934 A1, published June 3, 2004	1003
Martins	US 2003/0179218 A1, published Sept. 25, 2003	1004
Maguire	US 6,411,266 B1, issued June 25, 2002	1005

Petitioner also relies on the declaration of Jeremy Cooperstock, Ph.D. (Ex. 1002; “Cooperstock 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. §³	Reference(s)/Basis
21, 23, 37, 41, 42	103(a)	Fager, Martins
31	103(a)	Fager, Martins, Maguire

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 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

³ For purposes of this Decision, we assume the challenged claims have an effective filing date prior to March 16, 2013, the effective date of the relevant aspects of the Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), and we apply the pre-AIA versions of 35 U.S.C. § 102. *Cf.* Pet. 9 (Petitioner contending that “Pre-AIA law applies to the challenged claims.”).

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 would have possessed a bachelor’s degree in electrical engineering, computer science, or similar field, with two years combined experience in designing and/or developing interactive location-based computer systems/software, such as video games or other simulations incorporating location information (such as GPS information associated with a user’s physical location), and in designing and/or developing computer systems/software involving graphical virtual and/or augmented reality. A person could also have qualified as a person of ordinary skill in the art with some combination of (1) more formal education (such as a master’s of science degree) and less technical experience, or (2) less formal education and more technical or professional experience.

Pet. 4 (citing Cooperstock Decl. ¶¶ 21–25). 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). 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 contends that “[t]he prior art cited herein . . . renders the challenged claims obvious under any reasonable construction,” and “Petitioner therefore respectfully submits that, for purposes of this IPR,

express constructions are not required.” Pet. 7. Patent Owner contends that “no express claim construction is necessary for the purposes of this Preliminary Response,” and “[t]he challenged claims should be given their plain and ordinary meaning, consistent with the specification and as understood by a person of ordinary skill in the art.” Prelim. Resp. 7.

On this record and for purposes of this decision, we determine that no claim terms require express construction.

D. Ground 1: Obviousness based on Fager and Martins

Petitioner contends that claims 21, 23, 37, 41, and 42 would have been obvious over Fager and Martins. Pet. 10–40. Because the arguments presented by Patent Owner focus solely on independent claim 21, our analysis likewise focuses on that claim. *See, e.g.*, Prelim. Resp. 1 (“Because Ground 1 fails to disclose or suggest all claim requirements of independent claim 21, each of the two grounds fail.”).

For the reasons that follow, we determine that Petitioner has demonstrated a reasonable likelihood of showing at least independent claim 21 is unpatentable as obvious over Fager and Martins.

Independent Claim 21

Petitioner contends that Fager teaches or suggests most of the limitations of claim 21, and turns to Martins for teachings of a camera utilized to detect a surface of a physical object included in images. Pet. 10–32. In particular, Petitioner contends that “Fager discloses an ‘augmented reality’ system in which images of the user’s physical environment captured by a camera of a head-mounted display are combined with virtual images and presented together to the user via the head-mounted display.” *Id.* at 10 (citing Cooperstock Decl. ¶ 68; Ex. 1003 ¶¶ 51–52, 69, 84, 92, 94).

Petitioner asserts that “Fager further teaches that the ‘means for transferring visual impressions 12’ (**‘head-mounted display’**) can comprise a ‘**camera**’—which Fager refers to as ‘obtaining means for obtaining picture information.’” *Id.* at 13 (citing Fager ¶¶ 52, 94; Cooperstock Decl. ¶ 74); *see also id.* at 18 (“Fager discloses and renders obvious ‘a head-mounted display comprising a camera for obtaining images in view of said head-mounted display’ as claimed.” (citing Cooperstock Decl. ¶ 80)). Petitioner contends that “Fager further discloses and renders obvious that the ‘head-mounted display is operable to display a virtual object associated with an application’—such as a virtual ball or tennis racket (each a ‘virtual object’) associated with a tennis video game ‘application.’” *Id.* at 24 (citations omitted). Petitioner additionally contends that Fager’s hand-held controller (component 26) provides the recited first and second control signals to move the virtual racket or, alternatively, the virtual tennis ball. *See id.* at 27–31.

Petitioner additionally contends that Fager describes detecting and modeling physical objects (e.g., a lamp or floor surface) to determine how those would affect virtual game play, and relies on Martins for the teaching of using camera-captured images to recognize planes such as a floor, ceiling, and walls of a room. *See id.* at 18–21. Petitioner offers several reasons why a person of ordinary skill in the art would have combined the references’ teachings such that the images obtained by Fager’s camera would be utilized to detect surfaces of physical objects. *See id.* at 21–24.

Patent Owner urges that we deny the Petition because “Ground 1 . . . fails to disclose ‘a head-mounted display comprising a camera,’” there is no motivation to combine the teachings of Fager and Martins, and that “Ground 1 fails to disclose a handheld controller that provides two distinct

control signals from the same controller that move a virtual object in two different manners, whereby the second signal changes the object's movement as created by the first signal.” Prelim. Resp. 2–3.

1. Whether a head-mounted display comprising a camera is disclosed or suggested by Fager

Claim 21 calls for “a head-mounted display comprising a camera for obtaining images in view of said head-mounted display.” Ex. 1001, 18:21.

Patent Owner argues that Fager's “obtaining means for obtaining picture information” is not a camera, “[i]t is simply a part of a display that *receives* (‘obtains’) images from somewhere else for display to a user.”

Prelim. Resp. 10–11. According to Patent Owner:

[T]hat obtaining means receives its “picture information” from “the control- and calculating unit 17,” which . . . runs the simulation based on “model information from an external computer 18” and creates what the user sees, and sends that picture information via “signal path[] 19” to the obtaining means and the transferring means (the transparent LCD panel) for display to the user.”

Id. at 13 (citing Ex. 1003 ¶ 52) (alterations in original).

Although the cited paragraph appears to indicate that the control- and calculating unit 17 creates for the person a “milieu”—“generated pictures of the fictitious phenomena . . . incorporated with great accuracy in the real picture information of the room 1”—we do not read that paragraph as excluding a head-mounted camera from being the source of the picture information of the room. *See* Ex. 1003 ¶ 52.

Petitioner, discussing a tennis embodiment and with the supporting opinion testimony of Dr. Cooperstock, contends that a person of ordinary skill in the art would have understood that Fager describes camera functionality for obtaining the “real environment” portion of the milieu. *See*

Pet. 13–16 (citing Cooperstock Decl. ¶¶ 74–76). Petitioner also contends that “a camera would have been an obvious choice for obtaining ‘picture information’ of the user’s surroundings.” *Id.* (citing Cooperstock Decl. ¶ 76). Petitioner points to a different embodiment in Fager “where an ‘obtaining means’ ‘include[s] IR [infrared] cameras for obtaining information about the external environment in the night and/or when fog is present,” and contends that this further shows the obviousness of using a camera for the obtaining means of the head-mounted display in the tennis embodiment. *Id.* at 16 (quoting Ex. 1003 ¶ 74; Cooperstock Decl. ¶ 76) (alterations in original); *but see* Prelim. Resp. 14–15 (Patent Owner arguing that the IR camera 39 is vehicle mounted, not head-mounted, but acknowledging that “external obtaining means 39 is the camera” and “it feeds in information to control- and calculating unit 17, which, just as in the tennis example above, then feeds into the display (transferring means) 12.”). Petitioner additionally asserts that “[a] person of ordinary skill in the art would have recognized that Fager is describing what is known as a video see-through head-mounted display,” that such displays were known to use cameras, and that this supports its contention that it would have been obvious that Fager’s head-mounted display comprises a camera. Pet. 16–17 (citing Ex. 1006, p. 14; Cooperstock Decl. 78); *but see* Prelim. Resp. 17 (Patent Owner arguing that Exhibit 1006 “is not evidence of Fager’s display having cameras, and the exhibit is not a part of the combination and is not argued to be combined with Fager or provide a reason to modify Fager.”).

At this stage, and on this record, we determine that Petitioner has shown sufficiently for institution that Fager discloses or at least teaches or

suggests a head-mounted display having a camera, as recited in independent claim 21.

2. *Whether Petitioner has provided a sufficient a motivation to combine the teachings of Fager and Martins*

Patent Owner argues that Petitioner has failed to articulate a sufficient motivation to combine the references' teachings such that the combination would result in utilizing the images obtained by the camera to detect a surface of a physical object included in the images. Prelim. Resp. 18–32.

Patent Owner's arguments in this regard primarily are based on the assertion that Fager does not use a head-mounted camera to detect anything about an object but, rather, uses three-dimensional models pre-stored in a computer and that are fed to the display. *See id.* at 19–20; *see also, e.g., id.* at 22 (“There is no reason why a POSITA would undergo the massive redesign required to change Fager from using predefined 3-D models for all objects and environmental components (walls, floors, etc.) in its simulation to Martins's procedure”); *id.* at 30 (“There is no reason provided in the Petition, nor can there be a plausible reason, why a POSITA would change Fager's database-based system into an image-analysis-based system for just a ***small subset*** of the objects that it needs to model. Fager would still need to use its database-driven approach for the vast majority of the objects it models.”). For the reasons discussed above regarding the “camera” limitation, we, at this stage of the proceeding, do not agree with Patent Owner's argument that Fager lacks a head-mounted camera to detect objects.

Additionally, and on the present record, we do not agree with Patent Owner's argument that information for the real, physical objects to be eventually displayed come solely from a database. *See, e.g., id.* at 23 (Patent Owner arguing that “Fager does not utilize images obtained from a camera

to model suspended lamp 30, or any object. . . . Instead, the information for the lamp model comes from a database and is input into ‘control- and calculating unit 17,’ which models the lamp. (citing Ex. 1003 ¶ 80). Patent Owner’s cited paragraph from Fager for the purported database source states:

In this example, a physical object in the form of a suspended lamp 30 is present in the environment, but the object could be any occurring real object. This object is modelled in the control- and calculating unit 17. Furthermore, in the control- and calculating unit 17 there is stored information about the fictitious ball 29, a fictitious tennis net 24 and fictitious tennis lines 25, calculation models for how a tennis ball physically acts and other rules for how the game tennis is performed in the real world.

Ex. 1003 ¶ 80. Patent Owner does not explain adequately how this paragraph discloses a database as the exclusive source of lamp image information. Although unit 17 models the lamp, this does not appear to exclude a camera as the source of model inputs for physical objects, as Patent Owner implies. *Cf.* Prelim. Resp. 15 (Patent Owner asserting that, in Fager’s vehicle-mounted IR camera embodiment, the external obtaining means feeds information to the control- and calculating unit, which then feeds the display). Additionally, the paragraph appears to distinguish the source of information for real and virtual objects in stating that virtual (fictitious) object information is “stored” in the control- and calculating unit, suggesting that it may be a database that stores that virtual object information but not referring to real object information as being similarly stored.

Patent Owner argues that:

there is no motivation to combine Martins with Fager, which is substantially different from Martins and has no use for

Martins's video-based plane-detection mechanism, as it is insufficient for Fager's needs; Martins would only add complexity while still requiring all of Fager's functionality to remain, because Martins can exclusively only detect and model basic planes based on images, whereas Fager must model a wide variety of shapes and objects.

Prelim. Resp. 20. Patent Owner acknowledges that the basic planes that Martins can detect and model "may include all sides of the room, i.e., the walls, floor, or ceiling." *Id.* at 21 (citing Ex. 1004 ¶ 17). According to Patent Owner, Fager requires the modeling of complex objects like the suspended lamp (purportedly done via a "database-driven approach"), and "Martins would not accomplish what Fager needs and what the Petition proposes." *Id.* at 25, 30. Patent Owner details Martins' specific technique and argues that "[t]his requires an unnecessarily complicated and distinct step requiring involved user interaction in a system that is supposed to provide a real-time tennis game or similar." *Id.* at 31.

Aside from Patent Owner's unpersuasive premise that Fager is purely a database-driven approach and the unsupported attorney argument as to the capabilities of Martins, Patent Owner appears to mischaracterize the proposed combination as a bodily incorporation of Martins' specific technique into Fager's system. *See In re Keller*, 642 F.2d 413, 425 (CCPA 1981) ("The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference . . . Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art."); *Icon Health & Fitness, Inc. v. Strava Inc.*, 849 F.3d 1034, 1046 (Fed. Cir. 2017) ("Attorney argument is not evidence or explanation in support of a conclusion.").

It is our understanding that Petitioner’s obviousness theory merely relies on Martins’ teaching of using camera images to detect a surface of physical objects. *See* Pet. 21 (“It would have been obvious to a person of ordinary skill in the art to combine Martins’ teachings regarding using camera images to detect a surface of a physical object with Fager’s augmented reality and head-mounted display system.” (citing Cooperstock Decl. ¶ 84). The proposed resulting combination is “using the camera of Fager’s head-mounted display to capture images used to detecting physical surfaces of a play area, such as the floor, ceiling, and walls of a room in which a user wishes to play a game of, for example, virtual tennis.” *Id.* at 21–22 (citing Cooperstock Decl. ¶ 84). According to Petitioner, the combination would use images to detect wall surfaces, and that it would have been obvious “to apply the same functionality to detect the surfaces of other objects in Fager’s game, such as the ‘suspended lamp’ described in Fager and other objects, given that Fager’s system models the behavior and movement of virtual objects (such as a ‘fictitious ball’) based on the determined surfaces of real-world objects.” *Id.* at 22 (citing Ex. 1003 ¶¶ 80, 83, 85). Petitioner contends, *inter alia*, that the proposed combination would have been obvious as “the combination of prior art elements, with no change in their respective functions, according to known methods—i.e., simply using the camera of the user’s head-mounted display for performing surface detection in connection with modeling the user’s physical environment.” *Id.* at 21 (citing Cooperstock Decl. ¶ 84). Petitioner also contends that Fager provides a motivation in explaining that its system is primarily applied indoors, where there are surfaces such as floors, ceilings, and walls, and that physical objects may be incorporated into game play. *Id.* at 22–23.

Petitioner's contentions are supported by the testimony of Dr. Cooperstock, which, at this stage, is unrebutted.

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.

Patent Owner additionally argues that “the approach in Martins [is not] simple or easy to integrate with Fager [because it] requires moving cameras around an area to determine planes based on analyzing the ‘relative motion’ of the corners.” Prelim. Resp. 30–31 (citing Ex. 1004 ¶¶ 13–17). According to Patent Owner, “[i]t simply makes no sense to incorporate such a burdensome, complicated process into a system that already has a solution that works, especially where adding such features would not be able to fully replace the corresponding features already in place because the modeling it provides is limited to such simple shapes as planes.” *Id.* at 31; *see id.* (“It merely adds hardware, expense, time, and complication, for absolutely zero value.”).

We do not find these arguments persuasive. First, Patent Owner's arguments regarding complexity and such are premised on mere attorney argument, rather than evidentiary support. Second, Patent Owner urges us to consider a balance of the pros and cons of using camera images to detect surfaces in Fager's augmented reality system. 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). The Board must weigh the benefits and drawbacks of the modification against each other, to determine

whether there would be a motivation to combine. *Id.* at 1349 n.8. At this juncture, we are not persuaded that any purported disadvantages would render as non-obvious the use of Fager's camera images to detect, for example, floors, walls, and ceilings for incorporation into gameplay. *Cf.* Pet. 23 (Petitioner noting that Fager describes the virtual ball bouncing off of the floor (citing Ex. 1003 ¶ 82; Cooperstock Decl. ¶ 87)).

3. *Whether Fager's virtual tennis racket is a virtual object moved by the controller*

Limitation 21.b of independent claim 21 recites:

a hand-held controller for providing a first three-dimensional control signal to move said virtual object and a second three-dimensional control signal to change the movement of said virtual object from the movement provided from said first three-dimensional control signal, wherein said first three-dimensional control signal moves said virtual object three-dimensionally over at least three axes of movement in a first manner and said second three-dimensional control signal moves said virtual object three-dimensionally over at least three axes of movement in a second manner.

Ex. 1001, 18:27–37. Thus, the claim, generally speaking, calls for a controller to provide two control signals with the first signal moving the virtual object and the second signal changing the movement from that caused by the first signal.

Petitioner contends that Fager's handheld component 26 is the claimed controller and that the recited virtual object is the user's virtual tennis racket (associated with component 26). *See* Pet. 27–28. Petitioner further contends that moving the tennis racket is caused by the recited first control signal and that, during the course of play, the player would move handheld component 26 again to swing the racket in another direction in response to the recited second control signal. *See id.* at 29–31.

Patent Owner asserts that Fager's virtual racket is not the recited virtual object, arguing that "the controller does not move the virtual racket because they are one and the same." Prelim. Resp. 33 (heading; capitalization omitted). According to Patent Owner, the claim language that recites a controller providing a signal to move the virtual object "requires the controller to interact with a distinct virtual object, rather than the virtual object being a representation of the controller itself." *Id.* Patent Owner argues that:

The controller does not move the virtual object; it simply is the virtual object, under the Petition's read. There would be no separation between input and effect. That interpretation collapses the controller and the virtual object into the same thing, which contradicts the claim language that treats them as separate components with a defined relationship: the controller sends signals, and the virtual object responds.

Id. at 33–34.

We do not agree with Patent Owner's arguments. We are not persuaded that a real, physical controller is the same thing as a virtual object. Additionally, as to Patent Owner's assertion that the claim language has a defined relation where "the controller sends signals, and the virtual object responds," that appears to be what happens when Fager's user moves the controller and the virtual racket responds to a signal from the controller.

At this stage, and on this record, we determine that Petitioner has shown sufficiently for institution that Fager teaches limitation 21.b, including a hand-held controller for providing two control signals that move a virtual object (a virtual tennis racket⁴) as recited in independent claim 21.

⁴ Because we determine Petitioner's tennis racket contentions are adequate for purposes of institution, we need not reach at this time Petitioner's

E. Remaining Challenges

Because we find Petitioner has demonstrated a reasonable likelihood of showing at least one challenged claim is unpatentable as obvious over Fager and Martins, 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 '791 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 21, 23, 31, 37, 41, and 42 of the '791 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 '791 patent shall commence on the entry date of this Order, and notice is hereby given of the institution of a trial.

alternative contention that the virtual tennis ball is the recited virtual object. *See, e.g.*, Pet. 28, 30–32.

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PETITIONER:

Heidi Keefe
Phillip Morton
Andrew Mace
COOLEY LLP
hkeefe@cooley.com
pmorton@cooley.com
amace@cooley.com

PATENT OWNER:

Peter Snell
Brad Scheller
Reza Dokhanchy
MINTZ, LEVIN, COHN, FERRIS,
GLOVSKY AND POPEO, P.C.
pfsnell@mintz.com
bmscheller@mintz.com
rdokhanchy@mintz.com