

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

VALVE CORPORATION,
Petitioner,

v.

IMMERSION CORPORATION,
Patent Owner.

Case IPR2024-00557
Patent 10,665,067

**PATENT OWNER'S OBJECTIONS TO PETITIONER'S
ORAL HEARING DEMONSTRATIVES**

Pursuant to the Board’s April 10, 2025 Order Setting Oral Argument (Paper 23), Patent Owner, Immersion Corporation and Petitioner’s Valve Corporation, met and conferred regarding objections to the oral hearing demonstratives on May 5, 2025. Patent Owner hereby submits the following objections to Petitioner’s demonstrative slides.

1. Slide 12. Patent Owner objects to slide 12 in its entirety:

Immersion’s Assertion that Banerjee Does Not Superimpose Images on Haptic Device 22 Fails

Patent Owner’s Response

Note that Petitioner does not rely on haptic device 22 for this limitation, nor can it because Banerjee does not disclose superimposing any images on to the surface of haptic device 22 because haptic device 22 does not act as a proxy for virtual objects. This is also shown in the Petition’s discussion of the claimed

Paper No. 12 - POR at 26

Banerjee

taneous use of two haptic devices 22. A 3D image of a first surgical tool can be collocated with a first haptic device 22, and an image of a second surgical tool can be collocated with a second haptic device 22. For example, the simulation method can include a user holding a first haptic device 22 in a first hand, such as the right hand, and superimposing an image of a first surgical tool, such as an aneurysm clip holder or an arachnoid knife over the first haptic device 22. The

EX1011 (Banerjee) at [0034] (cited Petition, 15 and 18)

Petition

of the user’s hand as it moves the stylus. This tracking allows a virtual tool to be “collocated with [] haptic device 22” in views shown to the user. [0032]-[0034], Welch, ¶102.

Paper No.2 – Petition at 14-15

The “virtual reality display” from screen 28 includes a 3D image of a virtual tool that is collocated with haptic device 22’s physical stylus 27 so that the 3D image of the virtual tool reflected by mirror 30 is superimposed on the user’s view of the physical stylus and appears to be held in the user’s actual hand visible through mirror 30. [0029], [0034]-[0035], [0042]-[0044], [0053]-[0059], [0063], FIGS. 7-18; Welch, ¶114. FIG. 19 illustrates an example of this visual effect where the user has

Paper No.2 – Petition at 18

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

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Patent Owner objects to Petitioner’s assertion that Banerjee superimposes images on haptic device 22 itself, as opposed to stylus 27; this is a new argument.

2. Slide 17. Patent Owner objects to slide 17 in its entirety:

Immersion's Assertion that the Board Recognized that Banerjee Has No Sensor that Tracks the Position of Haptic Device 22 is False

Patent Owner's Sur-Reply

In limitation [1A], Valve argues that "proxy object" can be met by the combination of haptic device 22 and stylus 27. But limitation [1C] also uses the term "proxy object," and—because limitation [1C] requires a sensor for tracking the position of the proxy object—the Board would necessarily limit its interpretation of proxy object to stylus 27 to meet this element. That is because the position of haptic device 22 is not tracked by any sensor, as the Board recognized, and Valve does not dispute. Reply, 9 fn. 2.

Institution Decision

proxy object. See *supra* Section IV.C.2(b). Limitation 1C recites "a sensor for tracking a position of the proxy object," and the tracked position of haptic stylus 27 is one of the positions of haptic device 22 as a whole. We preliminarily find that a person of ordinary skill in the art would have understood that the system tracks haptic stylus 27 using one or more sensors. See, e.g., Ex. 1011 ¶ 34 ("[H]aptic devices 22... track the user's hand position..."), ¶ 42 ("[H]aptics rendering software... can read the position and orientation of each haptic device 22, for example a stylus 27), claim 1 ("the first haptic device tracks a user's hand movements"), Fig. 2 (depicting the measurement of "stylus position & orientation").

Thus, we determine that Valve has sufficiently shown, at this stage, that Banerjee discloses limitation 1C, or at least would have motivated a person of ordinary skill in the art to use a sensor as a well-known mechanism for tracking the position of a proxy object according to limitation 1C.

Institution Decision

Banerjee incorporates by reference U.S. Patent No. 7,812,815 (*id.* ¶ 32), which in turn describes the PHANTOM Desktop haptic device produced by SensAble Technologies as the preferred embodiment of haptic device 22. Ex. 1016, 3:35–36, 9:15–16. A separate application by Rawley et al., US Application No. 2010/0291505 A1 (Ex. 1019), which Petitioner does not assert as prior art in this proceeding, describes the PHANTOM force-feedback haptic interface device (*id.* ¶ 20) as depicted in Figure 3 below:

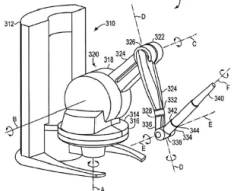


FIG. 3

Figure 3 of Rawley et al. depicts force-reflecting haptic interface 310. Ex. 1019 ¶ 39. It is a computer input device with six independent degrees of freedom, which also "provide[s] force feedback from the computer to the user." *Id.* At the end of the robotic arm is "free rotary user connection element 340 in the form of a stylus configured to be grasped by a user." *Id.* ¶ 40; see also Ex. 1017, Fig. 3 (depicting essentially the same haptic interface as Rawley's Figure 3).

Paper No. 17 – Sur-Reply at 13

Paper No. 9 – Institution Decision at 20

Paper No. 9 – Institution Decision at 13-14

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

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Patent Owner objects to Petitioner's assertion that Banerjee tracks the position of haptic device 22 itself, as opposed to stylus 27; this is a new argument.

2

3. Slide 18. Patent Owner objects to slide 18 in its entirety:

Immersion's Assertion that the Valve Does Not Dispute that Banerjee Has No Sensor that Tracks the Position of Haptic Device 22 is False

Patent Owner's Sur-Reply

In limitation [1A], Valve argues that "proxy object" can be met by the combination of haptic device 22 and stylus 27. But limitation [1C] also uses the term "proxy object," and—because limitation [1C] requires a sensor for tracking the position of the proxy object—the Board would necessarily limit its interpretation of proxy object to stylus 27 to meet this element. That is because the position of haptic device 22 is not tracked by any sensor, as the Board recognized, and Valve does not dispute. Reply, 9 fn. 2.

Paper No. 17 – Sur-Reply at 13

Welch Declaration

130. Additionally, a POSA would have understood that haptic device 22 includes individual sensors (e.g., optical encoders or potentiometers) that track movement of each articulating joint that defines the stylus's location in space—e.g., like the optical encoders and potentiometers that measure the angular location of corresponding rotary elements at respective joints in the haptic interface devices described in EX1017 and EX1018, which as I discussed above in §VII.A.4, are examples of the PHANTOM[®] haptic device that Banerjee discloses via incorporation by reference is the preferred implementation of haptic device 22 (or that alternatively would have been an obvious and conventional implementation of Banerjee's disclosed haptic devices 22). See EX1017, 1:18-56, 2:66-3-5, 12:64-13:46; EX1018, 1:12-49, 3:51-55, 12:54-13:12; Banerjee, [0032]-[0034], [0042]; EX1016, 9:15-31; EX1019, [0020], FIG. 3.

EX1003 (Welch Declaration) at ¶1130

Petition

Haptic device 22 tracks "a position of the proxy object" for multiple reasons. First, the tracked position/orientation of haptic stylus 27 is "a position" of haptic device 22 (a claimed "proxy object"—*supra* §VII.B.2.a) of which the stylus is a part—i.e., "haptics rendering software 44 can read the position and orientation of each haptic device 22, for example a stylus 27" ([0042]). Welch, ¶129.

* * *

Additionally, Banerjee's system meets [1C] because POSAs understood that haptic device 22 includes sensors (e.g., optical encoders) that track movement of each articulating joint defining the stylus's location in space (or alternatively that would have been an obvious way to implement what Banerjee discloses). Welch, ¶¶94-98, 130 (citing EX1017, 1:18-56, 2:66-3-5, 12:64-13:46; EX1018, 1:12-49, 3:51-55, 12:54-13:12). Each is a "sensor" that tracks "a position" of the haptic device 22 (a claimed "proxy object"—*supra* §VII.B.2.a) at the corresponding joint, thereby also tracking "a position" of the stylus 27 (a claimed "proxy object"—*supra* §VII.B.2.b) in space. Welch, ¶131.

Paper No.2 – Petition at 24-25

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

18

Patent Owner objects to Petitioner's assertion that Banerjee tracks the position of haptic device 22 itself, as opposed to stylus 27; this is a new argument.

4. Slide 22. Patent Owners objects to slide 22 in its entirety:

The Petition Showed that All Claimed Requirements Relating to the Proxy Object are Met By the Substrate 2000

Petition

2. [1A]: “a proxy object...”

In Meglan’s FIG. 8 embodiment below, “sensorized substrate 2000” (boxed in red) provides haptic output via pulse and heat generators so that trainee 100 can feel characteristics of the virtual wound being treated. Abstract, [0107], [0011], [0113], [0117]; Welch, ¶217.

FIG. 8

conform to the underlying surface of surrogate 20.” [0109]. This “sheet-like” substrate “that has the feel of human skin” ([0114]) acts as a proxy for the skin of the anatomical region the trainee is treating and for the virtual wound for which substrate 2000 provides haptic feedback; it is thus “a proxy object.” [0118] (using

3. [1B]: “a display...”

As shown in the snapshots in FIG. 2 (before trainee begins treatment) and FIG. 3 (while trainee interacts with surrogate 20), the merged output video feed includes the “actual imaged objects” ([0084]) in the physical environment (indicated with red) with the simulated trauma overlaid on the surface of surrogate 20 and substrate 2000 “so that the real surrogate 20 is displayed with a simulated wound 140 and hemorrhaging blood 150” ([0066]) from the trainee’s viewpoint. See also [0070]-[0072], [0082]-[0083]; Welch, ¶226.

Paper No.2 – Petition at 51-52

4. [1C]: “a sensor...”

Thus, Meglan’s camera system 50/1050 includes a claimed “sensor” producing data from which program 90 detects in real-time the “three-dimensional shape and position and orientation of the surrogate 20, the trainee’s hands, and any other object[s]” (including substrate 2000, [0113]) to “track and identify their movements” ([0074]), thus “tracking a position of the proxy object,” meeting [1C]. [0070]-[0074], [0078]-[0079], [0081]-[0082]; Welch, ¶231.

Paper No.2 – Petition at 53-54

Paper No.2 – Petition at 48-50

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

22

Patent Owner objects to Petitioner’s assertion that substrate alone has visual overlays; this is a new argument, and even the portion cited by Valve refers to both the surrogate and the substrate, not substrate alone.

5. Slide 27. Patent Owner objects to slide 27 in its entirety:

Immersion's Sur-Reply Admits that the Only POR Argument Against the Substrate Meeting the Proxy Object Fails

Patent Owner's Response

VI. GROUND 2: CHALLENGED CLAIMS 1-8, 11-12, AND 15-21 ARE NOT ANTICIPATED BY AND/OR OBVIOUS OVER MEGLAN.....27

A. Overview of Meglan (EX1012).....27

B. Meglan does not disclose "a proxy object" Error! Bookmark not defined.

C. Meglan does not disclose "determine a haptic effect based in part on data received from the sensor" that tracks a position of the proxy object as required by the claims of the '067 Patent.....29

D. Dependent Claims 2-8, 12, 15-20 are not anticipated by and/or obvious over Meglan.....34

the alleged proxy object's position. *Id.* Instead, according to the Petition, the haptic effects in Meglan are based on the location of the trainee's hands and fingers—not the alleged proxy object (i.e., what Petitioner points to as surrogate 20 and/or substrate 2000) (Pet., 49). *Id.*

Paper No. 12 - POR at iii, 30

Patent Owner's Sur-Reply

Although Meglan discloses an embodiment in which the surrogate and substrate are used, it does not determine haptics based on position tracking of the alleged combination because, as detailed above, only the position of the substrate is tracked to determine haptics. IV.A.1 and IV.A.2. Moreover, although Valve argues the surrogate and substrate can be combined to arrive at the claimed proxy object, this mischaracterizes Meglan. Nowhere does Meglan suggest that the surrogate

Paper No. 17 – Sur-Reply at 19

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

27

Patent Owner objects to Petitioner's presentation both because it assumes the new argument presented at slide 22 is correct and misstates the record regarding an alleged admission by Patent Owner.

6. Slide 31. Patent Owner objects to slide 31 in its entirety:

If Considered Immersion's Sur-Reply Arguments Fail Because Meglan's Display Outputs a Visual Effect Onto the Substrate

Patent Owner's Sur-Reply

2. The substrate does not have visual overlays.

* * *

device. But the substrate does not have a visual overlay. Valve does not contend that the substrate alone has an overlay. Pet, 55-57 (citing ¶¶72-83, 94); Figs. 1, 2, 3, and

Petition Paper No. 17 – Sur-Reply at 17

3. [1B]: “a display...”

* * *

FIG. 3 (while trainee interacts with surrogate 20), the merged output video feed includes the “actual imaged objects” ([0084]) in the physical environment (indicated with red) with the simulated trauma overlaid on the surface of surrogate 20 and substrate 2000 “so that the real surrogate 20 is displayed with a simulated wound 140 and hemorrhaging blood 150” ([0066]) from the trainee's viewpoint. See also [0070]-[0072], [0082]-[0083]; Welch, ¶226.

* * *

Thus, display 40/1040 is “configured to output a visual effect” (i.e., the appearance of a virtual wound) “onto a surface of the proxy object” because the surface of the actual surrogate and substrate in the real-world video gets overlaid with the virtual wound in the output video. Welch, ¶227. This also meets

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE Paper No.2 – Petition at 51-53

31

Patent Owner objects to this slide as it makes the same new argument as slide

22.

7. Slide 32. Patent Owner objects to slide 32 in its entirety:

If Considered Immersion's Sur-Reply Arguments Fail Because Meglan's Display Outputs a Visual Effect Onto the Substrate

Petition

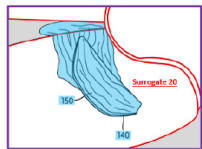


FIG. 2

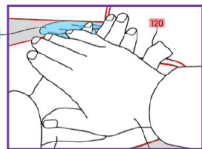


FIG. 3

Thus, display 40/1040 is "configured to output a visual effect" (i.e., the appearance of a virtual wound) "onto a surface of the proxy object" because the surface of the actual surrogate and substrate in the real-world video gets overlaid with the virtual wound in the output video. Welch, ¶227. This also meets

8. Slide 33. Patent Owner objects to slide 33 in its entirety:

If Considered Immersion's Sur-Reply Arguments Fail Because Meglan's Display Outputs a Visual Effect Onto the Substrate

Patent Owner's Sur-Reply

In fact, Meglan discloses the opposite of an overlay: it teaches a clear "line of sight" in the substrate embodiment similar to claims 1 and 13 detailed above, where the substrate may be filtered out of the display, such that the substrate is *invisible*.² EX1012, ¶112. The substrate is not a proxy object.

² The phrase "may filter" in ¶112 refers to a possible approach to achieve a clear "line of sight" onto the surrogate, such as by rendering the substrate invisible. The alternative is that the substrate remains visible, not that the substrate has an overlay. There is no disclosure of displaying an overlay on the substrate, and Valve cites none. Instead, Meglan treats an overlay on either the user's hands or the substrate as unwanted behavior to eliminate.

Paper No. 17 – Sur-Reply at 18

Meglan

[0112] The program 90 may filter the substrate 2000 and device 2100 out of the composite image sent to the display 40 such that the substrate 2000 and device 2100 are invisible to the trainee 100. Any suitable conventional mechanism for filtering objects out of video feeds may be used. For example, portions of the substrate 2000 and device 2100 that might enter the trainee's view could be colored a specific color that the program 90 is programmed to make transparent using known video filtering techniques.

EX1012 (Meglan) at [0112] (cited Sur-reply, 18)

Petition

[1B] a display configured to output a visual effect onto a surface of the proxy object;

Paper No.2 – Petition at 91

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

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- Patent Owner objects to this slide as it makes the same new argument as slide 22.

9. Slide 34. Patent Owner objects to slide 34 in its entirety:

Immersion's Sur-Reply Arguments Fail Because Meglan's Display Outputs a Visual Effect Onto the Substrate

Patent Owner's Sur-Reply

In fact, Meglan discloses the opposite of an overlay: it teaches a clear "line of sight" in the substrate embodiment similar to claims 1 and 13 detailed above, where the substrate may be filtered out of the display, such that the substrate is *invisible*.² EX1012, ¶112. *The substrate is not a proxy object.*

2. The substrate is not a "proxy object."

The substrate is not a proxy object. Although Valve argues in its Petition that "surrogate 20 and haptic substrate 2000, by themselves or together as a unit" disclose a proxy object, (Pet, 48), Valve made no attempt to support its contention that the substrate alone can be a proxy object. One of the conditions of a proxy object is that a "modified visual effect" can be "displayed on the proxy object." I.I.C. Although Valve cites ¶¶82-84 in support of its argument that the substrate "gets overlaid with the virtual wound in the output video," (Pet, 53), neither these paragraphs nor any part of Meglan make any reference to a visual overlay on the substrate. Meglan teaches the opposite: it teaches *excluding* the substrate from the visual overlay to make it invisible to the user. *Supra* IV.A.2.

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Paper No. 17 – Sur-Reply at 18, 21

34

Patent Owner objects to this slide as it makes the same new argument as slide

22.

10. Slide 43. Patent Owner objects to slide 43 in its entirety:

Immersion Misinterprets Rogers's Disclosure of Firing and Reloading

Patent Owner's Sur-Reply

the embodiments. The mere disclosure of tracking "pointing direction" does *not* disclose tracking position. "Position" is irrelevant in the reloading embodiment—only orientation is required. But Valve conflates: (1) a shooting/aiming embodiment, which requires position (X-Y-Z) and orientation (rotation), but does not produce a haptic effect; and a (2) reloading embodiment, which produces a haptic effect but does *not* require position (X-Y-Z), and instead only requires orientation (rotation).

Paper No. 17 – Sur-Reply at 23

Rogers

The moveable weight **800** may be utilized to provide sensations of momentum based on events occurring in the VR environment. For example, the moveable weight may be caused to move when the user fires a virtual weapon that is controlled by the directional interface object, providing a kickback sensation similar to that of an actual weapon. In another example, when a user reloads their corresponding virtual weapon by, for example, pointing the directional interface object **104** upward, the moveable weight **800** may be caused to move so as to mimic the sensation of weapon reloading mechanics of the virtual weapon.

EX1010 (Rogers) at [0105] (cited Petition at 76-77; Reply at 19-20)

[0106] FIG. 9 illustrates a user **100** using an HMD **102** to view a VR environment, in accordance with implementations of the disclosure. The user **100** is provided with a view **900** of a VR environment, and furthermore is holding a directional interface object **104** to interact with the virtual scene. The directional interface object **104** is utilized to aim a weapon in the VR environment and shoot at objects such as the threatening bear shown in the view **900**. A combination of visual tracking of the trackable object and data from inertial sensors in the directional interface object can be utilized as input to determine the pointing direction of the virtual weapon in the VR environment.

EX1010 (Rogers) at [0106](Reply, 25-26)

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

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Patent Owner objects to Petitioner's presentation, because its discussion of the shooting/aiming embodiment is a new argument.

11. Slide 54. Patent Owner objects to slide 54 in its entirety:

The Parties Agree that the Board Need Not Resolve the Claim Construction Disputes

Patent Owner's Response

IV. CLAIM CONSTRUCTION

Although Petitioner provides a summary of its arguments directed to claim construction disputes between the parties in the co-pending district court litigation (see Pet., 7-9), Patent Owner submits that for purposes of this Response, the Board need not resolve any of those specific disputes. None of the reasons discussed herein for why Grounds 1 to 3 fail depend on the disputed constructions in the district court.

Paper No. 12 - POR at 9

Petitioner's Reply

II. CLAIM CONSTRUCTION

Immersion repeats two claim-construction arguments that seek to narrowly construe the claims. But as the Board observed at institution, Immersion's proposed constructions are immaterial because the prior art meets the challenged claims even under Immersion's constructions. Paper No. 9 ("DI"), 15-17, 28-29. The Board thus need not determine whether Immersion's proposed constructions are correct to find the claims unpatentable. *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017). Nonetheless, Valve briefly addresses Immersion's flawed constructions below.

Paper No. 16 - Petitioner's Reply at 3

DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

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Patent Owner objects to this slide as it makes the same new argument as slides 17 and 18.

Respectfully submitted,

Date: May 6, 2025

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CERTIFICATE OF SERVICE

As authorized by Petitioner's Mandatory Notices, I hereby certify that on May 6, 2025, a copy of this document has been served in its entirety by electronic mail on Petitioner's lead and backup counsel.

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