

United States Patent and Trademark Office
Before the Patent Trial and Appeal Board

Valve Corporation

(Petitioner)

v.

Immersion Corporation

(Patent Owner)

Inter Partes Review

No. IPR2024-00557 | **U.S. Patent No. 10,665,067**

Petitioner's Demonstrative Exhibits

May 9, 2025

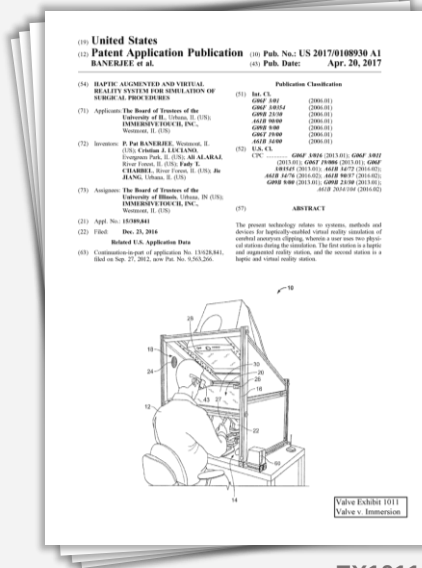
Valve Exhibit 1043
Valve v. Immersion
IPR2024-00557

The Petition's Grounds

GROUND	REFERENCE(S)	CLAIMS	BASIS
1	Banerjee	1-8, 11-12, 15-21	102/103
2	Meglan	1-8, 11-12, 15-21	102/103
3	Rogers	1-8, 11-12, 15-21	102/103

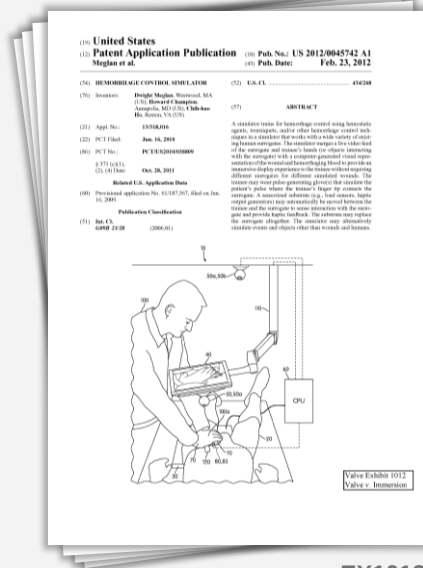
Paper No.2 – Petition at 4

Banerjee



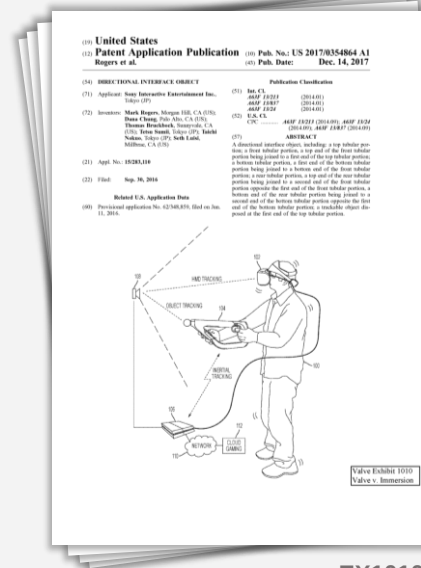
EX1011

Meglan



EX1012

Rogers



EX1010

Immersion Waived Arguments Not in the POR

Scheduling Order

Trials@uspto.gov
571-272-7822

Paper: 10
Date: Aug. 13, 2024

UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

VALVE CORPORATION,
Petitioner,

v.

IMMERSION CORPORATION,
Patent Owner.

IPR2024-00557
Patent 10,665,067 B2

Before WILLIAM V. SANDON, MICHAEL R. ZECHER, and
CHRISTOPHER L. OGDEN, Administrative Patent Judges.

OGDEN, Administrative Patent Judge.

SCHEDULING ORDER

A. DUE DATE 1

Patent Owner may file—

(a) A response to the petition (37 C.F.R. § 42.120). If Patent Owner elects not to file a response, Patent Owner must arrange a conference call with the parties and the Board. **Importantly, any arguments for patentability not raised in the response may be deemed waived.**

(b) A motion to amend the patent (37 C.F.R. § 42.121).

Paper No. 10 – Scheduling Order at 10

The '067 Patent Is Directed to Integrating Haptics Into an Augmented Reality System

(Petition, 1)

The '067 Patent

(12) United States Patent
Araki et al.

(16) Patent No.: US 10,665,067 B2
(45) Date of Patent: May 26, 2020

(54) SYSTEMS AND METHODS FOR INTEGRATING HAPTIC OVERLAY IN AUGMENTED REALITY

(71) Applicant: Immersion Corporation, San Jose, CA (US)

(72) Inventors: Satoshi Araki, Redwood City, CA (US); Christopher J. Ullrich, Saratoga, CA (US); James W. McManus, CA (US); Juan Manuel C. Hernandez, Montreal (CA); Danny A. Grant, Lowell (US); James Robert Fennell, CA (US); Colin Selsketh, San Jose, CA (US)

(73) Assignee: Immersion Corporation, San Jose, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(d) by 9 days.

(21) Appl. No. 16/016,258

(22) Filed: Jan. 15, 2018

(65) Prior Publication Data
US 2019/035419 A1 Dec. 19, 2019

(51) Int. Cl. G06F 03/00 (2006.01)
G06F 03/00 (2006.01)

(52) U.S. Cl. G06F 03/00 (2013.01); G06F 03/00 (2013.01)

(58) Field of Classification Search:
None
See application file for complete search history.

(56) References Cited
U.S. PATENT DOCUMENTS
6,942,436 B1 4/2004 Layer et al.
6,976,490 B2 6/2006 Mahoney
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(Continued)

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EP 2751044 A1 7/2014
WO 2017/04341 A1 2/2017

OTHER PUBLICATIONS
EP 3108047.5, "Extended European Search Report," dated Oct. 30, 2019, 39 pages.
(Continued)
Primary Examiner — Frank S. Chen
Cik, attorney, agent or flow — Kilpatrick Townsend & Stockton LLP

(57) ABSTRACT
Systems and methods for integrating haptic overlay in augmented reality are disclosed. One illustrative system described herein includes a haptic output device. The system also includes a display configured to output a visual effect. The system also includes a sensor for tracking a position of a proxy object. The system also includes a processor configured to determine a modified visual effect based in part on data received from the sensor, determine a haptic effect based in part on data received from the sensor, transmit a display signal associated with the modified visual effect to the display, transmit a haptic signal associated with the haptic effect to the haptic output device, and output the haptic effect using the haptic output device.

21 Claims, 4 Drawing Sheets

face devices. More specifically, the present application relates to integrating haptics overlay in augmented reality.

* * *

simulating that shooting through the dedicated controller. In AR space, it is difficult to provide a haptic effect to the user. Accordingly, systems and methods for integrating haptics overlay in augmented reality are needed.

EX1001 ('067 Patent) at 1:8-9 (cited Petition, 1); at 19-22 (cited Petition, 3)

Petition

Two primary AR techniques are: (1) optical see-through (OST) where the user sees the real environment directly (EX1013, Figure 11, below left), and (2) video see-through (VST) where the user sees the real environment indirectly via video capture, (EX1013, Figure 13, below right). EX1013, 361-363; Welch, ¶¶46, 53.

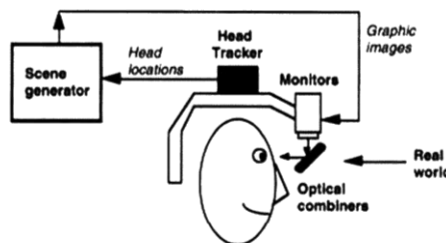


Figure 11. Optical see-through HMD conceptual diagram.

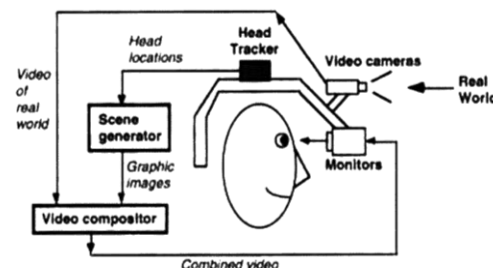
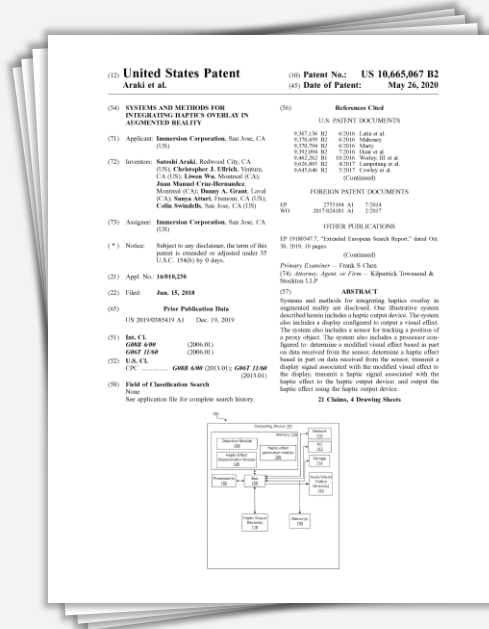


Figure 13. Video see-through HMD conceptual diagram.

The Independent Claims

(Petition, 91-93)

The '067 Patent



1. A system comprising:
 - a proxy object comprising one or more haptic output devices;
 - a display configured to output a visual effect onto a surface of the proxy object;
 - a sensor for tracking a position of the proxy object; and
 - a processor configured to:
 - determine a modified visual effect based in part on data received from the sensor;
 - determine a haptic effect based in part on data received from the sensor;
 - transmit a display signal associated with the modified visual effect to the display, the modified visual effect to be displayed on the proxy object via the display;
 - transmit a haptic signal associated with the haptic effect to the one or more haptic output devices; and
 - output the haptic effect using the one or more haptic output devices.

EX1001 ('067 Patent) at 10:41-58, Claim 1

Ground 1 – Banerjee

GROUND	REFERENCE(S)	CLAIMS	BASIS
1	Banerjee	1-8, 11-12, 15-21	102/103
2	Meglan	1-8, 11-12, 15-21	102/103
3	Rogers	1-8, 11-12, 15-21	102/103

Banerjee Meets Even Immersion's Overly-Narrow Construction

(Reply, 1)

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

Claim Term	Patent Owner's Proposed Construction
"a proxy object comprising one or more haptic output devices"	"a physical object that acts as a proxy for a virtual object and that itself contains inside a haptic output device, e.g., an actuator"

Paper No. 12 - POR at 10

Petitioner's Reply

record that is contrary to Federal Circuit precedent. Regardless, as the Board correctly observed at institution, Immersion's proposed construction is immaterial because Banerjee discloses "*a proxy object*" that contains a "*haptic output device*" and renders the challenged claims unpatentable even under Immersion's construction.

Paper No. 16 – Petitioner's Reply at 1

Patent Owner's Sur-Reply

B. It Is Undisputed that Banerjee Does Not Disclose "A Proxy Object Comprising One or More Haptic Output Devices" Under Immersion's Proposed Construction

If the Board accepts Immersion's proposed construction, Valve does not dispute that Banerjee fails to disclose a proxy object comprising one or more haptic output devices. Reply, 10-12.

Paper No. 17 – Sur-Reply at 14

The Petition Established That Banerjee's Haptic Device 22 (Including Stylus 27) Meets the Claimed "Proxy Object"

(Petition 14-16, Reply, 9)

Petition

a. Haptic Device 22 Meets [1A]

As boxed in red in annotated FIGS. 1 and 4 (below), haptic device 22 in both OSS 10 and MSS 11 includes haptic stylus 27 and tracks the position and orientation of the user's hand as it moves the stylus. This tracking allows a virtual tool to be

* * *

Thus, the user holds and manipulates haptic device 22's stylus 27 "as a proxy" for the virtual tool that the user is controlling in the simulation ([0029]-[0030]).

* * *

Haptic device 22 "compris[es] one or more haptic output devices" for three reasons. First, haptic device 22 is a haptic output device because it is explicitly

Institution Decision

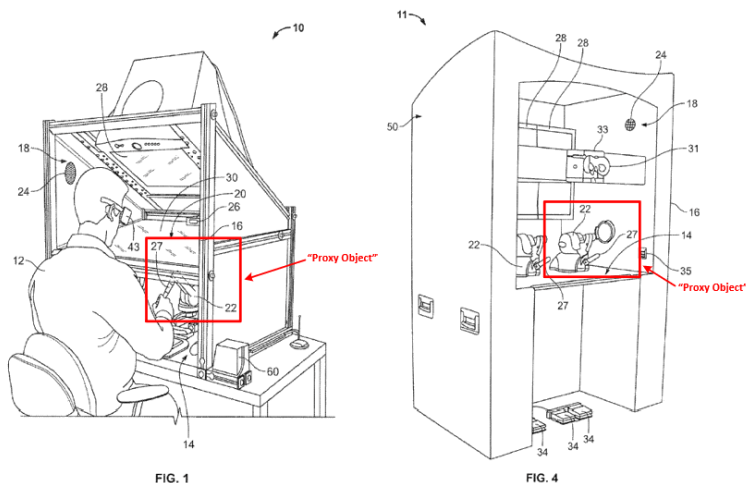
Based on the preliminary record, which may be developed further at trial, we find sufficiently persuasive Valve's argument that haptic device 22 and haptic stylus 27 can be treated together as the recited "proxy object."

Banerjee describes stylus 27 as part of haptic device 22. *See, e.g.*, Ex. 1011 ¶ 35 ("The user can hold and manipulate the haptic device 22 with its stylus 27 . . ."), ¶ 42 ("The haptics rendering software 44 can read the position and orientation of each haptic device 22, for example a stylus 27 . . ."). Functionally, stylus 27 is the part of haptic device 22 that directly interacts with the user. *See id.* ¶¶ 44, 57, claim 1.

If haptic device 22 comprises haptic stylus 27, as we preliminarily determine, it does not matter whether or not, during prosecution of the '076 patent, the applicant allegedly disclaimed an arrangement in which the "proxy object" is merely "mechanically coupled to" the recited haptic output devices. Here, haptic device 22, as a whole including stylus 27, comprises the haptic output devices (i.e., the force-feedback actuators) and is not merely mechanically coupled to them.

Banerjee

Paper No.2 – Petition at 14-16



Paper No.2 – Petition at 15 (annotating EX1001 (Banerjee) Figs. 1 and 4)

Paper No.9 – Institution Decision at 16

Immersion's Arguments All Hinge On Its Already Rejected and Erroneous Assertion That Banerjee's Stylus 27 is Not Part of Haptic Device 22

(Reply, 10)

Patent Owner's Response

device 22” (Pet., 14-16) or alternatively, “stylus 27” (Pet., 17). However, Banerjee does not disclose a proxy object and its three interrelated requirements expressly recited in the claims of the '067 Patent: (1) “a proxy object comprising one or more haptic output devices,” (2) “a sensor for tracking a position of *the proxy object*,” and (3) “the modified visual effect to be displayed on *the proxy object*.” EX1001, cl. 1; *see supra* §IV.A. In other words, these limitations require:

Paper No. 12 - POR at 19

As detailed below, neither of Banerjee's haptic device 22 or stylus 27 meet the claimed proxy object and its three interrelated requirements as understood by a POSA. EX2007, ¶64.

Paper No. 12 - POR at 20

EX1010 ¶¶ 35, 42, 44, 57, claim 1). But, Banerjee's haptic device 22 and stylus 27 cannot be treated together as a whole to meet the claimed proxy object and its expressly claimed interrelated requirements as understood by a POSA. EX2007, ¶¶69-70. A POSA would understand that stylus 27 is an appendage or extension

Paper No. 12 - POR at 22

Banerjee is Explicit that the Haptic Device 22 Includes Stylus 27

Petitioner's Reply

Banerjee is explicit that its stylus 27 is part of haptic device 22. As the Board observed (DI, 16), Banerjee explains that a “user can hold and manipulate the haptic device 22 with *its* stylus 27.” EX1011, [0035]. Likewise, Banerjee’s claim 1

Paper No. 16 – Petitioner’s Reply at 11

Banerjee

a first haptic device comprising a hand-held stylus and driven by haptics rendering logic, wherein the first haptic device tracks a user’s hand movements and provides force feedback to the user;

EX1011 (Banerjee) at Claim 1 (cited Institution Decision, 16)

will feel soft and bone hard. Haptics rendering software 44 can monitor and control each haptic device 22 including each stylus 27. The haptics rendering software 44 can read the position and orientation of each haptic device 22, for example a stylus 27, or a plurality of styluses 27 for different functions or for use by separate hands, and computes single or multi-point collision detections between a virtual device corresponding to the haptic device 22 and objects within the 3D virtual environment. The haptics rendering software 44

EX1011 (Banerjee) at [0042] (cited Petition, 15, Reply, 11)

[0062] To begin a virtual Sylvian fissure dissection, user task 83, the user can be seated at the microsurgery station 11, which can include a binocular surgical eyepiece 31, foot pedals 34, and two haptic devices for bimanual surgical technique, with each device having a haptic stylus 27, as shown in FIG. 4. The user will typically select two or more

EX1011 (Banerjee) at [0062] (cited Petition, 16, Reply, 11)

micro-surgery station 11. The haptic augmented and virtual reality system can include a software library that provides, in real time, a high level layer that encapsulates the rendering of a scene graph on either display screen 28, the stereoscopic vision interface 20, the handling of the hand tracking device shown as a haptic robot stylus 27, an interface with a haptic device 22, and playback of 3D spatial audio on a 3D sound system 24.

EX1011 (Banerjee) at [0037] (cited POR, 22)

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

Immersion's Assertion that Banerjee Discloses an Interface Between Stylus 27 and Haptic Device 22 is False

Patent Owner's Response

Banerjee also states that there is an “interface” between stylus 27 and haptic device 22, thus confirming that they are separate components coupled together.

EX1011, ¶37 (“The haptic augmented and virtual reality system can include [...] the hand tracking device shown as a haptic robot stylus 27, an interface with a haptic device 22”).

Paper No. 12 - POR at 22

Banerjee

micro-surgery station 11. The haptic augmented and virtual reality system can include a software library that provides, in real time, a high level layer that encapsulates the rendering of a scene graph on either display screen 28, the stereoscopic vision interface 20, the handling of the hand tracking device shown as a haptic robot stylus 27, an interface with a haptic device 22, and playback of 3D spatial audio on a 3D sound system 24.

EX1011 (Banerjee) [0037] (cited POR, 22)

Immersion's Sur-Reply Arguments Also Fail to Acknowledge that Banerjee's Haptic Device 22 Includes the Stylus 27

Patent Owner's Sur-Reply

found, however, that stylus 27 alone does not. DI, 17. Unable to cure this deficiency, Valve identifies the *inverse* relationship: a haptic device 22 (i.e., the alleged haptic output device) that includes stylus 27 (i.e., the alleged proxy object). Reply, 11. This does not meet the plain meaning of proxy object.

Valve argues that haptic device 22 and stylus 27 together form the proxy object. Although the Board preliminarily accepted Valve's argument, (DI, 16), it should reject it as inconsistent with the requirement that the proxy object include the haptic output device. This is set by the claim and cannot be inverted. Valve, however, concedes that Banerjee inverts it: "Banerjee's claim 1 explicitly recites 'a first haptic device comprising a hand-held stylus.'" Reply, 11. The Board does too: "haptic device 22 comprises haptic stylus 27." DI, 16. Banerjee's inverted structure does not anticipate because it is not arranged as in the claim. *Net MoneyIN, Inc.*, 545 F.3d at 1369 ("the prior art ... must not only disclose all elements of the claim within the four corners of the document, but must also disclose those elements arranged as in the claim.").

Paper No. 17 – Sur-Reply at 10-11

Valve's reliance on two disparate components requires an implicit construction that is inconsistent across the limitations. *Google LLC v. Ecfactor*,

Paper No. 17 – Sur-Reply at 12

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

Paper No. 17 – Sur-Reply at 13

Petition

[1A] a proxy object comprising one or more haptic output devices;

Paper No.2 – Petition at 91

Banerjee

stereoscopic vision interface 20, the handling of the hand tracking device shown as a haptic robot stylus 27, an

EX1011 (Banerjee) [0037] (cited POR, 22)

Immersion's Sur-Reply Mischaracterizes Valve's Claim Mapping

Petition

2. [1A]: “a proxy object comprising one or more haptic output devices;”

* * *

a. Haptic Device 22 Meets [1A]

As boxed in red in annotated FIGS. 1 and 4 (below), haptic device 22 in both OSS 10 and MSS 11 includes haptic stylus 27 and tracks the position and orientation of the user's hand as it moves the stylus. This tracking allows a virtual tool to be

* * *

Haptic device 22 “compris[es] one or more haptic output devices” for three reasons. First, haptic device 22 is a haptic output device because it is explicitly

Paper No.2 – Petition at 14, 16

4. [1C]: “a sensor for tracking a position of the proxy object”

* * *

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.

Paper No.2 – Petition at 24

Patent Owner's Sur-Reply

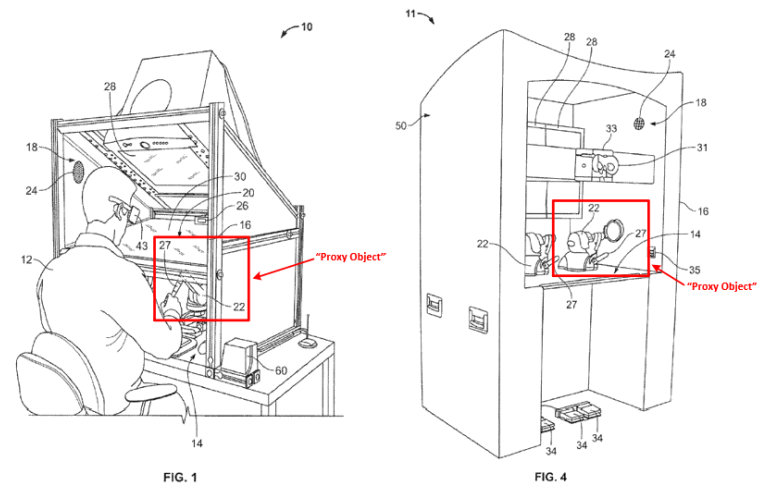
Claim Limitation	Valve's Mapping
[1A] a proxy object comprising one or more haptic output devices	[1A] a [haptic device 22 + stylus 27] comprising ~~haptic device 22~~ < one or more haptic output devices
[1C] a sensor for tracking a position of the proxy object	[1C] a sensor for tracking a position of the ~~stylus 27~~ < [haptic device 22]

* * *

Claim Limitation	Valve's Implicit Construction
[1A] a proxy object comprising one or more haptic output devices	[1A] a ~~haptic device~~ proxy object comprising one or more haptic output devices
[1C] a sensor for tracking a position of the proxy object	[1C] a sensor for tracking ~~haptic device~~ a position of the proxy object

Paper No. 17 – Sur-Reply at 13-14

Banerjee



Paper No.2 – Petition at 15 (annotating EX1001 (Banerjee) Figs. 1 and 4)

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

Paper No. 17 – Sur-Reply at 13

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.

Paper No.9 – Institution Decision at 20

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:

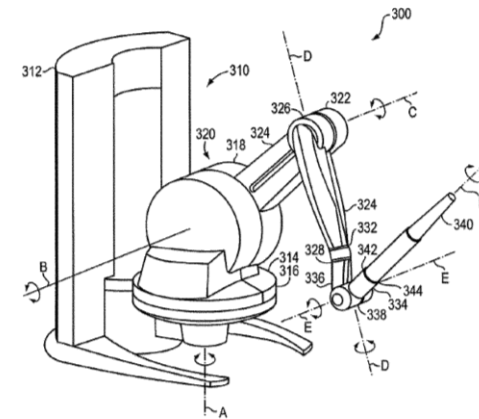


FIG. 3

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.9 – Institution Decision at 13-14

Immersion's Assertion that 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

Ground 2 – Meglan

GROUND	REFERENCE(S)	CLAIMS	BASIS
1	Banerjee	1-8, 11-12, 15-21	102/103
2	Meglan	1-8, 11-12, 15-21	102/103
3	Rogers	1-8, 11-12, 15-21	102/103

Meglan Overview

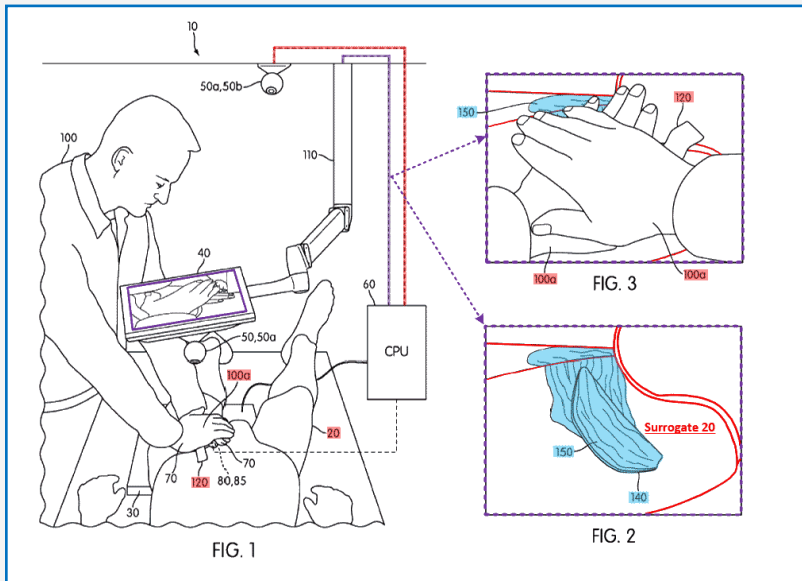
Petition

VIII. GROUND 2: CLAIMS 1-8, 11-12 AND 15-21 ARE ANTICIPATED BY, OR ALTERNATIVELY OBVIOUS OVER, MEGLAN

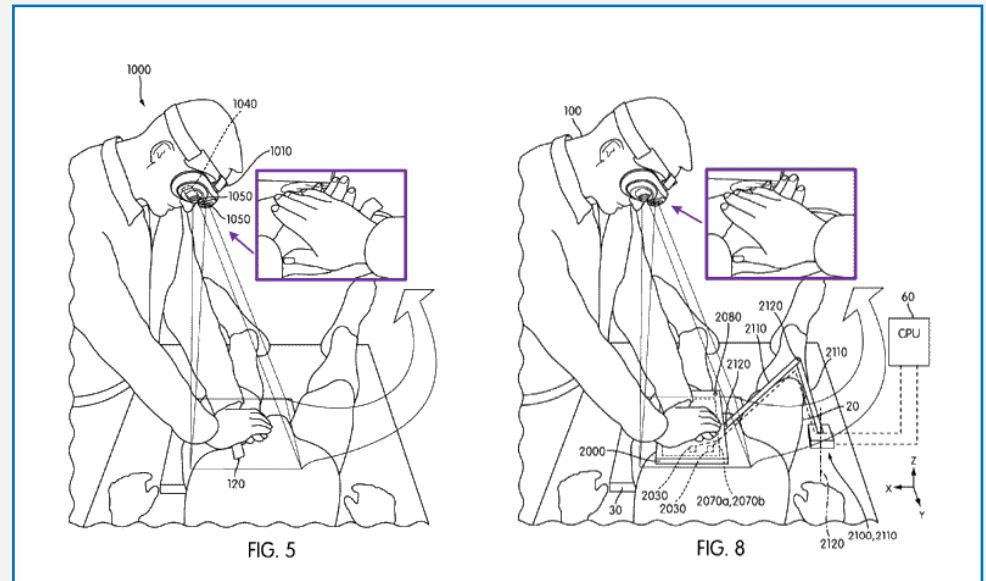
A. Meglan (EX1012)⁴

Paper No.2 – Petition at 46

Meglan



Petition 46 (annotating EX1012 (Meglan) at Figs. 1-2)



Petition 48 (annotating EX1012 (Meglan) at Figs. 5 and 8)

The Petition Showed that the Proxy Object is Met by Substrate 2000 Alone as Well as By Surrogate 20 and the Two Together

Petition

Meglan's surrogate 20 and haptic substrate 2000, by themselves or together as a unit, meet [1A]. Welch, ¶214.

Meglan's substrate 2000 is positioned in correspondence with the user's hands by device 2100 so that substrate 2000 is "sandwiched between the trainee's hands and the surrogate 20" such that when "trainee 100 attempts to contact the surrogate 20, the trainee 100 actually contacts the sensorized substrate 2000" ([0111]). [0108]-[0111]. Substrate 2000 is made "flexible" so that "gravity causes it to generally 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 substrate 2000 alone as the surrogate); Welch, ¶¶59-62, 218-219; *supra* §VII.B.2.a.

Meglan

Paper No.2 – Petition at 48, 50

The substrate **2000** material may include an elastic material that has the feel of human skin (e.g., rubber, material used for the skin of conventional mannequins, etc.).

EX1012 (Meglan) at [0114] (cited Petition, 50)

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.

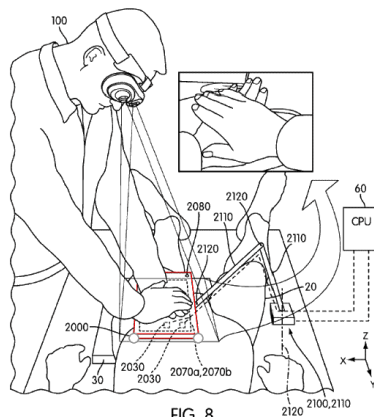


FIG. 8

* * *

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

The POR Only Argued that Meglan Does Not Track the Position of the Proxy Object (Substrate 2000)

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.*

The POR's Assertion that Meglan Does Not Track the Position of the Substrate Fails

Petition

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

Patent Owner's Response

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 30

Meglan

generators 70b' discussed above. The program 90 may determine the precise location of the substrate 2000 and its sensors 2030, pulse generators 2070a, and heat generators 2070b via position encoders of the device 2100 and/or via analysis of the substrate 2000 as imaged by the camera system 50. If the

EX1012 (Meglan) at [0113] (cited Petition, 53-54)

Meglan Uses the Position of the Substrate to Determine a Haptic Effect

Patent Owner's Response

As detailed below, Meglan does not disclose “determine a haptic effect based in part on data received from the sensor” as required by the claims of the '067 Patent.

Paper No. 12 – POR at 29

program 90 calculating a simulated pulse.” EX1012, ¶90. Thus, the simulated pulse is based on the placement of the hand on the surrogate and the amount of pressure applied on the surrogate **as determined by the load sensor** along with the finger location **relative to the simulated vascular structures** as determined by the camera. EX2007, ¶85. Meglan discloses that “the load sensor 30 senses a magnitude

Paper No. 12 – POR at 33

Petitioner's Reply

Meglan’s paragraph [0113] (cited Petition, 54) makes clear that the camera system is also used to “determine the precise location of the substrate 2000.” The location of the substrate 2000 is used to “accurately and precisely detect the interaction between the trainee 100 and the surrogate ... and precisely and accurately provide haptic feedback to the trainee.” EX1012, [0116].

Paper No. 16 – Petitioner's Reply at 15

Meglan

[0116] The use of substrates 2000 and devices 2100 may enable the simulator 10 to accurately and precisely detect the interaction between the trainee 100 and the surrogate via the sensors 2030, and **precisely and accurately provide haptic feedback to the trainee 100** via the pulse generators 2070a (and/or other haptic feedback devices such as the heat generators 2070b) without having to sensorize part or all of the surrogate 20. The substrate 2000 may be substantially smaller than the surrogate 20 or the simulated surface of the object being simulated. According to various embodiments, a sur-

EX1012 (Meglan) at [0116] (cited Reply, 15)

generators 70b' discussed above. The program 90 may **determine the precise location of the substrate 2000 and its sensors 2030, pulse generators 2070a, and heat generators 2070b** via

EX1012 (Meglan) at [0113] (cited Petition, 54)

Immersion's Assertion that the Petition Only Relied on the Position of the Trainee's Hands/Fingers Fails

Petition

As one example of a haptic effect that meets [1D2], when program 90 determines that trainee 100's hands are in contact with surrogate 20, program 90 uses "the location of the finger(s) over simulated vascular structures, combined with the current state of the hemodynamic simulation" to "calculat[e] a simulated pulse" ([0090]) that processor 60 signals to the pulse generator(s) to simulate haptically. *See also* [0106]-[0107]. The "specific feel of the pulse" provided by the "calculated

As another example, when program 90 determines that trainee 100's hands are in contact with surrogate 20 based on the video feed from camera system 50/1050 (i.e., "*based on data from the sensor*"), program 90 causes the heat generator to generate heat (i.e., "*determine[s] a haptic effect*") "so that the trainee feels the heat of the simulated patient's body and/or blood upon contact with the simulated patient and/or hemorrhaging blood." [0089]; *see also* [0106]-[0107]; *compare with*

Paper No.2 – Petition at 57-58

Meglan

[0107] As shown in FIG. 8, according to an alternative embodiment, the gloves 70' are replaced by a sensorized substrate 2000 and automated positioning device 2100. Load

EX1012 (Meglan) at [0107] (cited Petition, 58)

Patent Owner's Response

sensor. In the first example, Petitioner alleges that Meglan discloses claim element [1D-2] because haptic effects provided by a pulse generator are *based on the trainee's finger location* that is detected by the camera sensor. Pet., 57-58. Petitioner also provides a second example in which haptics effects provided by a heat generator are allegedly based on the location of the *trainee's hands* as detected by the camera. *Id.*, 58.

Paper No. 12 – POR at 31

² Patent Owner notes that the Petition does not contend that Meglan discloses tracking the position of the stationary surrogate 20 as *Petitioner only argues that the position of the user's hands and fingers are tracked by the camera* (Pet. 57-58). *See SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1356 (2018) (The Board may not institute a different IPR than what is described in the Petition).

Paper No. 12 – POR at 32

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

Immersion's Sur-Reply Does Not Refute that Meglan Determines the Position of the Substrate 2000 and Instead Offers New Arguments

Patent Owner's Response

Meglan does not disclose “determin[ing] a haptic effect based in part on data received from the sensor,” where the data reflects **the proxy object's position that is tracked by the sensor** as required by claim elements [1C] and [1D-2]. EX2007,

Paper No. 12 - POR at 30

Patent Owner's Sur-Reply

IV. GROUND 2: MEGLAN DOES NOT ANTICIPATE OR RENDER THE CLAIMS OBVIOUS	15
A. Overview of Meglan.....	15
1. Meglan does not track the position of the surrogate “to determine a haptic effect.”	15
2. The substrate does not have visual overlays.	17
3. The surrogate does not comprise the substrate.	19
B. Meglan Does Not Disclose the Claimed “Proxy Object”	20
1. The surrogate is not a “proxy object.”	20
2. The substrate is not a “proxy object.”	21
3. The surrogate and substrate together are not a “proxy object.”	21
C. Meglan Does Not Disclose Limitation [1A] Under Immersion's Proposed Construction	23

Paper No. 17 – Sur-Reply at ii, iii

Immersion's Sur-Reply Makes a Host of New Arguments That Should Not be Considered

Petition

[1A] a proxy object comprising one or more haptic output devices;

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

Paper No.2 – Petition at 91

Petitioner's Identification of New Arguments

limitation [1A]. *See, e.g.*, Paper No. 17 (“Sur-Reply”) at 20-23. The arguments made in the following sections of Immersion’s Sur-Reply are advanced to support Immersion’s new “*proxy object*” argument and are improper:

- Section IV.A.2: “The substrate does not have visual overlays.” (Sur-Reply at 17-19);
- Section IV.A.3: “The surrogate does not comprise the substrate.” (Sur-Reply at 19-20);
- Section IV.B: “Meglan Does Not Disclose the Claimed “Proxy Object” (Sur-Reply at 20-23), including:
 - Section IV.B.1: “The surrogate is not a ‘proxy object.’” (Sur-Reply at 20-21);
 - Section IV.B.2: “The substrate is not a ‘proxy object.’” (Sur-Reply at 21); and
 - Section IV.B.3: “The surrogate and substrate together are not a ‘proxy object.’” (Sur-Reply at 21-23).

Scheduling Order

A. DUE DATE 1

Patent Owner may file—

(a) A response to the petition (37 C.F.R. § 42.120). If Patent Owner elects not to file a response, Patent Owner must arrange a conference call with the parties and the Board. Importantly, any arguments for patentability not raised in the response may be deemed waived.

(b) A motion to amend the patent (37 C.F.R. § 42.121).

Paper No. 10 – Scheduling Order at 10

Immersion's Sur-Reply Fails to Identify Anywhere in the POR Where the Sur-Reply Arguments Were Advanced

Board's Email - April 9, 2025

Counsel,

In lieu of Petitioner's proposed motion to strike, the Board authorizes Petitioner to submit a paper on or before April 15, 2025, limited to two pages, identifying any alleged new arguments in Patent Owner's Sur-reply. We also authorize Patent Owner to submit a responsive paper, limited to two pages, by April 22, 2025. Patent Owner's paper, if any, must be limited to identifying where it contends any challenged arguments in Patent Owner's Sur-reply were first raised in the prior record.

Regards,

Andrew Kellogg,
Deputy Chief Clerk, Trials
Patent Trial and Appeal Board
USPTO

Board 4/9/25 Email

Patent Owner's Paper 27

Immersion's Patent Owner Response is premised on showing that Meglan does not disclose a "proxy object" as that term is used in the claims. POR, 27-34.

* * *

In its POR, Immersion established that "proxy object" has three requirements: it (1) comprises the haptic output device; (2) has its position tracked; and (3) has a modified visual effect displayed on it. POR 1-3, 10-17. Immersion focused on the fact that in Meglan, the position of the alleged proxy object is not tracked. POR, 27-34. In Reply, Valve argued that "Immersion mischaracterizes Meglan's disclosure"

* * *

Reply, 13-14. By doing so, Valve forced Immersion to further address how Meglan fails to disclose a proxy object. In Sur-Reply, Immersion elaborated on the argument

"expand[ed] the same argument" it made in its POR. *Id.* Each of the allegedly "new" arguments that Valve identifies are just elaborations that Valve made necessary by insisting on Reply that Meglan discloses a proxy object with a position that is tracked. Compare Reply at 13-14 with Sur-Reply at 17-19, 20-23.

Paper 27 at 2

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.

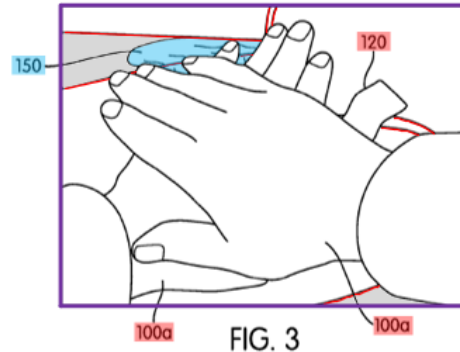
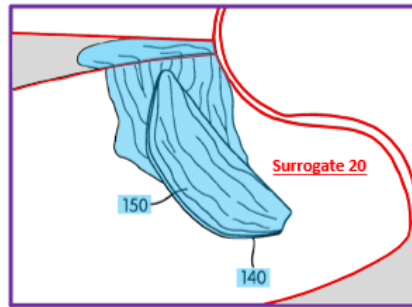
* * *

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

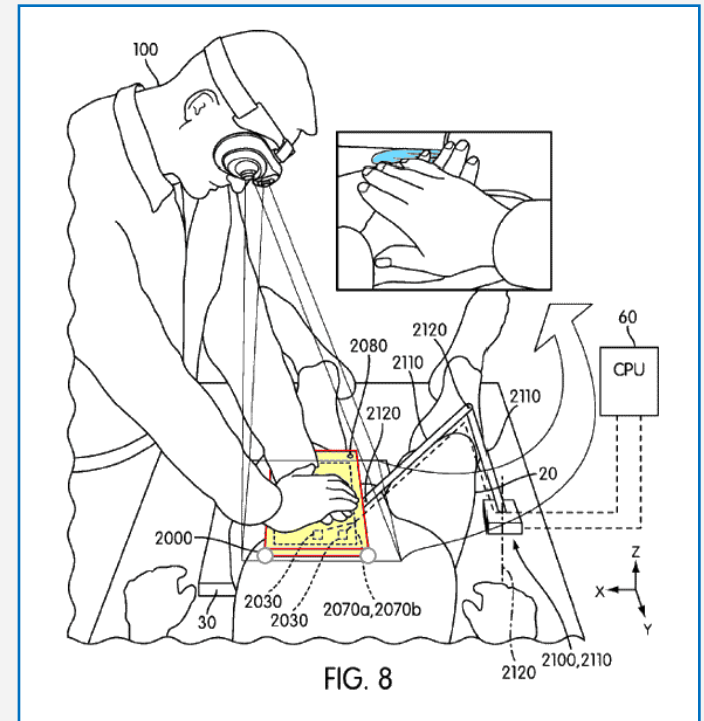
Paper No.2 – Petition at 51-53

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

Petition



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



Paper No.2 – Petition at 53

EX1012 (Meglan) Fig. 8 (citing Petition, 49)

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

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.” II.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.

Ground 3 – Rogers

GROUND	REFERENCE(S)	CLAIMS	BASIS
1	Banerjee	1-8, 11-12, 15-21	102/103
2	Meglan	1-8, 11-12, 15-21	102/103
3	Rogers	1-8, 11-12, 15-21	102/103

Rogers Overview

Petition

IX. GROUND 3: CLAIMS 1-8, 11-12 AND 15-21 ARE ANTICIPATED BY, OR ALTERNATIVELY OBVIOUS OVER, ROGERS

A. Rogers (EX1010)⁵

Rogers discloses a virtual-reality game system; an example is depicted in FIG. 1, below. [0001]-[0007]; [0021].

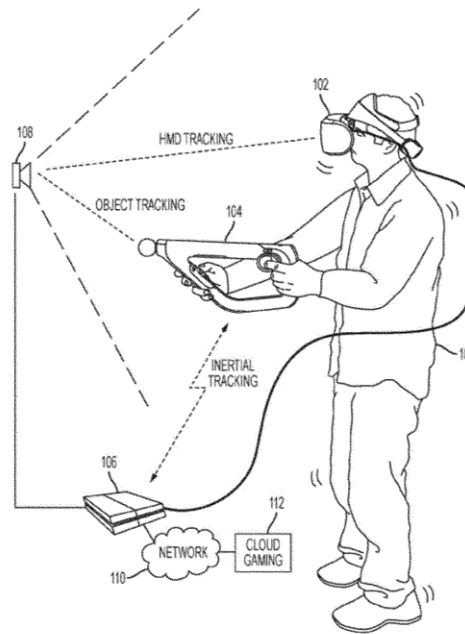


FIG. 1

Virtual-Reality Gaming System: Paper No.2 – Petition at 67-68

Rogers's Directional Interface Object is a Proxy Object Tracked by Sensors

Rogers

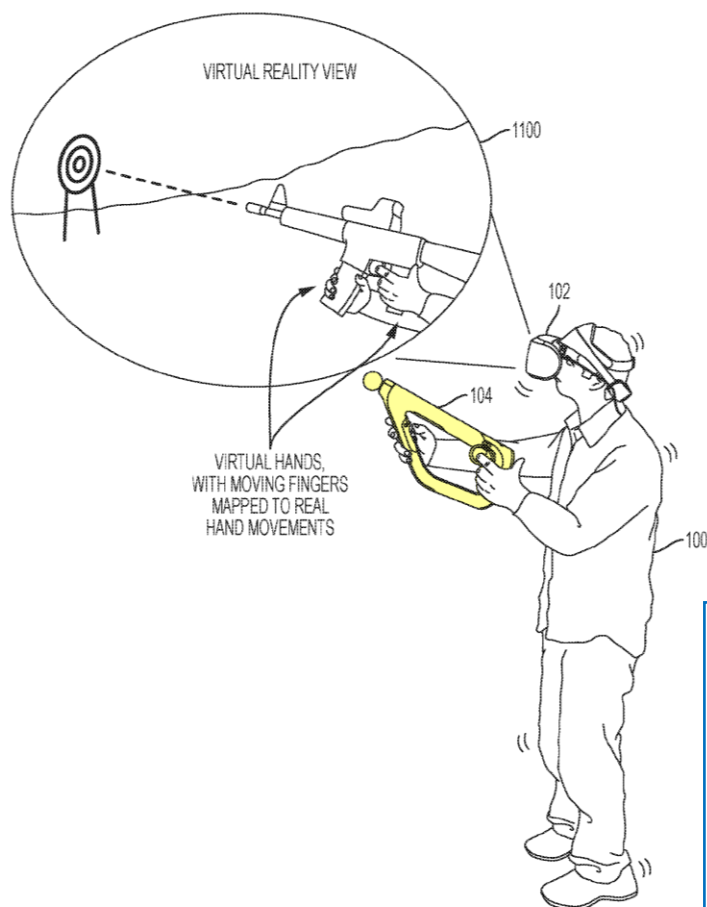


FIG. 11

EX1010 (Rogers) at Fig. 11 (cited Petition at 69-70)

Petition

4. [1C]: "a sensor..."

Rogers's system includes "camera 108" for "determin[ing] the location and movements of the...interface object 104." [0044]; *see also* [0081] [0103]; Welch, ¶¶299-300. Camera 108 is "a sensor for tracking a position of the proxy object."

Rogers's interface object 104 also "includes an inertial sensor" by which "inertial tracking [is] communicated with computer 106" ([0052]) to determine interface object 104's "location and orientation" ([0044]). *See also* [0111], FIG.1 ("Inertial Tracking"), claim 9. This inertial sensor is also "a sensor for tracking a position of the proxy object." Welch, ¶¶300-302.

Consistent with the '067 patent's disclosure that "[a]ny suitable number, type, or arrangement of sensors can be used" in "any combination," POSAs understood that camera 108 and the inertial sensor together also meet [1C]'s "sensor." EX1001, 4:1-18; Welch, ¶303.

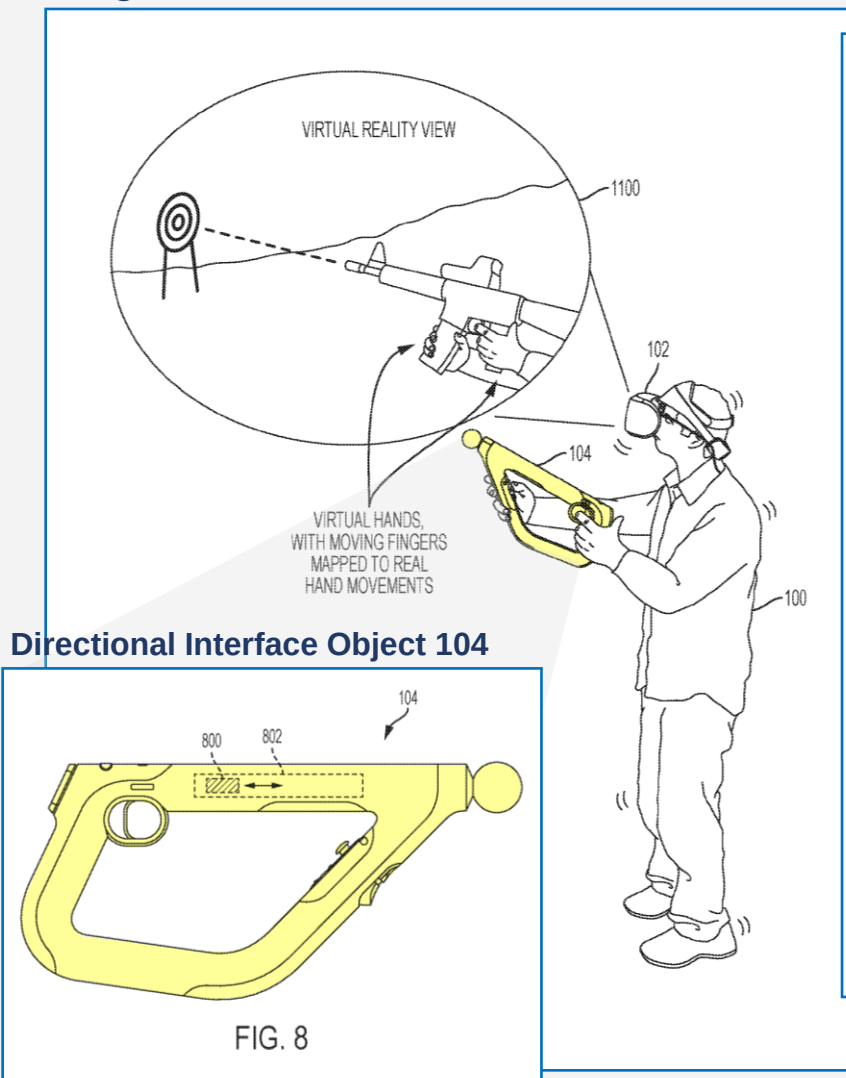
[0044] The user 100 may operate a directional interface object 104 to provide input for the video game. Additionally, a camera 108 can be configured to capture images of the interactive environment in which the user 100 is located. These captured images can be analyzed to determine the location and movements of the user 100, the HMD 102, and the directional interface object 104. In various implementations, the directional interface object 104 includes a light which can be tracked, and/or inertial sensor(s), to determine its location and orientation.

Paper No.2 –
Petition at 72-73

EX1010 (Rogers) at [0044] (cited Petition at 70, 72-73, 75-76; POR at 39, 42; Sur-reply at 25)

Rogers's System Determines a Haptic Effect When Firing and Reloading

Rogers



[0105] FIG. 8 illustrates a directional interface object having a movable weight, in accordance with implementations of the disclosure. In the illustrated implementation, the moveable weight 800 is disposed inside of the top tubular portion of the directional interface object 104, and configured to move along a track 802. However, in other implementations, the moveable weight 800 may be disposed in other portions of the directional interface object 104. The moveable weight 800 can be caused to move in response to tactile feedback data received from a computer or HMD. The moveable weight 800 can be controlled to move at variable acceleration levels, variable velocities, and for variable distances depending upon the desired haptic effect. 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 69-70; 76-77)

EX1010 (Rogers) at Figs.8, 11(cited Petition at 68-70)

The Petition Establishes That Rogers’s Meets Limitation [1D2]: “*determine a haptic effect based in part on data received from the sensor*”

(Petition 77, Reply, 19-26)

Petition

b. [1D2]: “determine a haptic effect...”

* * *

As discussed for [1D1], the direction that interface object 104 points is determined from camera 108’s images and inertial sensor data (i.e., “*data received from the sensor*”—*supra* §IX.B.4); thus computer 106’s processor performs [1D2] by detecting that interface object 104 is pointed upwards for reload and providing the “tactile feedback data” to control moveable object 800 to produce the “reloading” haptic effect. [0105]; Welch, ¶¶318-319.

Paper No.2 – Petition at 77

Institution Decision

At this stage, we question whether this argument is material. Although limitation 1C recites “a sensor for tracking a position of the proxy object,” limitation 1D2 only explicitly requires determining a haptic effect based on “data received from the sensor”—not necessarily *positional* data received from the sensor. It appears that in claim 1, a “sensor” may comprise a combination of sensors. *See* Ex. 1001, 11:6–7 (dependent claim 7 in which the “sensor” of claim 1 potentially comprises a combination of sensors such as a camera and an accelerometer). There is at least some merit to Valve’s position that the combination of camera 108 and the inertial sensor of directional interface object 104, collectively, is “a sensor for tracking a position of” proxy object 104 as per limitation 1C, and that “data” from the combined sensor—in this case directional data—is used to determine a haptic effect as per limitation 1D2.

Paper No.9 – Institution Decision at 28

Immersion Misinterprets Rogers's Disclosure of Sensors

(POR, 44)

Patent Owner's Response

Challenged Claims of the '067 Patent. As detailed below, Rogers does not disclose “a sensor for tracking a position of the proxy object” that is used to determine a haptic effect based on the position tracking data from that sensor as required by claim elements [1C] and [1D-2]. As detailed in §IV.B, the proper construction of the term

Paper No. 12 - POR at 37

Rogers

[0044] The user 100 may operate a directional interface object 104 to provide input for the video game. Additionally, a camera 108 can be configured to capture images of the interactive environment in which the user 100 is located. These captured images can be analyzed to determine the location and movements of the user 100, the HMD 102, and the directional interface object 104. In various implementations, the directional interface object 104 includes a light which can be tracked, and/or inertial sensor(s), to determine its location and orientation.

EX1010 (Rogers) at [0044] (cited Petition at 70, 72-73, 75-76; POR at 39, 42; Sur-reply at 25)

[0047] In another embodiment, the computer 106 functions as a thin client in communication over a network with a cloud gaming provider 112. The cloud gaming provider 112 maintains and executes the video game being played by the user 102. The computer 106 transmits inputs from the HMD 102, the directional interface object 104 and the camera 108, to the cloud gaming provider, which processes the inputs to affect the game state of the executing video game. The output from the executing video game, such as video data, audio data, and haptic feedback data, is transmitted to the computer 106. The computer 106 may further process the data before transmission or may directly transmit the data to the relevant devices. For example, video and audio streams are provided to the HMD 102, whereas a vibration feedback command is provided to the directional interface object 104.

EX1010 (Rogers) at [0047] (cited Reply at 21)

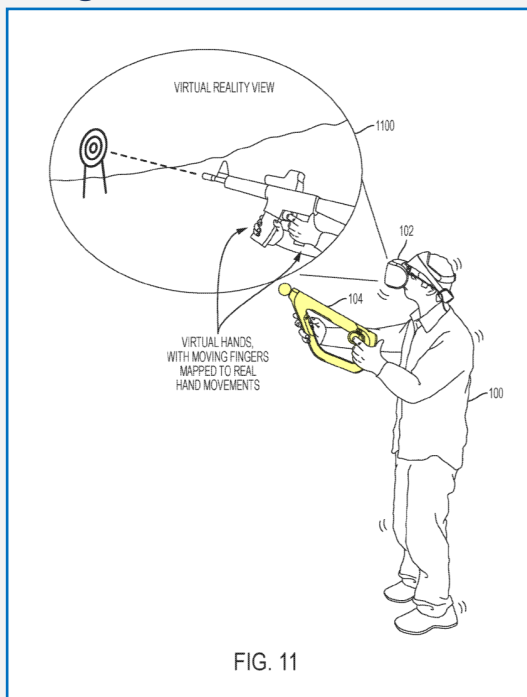
Immersion Misinterprets Rogers's Disclosure of Using the Camera

Patent Owner's Response

Contrary to Petitioner's argument that camera 108 is used to sense the direction of the weapon in the embodiment above (Pet., 77), there is no disclosure whatsoever in Rogers that position tracking data from camera 108 is utilized for this weapon reload use case. Rogers does not disclose the use of position tracking data to sense whether the weapon is tilted upward. EX2007, ¶94. Yet, Petitioner cites to

Rogers

Paper No. 12 - POR at 38



EX1010 (Rogers) at Fig. 11 (cited Petition at 69-70)

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.

* * *

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 [0105],[0106] (cited Petition at 76-77; Reply at 19-20)

Immersion Misinterprets Rogers's Disclosure of Using the Inertial Sensor

Rogers

17. A system, comprising:
- a directional interface object, the directional interface object including,
 - a top tubular portion,
 - a front tubular portion, a top end of the front tubular portion being joined to a first end of the top tubular portion,
 - a bottom tubular portion, a first end of the bottom tubular portion being joined to a bottom end of the front tubular portion,
 - a rear tubular portion, a top end of the rear tubular portion being joined to a second end of the front tubular portion opposite the first end of the front tubular portion, a bottom end of the rear tubular portion being joined to a second end of the bottom tubular portion opposite the first end of the bottom tubular portion,
 - a trackable object disposed at the first end of the top tubular portion, and
 - at least one inertial sensor configured to generate inertial data indicative of movement of the directional interface object;
 - an image captured device configured to capture images of an interactive environment in which the directional interface object is disposed;
 - a computing device configured to execute an interactive application to render a view of a virtual environment to a head-mounted display (HMD), the computing device configured to process the captured images and the inertial data to determine a position of a virtual object that is rendered in the view of the virtual environment.

EX1010 (Rogers) at Claim 17 (cited Reply at 19, 23)

Patent Owner's Response

2. Rogers' Inertial Sensor

Petitioner also contends that Rogers' "inertial sensor" for determining "interface object 104's 'location and orientation'" satisfies claim element [1C] as well. *Id.*, 73 (citing EX1010, ¶[0044]). Rogers, however, repeatedly explains that the "inertial sensors" track movement—not position. See, e.g., EX1010, ¶[0016] ("In some implementations, the directional interface object further includes at least one inertial sensor for *sensing movement* of the directional interface object."), ¶[0018].

Paper No. 12 - POR at 41 (cited Petition at 76-77; Reply at 19-20)

Collins English Dictionary 2016

being without movement or motion ■ **movement** ('mu:vmənt) *n* 1 **a the act, process, or result of moving** 2 **an instance of moving** 3 **the manner of**

* * *

move (mu:v) *vb* 1 **to go or take from one place to another; change in location or position** 2 **(usually intr) to change (one's dwelling, place of business, etc)**

* * *

position (pə'zɪʃən) *n* 1 **the place, situation, or location of a person or thing;**

EX1040 at 1548, 1282 (cited Reply at 22-23)

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)

Immersion Misinterprets Rogers's Disclosure of Modified Visual Effect

(POR, 44-45)

Patent Owner's Response

Rogers does not disclose determining a modified visual effect based on sensor data that is also used to determine haptic effect as claimed by the '067 Patent. Indeed,

Paper No. 12 - POR at 45

Patent Owner's Sur-Reply

Valve further cites to Rogers' claim 17 as support for Rogers disclosing the for "determining a position" limitation. Reply, 23. Rogers' claim 17, however, makes no mention of *haptics*. Instead, it determines a position for *visual* purposes: "to determine a position of a virtual object that is rendered in the view of the virtual environment."

Paper No. 17 – Sur-Reply at 26

Rogers

first end of the top tubular portion, and at least one inertial sensor configured to generate inertial data indicative of movement of the directional interface object; an image captured device configured to capture images of an interactive environment in which the directional interface object is disposed; a computing device configured to execute an interactive application to render a view of a virtual environment to a head-mounted display (HMD), the computing device configured to process the captured images and the inertial data to determine a position of a virtual object that is rendered in the view of the virtual environment.

EX1010 (Rogers) at [0018] (cited Petition at 74-76; Reply at 25)

17. A system, comprising:
a directional interface object, the directional interface object including,

* * *

a trackable object disposed at the first end of the to tubular portion, and
at least one inertial sensor configured to generate inertial data indicative of movement of the directional interface object;
an image captured device configured to capture images of an interactive environment in which the directional interface object is disposed;
a computing device configured to execute an interactive application to render a view of a virtual environment to a head-mounted display (HMD), the computing device configured to process the captured images and the inertial data to determine a position of a virtual object that is rendered in the view of the virtual environment.

EX1010 (Rogers) at Claim 17 (cited Reply at 19, 23)

Immersion Misinterprets Rogers's Disclosure of Modified Visual Effect

Patent Owner's Sur-Reply

Lastly, Valve cites ¶47 as purportedly confirming the camera's role in determining when to generate haptics. Reply, 21. This disclosure, however, does not state that the camera is used to determine the location of the directional interface object for the reload embodiment, which is required for Rogers to anticipate. *Net*

Rogers

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.

* * *

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.

Paper No. 17 – Sur-Reply at 26

[0047] In another embodiment, the computer 106 functions as a thin client in communication over a network with a cloud gaming provider 112. The cloud gaming provider 112 maintains and executes the video game being played by the user 102. The computer 106 transmits inputs from the HMD 102, the directional interface object 104 and the camera 108, to the cloud gaming provider, which processes the inputs to affect the game state of the executing video game. The output from the executing video game, such as video data, audio data, and haptic feedback data, is transmitted to the computer 106. The computer 106 may further process the data before transmission or may directly transmit the data to the relevant devices. For example, video and audio streams are provided to the HMD 102, whereas a vibration feedback command is provided to the directional interface object 104.

EX1010 (Rogers) at [0047] (cited Reply at 21; Sur-Reply at 26)

EX1010 (Rogers) at [0105],[0106] (cited Petition at 76-77; Reply at 19-20)

Additional Slides

Immersion's Claim Construction Limiting a Proxy Object to 'Contain Inside' a Haptic Output Device Fails

Patent Owner's Response

Claim Term	Patent Owner's Proposed Construction
"a proxy object comprising one or more haptic output devices"	"a physical object that acts as a proxy for a virtual object and that itself contains inside a haptic output device, e.g., an actuator"

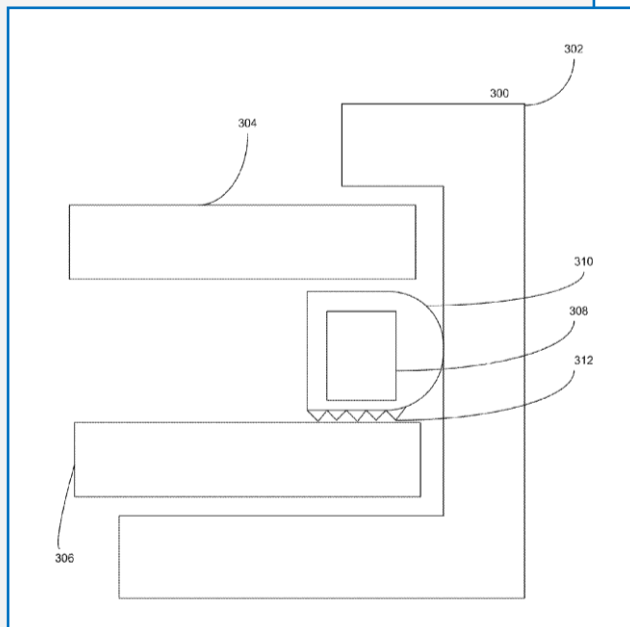
Paper No. 12 - POR at 10

Immersion's Construction Limiting a Proxy Object to 'Contain Inside' a Haptic Device Excludes the Haptic Tape Embodiment

The '067 Patent

same or different type to output haptic effects. For example, haptic output device **118** may comprise one or more of, for example, a piezoelectric actuator, an electric motor, an electro-magnetic actuator, a voice coil, a shape memory alloy, an electroactive polymer, a solenoid, an eccentric rotating mass motor (ERM), or a linear resonant actuator (LRA), a low profile haptic actuator, a haptic tape, or a haptic output device configured to output an electrostatic effect, such as an Electrostatic Friction (ESF) actuator. In

EX1001 ('067 Patent) at 4:25-33 (cited Reply, 4)



EX1039 at Fig. 3 (cited Reply, 4 and Sur-reply, 2-3)

Modarres

The embodiment shown in FIG. 3 also comprises a piezoelectric actuator **308**. The piezoelectric actuator **308** is substantially completely embedded in a polymer matrix **310**, such as silicone. The embedded actuator, **308** is coupled to the display **306**, such as to a frame of the display **306**, by a layer of adhesive **312**. When assembled, the embedded actuator **308** in combination with the adhesive layer **312** forms a seal between the touch-sensitive input device **304** and display **306**.

The adhesive layer **312** may be bonded along substantially an entire surface (e.g., the surface of polymer matrix **310** which is bonded to display **306**) or along multiple surfaces of the embedded actuator **308** (e.g., along one surface of polymer matrix **310** and a surface opposite that surface). Such an embodiment might be referred to as a "haptic tape." In some embodiments, a haptic tape may comprise a pre-applied adhesive covered by a protective layer, such as paper. When the haptic tape is installed, the protective layer removed, the haptic tape put into position, and thereafter held in place by the pre-applied adhesive.

EX1039 at 5:16-34 (cited Reply, 4, Sur-Reply, 2-3)

Immersion's Construction Limiting a Proxy Object to 'Contain Inside' a Haptic Device Excludes the Haptic Tape Embodiment

Patent Owner's Sur-Reply

interior of the device. The '067 Patent teaches that haptic tape is “integrated into a proxy object.” EX1001, 4:26-39. The unrelated patent also supports Immersion:

Paper No. 17 – Sur-Reply at 1

The '067 Patent

same or different type to output haptic effects. For example, haptic output device **118** may comprise one or more of, for example, a piezoelectric actuator, an electric motor, an electro-magnetic actuator, a voice coil, a shape memory alloy, an electroactive polymer, a solenoid, an eccentric rotating mass motor (ERM), or a linear resonant actuator (LRA), a low profile haptic actuator, a haptic tape, or a haptic output device configured to output an electrostatic effect, such as an Electrostatic Friction (ESF) actuator. In some embodiments, haptic output device **118** may comprise a plurality of actuators, for example a low profile haptic actuator, a piezoelectric actuator, and an LRA. Further, haptic output device **118** may be integrated into a proxy object or into the user's clothing or a wearable device.

EX1001 ('067 Patent) at 4:26-39 (cited Sur-reply, 1)

Immersion's Attempt to Rely on an Unentered Amendment Fails

Patent Owner's Response

actuator. EX1002, 280-88. Indeed, the intention of the Applicant to narrow the claim scope to only proxy objects with haptic output devices (e.g., actuators) inside of it is also reflected in a previous claim amendment (that was not entered). The Applicant had amended the “haptic output device” limitation of claim 1 as follows: “a haptic output device ~~mechanically coupled to~~ within the proxy object.” *Id.*, 258. Thus, a

Paper No. 12 - POR at 13

Patent Owner's Sur-Reply

Regarding the prosecution history, it is undisputed that applicants entered amendments clarifying the relationship between the proxy object and haptic output devices to distinguish art where the two structures were external and separate from each other. *See, e.g.*, EX1002, 287 (distinguishing Gonzalez because the proxy object with overlaid visual effects did not contain haptic output device, which was in separate glove without visual overlay). First, applicants claimed a proxy object

Paper No. 17 – Sur-Reply at 2

Meglan Tracks the Position of the Proxy Object as Well as the Trainee's Hands

Institution Decision

Based on the preliminary record, we disagree. Meglan discloses that the camera system tracks not just trainee 100's hands, but also the position and orientation of surrogate 20. Ex. 1012 ¶¶ 72–74, claims 1, 13 (“determine, based at least in part on the input video feed, a location of the surrogate and the at least one object,” e.g., “a hand of the user”). This appears to be necessary because the system provides a haptic effect, such as “the specific feel of [a simulated] pulse” only when trainee 100's hands contact the surface of surrogate 20. Ex. 1012 ¶ 90. The haptic effect is therefore based, at least in part, on the position of surrogate 20 as sensed from the camera feed, and whether the user's hands are in contact with that position.

Paper No.9 – Institution Decision at 25

Petitioner's Reply

[0074], [0090], claims 1, 13). Claim 1 of Meglan—which the Board cited—makes crystal clear that Meglan (i) uses a “*video feed*” to determine “*a location of the surrogate* and [] at least one object,” (ii) “detect[s] an interaction” between the surrogate and the object “*based at least in part on the determined location of the surrogate* and the at least one object,” and then (iii) “generate[s] a simulated hemodynamic consequence of the detected interaction,” *i.e.*, a haptic effect. EX1012, claim 1; *see also* claim 7 (“simulated blood flow based on...*the determined location of the surrogate...*”), claim 15 (similar to claim 1). Thus, the Board rightly concluded that Meglan's haptic effect is “based, at least in part, on the position of surrogate 20 as sensed from the camera feed, and *whether the user's hands are in contact with that position.*” DI, 25.

Paper No. 16 – Petitioner's Reply at 13-14

Immersion's Surreply Argument that Meglan Does Not Track the Position of the Surrogate to Determine a Haptic Effect Fails

Institution Decision

Based on the preliminary record, we disagree. Meglan discloses that the camera system tracks not just trainee 100's hands, but also the position and orientation of surrogate 20. Ex. 1012 ¶¶ 72–74, claims 1, 13 (“determine, based at least in part on the input video feed, a location of the surrogate and the at least one object,” e.g., “a hand of the user”). This appears to be necessary because the system provides a haptic effect, such as “the specific feel of [a simulated] pulse” only when trainee 100's hands contact the surface of surrogate 20. Ex. 1012 ¶ 90. The haptic effect is therefore based, at least in part, on the position of surrogate 20 as sensed from the camera feed, and whether the user's hands are in contact with that position.

Paper No.9 – Institution Decision at 25

Meglan

generator(s) 80 to exhibit the calculated simulated pulse. By combining the information from the load sensor 30 beneath the surrogate 20 with the finger location(s) detected by the camera system 50, the status of the injury, and the hemodynamic state, the specific feel of the pulse can be modified to reflect the strength of the trainee's pressing into the surrogate 20.

EX1012 (Meglan) at [0090] (cited Petition, 58)

Patent Owner's Sur-Reply

1. Meglan does not track the position of the surrogate “to determine a haptic effect.”

Although Valve argues that Immersion's argument is based on two “unfounded assertions,” its purported support for this only underscores Valve's own misrepresentations. The primary dispute concerns the surrogate at ¶90, because Valve relies on it for its central premise, i.e., its contention that Meglan teaches (1) tracking the position of the surrogate (2) “to determine a haptic effect.” Pet, 57-58; see also DI, 25; Reply, 12. But ¶90 makes no such disclosure. This is fatal to Valve's argument. *Infra*, IV.B.

Paper No. 17 – Sur-Reply at 15

whether the user's hands are in contact with that position.” DI, 25. None of these disclosures support that proposition. Meglan does not teach tracking the position of the surrogate for determining haptics; it discloses tracking the position of the surrogate for visual effects.

Paper No. 17 – Sur-Reply at 17

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

Guy (EX1017)

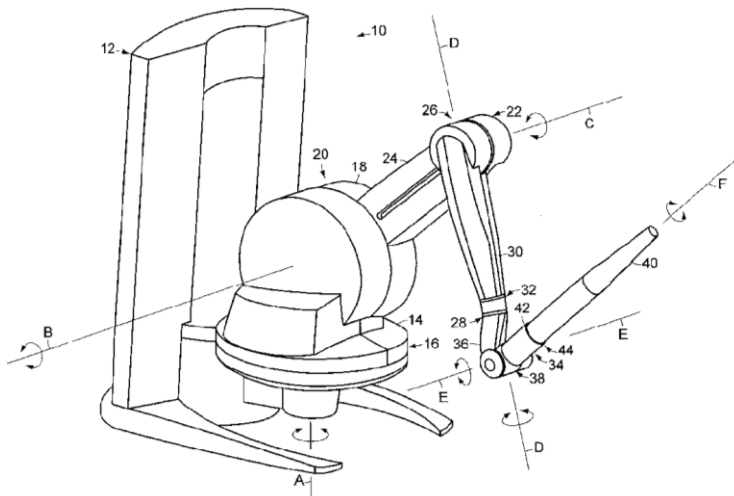
Patent No.: US 6,417,638 B1

* * *

FORCE REFLECTING HAPTIC INTERFACE

* * *

Assignee: **SensAble Technologies, Inc.**, Woburn,
MA (US)



EX1017 (Guy) at Cover (cited Petition, 25)

Massie (EX1018)

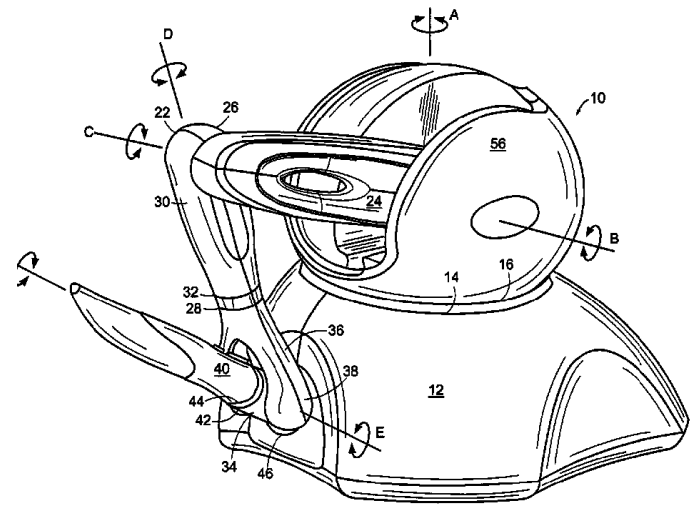
Patent No.: US 7,411,576 B2

* * *

FORCE REFLECTING HAPTIC INTERFACE

* * *

Assignee: **SensAble Technologies, Inc.**, Woburn,
MA (US)



EX1018 (Massie) at Cover (cited Petition, 25)

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

The Federal Circuit is Clear that a Genus Can Anticipate Each Member of a Limited Class

Patent Owner's Sur-Reply

rejected. *Google LLC*, 759 Fed. Appx. at 996-997. At best, Rogers discloses tracking “movement,” which is a genus that includes two species, tracking changes in position *and* orientation (rotation). A genus (movement) cannot anticipate a species (position). “It is well established that disclosure of a genus in the prior art is not

Paper No. 17 – Sur-Reply at 26 (citing *Wasica Fin. GmbH v. Cont’l Auto. Sys.*, 853 F.3d 1272, 1285 (Fed. Cir. 2017))

Wasica Finance GmbH v. Continental Auto. Systems



To be sure, we have recognized instances where a prior art genus may anticipate a later species, *see, e.g., Kennametal, Inc. v. Ingersoll Cutting Tool Co.*, 780 F.3d 1376, 1381-83 (Fed. Cir. 2015), but Continental has not shown how that situation exists here. For example, we have explained that a disclosed genus may anticipate a claimed species when the genus is so small that one of ordinary skill in the art would "at once envisage each member of this limited class." *AbbVie Inc. v. Mathilda & Terence Kennedy Inst. of Rheumatology Tr.*, 764 F.3d 1366, 1379 (Fed. Cir. 2014) (internal quotation marks omitted). But

Wasica, 853 F.3d at 1285 (cited Reply, 5)

The Federal Circuit is Clear that a Withdrawn Narrowing Amendment Does Not Limit the Scope of the Claim

Liebel-Flarsheim Co. v Medrad Inc.

The second reason for rejecting Medrad's argument is that the prosecution history of the '669 and ¶ 261 patents is squarely contrary to its contention that all the claims of those two patents require injectors that use pressure jackets. The applications that matured into the '669 and ¶ 261 patents derived from the '110 application. In the prosecution of each of those applications, the applicants replaced claims that had included references to a pressure jacket with a new set of claims, many of which did not include the pressure jacket limitation. The omission of reference to a pressure jacket in many of the claims of the applications that matured into the '669 and ¶ 261 patents is a strong indication that the applicants intended those claims to reach injectors that did not use pressure jackets. Moreover, in a paper filed during the prosecution of the ¶ 261 patent, the applicants clearly stated that "[i]n the claims as amended herein, the locking structure is not necessarily at the front end of the syringe, nor is there necessarily a pressure jacket."

Liebel-Flarsheim Co. v. Medrad, Inc., 358 F.3d 898 (2004)
(cited Reply, 5)



3M Innovative Properties Co. v Avery Dennison Corp

A broadening claim amendment made during the prosecution history of the ¶ 930 patent supports a plain-meaning construction of claim 1 without a sequential-embossment limitation. As filed in the original patent application, claim 1 was expressly limited to a "multiple sequentially embossed" web.³ In response to the examiner's § 112, ¶ 2 indefiniteness rejection, 3M amended claim 1 to claim a carrier web "that has a multiple embossed pattern having a first embossed pattern and a second embossed pattern," referring to definitions of "multiple embossed" and "embossed" that were in the specification at the time of the original patent application. The fact that 3M broadened its claims in response to an indefiniteness rejection and dropped the sequential limitation is perhaps unusual, but it is entirely permissible, and the plain language of the claim as issued must control. *Cf.* ¶ *Smith v. Snow*, 294 U.S. 1, 16, 55 S.Ct. 279, 79 L.Ed. 721 (1935) ("It is of no moment that in the course of the proceedings in the Patent Office the rejection of narrow claims was followed by the allowance of the broader claim 1."); ¶ *United States v. Teletronics, Inc.*, 857 F.2d 778, 782–83 (Fed.Cir.1988) (concluding that adding a limitation to a claim during prosecution and then removing it when the limitation failed to result in allowance of the claim over the prior *1373 art does not permit reading of limitation into claim when the claim issued without it).

3M Innovative Properties Co. v. Avery Dennison Corp.,
350 F.3d 1365 (2003) (cited Reply, 5)

The Position of the Stylus Relative to the Rest of the Haptic Device Impacts the Position of the Haptic Device Under the Plain Meaning of Position

Petitioner's Reply

As discussed in more detail *infra* pp. 22-24, “*position*” is a broad non-technical term, and the specification does not re-define or disavow the term’s full breadth. Plainly, determining the direction an object is pointing determines how that object is *positioned*, *i.e.*, arranged in space. EX1040, 1548 (“the manner in which a person or thing is placed; arrangement”); EX1041, 839 (similar); EX1042, 1374-75 (similar).

Paper No. 16 – Petitioner’s Reply at 21

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