

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

VALVE CORPORATION,
Petitioner,

v.

IMMERSION CORPORATION,
Patent Owner.

Case No. IPR2024-00478
Patent No. 9,430,042

PETITIONER'S REPLY TO PATENT OWNER RESPONSE

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1001	U.S. Patent No. 9,430,042
1002	Prosecution History of U.S. Patent No. 9,430,042
1003	Declaration of Jean Renard Ward
1004	CV of Jean Renard Ward
1005	U.S. Provisional Application No. 60/877,333
1006	European Patent No. 2126667
1007	U.S. Patent No. 6,636,197
1008	U.S. Patent Application Publication No. US 2006/0038781
1009	U.S. Patent No. 6,429,846
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1016	U.S. Patent No. 6,686,911
1017	U.S. Patent No. 6,917,867
1018	U.S. Patent Application Publication No. US 2007/0222765
1019	Plaintiff's Preliminary Infringement Contentions, <i>Immersion Corp. v. Valve Corp.</i> , 2:23-cv-00712 (W.D. Wash.) (served Oct. 20, 2023)
1020	Amended Joint Status Report and Discovery Plan, <i>Immersion Corp. v. Valve Corp.</i> , 2:23-cv-00712, Dkt No. 45 (W.D. Wash) (filed Nov. 2, 2023)
1021	Exhibit C to Plaintiff's Preliminary Infringement Contentions, <i>Immersion Corp. v. Valve Corp.</i> , 2:23-cv-00712 (W.D. Wash.) (served Oct. 20, 2023)

1022	International Application Publication Number WO 02/102616
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1024	U.S. Patent Application Publication No. US 2007/0120830
1025	U.S. Patent No. 6,157,372
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1032	Rosch, “Alternative Input--Digitizing Tablets-Pointing the Way to Easier Input,” PC Magazine p. 227 (Nov. 28, 1989)
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1035	U.S. Patent No. 4,202,041
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1037	U.S. Patent No. 5,903,229
1038	U.S. Patent Appl. 2006/0291666A1
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1040	U.S. Patent Appl. 2007/0222765A1
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1083	Federal Court Management Statistics (September 2023)
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1086	File History for European Patent No. 2126667
1087	Declaration of Dr. Robert Akl in <i>Immersion Corp. v. Valve Corp.</i> , 2:23-cv-00712 (W.D. Wash.) (March 29, 2024)

1088	Complaint for Patent Infringement in <i>Immersion Corp. v. Valve Corp.</i> , 2:23-cv-00712 (W.D. Wash.) (May 15, 2023)
1089	Transcript of December 18, 2024 Deposition of Robert Akl
1090	Reply Declaration of Jean Renard Ward
1091	WO 2001/024158A1
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1093	The New Oxford American Dictionary (2001)
1094	U.S. Patent Appl. Publ. No. 2006/0192760A1

I. INTRODUCTION¹

At institution, the Board found Rosenberg-I anticipatory. The Board was right, and Immersion's post-institution attempt to narrowly construe the claims to avoid Rosenberg-I's disclosure should be rejected as Immersion's construction has no support in the intrinsic evidence. Regardless, Rosenberg-I also anticipates the challenged claims even under Immersion's construction.

For Ichinose-Levin and Wang-Ichinose, the Board expressed skepticism as to the Petition's showing, but that skepticism was based on Immersion's mischaracterization of Levin and Wang as limited to assistive and resistive force feedback. Neither reference is limited to such forces, and Levin explicitly teaches the use of vibrational effects ("jolts") to simulate detents. On the fully developed record, Ichinose-Levin and Wang-Ichinose each renders the challenged claims unpatentable.

II. CLAIM INTERPRETATION

A. "*virtual detent*" and "*detent profile*"

Immersion suggests these terms need construction, but never says what its proposed constructions are.

¹ Emphasis added; claim language italicized.

For “*detent profile*,” Immersion seemingly agrees with Valve’s district-court position that “*detent profile*” is “computer code or actuator characteristics that represent a virtual detent,” *e.g.*, its duration and magnitude. Paper No. 14 (“POR”), 29; EX2003, 28.

For “*virtual detent*,” Immersion does not explicitly disagree with Valve’s district-court position that a “*virtual detent*” is “vibrotactile feedback that simulates a mechanical detent.” POR, 28; EX2003, 19. If there is a dispute, it is whether Rosenberg-I’s vibrotactile feedback “simulates a mechanical detent” because Immersion says such simulation requires a sense of *mechanical resistance* and Rosenberg-I allegedly lacks such simulated resistance. POR, 58-59.

As discussed *infra* Section VI.C, however, Rosenberg-I discloses the *same* vibrotactile feedback the ’042 patent identifies as a “*virtual detent*.” The Board therefore need not expressly construe “*virtual detent*” to resolve the parties’ dispute because however “*virtual detent*” is construed, Rosenberg-I discloses it. *Nidec Motor v. Zhongshan Broad Ocean Motor*, 868 F.3d 1013, 1017 (Fed. Cir. 2017).

B. “*a plurality of systems*”

Immersion’s construction is relevant to Ground 3, and Valve addresses it in Section VI.A.

III. THE “KNOB PRIOR ART” IS ANALOGOUS

Grounds 1-2 and 4 combine (i) references disclosing touchpads that provide haptic feedback using vibrations (Ichinose or Rosenberg-I) with (ii) a reference that uses haptic feedback to emulate the feel of mechanical detents—either Levin, Wang, or Goldenberg. Immersion refers to these latter references as “Knob Prior Art,” and argues they are non-analogous. POR, 18-25. Immersion is wrong.

Field of Endeavor. Immersion (at 21-22) says the field of endeavor is “providing virtual detents through vibrotactile feedback,” but this improperly limits the field “to the specific point of novelty.” *Unwired Planet v. Google Inc.*, 841 F.3d 995, 1001 (Fed. Cir. 2016); *Netflix, Inc. v. DivX*, 80 F.4th 1352, 1358-59 (Fed. Cir. 2023). The field-of-endeavor test is not limited to the particular subject matter recited in the claims, and is intended only to weed out art that is “*too remote*.” *In re Sovish*, 769 F.2d 738, 741 (Fed. Cir. 1985).

Using the correct legal framework,² the patent’s field of endeavor is providing haptic feedback to input devices. EX1090 (“Ward-Reply”), ¶¶14-21. This is how

² Immersion (at 21) cites *Wang Laboratories, Inc. v. Toshiba Corp.*, 993 F.2d 858 (Fed. Cir. 1993), but *Wang*’s relevance is questionable following *KSR*. *Wyers v. Master Lock*, 616 F.3d 1231, 1238 (Fed. Cir. 2010) (“[*KSR*] directs us to construe the scope of analogous art broadly.”).

the provisional application defines the field. EX1005, [001]. It is also how Immersion (and its expert) described the patent in district court. EX1088, ¶36; EX1087, ¶41. And it is consistent with Immersion’s POSA definition which is not limited to either vibrotactile feedback or virtual detents. POR, 27; EX2007, ¶¶30-31; Ward-Reply, ¶¶22-23.

Immersion focuses on the specification’s “Field of the Invention” (POR, 19-20), but fails to address other passages saying the invention includes haptic feedback *more generally*. EX1001, 2:58 (“Illustrative Devices for Enhanced *Haptic* Feedback”); 5:13-16 (“vibrotactile *or other haptic effects*”); 6:40-45 (same). The specification is not limited to the particular haptic effect recited in the claims. *In re Bigio*, 381 F.3d 1320, 1325-26 (Fed. Cir. 2004).

Immersion does not dispute that Levin, Wang, and Goldenberg relate to haptic feedback for input devices. POR, 26 (“Knob Prior Art solves a haptics-related problem”). This is notable because Levin was disclosed *by Immersion* to the Patent Office during prosecution and was identified by the Examiner as “*pertinent*.” EX1002, 406, 513. Immersion cannot credibly argue Levin is too remote when Immersion previously cited it, the Examiner highlighted it, and Immersion never objected to it as non-analogous. *Elektro Ltd. v. ZAP Surgical*, 81 F.4th 1368, 1375 (Fed. Cir. 2023).

Likewise, Goldenberg was cited by the EPO to reject claims of the European counterpart to the '042 patent³ and Immersion's European patent expressly identifies Goldenberg as a relevant reference. EX1086, 47-52; EX1006, [0005].

The presence of Levin and Goldenberg in the prosecution history of the '042 patent and its foreign counterpart confirms those references (and similar haptic-feedback references like Wang) are within the patent's field of endeavor. Ward-Reply, ¶¶18-19 (identifying additional haptic-feedback references cited during prosecution); *see also* Ward-Reply., ¶¶24-32; *Apple Inc. v. Samsung Elecs.*, 816 F.3d 788, 803 n.8 (Fed. Cir. 2016) (“[P]rior art listed in an [IDS] can be informative as to the field of endeavor.”).

Immersion tries to narrowly define the field of endeavor by mischaracterizing the teachings of Levin, Goldenberg, and Wang. But Immersion's attempt to make those references appear different from the '042 patent fails.

Immersion says Levin “provid[es] *mechanical detents* for physical input controls” (POR, 22), but Immersion elsewhere admits Levin and the Knob Prior Art “*mimic* the feel of a traditional mechanical detent” (POR, 2). Immersion also wrongly says Levin does not use vibrotactile effects to simulate detents—Levin does that. EX1016, 10:17-18 (“force detents can be simple jolts”); EX1003 (“Ward-

³ Levin was cited too. EX1086, 124-127, 161-163.

Opening”), ¶71 (“a jolt sensation is a vibrotactile sensation”); *infra* pp. 16-20. And Immersion’s suggestion that Levin’s “force feedback” is different from vibrotactile feedback (POR, 22) is wrong because Levin uses the term “force feedback” to refer to various “physical sensations” provided to a user, including vibrations. EX1016, 1:36-38, 10:11-21, 14:26-29; Ward-Reply, ¶¶34-37.

Immersion also says Wang is limited to “force feedback.” POR, 22. But Wang never even uses that phrase. Regardless, force feedback is a form of haptic feedback just like vibrotactile feedback is. EX1089, 11:24-12:9; EX1009, 1:33-35; Ward-Opening, ¶68. This is why Wang refers to its system as a “***haptic*** reconfigurable dashboard.” EX1022, Abstract. Wang is silent on the type of haptic feedback used and only explains that users “can feel a sense of touching or force through the haptic device.” *Id.* Wang leaves for POSAs to decide how to achieve “a sense of touching or force” with its device, and Wang does not exclude using vibrations to do so. Ward-Reply, ¶¶38-41.

Finally, although Immersion now says Goldenberg is not concerned with a “***virtual device***” (POR, 23 (emphasis original)), Immersion’s European patent says Goldenberg discloses “providing haptic feedback ***simulating*** detents,” *i.e.*, virtualizing detents. EX1006, [0005]. What Immersion said before is correct. Ward-Reply, ¶¶42-43.

Reasonably Pertinent. Because the Knob Prior Art is within the field of endeavor, the Board need not determine whether the references are reasonably pertinent to a problem the patent addressed. *In re Asset Guard Prods., Inc.*, 2022 WL 1097363, *4 (Fed. Cir. 2022). Regardless, the Knob Prior Art is pertinent.

The '042 patent says a drawback to replacing mechanical input devices with electronic versions is that the latter are less intuitive to use because they lack “a sense of mechanical resistance.” EX1001, 1:30-37; POR, 6. The patent is thus directed to “simulating the experience of physical input devices.” POR, 2; Ward-Reply, ¶48.

The Knob Prior Art is directed to that same problem and solution as each uses haptic feedback to simulate traditional mechanical feedback. EX1016, Abstract, 1:36-54, 10:57-60, 11:54-56; EX1007, Abstract, 1:59-2:3; EX1022, Abstract, 1:8-2:2, 6:22-26, 8:6-31, 16:30-17:2; Ward-Reply, ¶¶49-53.

Immersion downplays the Knob Prior Art’s pertinence by noting each describes outputting forces on knobs, not touchpads. POR, 24-26. But the '042 patent primarily describes outputting forces on knobs (EX1001, 2:39-55, 3:40-42, 10:55-64, 13:37-46, FIGS. 9A-9H), and only briefly mentions touchpads (EX1001, 3:40-47, 6:21-25, 8:20-21). Ward-Reply, ¶¶44-45, 54.

IV. GROUND 1: ICHINOSE+LEVIN

Ichinose discloses a steering wheel with a touchpad. EX1015, FIG. 1A. Drivers use the touchpad to select vehicle-system functions (*e.g.*, volume) shown on

a dashboard display. *Id.*, 2:22-3:9; FIGS. 2A-2B. Ichinose teaches a “feedback device” that outputs vibrations when “the user taps the touchpad [] to select a function,” and Ichinose explains “variations of the feedback device [] are anticipated.” *Id.*, 4:24-34. Immersion disputes **none** of this.

In the same automobile context as Ichinose, Levin describes forces an actuator outputs onto knobs used to control a car’s systems. Levin’s forces beneficially allow drivers to “select” system settings “based purely on tactile feel, so that the driver need not look at the [dashboard] display.” EX1016, 8:17-21. Levin’s forces include “force detents” that can be “simple jolts” that, *e.g.*, “correspond to a particular radio station frequency” selected. *Id.*, 10:17-24. As Mr. Ward explained, POSAs would have been motivated to incorporate Levin’s jolt-based detents in Ichinose’s system because, *inter alia*, Levin says such haptic feedback allows drivers to know system settings have been selected without unnecessary distraction. Ward-Opening, ¶117.

Immersion’s response to Ichinose-Levin is to mischaracterize Levin’s disclosure. According to Immersion, Levin **only** discloses assistive or resistive force feedback, and Immersion argues assistive/resistive forces cannot be used with touchpads. POR, 39-40.

Immersion’s argument limits Levin to one particular teaching, but Levin must be “read for **all** that it teaches.” *In re Mouttet*, 686 F.3d 1322, 1331 (Fed. Cir. 2012). As discussed below, Levin teaches vibrotactile “jolts” that simulate mechanical

detents, and it was this teaching—not Levin’s assistive/resistive teachings—upon which Ichinose-Levin was built.

A. Levin’s “Jolts” are Vibrotactile Effects.

Immersion argues Ichinose-Levin lacks a “*virtual detent*” because neither Ichinose nor Levin discloses simulating mechanical detents using vibrotactile feedback. POR, 39. This is wrong.

Levin is *explicit* that its “force *detents* can be simple jolts.” EX1016, 10:14-18. As Levin explains, “a detent force (e.g., jolt) is output to indicate how much a particular value has been changed. For example, a jolt can be output for each 10 MHz of [radio] frequency that is increased.” *Id.*, 7:65-8:2. Levin straightforwardly teaches the use of “jolts” to simulate the feel of a mechanical detent, *e.g.*, the detent (click-sensation) felt when adjusting the radio station with a mechanical knob. As Mr. Ward explained, Levin’s “jolts” are vibrational effects. Ward-Opening, ¶¶71, 120-121.

Immersion argues Levin’s “jolts are a *force feedback* effect—not vibrational.” POR, 41. For support, Immersion relies on Levin’s characterization of jolts as a form of “force feedback,” and argues “force feedback” is limited to assistive/resistive forces. *Id.* But Immersion mischaracterizes Levin.

Levin uses the term “force feedback” as a *generic* term for “physical sensations” felt by users moving Levin’s knob/slider. EX1016, 1:37-38, *see also*

10:11-12; Ward-Reply, ¶37. Force feedback effects, Levin explains, can take *many* forms including “damping forces, texture forces, *jolts*, obstruction forces, assistive forces, periodic forces such as *vibration* forces, and end-of-travel forces.” *Id.*, 14:26-29; *see also* 7:12-14, 29:15-18. Levin plainly uses “force feedback” generically to refer to both assistive/resistive forces (*e.g.*, obstruction/assistive forces) and vibrational forces (*e.g.*, jolts, vibrations). Ward-Reply, ¶¶74-77.

Immersion baldly says Levin “does not disclose that jolts are vibrations.” POR, 41. But POSAs understood jolts are vibrations of short duration. Mr. Ward addressed this exact issue in his opening declaration. Ward-Opening, ¶71 (“POSITA would also know from prior-art teachings that a jolt sensation is a vibrotactile sensation”); ¶121 (“Levin’s ‘jolt’ detent force is a form of vibrotactile effect”; “a ‘jolt’ could be produced by a short single vibration of particular magnitude...”). Mr. Ward *corroborated* his testimony with several prior-art references teaching that jolts are vibrotactile effects. Ward-Opening, ¶71 (citing, *e.g.*, EX1060 (“tactile sensations include vibrations, for example, jolts...”); EX1059 (“vibrotactile effects may also be implemented, such as a jolt...”)).

Immersion, in contrast, provides attorney argument to support its contention that Levin’s jolts are not vibrations. POR, 41. And while Immersion’s expert repeats—verbatim—Immersion’s contention (EX2007, ¶105), Dr. Akl’s

uncorroborated testimony should be given little weight. *Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 12 at 5 (Feb. 10, 2023).

Rosenberg-I—an Immersion reference—further confirms Mr. Ward’s testimony as it describes “a jolt or ‘pulse,’” in the context of *vibrational touchpads*, as “a single impulse of force that quickly rises to the desired magnitude and then is turned off or quickly decays back to zero or small magnitude.” EX1009, 11:29-33. A jolt/pulse is simply a short vibration. Ward-Reply, ¶¶79-80.

Rosenberg-I’s disclosure and Mr. Ward’s testimony are also consistent with the ’042 Patent *itself*, which says a “virtual detent may comprise a simulated click generated through *a single pulse*,” *i.e.*, jolt. EX1001, 6:16-17; EX1009, 8:58 (“pulses (jolts)”); 11:3 (“jolts or pulses”); Ward-Reply, ¶81. Likewise, the provisional application *explicitly* identifies “a jolt” as an example of “a virtual detent.” EX1005, [0012]; Ward-Reply, ¶81. If further proof is needed, Mr. Ward’s reply declaration identifies additional references *assigned to Immersion* that confirm jolts are vibrotactile effects suitable for vibrotactile devices like Ichinose’s touchpad. Ward-Reply, ¶¶82-84.

Citing a different passage in Levin, Immersion argues “Levin merely describes jolts as a kind of force feedback detent.” POR, 41 (citing EX1016, 11:62-63). But this argument mischaracterizes the cited Levin disclosure which says jolts are an “[a]lternative[]” to an “obstruction force,” *i.e.*, resistive force. EX1016,

11:54-67. The cited disclosure thus *directly contradicts* Immersion’s contention that Levin’s jolts and assistive/resistive forces are the same. Ward-Reply, ¶¶86-88.

Immersion argues Levin only uses vibrations/jolts to augment assistive/resistive detents. POR, 10-11, 42. This argument again ignores Levin’s disclosure that detents can be “simple jolts,” *i.e.*, on their own without any assistive/resistive forces. EX1016, 10:14-18; Ward-Reply, ¶89.

Immersion notes the Petition cited Levin’s Figure 6A. POR, 40-41. That figure depicts a “detent profile” for simulating detents using assistive/resistive forces. EX1016, 14:30-15:2. But the Petition cited Figure 6A as an *example* of the data included in a “*detent profile*,” *i.e.*, magnitude/duration of force to be output. Pet., 12-13, 19; Ward-Opening, ¶¶114-115, 135-138; EX1016, 14:35-39.

The Petition never said POSAs would bodily incorporate the resistive/assistive detent profile in Figure 6A into Ichinose’s system. Instead, the Petition pointed to Figure 6A as an example of the data that could be used to cause an actuator to output successive jolts to generate the “clicks” felt when sliding virtual sliders. Pet., 20. The Petition also explained a “similar” profile would be used when only a single jolt was generated to simulate a click and that such a jolt-based “*detent profile*” would “include[] at least the magnitude of the vibration that the actuator would need to output to simulate [a] ‘click.’” Pet., 20.

Once Immersion’s mischaracterization of Levin is rejected, Immersion’s remaining arguments against the combination fall apart. For example, Immersion contends Ichinose’s vibrations do not mimic a mechanical detent. POR, 42. True or not, the issue is whether Ichinose’s vibrations do so in the Ichinose-Levin *combination*, and the Petition established the vibrations in the combination would be Levin’s vibrational *jolts* used to, *e.g.*, simulate the “click”-type detent that one experiences when pressing a button or moving a slider. Pet., 13-21.⁴

B. The Petition Established a Motivation to Combine.

The Petition established two reasons motivating POSAs to implement Levin’s jolt-based detents in Ichinose—the references explicitly motivate the combination, and the combination is the use of a known technique to improve similar systems. Pet., 13-14. The Petition then discussed three beneficial uses of Levin’s jolt-based detents in Ichinose’s system. Pet., 14-17.

Immersion’s challenge to the Petition’s motivation-to-combine showing rests on its mischaracterization of Levin. In short, Immersion argues POSAs would not

⁴ Immersion’s arguments that Ichinose-Levin does not disclose “*a detent profile*” or “*generating a vibrotactile signal*,” depend on Immersion’s incorrect contention that the combination does not disclose “*a virtual detent*.” POR, 43-44.

have used Levin’s resistive/assistive forces with Ichinose’s touchpad because Levin’s forces “require 3-dimensional input devices such as knobs.” POR, 44.

Immersion’s argument fails once Levin is correctly read to disclose the use of simple vibrational jolts to simulate detents. *Supra* Section IV.A. There should be no dispute that vibrational jolts do not “require 3-dimensional knobs” (POR, 45), and would be suitable for use in vibrational touchpads like Ichinose’s touchpad. Ward-Opening, ¶¶126-127; Ward-Reply, ¶93.

Immersion repeatedly notes that Levin discloses “rotary and linear forces,” and suggests those forces would not be used with touchpads. POR, 44-45. But two of the Petition’s use cases for the Ichinose-Levin combination do not require linear or rotary forces—they require simply outputting a “detent force (e.g. jolt)” each time a user taps an icon to select or change a function. Pet., 15-16. In these use cases, the jolt simulates the detent felt when clicking a mechanical button. POR, 29 (“click[] felt when...pushing a button” is a virtual detent). Immersion’s focus on “rotary and linear” forces is irrelevant for these use cases.

The one use case relying on linear forces implements Ichinose using virtual sliders rather than buttons to adjust, *e.g.*, the radio. Pet., 16. Immersion does not dispute that such an implementation would have been obvious. Once Ichinose is implemented to include virtual sliders, the use of linear “force detents” to indicate, *e.g.*, each successively selected radio station is a straightforward application of

Levin’s disclosure of using such detents with a physical slider for that same purpose. Ward-Opening, ¶124; EX1016, 7:7-31.

Immersion also argues there is “no evidence that implementing rotary and linear forces in 2-dimensional touchscreens were ‘known techniques.’” POR, 45. Yet, Levin confirms producing vibrational jolts on input devices was *a known technique* for simulating a detent. That Levin did not produce its jolts on a touchpad is irrelevant because Ground 1 was premised on applying Levin’s known technique “to a piece of prior art ready for the improvement,” *i.e.*, Ichinose and *its* vibrational touchpad. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 417 (2007).

Finally, Immersion argues hindsight motivates the combination because only the ’042 patent suggests it would be beneficial to simulate detents using vibrotactile feedback. POR, 46-47. But Levin teaches the benefits to simulating detents—*e.g.*, they allow drivers to feel when system changes occur—and Levin simulates such detents using vibrational jolts. EX1016, 10:17-24. There is no hindsight.

C. The Petition Established a Reasonable Expectation of Success.

Immersion argues the Petition did not establish a reasonable expectation of success (POR, 47-48), but that argument depends (again) on limiting Levin to resistive/assistive forces. Immersion does not dispute POSAs would know how to produce vibrational jolts on touchpads, which is all Ichinose-Levin requires. Indeed, the ’042 patent provides *no* details on how it produces vibrations on touchpads to

simulate detents, and assumes (correctly) POSAs would know how to do so based on its teachings regarding vibrations on knobs. EX1001, 13:37-14:57; FIGS. 9A-9H; *In re Epstein*, 32 F.3d 1559, 1568 (Fed. Cir. 1994). That Rosenberg-I discloses touchpads that vibrate to simulate detents (*infra* Section VI), further confirms such functionality was within POSAs' capabilities. Ward-Reply, ¶93.

Immersion also suggests Levin's actuators are not compatible with Ichinose's touchpad. POR, 48. The combination, however, uses *Ichinose's* vibrotactile actuator. Pet., 30. Regardless, Levin uses the same actuators as the patent. *Compare* EX1016, 10:2-5 *with* EX1001, 6:32-37.

V. GROUND 2: WANG+ICHINOSE

Wang discloses systems for manipulating virtual knobs and sliders using a "haptic device" that outputs a "force effect" so a driver "can feel a sense of touching or force" when manipulating the virtual controls. EX1022, Abstract, FIG. 4. Wang's force effects include emulated detents. EX1022, 7:18-22, 8:29-31, 16:22-24, 16:30-17:2.

The Petition relied on Wang's Figure 4 embodiment (below) where the haptic device is on a steering wheel and controls a cursor on a display. Pet., 32-33. The Petition established using Ichinose's touchpad as the haptic device emulating detents would have been obvious. Pet., 34-35.

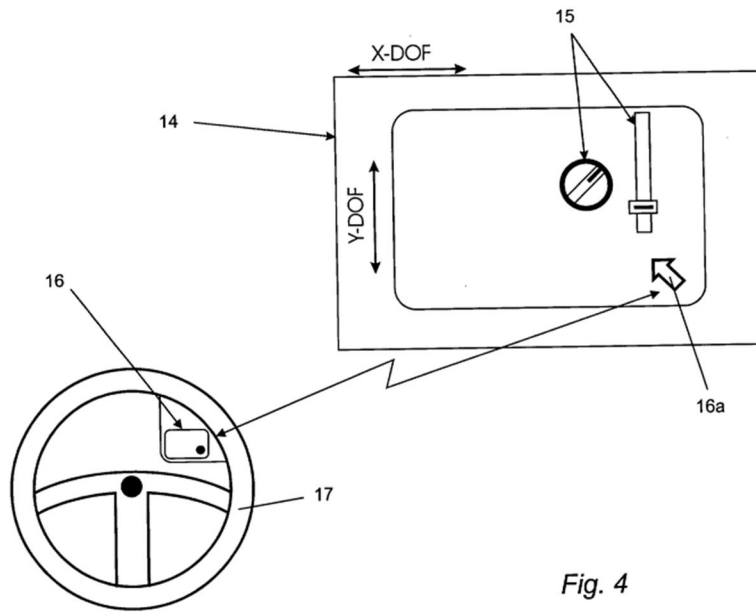


Fig. 4

Immersion argues (i) Wang’s emulated detents are assistive/resistive forces, not vibrotactile forces, and (ii) POSAs would not use such forces in a touchpad. POR, 49-51. Immersion’s arguments fail to consider Wang for all it teaches.

A. Immersion Unjustifiably Limits Wang’s Teachings

Immersion limits Wang’s teachings to “non-vibratory rotational and linear force feedback.” POR, 49-50. But Wang’s teachings are broader.

Wang is directed to a “***haptic*** device” with an actuator that causes users to “feel a sense of touching or force” when manipulating a virtual knob/slider. EX1022, Abstract. That broad teaching sweeps in all forms of haptic feedback, and haptic feedback unquestionably ***includes*** vibrotactile feedback. EX1089, 11:24-12:9; Ward-Reply, ¶¶94-97.

Immersion limits Wang to assistive/resistive forces because Wang's Figures 2 and 3 depict the haptic device as a physical lever/knob. POR, 12-13, 50. But the Petition relied on Wang's **Figure 4** embodiment—where the haptic device is located on a steering wheel—and argued POSAs had reason to implement that embodiment using Ichinose's **vibrating** touchpad as the haptic device. Pet., 34-35. Whether the haptic device used in Wang's Figures 2 and 3 is limited to assistive/resistive forces is immaterial to whether the haptic device in the Wang-Ichinose **combination**—*i.e.*, Ichinose's vibrating touchpad—is so limited.⁵

Immersion's argument (at 49) that “the alleged combination only teaches force feedback” is not correct given (i) Wang's broad haptic-feedback teachings and (ii) Ichinose's specific vibrotactile-feedback teachings. Immersion's argument attacks Wang and Ichinose **individually**, but the salient question is what the proposed **combination** teaches. *Mouttet*, 686 F.3d at 1332-33. In the combination, the references' teachings are combined to yield a system where Ichinose's touchpad vibrates to “emulate” the detents that Wang teaches are beneficial when controlling its virtual slider or knob. Pet., 34-39.

⁵ Immersion has not disputed using haptic touchpads on steering wheels was conventional. Ward-Opening, ¶¶215-220.

Similar to Immersion, the Board said at institution that “neither [Wang nor Ichinose] appears to disclose using vibrotactile signals to emulate a detent.” Paper No. 11 (“DI”), 32. Respectfully, however, “[t]hat the proposed combination[]—rather than one of the individual references—discloses the disputed claim limitations does not defeat” obviousness. *Fleming v. Cirrus Design Corp.*, 28 F.4th 1214, 1222 (Fed. Cir. 2022). Put simply, (i) Wang teaches emulating detents with haptic feedback, and (ii) Ichinose discloses a particular form of haptic feedback (vibrotactile) that POSAs had reason to implement in Wang’s system. Nothing more is needed to establish obviousness.

B. The Petition’s Motivation-to-Combine and Reasonable-Expectation-of-Success Theories Are Well-Supported.

Immersion challenges the Petition’s motion-to-combine and reasonable-expectation-of-success theories. POR, 50-52. Immersion’s arguments, however, are premised on limiting Wang to assistive/resistive feedback, which is improper. Once Immersion’s mischaracterization of Wang is rejected, Immersion’s challenges to the Petition’s motivation-to-combine and reasonable-expectation-of-success theories fail.

VI. GROUND 3: ROSENBERG-I

Rosenberg-I discloses touchpads that output haptic sensations, *e.g.*, vibrations, to simulate detents. At institution, the Board found a reasonable likelihood that Rosenberg-I anticipates. DI, 18-27. The Board was correct, and

Immersion’s post-institution attempt to narrowly interpret the claims to avoid Rosenberg-I’s disclosure should be rejected.

A. Immersion’s “Clarifying Construction” is Improper.

The claims recite a touchpad “*configured to control a plurality of systems.*” Immersion argues “*a plurality of systems*” should be construed to mean: “a plurality of systems, *where each system to be manipulated provides context for virtual detents.*” POR, 31. As the added emphasis highlights, Immersion is not construing any word in the claim, it is merely adding narrowing language to it. Immersion’s construction should be rejected.

To start, although not explicit in its construction, Immersion argues the word “*systems*” includes both physical systems (*e.g.*, computers) **and** software applications. POR, 35. For this proceeding, Valve does not disagree as Rosenberg-I anticipates under that construction.

Valve **disagrees**, however, with Immersion’s proposal to limit “*systems*” to those that “provide[] context for virtual detents.” Although vaguely worded, Immersion essentially seeks to require that “*virtual detents*” and their corresponding “*detent profiles*” be system-specific (or application-specific). POR, 55 (“per-application basis”).

Immersion advanced a similar argument pre-institution, arguing the claims required each system to have a unique “*detent profile.*” POPR, 49-51. The Board

rejected that argument because the claim only requires a “*detent profile*” be “*associated*” with one system and a common profile “*associated*” with ***all*** systems is also associated with “*one of the systems.*” DI, 24-25. Similar reasoning compels rejection of Immersion’s new attempt at narrowing the claims—***nothing*** in the claim’s language limits the claims to system-specific or application-specific “*detent profiles.*” Ward-Reply, ¶¶56-60.

Turning to the specification, Immersion relies on this passage: “The processor 206 can be configured to determine a specific detent signal to generate. The **detent signal may be based at least in part on the system which is actively being controlled.**” POR, 34-35 (emphasis original) (quoting EX1001, 8:38-46). The use of the word “***may***” in the emphasized sentence, however, means that a system-specific detent signal is an ***optional*** implementation. Ward-Reply, ¶61.

Indeed, the specification earlier describes “processor 206” as generating a “detent signal” based ***only*** on the input signal it receives from the input device, *e.g.*, when “the input signal indicates a rotation of a knob in more than 5 degrees of motion.” EX1001, 7:66-8:4. In this embodiment, the system being controlled does not dictate what detent signal is generated. Ward-Reply, ¶¶62-63.

The specification repeatedly describes embodiments where the processor generates detent signals (triggering virtual detents) based on the input signal ***alone***. EX1001, 4:50-60; 11:39-49; 12:33-38; FIGS. 5-6; Ward-Reply, ¶¶64-67. Requiring

that the system(s) being controlled “provide context for virtual detents,” impermissibly reads these system-agnostic embodiments out of the claims.⁶ *Google v. EcoFactor, Inc.*, 92 F.4th 1049, 1058 (Fed. Cir. 2024).

Immersion (at 35) also points to a passage saying the processor “*may*” process software and “utilize the input signal in the context of the software code to generate signals configured to cause virtual detents.” EX1001, 4:30-34. Again, the word “*may*” confirms this is not a requirement of all embodiments, much less the claims.

As for the prosecution history, Immersion cites the Board’s summary of the patent (POR, 37), but ignores the Board’s description of claim 1, a description consistent with the claim’s plain meaning. EX1002, 590. Immersion likewise quotes the applicant’s description of claim 1 (POR, 38), but that description only says the claim encompasses system-specific detent profiles. There is no dispute the claim encompasses such systems—the dispute is whether the claim should be limited to such systems and nothing in the intrinsic record suggests it should. Finally, the

⁶ The claims do require “*a detent profile be **associated with** one of the systems,*” but the Board correctly observed that such language does not require a “unique association.” DI, 25. That is, “*a detent profile*” generated, *e.g.*, whenever a knob is turned 5 degrees, could be used with, *i.e.*, “*associated with,*” all the systems even though the profile is agnostic to the particular system with which it is used.

Board’s reversal of the Examiner’s rejection is irrelevant as the Board was focused on the Examiner’s use of hindsight, not the claims’ breadth. EX1002, 590-591.

B. Rosenberg-I Discloses “*A Plurality of Systems*” Regardless of How the Term Is Construed.

Immersion confusingly offers the “clarifying construction” discussed above, while also arguing Rosenberg-I does not anticipate because the plain meaning of “*a plurality of systems*” would not encompass a single computer running multiple applications. POR, 52-53. Valve does not disagree—if the Board explicitly construes the claims to exclude a single computer running multiple applications, then Rosenberg-I does not anticipate.

Immersion, however, does not contend its plain-meaning construction is right. It instead argues that, when read in view of the intrinsic evidence, (1) “*systems*” includes applications, and (2) those applications must provide “context for virtual detents.” POR, 29-38. Valve agrees with (1) for purposes of this proceeding, but not (2), and Immersion does not dispute that Rosenberg-I discloses “*a plurality of systems*” if (1) is adopted, but (2) is not.

Yet, even if the Board agrees with Immersion on ***both*** (1) and (2), Rosenberg-I still anticipates because the applications running on Rosenberg-I’s computer provide context for Rosenberg-I’s virtual detents. Rosenberg-I is explicit that the “***application***” running on the computer “utilizes the input from the touchpad 16 and ***outputs force feedback commands to the touchpad.***” EX1009, 6:16-18. That is,

Rosenberg-I's applications determine what vibrotactile feedback the touchpad outputs, and the feedback is thus *application-specific*. EX1089, 19:11-23 (agreeing applications having "code that would trigger...a virtual detent" meet the claim); EX2007, ¶38; Ward-Reply, ¶¶99-101.

As Rosenberg-I explains, its computer displays a "graphical environment...based on application programs...that are running" on the computer. EX1009, 3:46-48; FIG. 1. The applications then "display[] graphical images" within that environment (EX1009, 6:7-9), and the user's interaction with those images is what causes *the application* to output force commands to the touchpad to generate vibrotactile feedback like a pulse (EX1009, 6:16-18, 13:6-21). Ward-Reply, ¶¶102-104; EX2007, ¶83 ("haptic sensations are associated with user interaction with interface elements"); EX1009, 13:18-20 (explaining a "developer" can "associate particular graphical objects with customized haptic sensations"). Rosenberg-I even details different types of force commands associated with different types of applications. EX1009, 12:27-49; 13:23-66; Ward-Reply, ¶105.

Immersion (at 56) says "Rosenberg separately teaches tactile sensations and software applications without describing any relationship between them," but that is inconsistent with Rosenberg-I's text. Rosenberg-I's "applications and force commands" are not "untethered components" (POR, 57), they are tied together because the application determines what force command is provided to the touchpad.

Accordingly, even if the claims are incorrectly construed to require application-specific “*virtual detents*,” Rosenberg-I still anticipates.

C. Rosenberg-I Discloses a “*Virtual Detent*.”

The Petition mapped the claimed “*virtual detent[s]*” to vibrational pulses Rosenberg-I outputs to indicate, *e.g.*, discrete settings in an adjustable range like volume. Pet., 53-54. Immersion does not dispute Rosenberg-I’s “pulse” is a “*vibrotactile effect*,” but contends the effect does not comprise a “*virtual detent*” because Rosenberg-I never says the pulse simulates “mechanical resistance.” POR, 58-59. Immersion’s argument is incompatible with the ’042 patent and Rosenberg-I.

The ’042 patent teaches a simple vibrational “pulse”—by itself—is a “*virtual detent*.” EX1001, 6:16-17. The patent does not suggest its pulse is unique or somehow simulates “mechanical resistance” differently than any other vibrational pulse would. Rosenberg-I’s vibrational pulse is no different than the patent’s pulse and therefore Rosenberg-I’s vibrational pulse is a “*virtual detent*.” EX1009, 11:29-34; Ward-Opening, ¶305; Ward-Reply, ¶107.

Immersion argues Rosenberg-I never says its pulses “simulate mechanical resistance.” POR, 58. But the ’042 patent also never says its pulse simulates mechanical resistance. EX1001, 6:16-17. Regardless, Rosenberg-I *explicitly* teaches its “pulse[s]” provide the “physical confirmation” users expects to feel when,

e.g., “pressing a physical button,” *i.e.*, mechanical resistance. EX1009, 13:41-54; Ward-Reply, ¶¶108-109.

Immersion (at 58) says Rosenberg-I’s pulses indicate “locations within a range,” and argues such information is unrelated to detents. But the ’042 patent teaches that “detent[s]” are used to divide a range “into discrete increments.” EX1001, 1:38-41. That is what Rosenberg-I’s pulses do—*e.g.*, they indicate discrete volume settings within a range of volume or discrete items in a menu being scrolled.⁷ Ward-Opening, ¶306; Ward-Reply, ¶¶110-111. In other words, Rosenberg-I’s pulses simulate the “click” or “tick” sensation that traditional detents provide when mechanical knobs are used to scroll through a range of settings. Ward-Opening, ¶306.

Immersion (at 59) says Rosenberg-I’s teaching that the strength/frequency of a vibration/pulse can be varied to indicate the magnitude of a change (*e.g.*, increase in volume) is not a “*virtual detent*.” But Immersion does not dispute Mr. Ward’s testimony that Rosenberg-I’s effect aligns with the “hill *virtual detent*” identified in

⁷ Immersion (at 58) implies Rosenberg-I’s “ticks” are different than its “pulses,” but Rosenberg-I’s pulses indicate the location of Rosenberg-I’s “ticks” which themselves merely indicate discrete settings within a range. EX1009, 12:56-58; Ward-Reply, ¶110 n.8.

the patent. Ward-Opening, ¶308. Immersion only says Rosenberg-I does not explain how its variable-vibration effect “is used” (POR, 59), but Rosenberg-I uses the effect when adjusting “volume” and Mr. Ward explained POSAs would understand Rosenberg-I to mean that as the volume increases the vibration increases. Ward-Opening, ¶308. This is what the patent’s “hill virtual detent” does if used when adjusting volume. EX1001, 13:63-14:5.

Finally, Immersion’s contention (at 59) that Rosenberg-I’s pulses are “generic” is simply wrong. As shown above, Rosenberg-I’s pulses are used to provide haptic feedback to users, and the pulses are used in specific *detent*-related scenarios like scrolling through a list of menu items or adjusting volume.

D. Rosenberg-I Discloses a “*Detent Profile*.”

Immersion (at 59-60) contends Rosenberg-I does not disclose a “*detent profile*,” but its argument rests on its contention that Rosenberg-I does not disclose a “*virtual detent*.” Once that argument is rejected, Immersion’s “*detent profile*” argument collapses.

Immersion argues Rosenberg-II (which Rosenberg-I incorporates) only discloses “*profiles*” for non-vibrational feedback. POR, 60. But Immersion never disputes the Petition’s showing that POSAs would have understood Rosenberg-I to teach that its *vibrational* “pulses” are generated using “*profiles*” (like Rosenberg-II’s) comprising haptic data, and such data for a “pulse” would be a sequence of

command parameters representing a *vibrational* force to be applied by the actuator. Pet., 54-56. And even if (somehow) Rosenberg-I was not anticipatory, Immersion does not even try to rebut the Petition’s obviousness showing. Pet., 55.

Immersion (at 60) faults the Petition for using the phrase “would have” when describing Rosenberg-I. But the Petition was explaining how POSAs “would have” understood Rosenberg-I’s teachings. That is proper for anticipation, and certainly proper for the Petition’s alternative obviousness argument. *Google Inc. v. Intellectual Ventures II*, 701 F. App’x 946, 953 (Fed. Cir. 2017).

VII. GROUND 4: ROSENBERG-I+GOLDENBERG

The Petition advanced Ground 4 as an alternate if Immersion argued Rosenberg-II’s “force profiles” were not incorporated into (or obvious to use in) Rosenberg-I. Pet., 66-67. Because Immersion has not made this argument or otherwise disputed that Rosenberg-I uses “*profiles*” of haptic data to control its actuator, Ground 4 is not relevant.

VIII. CONCLUSION

Claims 1-19 are unpatentable.

Respectfully submitted,
Valve Corp.

Date: 01-17-2025

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CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. § 42.24, the undersigned certifies that the foregoing **PETITIONER'S REPLY TO PATENT OWNER RESPONSE** contains 5,593 words excluding; a table of contents, a table of authorities, a certificate of service or word count, or appendix of exhibits or claim listing. Petitioner has relied on the word count feature of the word processing system used to create this paper in making this certification.

Date: January 17, 2025

/MacAulay Rush/

MacAulay Rush

Paralegal

WOLF, GREENFIELD & SACKS, P.C.

CERTIFICATE OF SERVICE UNDER 37 C.F.R. § 42.6 (e)(4)

I certify that on January 16, 2025, I will cause a copy of the foregoing document, including any exhibits filed therewith, to be served via electronic mail, as previously consented to by Patent Owner, upon the following:

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