

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

VALVE CORPORATION.
Petitioner,

v.

IMMERSION CORPORATION
Patent Owner.

Case No. IPR2024-00714
Patent No. 10,627,907

PETITIONER'S REPLY TO PATENT OWNER RESPONSE

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LISTING OF EXHIBITS

Exhibit	Description
1001	U.S. Patent No. 10,627,907
1002	Prosecution History of U.S. Patent No. 10,627,907
1003	Declaration of Jean Renard Ward
1004	CV of Jean Renard Ward
1005	U.S. Patent Application Publication No. 2008/0055244 (“Cruz-Hernandez”)
1006	U.S. Patent Application Publication No. 2007/0152988 (“Levin”)
1007	U.S. Patent Application Publication No. 2013/0147610
1008	U.S. Patent Application Publication No. 2001/0008849
1009	Proof of Service in <i>Immersion Corp. v. Valve Corp.</i> , 2:23-cv-00712
1010	Defendant Valve’s Motion to Stay Pending <i>Inter Partes</i> Review, <i>Immersion Corp. v. Valve Corp.</i> , 2:23-cv-00712 (W.D. Wash.)
1011	Federal Court Management Statistics (September 2023)
1012	U.S. Patent Application Publication No. 2006/0142657
1013	<i>Immersion Corp. v. Valve Corp.</i> , 2:23-cv-00712, Dkt. No. 1 (Complaint) (W.D. Wash.) (filed Oct. 20, 2023)
1014	Plaintiff’s Preliminary Infringement Contentions, <i>Immersion Corp. v. Valve Corp.</i> , 2:23-cv-00712 (W.D. Wash.) (served Oct. 20, 2023)
1015	Exhibit E to Plaintiff’s Preliminary Infringement Contentions, <i>Immersion Corp. v. Valve Corp.</i> , 2:23-cv-00712 (W.D. Wash.) (served Oct. 20, 2023)
1016	U.S. Patent Application Publication No. 2004/0032395 (“Goldenberg”)
1017	U.S. Patent Application Publication No. 2007/0139375 (“Rosenberg”)
1018	U.S. Patent No. 6,203,432 (“Roberts”)
1019	November 21, 2023 Order Setting Jury Trial in <i>Immersion Corp. v. Valve Corp.</i> , Case No. 2:23-cv-00712 (W.D. Wash.)

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1110	“Stick shaker” Wikipedia. https://en.wikipedia.org/wiki/Stick_shaker (accessed Feb. 20, 2024)
1111	U.S. Application Publication No. 2011/0295395A1
1112	Declaration of Elizabeth A. DiMarco in Support of Admission <i>Pro Hac Vice</i>
1113	Declaration of Nathan R. Speed in Support of Admission <i>Pro Hac Vice</i>

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1116	Bryan A. Garner, Garner's Modern English Usage (4th Ed. 2016)

I. INTRODUCTION

Immersion’s Patent Owner Response (Paper 12, “POR”) recycles the same flawed arguments made in its Preliminary Response (Paper 6, “POPR”). The Board rightly rejected those arguments at institution (Paper, 9, “DI”) because they were premised on improper claim constructions and mischaracterizations of the prior art. Immersion asks the Board to reach a different decision now, but Immersion provides no new evidence other than an expert declaration parroting the POR. The Board should reach the same conclusion now as it did at institution.

Every independent claim recites “*defining position and range information for [a] user input element.*”¹ The Petition identified three references that each disclose this limitation: Goldenberg, Rosenberg, and Levin. Immersion argues that the references do not disclose the “*defining*” limitation because they disclose ***pre-defined*** “*position and range information.*” According to Immersion, “*defining position and range information*” does not encompass “*position and range information*” that has been ***pre-defined***; it ***only*** encompasses “*position and range information*” defined during use of the input device. *E.g.*, POR, § IV.A.2.

¹ Claim language italicized, other emphasis is added, and internal quotations omitted.

The Board already rejected Immersion’s transparent attempt to avoid the prior art’s disclosures (DI, 8-11) and should do so again. As the Board rightly observed, there is no disclosure in the ’907 patent “suggesting that range settings *must* be user settable.” DI, 10. Rather, the patent discloses that ranges “may be *fixed* or variable” (EX1001, 5:29-30), which “suggests that an embodiment in which all the range information is fixed (i.e., unalterable by a user) would be within the scope of the claimed invention.” DI, 10. As the Board observed, it is illogical to characterize information that has been pre-defined as not having been defined at some point. *Id.*, 10-11. There is no support for Immersion’s overly narrow construction of “*defining*.”

Immersion’s other arguments against the Petition’s Grounds are incompatible with the claims’ plain language and/or premised on mischaracterizations of the prior art. For example, Immersion’s lone additional challenge to the Petition’s Rosenberg-based Grounds 3-5 (covering all challenged claims) mischaracterizes Rosenberg’s force profiles as mere “abstract picture[s]” (POR, 57) when Rosenberg is explicit that its profiles are commands dictating how an actuator should provide force feedback to an input device based on predetermined “*position and range information*” for that device. *See* Rosenberg, [0016].

II. CLAIM INTERPRETATION²

A. “*defining position and range information*”

Immersion asks the Board to construe “*defining position and range information*” to mean “[a] step taken by, or a feature allowing, a user or device to change the settings of a controller to adjust the claimed ranges based on user input.”

POR, 13; POPR, 3 (similar).

Immersion restricts “*defining*” to a user-controlled action to exclude prior art that “us[es] default or pre-existing or predetermined position and range profiles or settings.” POR, 14. As the Board found at institution (DI, 8-11), there is no support for Immersion’s attempt to engraft narrow language into the claims.

1. Immersion Mischaracterizes the Claim Language.

Immersion’s principal argument for limiting “*defining*” to user-controlled actions is that “*defining*” is written using “the present-continuous tense” so it must be performed “*now*.” POR, 17-20 (emphasis original). Immersion is wrong and its position should be rejected. Significantly, Immersion’s argument would apply to nearly any method claim that recites steps ending in **-ing**. Adopting Immersion’s

² Immersion defines POSA differently than Valve (POR, 11; Pet., 6). Neither party identifies a dispute where the result depends on the definition adopted. DI, 8.

baseless position here could lead to a flood of disputes over the scope of existing method claims.

Initially, Immersion is wrong as a matter of grammar. The challenged claims *do not* use “*defining*” in the purported present-continuous tense. The present-continuous “is formed with a *be*-verb plus the main verb’s present participle.” (EX1116, 991) (emphasis original). For example, “I *am* eating dinner” or “we *are* walking,” are written in the present-continuous tense because they include a form of the verb “to be” (am, are) in front of the present participle of a verb (eating, walking), it is that *combination* that conveys the meaning that the action *is occurring* presently.

The claim language³ is written as “*defining*” rather than “*is defining*.” There is no *be*-verb in front of the present participle “*defining*.” Thus, in the claims, “*defining*” is not in the present-continuous tense.⁴ Instead, “*defining*” is used as a gerund which is a “present-participial form that functions as a noun.” EX1116, 1006. Claim 1 is a method reciting two steps (*i.e.*, two nouns) and those two steps

³ “*defining*” appears in limitations 1[A], [8A], and [15C].

⁴ Immersion also misunderstands the present-continuous. *See* EX. 1116 at 991 (“aspect” is the “feature of a verb” that “express[es] the duration and type of activity that the very denotes”); *id.* at 1020 (similar).

are defined by the gerunds “*defining*” and “*rendering*.” Because gerunds function as nouns rather than verbs, *they have no verb tense*. *Id.*

Immersion’s contention that “*defining*” must be a user-controllable action that occurs “*now*” (POR, 17 (emphasis original)) is thus premised on an erroneous understanding of grammar. The claims recite two steps (nouns) that must occur, but the claims impose no temporal restriction on when they occur. If Immersion were right that “*defining*” is written in the present-continuous sense, then most method claims—which recite steps using gerunds—would require the steps to occur “now.” However, temporal restrictions are not imposed on method claim steps unless the claim specifically requires that certain steps occur at a certain time or in a certain order. *See Niazi Licensing Corp. v. St. Jude Med. S.C., Inc.*, 30 F.4th 1339, 1352 (Fed. Cir. 2022) (method claim reciting steps of “inserting” and “withdrawing” did not include a temporal requirement); *Mformation Technologies, Inc. v. Research in Motion Ltd.*, 764 F.3d 1392, 1398 (Fed. Cir. 2014) (method claims steps are interpreted to require a specific sequence only if they “actually recite an order” or the specification so requires); *Interactive Gift Express, Inc. v. CompuServe, Inc.*, 256 F.3d 1323, 1342 (Fed. Cir. 2001) (similar).

Immersion’s only cited case for this principle—*Ex parte Ivo Nelson* (POR at 17)—undermines Immersion’s own position. Immersion’s reliance on *Nelson* (POR, 17) is misplaced. *Nelson*’s claim language was materially distinct from the

challenged claims here. In *Nelson*, the method claim at issue was written such that “[e]ach following step repeat[ed] its preceding verb form in a phrase beginning with the word ‘*after*’ before reciting the then next step.” *Nelson*, 2015 WL 5073651, at *9 (PTAB Aug. 27, 2015). For example, claim 2 at issue in *Nelson* recited “*after said receiving ... developing a vision* for using said information.” The Board specifically held that the use of the present participle verb form was “a critical fact in construing the meaning of these verb forms *when they subsequently follow the word ‘after’* in the claims.” *Id.* No language such as “after” exists in the ’907 challenged claims, nor does any other language dictating an order. *Nelson* also did not hold that a verb ending in “-ing” is a “present continuous” term as Immersion suggests. *Id.* at *9 (“*[T]he verbs are continuing.*”).

Properly understood, the “*defining*” step of the challenged claims can occur at any point—there is no relevant distinction between defining “now” and “pre” defining. The claims thus cover scenarios where position and range information is defined by a user during use *and* scenarios where position and range information is defined before user operation of the input device, *e.g.*, creating “pre-defined” information stored in memory.

This understanding of “*defining*” is consistent with its plain meaning which simply means to “mark out the limits of.” EX1114, 376; EX1115, 524 (similar).

Nothing in that plain meaning limits when information can be defined. Anything pre-defined was actively defined at some point.

The Board explained at institution that “predetermined” position and range information was demonstrably defined at some earlier point in time. DI, 10-11 (“the proposition that something ‘pre-defined’ is not ‘defined’ [is] illogical” and “nothing in the challenged claims explicitly limit[]s *when* the recited ranges of positions must be defined.”) (emphasis original). Unable to refute it, Immersion’s POR ignores the Board’s prior analysis entirely.

2. The Specification Does Not Support Immersion’s Construction

Immersion’s assertion that “*position and range information*” must be capable of being “change[d]” or “adjust[ed]” by during use (POR, 14) is refuted by the specification’s disclosure that ranges “may be ***fixed*** or variable.” EX1001, 5:29-30; DI, 10. The Board noted (DI, 10) this disclosure “suggests that an embodiment in which all the range information is fixed (i.e., unalterable by a user) would be within the scope of the claimed invention.”

Immersion alleges that reading the claims to encompass the “fixed” embodiment “would improperly read the present continuing tense of ‘defining’ out of the claims.” POR, 22. That fails because no claim uses “*defining*” in the present-continuous tense. *Supra* §II.A.1.

Immersion also alleges that “fixed” means the ranges are fixed only “*after* being set” by the user. POR, 22-23. That does violence to the plain meaning of “fixed” which is the opposite of the “variable” alternative the specification describes. EX1001, 5:29-30; EX1115, 741 (“fixed”: “not subject to change”), 2194 (“variable”: “capable of change”).

Moreover, Immersion’s assertion that the specification at 5:30-38 discloses “fixed ranges that do not change after being set” by the user is baseless. POR, 23. That passage never says how the ranges were set and is entirely consistent with the ranges being set before use (*e.g.*, by the manufacturer)—just as the word “fixed” connotes. This disclosure is ambiguous at best and does not disavow the plain meaning of “*defining*.” “To disavow claim scope, the specification must contain ‘expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope.’” *Retractable Techs., Inc. v. Becton, Dickinson & Co.*, 653 F.3d 1296, 1306 (Fed. Cir. 2011).

Immersion cites expert testimony (EX2004, ¶41) but that testimony deserves no weight because it parrots the POR with no additional analysis. *Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 12 at 5 (Feb. 10, 2023) (precedential). Rather than meaningfully engaging with the patent’s “fixed”—as opposed to “variable”—disclosure, Immersion argues that other specification passages support Immersion’s construction. None do.

Immersion wrongly says the following passage teaches that “the range values may be set by pulling the controller trigger *at runtime*” (POR, 21):

In some instances, these [primary, secondary and boundary range] values may be calculated based on the movement of the user input device from the maximum out position to the grounding position.

EX1001, 9:48-51.

First, the immediately-preceding sentence says “*functionality* 500 may initially set position and range information.” EX1001, 9:45-48. “Functionality” references software modules a processor executes. EX1001, 3:21-39. Thus, software—not the user—can set the position and range information.

Second, the passage never says the *user* moves the input device between its maximum out and ground positions to allow the ranges to be calculated. This passage is entirely consistent with the calculations being performed at the factory when the device is made or automatically (*e.g.*, by software) when the device is powered on.

Third, even if the passage describes an embodiment in which the user must manually move the input device to set the ranges, this only applies “[i]n some instances.” EX1001, 9:44-51. The use of the phrase “in *some* instances” indicates that there are other “instances” where this is not true. *Id.*, 1:59-62 (embodiments “not intended to limit the invention”); 13:42-53 (similar). Regardless, even if “the only embodiments, or all of the embodiments, contain a particular limitation,” that

“is not enough...to limit claims beyond their plain meaning.” *Unwired Planet v. Apple, Inc.*, 829 F.3d 1353, 1359 (Fed. Cir. 2016).

Immersion also relies on the patent’s explanation that Figure 3’s “trigger engine 316” “*may* modify the haptic data based on user input data” such as parameters indicating the position or range of a controller trigger. POR, 21 (*citing* EX1001, 7:1-3, 8:10-13). This passage describes modifying haptic data based on the trigger’s position and range—not modifying the trigger’s position/range. Moreover, even if read to suggest that the trigger engine “may” modify position/range information, “may” describes optional functionality, confirming other embodiments lack this functionality.

Immersion points to Figure 4 (POR, 21-22), which “illustrates a flow diagram of functionality for controlling a user input.” EX1001, 2:11-15. But Figure 4 *undercuts* Immersion’s argument.

Figure 4’s functionality defines the primary and secondary ranges at step 410 and “[n]ext” defines the boundary range at step 420. EX1001, 9:21-27. There is no discussion of user input playing any part in defining the ranges. To the contrary, the specification states that “[a]fter the various ranges are defined, functionality 400 monitors the position of the user input element, at [step] 430.” *Id.*, 9:27-29, claim 6. Thus, Figure 4—which “contains a flow chart with steps described in language

similar to the claims” (POR, 21)—describes the defining ranges *before* the position of the user input element is monitored. EX1001, 9:27-29.

Immersion’s assertion that Figure 4 “indicates that each of these steps are performed during use” is unsupported. POR, 21-22. Immersion cites nothing in the ’907 patent to support this assertion. Indeed, “monitoring” the user input element is a limitation of the dependent claims (*e.g.*, claim 6), which means that step is not even required for the independent claims.

Immersion only cites expert testimony that is entitled to no weight (POR, 23 *citing* EX2004, ¶41) because it parrots the POR. *Xerox Corp.*, IPR2022-00624, Paper 12 at 5. And the Board “must disregard the testimony of an expert that is plainly inconsistent with the record.” *Homeland Housewares v. Whirlpool*, 865 F.3d 1372, 1378 (Fed. Cir. 2017).

3. Immersion’s Reliance on Extrinsic Evidence Fails

Immersion cites definitions of “define” and “predetermine,” and argues they have different meanings. POR, 23-24. Immersion’s definitions confirm the obvious: pre-determined/pre-defined information is defined at some earlier point. The definitions do not suggest that pre-defined information was never *defined* at some point.

Once Immersion’s “present-continuous tense” mischaracterization of English grammar rules is stripped away, “*defining*” can be met by defining the position and

boundary ranges at any point in time. Immersion does not meaningfully dispute that the ranges “predetermined” in the prior art were established by defining them at *some* point. The Board rightly concluded that the claims require nothing more. DI, 10-11.

4. Immersion’s Assertion that Its Claims Exclude Prior-Art Force Profiles is Wrong

Immersion argues that because the ’907 patent does not use the term “force profile,” the claims cannot encompass such profiles. POR, 14-16. But patentees cannot avoid prior art disclosures by using different terminology.

Immersion cites *e.Digital* for the non-controversial proposition that a patent’s claims must be construed based on that patent’s disclosures, not those of unrelated patents. POR, 14. But Valve has construed the challenged claims based on the ’907 patent’s disclosure.⁵

Immersion suggests that because prior-art Immersion patents used the term “force profile” (or something similar) but the ’907 patent did not, the ’907 patent disclaimed or disavowed such “profiles.” POR, 14-16. But a disclaimer or disavowal of claim scope must be “clear and unmistakable.” *Luminara Worldwide, LLC v. Liown Electronics Co.*, 814 F.3d 1343, 1353 (Fed. Cir. 2016). As shown

⁵ Immersion also cites *Berg* (POR, 14-15). That case concerns obviousness-type double-patenting and has no relevance here.

supra § II.A.2, there is no such disclaimer or disavowal in this case because the specification **supports** an interpretation of “*defining*” that encompasses pre-defined position and range information as used by the prior-art force profiles.

If Immersion wanted to disclaim force profiles from the scope of its claims, then Immersion needed to draft its claims carefully to avoid such profiles or provide a clear disclaimer in its specification. It did neither. The Board must “construe the claim as written, not as [Immersion] wish[es] they had written it.” *Chef Am., Inc. v. Lamb-Weston, Inc.*, 358 F.3d 1371, 1374 (Fed. Cir. 2004).

Citing *Ruckus Wireless v. Innovative Wireless*, 824 F.3d 999 (Fed. Cir. 2016), Immersion argues that construing the claims to cover “force profiles” would “improperly broaden[] claim scope in a way that lacks any support in the written description.” POR, 16. But construing the disputed term in *Ruckus* to cover wireless communications was **contrary** to both the term’s plain meaning and the specification’s teachings. 824 F.3d at 1003-04. Here, construing “*defining*” to include pre-defined information is **consistent** with both the plain meaning of “*defining*” (*supra* §II.A.1) and the specification’s teachings (*supra* §II.A.2).

Immersion’s repeated suggestion that the ’907 patent covers **user-adjustable** position and range definitions is misplaced. *See, e.g.*, POR, 1-3, 5-7, 13-14, 17, 20-22. Valve does not dispute the claims are broad enough to cover user-adjustable position and range information. But the claims are not so limited. Immersion had

control over the subject matter it chose to claim. Immersion could have narrowed its claims by *requiring* user-adjustable position and range information. Immersion did not do so.

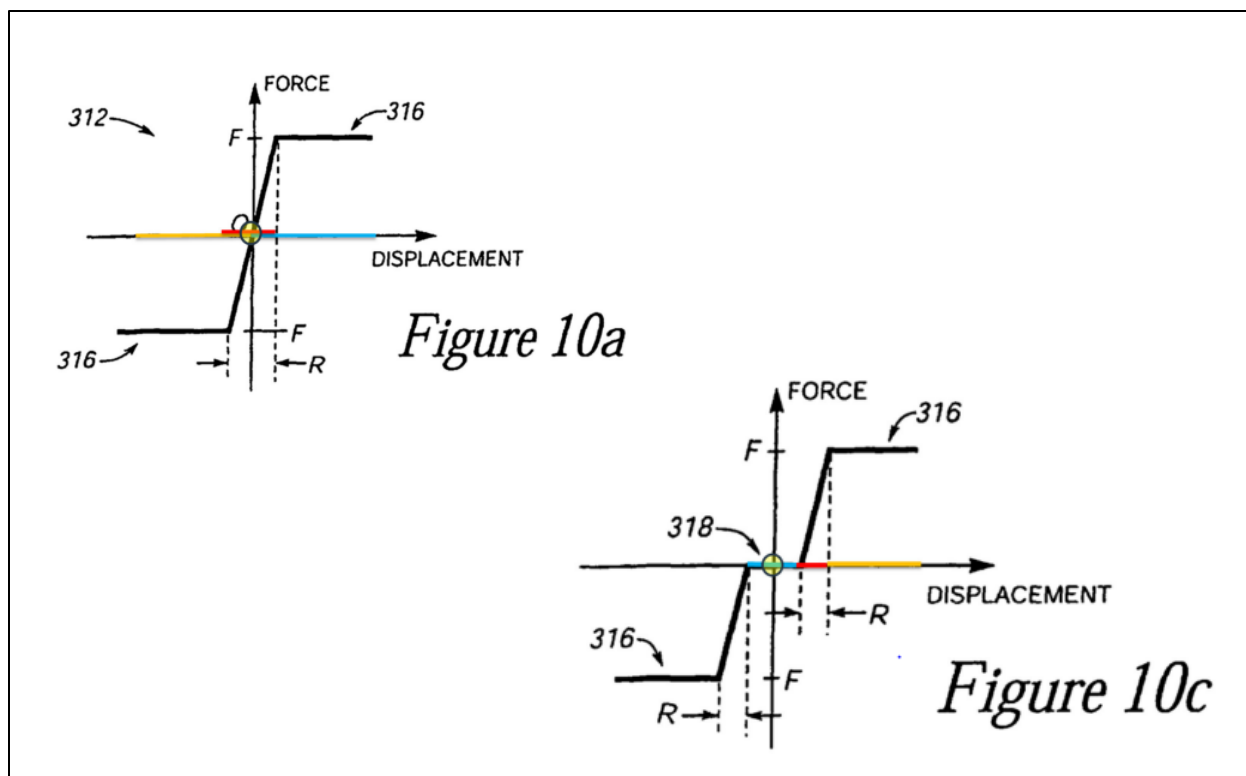
B. “*partially overlaps*” and “*in response to*”

Immersion proposes express constructions for these terms and alleges that its “partially overlaps” construction avoids Goldenberg and Levin, while its “in response to” construction avoids Levin. POR, 13, 49-50, 61-71. The Board need not expressly construe either term because the prior art meets the claims even under Immersion’s constructions as discussed *infra* §§IV.B.2 and V.B-C.

III. GROUNDS 3-5: ROSENBERG

Rosenberg discloses input devices with “force feedback.” Rosenberg, [0002]; [0010]. Rosenberg stores force profiles in memory and uses the profiles to command an actuator to output force-feedback effects. *Id.*, [0103]. One effect is a restoring force in which force feedback urges an input device back toward an origin position. *Id.*, [0164]; FIGS. 10a-10c.

As the Petition established, Rosenberg’s force profiles “*defin[e] position and range information*” for the input device; each includes a primary range (**blue**), a secondary range (**orange**), and a boundary range partially overlapping the other ranges (**red**) (*See, e.g., Pet.*, 45-46):



Immersion argues that Rosenberg fails to disclose “*defining position and range information*” under Immersion’s narrow construction “*because* [Rosenberg’s] input position and range profile is *predetermined*.” POR, 57. The Board should reject Immersion’s construction for the reasons discussed *supra* § II.A.

Immersion’s only other dispute with the Rosenberg-based grounds mischaracterizes Rosenberg’s force profiles as mere graphs/illustrations/abstract picture. POR, 56-57. Immersion asserts that using such profiles does not involve “*defining position and range information*.” Rosenberg *illustrates* its force profiles using graphs, but the profiles are values “that have been previously calculated or sampled and stored as a digitized ‘force profile’ in memory or other storage device.” Rosenberg, [0103]. Immersion concedes Rosenberg’s force profiles are

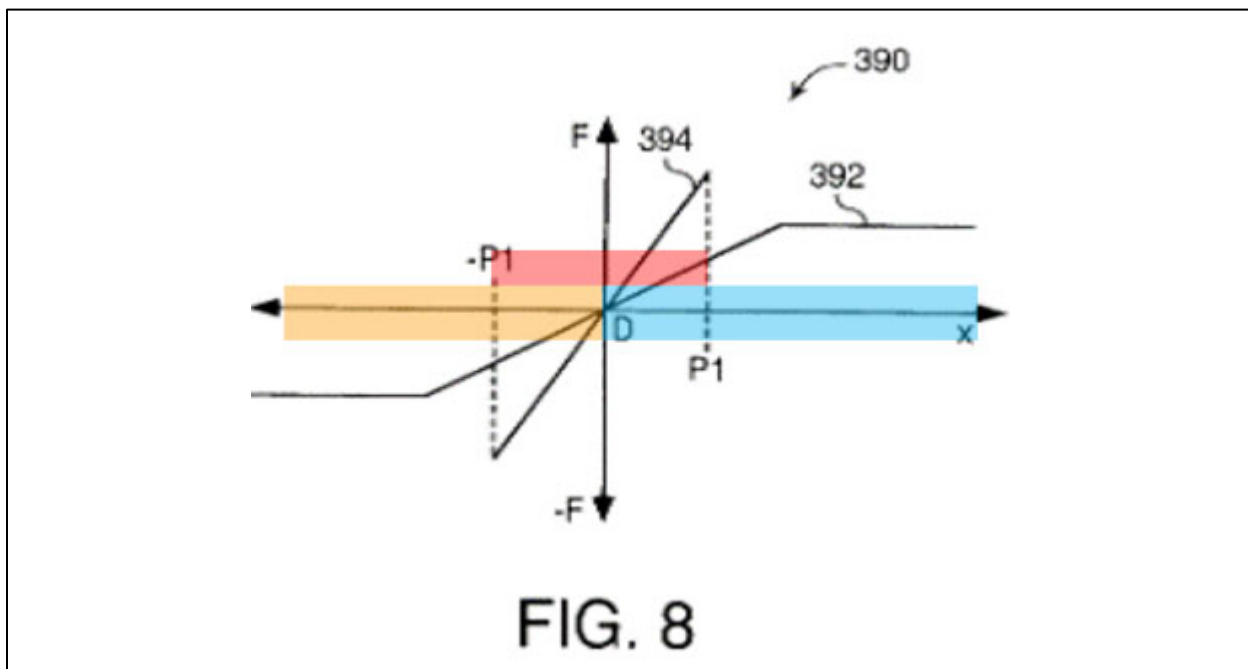
“predetermined commands stored in a table.” POR, 57 (*citing* Rosenberg, [0105]). Rosenberg’s profiles are thus pre-defined sets of “*position and range information*” under the proper construction of “*defining*.” If the Board agrees, then that finding is dispositive. Immersion offers no other challenge to the Petition’s showing that Rosenberg alone, or in combination with other references, renders claims 1-20 unpatentable.

Rosenberg meets “*defining position and range information*” even under Immersion’s construction. Rosenberg’s system includes multiple force profiles like the distinct profiles illustrated in Figures 10a and 10c. When Rosenberg’s system switches from utilizing one profile to a different profile based on how the user is interacting with the system, the system is “*defining position and range information*” for haptic feedback under Immersion’s construction because the system changes from one set of predefined position/ranges to a different set during use. Rosenberg, [103]; [0121] (“The user's manipulations of object 34 may have caused a new type of force to [be] required.”); Pet., 47. For example, when the host computer sends a command to switch from the Figure 10a profile to the Figure 10c profile, that command defines *during use* new primary, secondary, and boundary ranges of positions for the input device’s range of motion. *See* Rosenberg, [166].

IV. GROUNDS 1-2: GOLDENBERG

Goldenberg discloses knobs with “force feedback.” Goldenberg, [0007]. Goldenberg uses force models—stored computer instructions—that command an actuator to output force feedback based on the knob’s position. *Id.*, [0066], [0102]. In the jog-shuttle model, a “spring” force is exerted against the knob to bias it toward an origin and a different “spring” of stronger magnitude is applied in a smaller range around the origin. *Id.*, [0115]-[0117].

Goldenberg’s force model “defin[es] position and range information” for the input device, including a primary (clockwise) range (**blue**), a secondary (counterclockwise) range (**orange**), and a boundary range (between -P1 and P1) that partially overlaps each of the two other ranges (**red**) (Petition, 15):



A. Immersion’s “*Defining*” Argument Falls With Its Erroneous Construction

Immersion concedes that Goldenberg’s force profile “use input position and range information” (POR, 42) but argues that Goldenberg’s *use* of “predetermined ranges” is “distinct from the process of defining them” (POR, 40). Immersion argument that Goldenberg does not disclose “*defining position and range information*” is based on Immersion’s erroneous construction discussed *supra* § II.A. POR, 39 (“does not disclose...‘defining’ that range *during use*”), 40 (similar), 44 (similar). If the Board rejects Immersion’s proposed (and “illogical”) construction (DI, 9-11; *supra* § II.A), Immersion’s argument that Goldenberg does not disclose “*defining position and range information*” fails.

Immersion says Goldenberg’s profiles are “graphs” or diagrams that “depict[] ranges in the abstract.” POR, 42, 44. Not so. As the Petition established, Goldenberg’s force profiles “define, *inter alia*, ‘position and range information’ used ‘to determine appropriate output actuator signals.’” Pet., 10-11 (*citing* Goldenberg, [0066]; Ward, ¶89). Goldenberg *illustrates* its force profiles using graphs, but the profiles are computer instructions a processor uses to “determine appropriate output actuator signals” sent to an actuator. Goldenberg, [0066]. As the Board rightly observed at institution, Goldenberg’s force profiles include *defined* sets of position and range information stored in memory. DI, 16; *see* Goldenberg, [0073].

Immersion argues positions -P1 and P1 in Goldenberg's Figure 8 are "abstract" and do not define actual knob positions. POR, 45. But -P1 and P1 identify the endpoints of the range of positions in the knob's rotational freedom of movement at which spring-force 394 applies. Goldenberg, [0116]; claim 1. Simply put, -P1 and P1 are "*defin[ed]*" positions for the knob that together "*defin[e]*" a "*boundary range of positions.*"

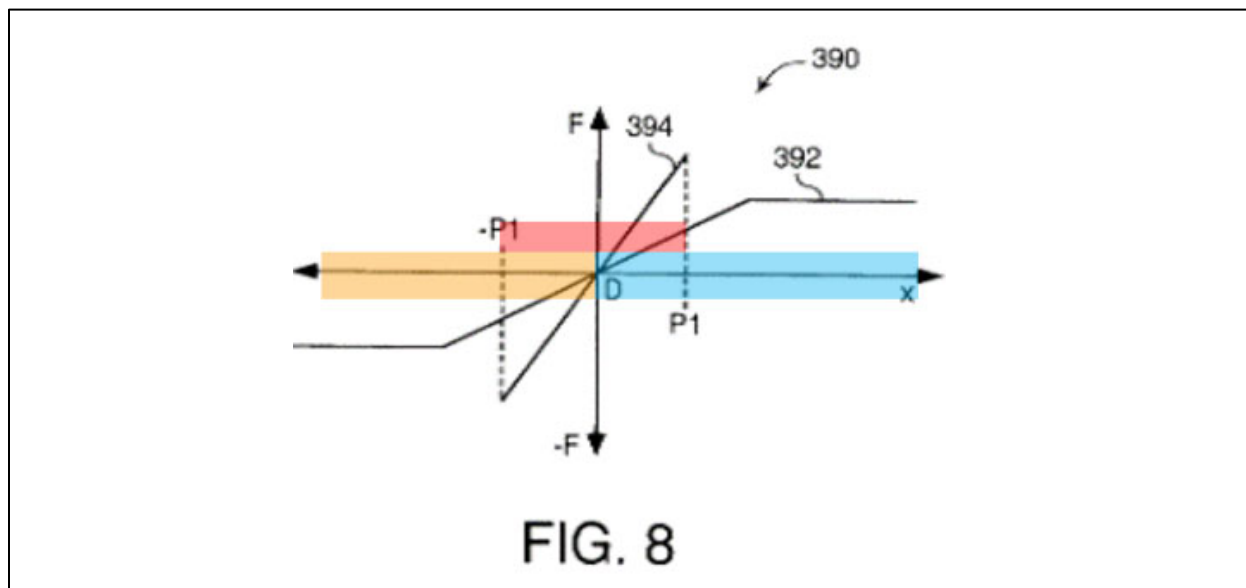
Separately, Goldenberg discloses the "*defining*" limitation even under Immersion's proposed construction. Similar to Rosenberg, Goldenberg also permits a user to change from one force profile (*e.g.*, a standard detent profile) to another (*e.g.*, the jog-shuttle profile). Goldenberg, [0012], [0108] ("detent model"), [0115]-[0117] ("jog shuttle model"). When Goldenberg's system switches from utilizing one profile to a different profile based on a user's interaction with the system, the system is "*defining position and range information*" for haptic feedback under Immersion's construction because the system changes from one set of predefined position/ranges to a different set during use.

B. Goldenberg Discloses the Three Claimed Ranges.

1. Goldenberg's First Spring Effect Includes Two Ranges

As the Petition explained, Goldenberg's Figure 8 depicts (i) a defined first range of positions to the right of the origin (**blue**) corresponding to forces resisting clockwise rotation; (ii) a defined second range of positions to the left of the origin

(orange) corresponding to forces resisting counterclockwise rotation; and (iii) a defined boundary range (red) wherein a steeper force curve 394 is applied so the knob feels stiffer around the origin. Pet., 11-12 (*citing* Goldenberg, [0115]-[0117]).



Immersion alleges that because Goldenberg characterizes the forces that resist clockwise rotation and those that resist counterclockwise rotation as a “first spring effect” there is only a “single range” corresponding to that spring effect. POR, 46-48. As the Board recognized, this argument is inconsistent with the plain meaning of “range.” DI, 18-19.

As Immersion points out, the parties *agree* that a “range” is simply “a sequence, series, or scale between limits.” POR, 12. And as the Board noted, the claims impose “no explicit restriction” on how ranges are identified (other than that the “boundary range” must partially overlap other ranges). DI, 18-19.

The examiner similarly explained during prosecution that “distances in proximity to boundaries” are ranges and that any range can “constitute first and second ranges.” EX1002, 100. Immersion argues the examiner’s statement should be afforded little weight because the applicants further amended the claims (POR, 46-47), but the examiner’s understanding of “range” is part of the intrinsic record that should be considered. *See Ventana Medical Sys., Inc. v. Biogenex Labs., Inc.*, 473 F.3d 1173, 1183 (Fed. Cir. 2006).

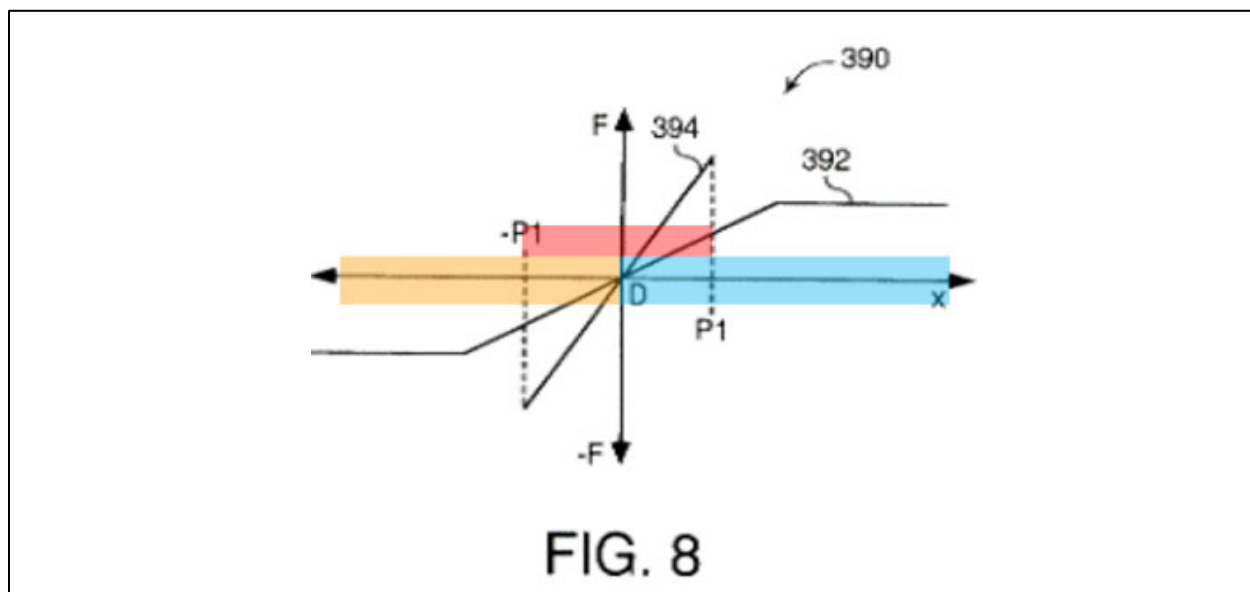
Applying the parties’ agreed meaning of “range” lays bare that Immersion’s contention that Goldenberg’s “first spring effect” is implemented using only a single range fails. Valve does not disagree that the blue and orange ranges shown above *could* be considered as one larger range. But any such range would be comprised of two distinct smaller ranges—a first range (blue) corresponding to forces resisting clockwise rotation and a second range (orange) corresponding to forces resisting counterclockwise rotation. Pet., 11-12 (*citing* Goldenberg [0115]-[0117]). That the two ranges correspond to different functionality being performed by the system—rewinding/fast-forwarding—further confirms that these are distinct ranges. Goldenberg, [0115].

2. Goldenberg’s Second Spring Effect is Implemented by a Boundary Range of Increased Force Around the Origin

Immersion alleges that Goldenberg’s range of positions corresponding to the second spring effect cannot be a “boundary range” because that range (red) overlaps

entirely with the combination of the primary (**blue**) and secondary (**orange**) ranges. POR, 49. That assertion is at odds with the claims' plain language and Immersion's own construction. The Board should reject this argument. DI, 19-20.

The claims require that the boundary range “*partially overlaps each of the primary...and secondary range.*” As seen below, Goldenberg's range between -P1 and P1 (**red**) irrefutably “*partially overlaps each of*” the primary (**blue**) and secondary (**orange**) ranges. Using Immersion's own plain-meaning terminology, the overlap between Goldenberg's “*boundary range*” and “*each of*” the other two ranges is “not complete[.]” POR, 25. Immersion cannot meaningfully dispute this.



Immersion's assertion that Goldenberg's (**red**) “*boundary range*” does not meet the “*partially overlaps*” requirement “because the overlap would be total” (POR, 49) reads “*each of*” out of the claims. As seen above, Goldenberg's

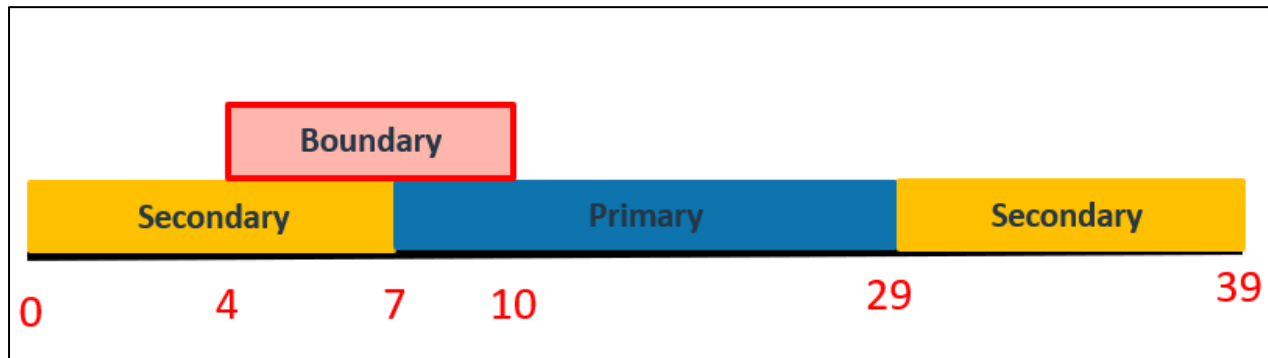
“boundary range” does not **totally overlap** “each of” the “primary...and secondary range of positions”—it “**partially overlaps** each of” those ranges.

Indeed, Goldenberg discloses the claimed ranges even under Immersion’s proposed construction because the “[o]verlap between **two** ranges [*i.e.*, the **red** range and either of the **blue** or **orange** range] is less than total, such that neither range is completely overlapped by the other.” POR, 13. Immersion’s contention that it would be improper to construe “the claims such that the overlap between the boundary range and **either** of the primary or secondary ranges could be total” does not help Immersion because the overlap between Goldenberg’s “boundary range” and either of those ranges is not total—**it is partial**. POR, 25.

Immersion’s expert citations (EX2004, ¶¶90, 92, 95) deserve no weight because the expert testimony parrots the POR verbatim. *Xerox*, IPR2022-00624, Paper 12 at 5. Even if considered, the testimony cannot contradict the claims’ plain language. *Homeland*, 865 F.3d at 1378.

Immersion also discusses a specification embodiment with one primary range and two secondary ranges (on each end of the primary range). POR, 26 (*citing* EX1001, 5:29-38). As Immersion admits, no boundary range is disclosed. POR, 26. Immersion proposes a hypothetical boundary range that would be consistent with this embodiment “without rendering...‘*partially*’ superfluous.” *Id.* Illustrating Immersion’s hypothetical scenario below shows that it corresponds **directly with**

Goldenberg’s Figure 8 because the hypothetical “*boundary range*” (positions 4-10) partially overlaps each of the “*secondary range*” (positions 0-7) and “*primary range*” (positions 7-29).



As Immersion correctly says, the hypothetical “boundary range would partially overlap both the primary range and the initial secondary range...without the boundary range being entirely within the primary range *or* secondary range.” POR, 26. ***This is Valve’s point.*** The hypothetical boundary range only “*partially overlaps each of*” the other two ranges even though the ***combination*** of those two ranges completely overlaps the boundary range. Immersion’s admission that the claims encompass Immersion’s hypothetical boundary range is fatal to Immersion’s argument that the claims do not encompass Goldenberg’s boundary range.

3. There Is No Inconsistency in Valve’s Mapping of Goldenberg to the Challenged Claims.

Immersion argues that if Valve is correct that Goldenberg’s first spring effect can be considered to encompass ***two*** ranges, then Goldenberg’s second spring effect cannot correspond to a ***single*** “*boundary range*.” POR, 51. Conversely, if the second

spring effect is considered to correspond to a single range, then Immersion argues that the first spring effect should be considered to be a single range too. *Id.* Thus, Immersion contends that Valve’s mapping is “internally inconsistent.” POR, 50. There is no inconsistency. *See* DI, 19.

Although Goldenberg’s Figure 8 *could* be divided into two or four ranges (POR, 51-54), it also can be divided into the three ranges the Petition identified. Again, Immersion elected not to impose any specific limitations on how the “range[s]” are identified other than that the “boundary range” must partially overlap with each of the other ranges. *Chef Am.*, 358 F.3d at 1374.

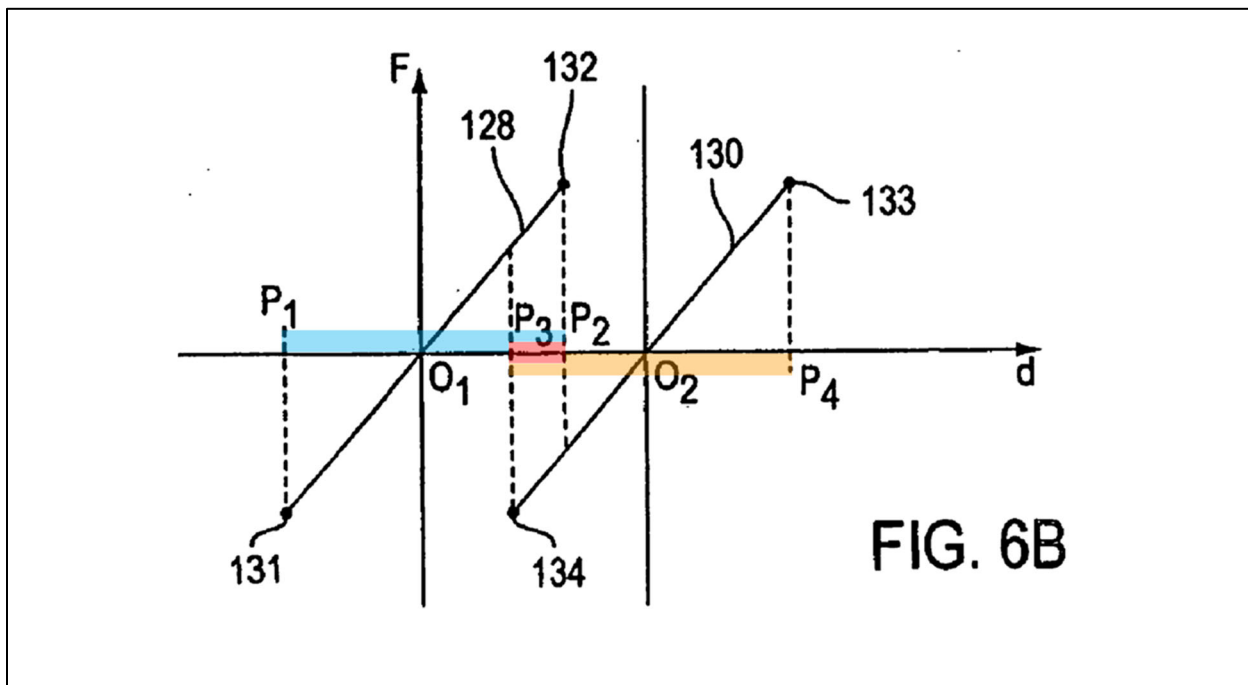
As the Board found, “regarding the range between -P1 and +P1 as a single boundary range” is not inconsistent with considering the positions corresponding to first spring effect as encompassing two ranges because the range between -P1 and +P1 “is the only range of knob positions in which the second spring effect (curve 394) is active.” DI, 19. Indeed, this range of positions is distinct because the force output within this range is higher than the force output at any other position within the knob’s freedom of movement. Goldenberg, [0116].

V. GROUND 6: LEVIN

Levin teaches applying force feedback when a knob is rotated to positions “within a range of” a first or second detent. Levin, [0009]; *see* [0030], [0047]; FIG.

1; FIG. 6A-6D. In Figure 6B's implementation, "[a] portion of the range of the first detent overlaps a portion of the range of the second detent." *Id.*, [0009].

As Petitioner established (using the annotated image below), Levin's detent profile "*defin[es] position and range information*" for the input device, including (i) a "*primary range of positions*" corresponding to Levin's force curve 128 between positions P_1 - P_2 (blue), (ii) a "*secondary range of positions*" corresponding to Levin's force curve 130 between positions P_3 - P_4 (orange), and (iii) a "*boundary range of positions*" corresponding to Levin's "overlapped zone" between positions P_3 - P_2 (red) (Pet., 67-68):

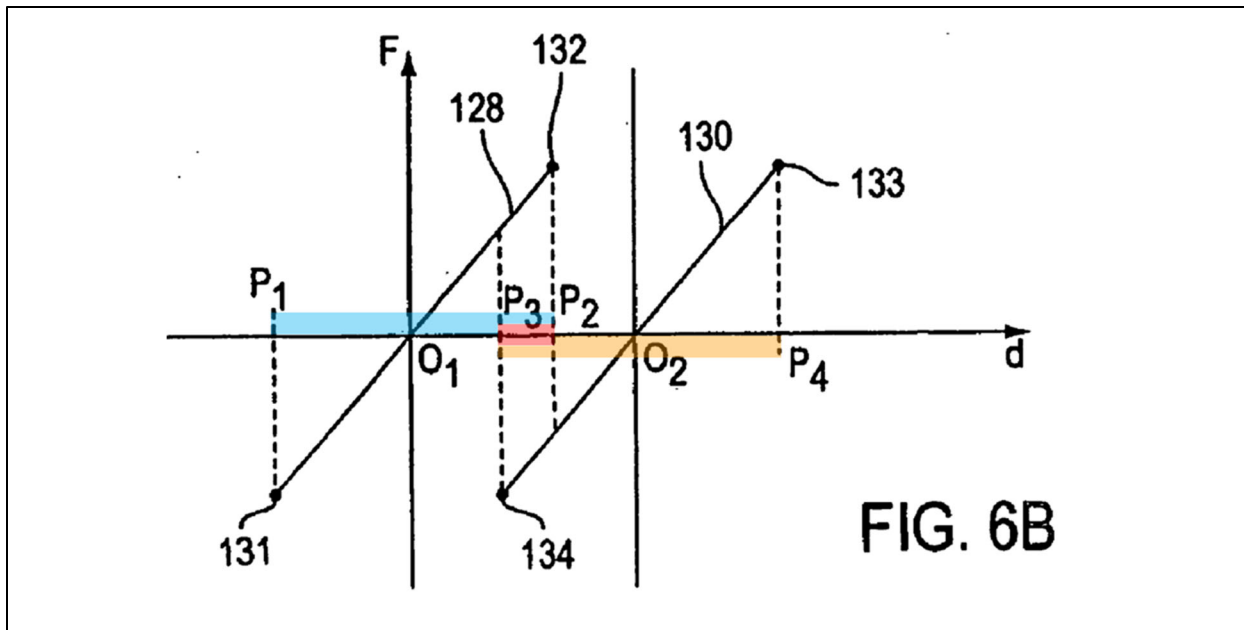


A. Immersion’s “*Defining*” Argument Falls With Its Erroneous Construction.

Immersion says Levin does not “*defin[e] position and range information*” for the knob because the “position and range information [for the detent force profile] is *predetermined*.” POR, 60. This argument depends upon, and fails with, Immersion’s improper construction for “*defining*.”

B. Levin’s “*Boundary Range*.”

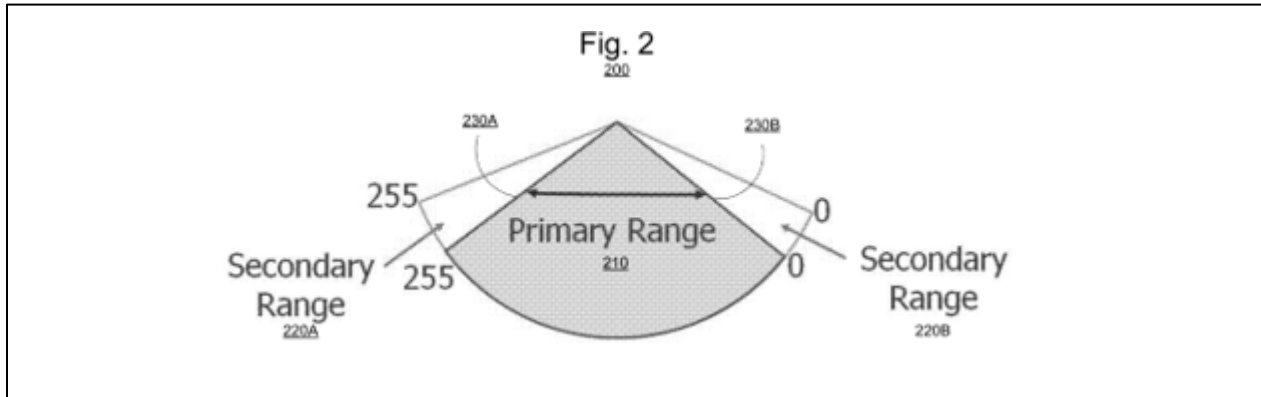
Immersion never disputes that curve 128 is a “*primary range of positions*” (P₁-P₂, blue) and curve 130 is a “*secondary range of positions*” (P₃-P₄, orange). Pet., 67-68; POR, 59-71. Immersion only alleges that Figure 6B’s “overlapped zone” from P₃-P₂ (red) does not meet the claimed “*boundary range*” because it allegedly does not “*partially overlap[]*” each of the primary and secondary ranges. POR, 61-65. The Board rejected this argument at institution (DI, 28-29) and should do so again. *See supra* § IV.B (Goldenberg).



Valve agrees that “*partially*” means “less than total.” POR, 13. In the claims, “*partially overlaps*” means the “*boundary range*” positions include some but “less than” all the positions for “*each of*” the “*primary*” and “*secondary*” ranges. Levin’s Figure 6B profile meets the claims because the positions between P3 and P2 include some but not all the positions for the “*primary*” range (P1-P3) and some but not all the positions for the “*secondary*” range (P3-P4).

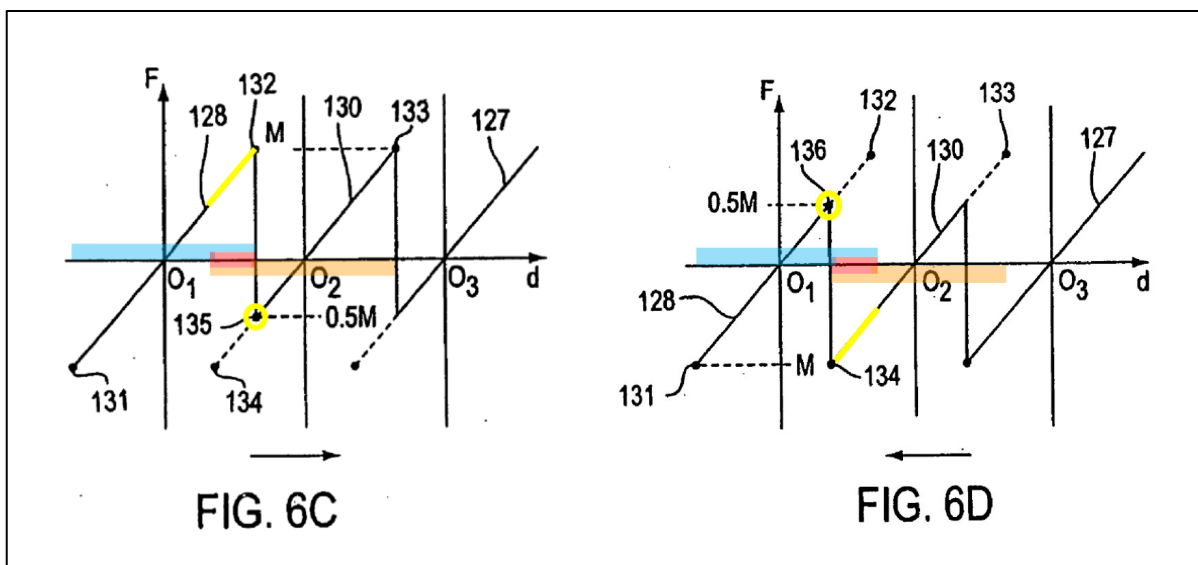
As the Board found, Valve’s understanding of the claims is consistent with Figure 2 of the ’907 patent where the boundary range (230A or 230B) can be entirely subsumed within the primary range (210). EX1001, 5:19:29, Fig. 2; Pet., 15; DI, 19-20 (the claim is met “so long as the primary and second ranges, themselves, are only partially overlapped”). Immersion responds by alleging that the “*boundary range*” must be distinct from an area of overlap between the “*primary*” and

“secondary” ranges. POR, 63-64. That transparent attempt to rewrite the claim to avoid Levin should be rejected because the claim language imposes no such restriction.



C. Levin “*Render[s] a Haptic Effect*” In Response to the Knob Entering “*Positions Within the Boundary Range*.”

Levin “*render[s] a haptic effect*” in the “*boundary range*” (where detent curves 128 and 130 overlap) that is unique. The haptic effect applied in response to the knob entering a position in that boundary range is dependent on the direction the knob was rotating when it enters that position. Pet., 74-78. For example, for a knob position between O_1 and the position corresponding to 132 and 135 in Figs. 6C-6D (annotated below), force from curve 128 is applied when the knob is rotating clockwise (FIG. 6C) and force from curve 132 is applied when the knob is rotating counterclockwise (FIG. 6D). *Id.* This knob rotation-direction dependency for the applied haptic force is unique to the boundary range.



Immersion argues that Levin’s haptic effect is not rendered “in response to’ entry into the boundary range.” POR, 65. That fails for the reasons the Board found at institution because the unique rotation-direction dependency is triggered in response to entry into the boundary range. DI, 29-30.

Immersion’s argument also fails because the claims do **not** require rendering a haptic effect in response to entry “into the boundary range” (POR, 65); they require doing so in response to entry into “*one or more positions within the boundary range.*” Levin renders a unique haptic effect when the knob enters each “*position[] within the boundary range*” because the applied force changes for each position along force curve 128 or 130. Pet., 78.

VI. CONCLUSION

Claims 1-20 are unpatentable.

Respectfully submitted,
Valve Corp.

Date:04-29-2025

By: /Elizabeth A. DiMarco/
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CERTIFICATE OF SERVICE UNDER 37 C.F.R. § 42.6 (E)(4)

I certify that on April 29, 2025, I will cause a copy of the foregoing document, including any exhibits or appendices filed therewith, to be served via electronic mail, as previously consented to by Patent Owner, upon the following:

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Date: April 29, 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 5,597 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: April 29, 2025

/MacAulay Rush/

MacAulay Rush

Paralegal

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