

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

VALVE CORPORATION
Petitioner,

v.

IMMERSION CORPORATION,
Patent Owner.

Case IPR2024-00478
U.S. Patent 9,430,042

PATENT OWNER'S NOTICE OF APPEAL

Pursuant 35 U.S.C. §§ 141, 142, 319, and 37 C.F.R. §§ 90.2-90.3, Patent Owner Immersion Corporation (“Immersion”) provides notice that it hereby appeals to the United States Court of Appeals for the Federal Circuit from the Final Written Decision of the Patent Trial and Appeal Board (“Board”) entered June 12, 2025 (Paper 30) and from all underlying and related orders, decisions, rulings, and opinions regarding U.S. Patent No. 9,430,042 (“the ’042 patent”) in *Inter Partes* Review IPR2024-00478. A copy of the Final Written Decision is attached as Exhibit A.

In accordance 37 C.F.R. § 90.2(a)(3)(ii), Immersion further indicates that the issues on appeal include, but are not limited to, the following: (1) the Board’s conclusion that claims 1-19 of the ’042 patent have been shown to be unpatentable; (2) the Board’s factual findings, conclusions of law, and other determinations supporting or related to the aforementioned issue; and (3) all other issues decided adversely to Immersion in any orders, decisions, rulings, and opinions.

Pursuant to 35 U.S.C. § 142 and 37 C.F.R. § 90.2(a), a copy of this Notice is being filed with the Director of the United States Patent and Trademark Office and with the Patent Trial and Appeal Board. In addition, a copy of this Notice and the required docketing fees are being filed with the Clerk’s Office for the United States Court of Appeals for the Federal Circuit via CM/ECF.

Respectfully Submitted,

Dated: August 14, 2025

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CERTIFICATE OF FILING

The undersigned hereby certifies that, in addition to being electronically filed through the Patent Trial and Appeal Board's P-TACTS system, a true and correct copy of the above-captioned PATENT OWNER'S NOTICE OF APPEAL is being mailed by U.S. Priority Mail Express to the Director of the United States Patent and Trademark Office on August 14, 2025, at the following address:

Director of the United States Patent and Trademark Office
c/o Office of the Solicitor
United States Patent and Trademark Office
Mail Stop 8
P.O. Box 1450
Alexandria, Virginia 22313-1450

The undersigned also hereby certifies that a true and correct copy of the above-captioned PATENT OWNER'S NOTICE OF APPEAL and the filing fee is being filed via CM/ECF with the Clerk's Office of the United States Court of Appeals for the Federal Circuit on August 14, 2025.

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CERTIFICATE OF SERVICE

I hereby certify that on August 14, 2025, a true and correct copy of the above-captioned PATENT OWNER'S NOTICE OF APPEAL was served in its entirety by electronic mail on Petitioner's counsel of record.

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EXHIBIT A

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

VALVE CORPORATION,
Petitioner,

v.

IMMERSION CORPORATION,
Patent Owner.

IPR2024-00478
Patent 9,430,042 B2

Before CHRISTOPHER L. OGDEN, MATTHEW J. McNEILL, and
SCOTT RAEVSKY, *Administrative Patent Judges*.

RAEVSKY, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

Petitioner, Valve Corporation, filed a Petition requesting an *inter partes* review challenging claims 1–19 of U.S. Patent No. 9,430,042 B2 (Ex. 1001, “the ’042 patent”). Paper 2 (“Pet.”). Patent Owner, Immersion Corporation, filed a Preliminary Response. Paper 6. Based on these and other papers filed by the parties, we instituted *inter partes* review. Paper 11; Paper 8; Paper 10.

Subsequent filings include a Patent Owner Response (Paper 14, “PO Resp.”), a Petitioner Reply (Paper 17, “Reply”), and a Patent Owner Sur-reply (Paper 18, “Sur-reply”). We held an oral hearing on April 30, 2025, a transcript of which has been entered into the record (Paper 29, “Tr.”).

We have jurisdiction over this proceeding under 35 U.S.C. § 6(b). After considering the evidence and arguments of the parties, we determine that Petitioner has proven by a preponderance of the evidence that claims 1–19 are unpatentable.

II. BACKGROUND

A. The ’042 patent

The ’042 patent generally relates to providing virtual detents through vibrotactile feedback. Ex. 1001, code (54). According to the ’042 patent, with many traditionally mechanical functions being replaced by electronics, operation of electronic controls has been made less intuitive to users. *Id.* at 1:30–32. In particular, without click-stops or detents, or otherwise a sense of mechanical resistance, it may be difficult to obtain a similar experience from an electronic substitute for a traditional mechanical control device. *Id.* at 1:32–37. To address this issue, the ’042 patent discloses methods and

systems for providing virtual detents through vibrotactile feedback. *Id.* at 1:47–49.

Figure 3, depicted below, illustrates an example portable music player 300.

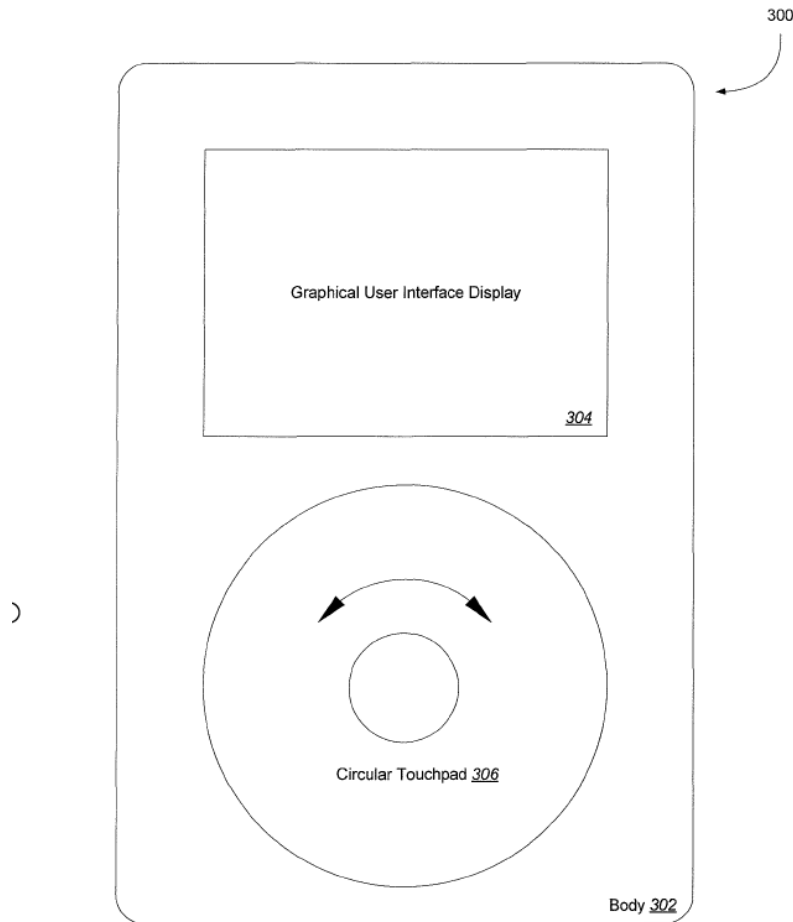
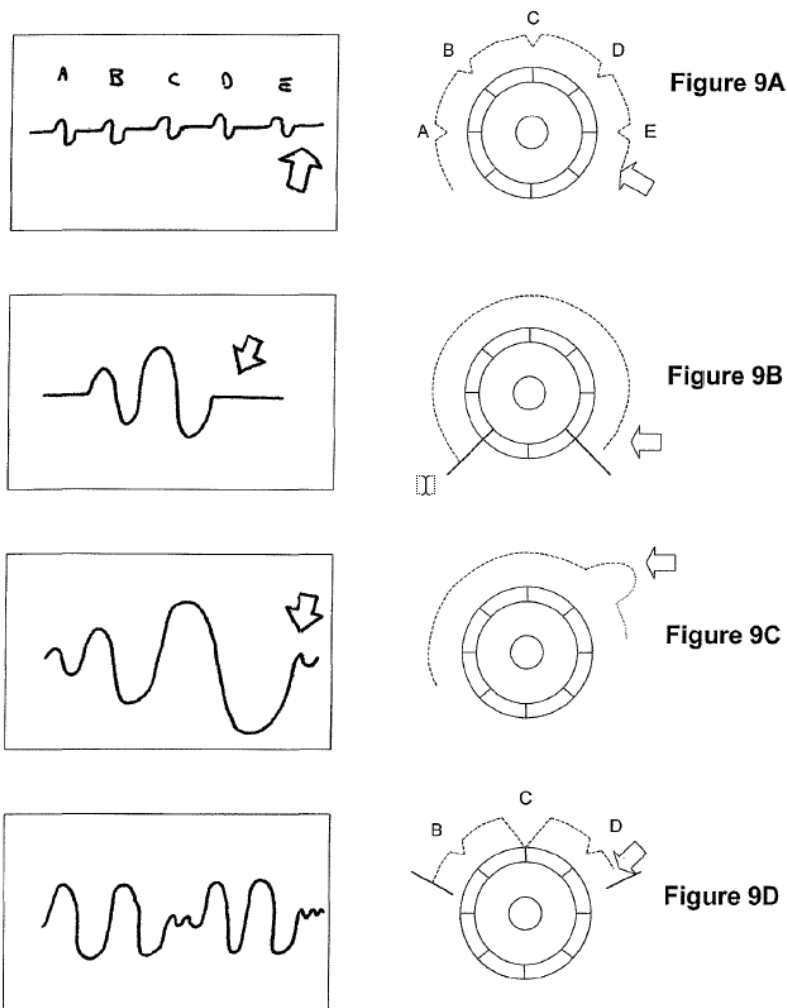


Figure 3

Id. at 9:9. The portable music player 300 has a circular touch pad 306 that a user may use to select an object on a menu shown in display 304. *Id.* at 9:27–29. For example, the user may drag a finger around the circular touch pad 306 to select an object from the displayed menu. *Id.* at 9:29–31. An actuator, not shown, is coupled to the touch pad 306. *Id.* at 9:33–34. As the user manipulates the touch pad 306, vibrotactile feedback in the form of

virtual detents are provided to the user when the actuator vibrates the touch pad. *Id.* at 9:34–37. These virtual detents simulate mechanical feedback. *Id.* at 9:37–38.

A processor may determine which of a plurality of simulated mechanical detents to generate based on virtual detent profiles stored in memory. *Id.* at 4:50–56. Figure 9, depicted below, illustrates example virtual detent profiles.



Id. at 13:37–38; *see also id.* at Figs. 9E–9H. In Figure 9, different example rotary knobs are shown on the right (Figs. 9A–9D) along with a representation of a virtual detent profile on the left corresponding with the

rotary knob. *Id.* at 13:39–41. In Figure 9A, for example, virtual detents are shown at points A, B, C, D, and E along the rotary knob. *Id.* at 13:47–48. As the rotary knob is rotated through each point A–E, the rotary knob may be vibrated to generate the feeling of a real detent. *Id.* at 13:49–50. As another example, Figure 9B illustrates a hard stop virtual detent profile, indicating that a barrier has been reached by a user. *Id.* at 13:54–62.

B. Challenged Claims

Claim 1 is listed below, with Petitioner’s element labeling for ease of reference:

1. [PRE] A method comprising:
 - [1A] receiving an input signal comprising information associated with a manipulation of an input device configured to control a plurality of systems, wherein the input device comprises a touch-pad;
 - [1B] receiving a detent profile associated with one of the systems, the detent profile comprising haptic data associated with a virtual detent; and
 - [1C] generating a vibrotactile signal configured to cause an actuator to produce a vibrotactile effect to the input device, the vibrotactile effect comprising the virtual detent.

Ex. 1001, 15:2–13; Pet. 7.¹

¹ Although Petitioner labels these limitations with uppercase letters, both parties also use lowercase labeling throughout their briefing.

C. Asserted Challenges to Patentability

Petitioner asserts the following challenges to patentability (Pet. 3):

Claim(s) Challenged	35 U.S.C. §²	Reference(s)/Basis
1–19	103	Ichinose, ³ Levin ⁴
1–19	103	Wang, ⁵ Ichinose
1–19	102/103 ⁶	Rosenberg I ⁷
1–19	103	Rosenberg I, Goldenberg ⁸

To support these challenges, Petitioner relies on two declarations of Jean Renard Ward (Exs. 1003, 1090). Patent Owner relies on the Declaration of Robert Akl, D.Sc. (Ex. 2007).

² The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112–29, 125 Stat. 284, 287–88 (2011), amended 35 U.S.C. § 102, effective March 16, 2013. Because the challenged claims of the ’260 patent have an effective filing date before March 16, 2013, the pre-AIA versions of 35 U.S.C. §§ 102, 103 apply.

³ US 6,819,990 B2, issued November 16, 2004 (Ex. 1015).

⁴ US 6,686,911 B1, issued February 3, 2004 (Ex. 1016).

⁵ WO 02/102616 A2, published December 27, 2002 (Ex. 1022).

⁶ Petitioner initially refers to this ground as simply a “102” ground, Pet. 3, but also advances an obviousness position over Rosenberg I, *id.* at 55. (The parties also hyphenate “Rosenberg-I,” but we omit the hyphen throughout this decision, including in quotations, without indicating any alteration.)

⁷ US 6,429,846 B2, issued August 6, 2002 (Ex. 1009).

⁸ US 6,636,197 B1, issued October 21, 2003 (Ex. 1007).

IV. ANALYSIS

A. Level of Ordinary Skill in the Art

Petitioner contends that a person having ordinary skill in the art (“POSITA”)

would have a bachelor’s degree in electrical engineering, computer science, or a related field, plus at least two years of industry or graduate level experience with software engineering, haptics programming, and/or human-computer interaction, including experience with user-interfaces and applications involving touchscreens, touchpads, and related technologies.

Pet. 8 (citing Ex. 1003 ¶¶ 37–43).

Patent Owner contends that a POSITA

would have had a bachelor’s degree in electrical engineering or computer science (or an equivalent degree), and two years of practical or industry experience in the field of human computer interaction (HCI), including implementation of computer-based systems and software for providing haptic feedback effects to a user. . . . Also, a person could have qualified as a [POSITA] with more formal education and less practical or industry experience, or vice versa.

PO Resp. 27 (citing Ex. 2007 ¶ 30).

Although these level of skill definitions are not the same, the differences are minor, and Patent Owner does not argue that its level of skill definition is dispositive. To the contrary, Patent Owner asserts that “the challenged claims of the ’042 patent are patentable under either . . . definition.” *Id.* We apply Petitioner’s level of skill but would have reached the same result had we applied Patent Owner’s.

B. Claim Construction

Patent Owner proposes constructions for three terms: “detent profile,” “virtual detent,” and “a plurality of systems.” PO Resp. 27–38; Sur-reply

3–7. In the Sur-reply, Patent Owner concedes that “none of the issues depend on construing” the term “detent profile.” Sur-reply 3. The parties also largely agree on the meaning of “virtual detent,” although their positions have nuances. *See* Reply 2; Sur-reply 3–4. We briefly address the term “virtual detent,” explaining why it does not need to be construed, and then construe “a plurality of systems.”

1. *virtual detent*

Patent Owner contends that a virtual detent means “vibrotactile feedback that simulates a mechanical detent.” PO Resp. 28; Sur-reply 3. Petitioner “does not explicitly disagree” that a virtual detent is “vibrotactile feedback that simulates a mechanical detent.” Reply 2. Petitioner asserts that “[i]f there is a dispute, it is whether Rosenberg I’s vibrotactile feedback ‘simulates a mechanical detent’ because [Patent Owner] says such simulation requires a sense of *mechanical resistance* and Rosenberg I allegedly lacks such simulated resistance.” *Id.* (citing PO Resp. 58–59).

Patent Owner responds that “the claims distinctly recite a ‘vibrotactile effect,’ separate from a ‘virtual detent,’ confirming that these terms must have distinct meanings.” Sur-reply 3. Accordingly, Patent Owner argues, a virtual detent “must include more than just generic vibrotactile feedback.” *Id.* at 4. And the way Petitioner interprets Rosenberg I reads out the requirement that virtual detents simulate a mechanical detent, Patent Owner argues. *Id.*

We agree with Petitioner that the dispute is as to the teachings of the art, not the meaning of virtual detent. Thus, we need not construe the term. We apply the undisputed construction of the parties that virtual detent means “vibrotactile feedback that simulates a mechanical detent.”

2. *plurality of systems*

Each of the independent claims recites “an input device configured to control a plurality of systems.” Patent Owner proposes construing this phrase to mean “an input device configured to control a plurality of systems, *where each system to be manipulated provides context for virtual detents.*” PO Resp. 31 (emphasis added).

Patent Owner contends that the specification and prosecution history support this construction. *Id.* at 31–38. Petitioner disagrees, asserting that the proposed construction is “vaguely worded” and unsupported by the specification and prosecution history. Reply 20–23. We agree with Petitioner. We begin by analyzing the claim language, followed by reviewing the specification and prosecution history.

a. *Claim Language*

The plain language of the claims does not support Patent Owner’s interpretation. Petitioner asserts, and we agree, that Patent Owner is not actually construing any word in the claim but instead merely adds narrowing language to it (i.e., “where each system to be manipulated provides context for virtual detents”). Reply 20.

Patent Owner discusses claim 15, but it is unclear how this analysis supports its proposed construction. *See* PO Resp. 32. Patent Owner argues that claim 15 recites a “system comprising” “an input device configured to control one of a plurality of systems,” and hence “the recited plurality of systems are subsystems *in addition* to the containing system.” *Id.* We question how this point supports Patent Owner’s proposal because this does not address why each system must “provide[] context for virtual detents.” But regardless, we find it unpersuasive because claim 15’s preamble is not

limiting (merely reciting “A system comprising”). *See Summit 6, LLC v. Samsung Elecs. Co.*, 802 F.3d 1283, 1292 (Fed. Cir. 2015) (“[P]reamble language that merely states the purpose or intended use of an invention is generally not treated as limiting the scope of the claim.”); *see also* Tr. 80:4–8 (Patent Owner conceding that the preamble is non-limiting). Nor is there any explicit language in claim 15 that would exclude any particular system, such as the system recited in the preamble, from the recited “plurality of systems.”

b. Specification

Patent Owner next contends that the specification requires its “context for virtual detents” proposal. PO Resp. 34–37. But Petitioner contends, and we agree, that Patent Owner relies on non-limiting language. Reply 21–22. For example, Patent Owner refers to language such as a “processor *can* be configured to determine a specific signal,” a “detent signal *may* be based at least in part on the system which is actively being controlled,” and “[i]n one *embodiment*, the processor can access an effect profile stored in memory.” PO Resp. 34–36 (citing Ex. 1001, 8:38–46, 47–53 (emphasis changed)). As Petitioner persuasively argues, “[t]he use of the word ‘*may*,’” for example, “means that a system-specific detent signal is an *optional* implementation.” Reply 21. The same goes for “can” and “[i]n one embodiment”—these are non-limiting terms. *See ATOS, LLC v. Allstate Insurance Company*, No. 2023-1621 (Fed. Cir. May 23, 2025) (nonprecedential) (“The term ‘can’ is non-limiting.”) (citing *See i4i Ltd. P’ship v. Microsoft Corp.*, 598 F.3d 831, 844 (Fed. Cir. 2010), *aff’d*, 564 U.S. 91 (2011)).

The parties also disagree as to what extent the term “systems” encompasses software applications. Petitioner believes that “systems”

include software applications because Patent Owner allegedly argued for this interpretation in its infringement contentions. Pet. 52 (citing Ex. 1021).⁹

Patent Owner concedes that at least *some* software applications are “systems” but disagrees as to which applications are included. PO Resp. 35; Tr. 78:7–9 (“JUDGE RAEVSKY: Mr. Kim, you agree that at least some software qualifies as systems, correct? MR. KIM: That’s exactly right.”). That is, Patent Owner argues that “software applications *can be* systems to be manipulated if those applications provide *context* for virtual detents,” relying on the following specification passage:

the processor 106 may process **software code running as an application** on the processor and utilize the input signal in the **context of the software code to generate signals configured to cause virtual detents**.

PO Resp. 35 (quoting Ex. 1001, 4:30–34).

We agree that software applications can be “systems.” The specification also supports this interpretation, for example, by describing an example “system to be controlled” as being “a menu system,” which describes software. Ex. 1001, 12:56–59; *see also id.* at 9:16 (describing “navigat[ing] a menu system which may be shown on the display”). However, we do not see any limiting language in the specification requiring “context” or “distinct from the containing system.” The additional “context” language Patent Owner proposes adding to “software applications” is not required. The passage Patent Owner highlights says the processor “*may*

⁹ We sidestep the parties’ discussion of the infringement contentions, as the usefulness of infringement contentions for claim construction is quite limited and because Patent Owner concedes that at least some software applications are systems. *See* PO Resp. 29–31, 35; Pet. 52.

process software . . . in the context,” so this language is non-limiting. Ex. 1001, 4:30–34 (emphasis added).

c. Ambiguity of Patent Owner’s Proposed Construction

Before we turn to Patent Owner’s prosecution history arguments, we note that Patent Owner’s construction is also defective because of its ambiguity. It is not clear at all what Patent Owner means by “context.” The specification passage Patent Owner cites does not explain what it means to use “*context* of the software code to generate signals configured to cause virtual detents.” See Ex. 1001, 4:30–34. It appears that Patent Owner intends us to read “context” to mean something more detailed, but Patent Owner’s explanations are ambiguous, contradictory, and unsupported.

Patent Owner argues that the specification makes clear that “context” means that “the virtual detents can vary on a per-application basis.” PO Resp. 55 (citing Ex. 2007 ¶¶ 35–49, 128–129; Ex. 1001, 8:38–46, 4:30–34). So in the case of hardware subsystems, Patent Owner argues, “the specification discloses specific detents that are determined *contextually* based on the subsystem (e.g., video system, stereo system) being controlled.” *Id.* (citing Ex. 1001, 8:38–46).

Petitioner views this argument to mean “that ‘*virtual detents*’ and their corresponding ‘*detent profiles*’ be system-specific (or application-specific).” Reply 20 (citing PO Resp. 55). The Sur-reply responds that this is a “misreading” because Patent Owner’s construction “clarifies that the manipulated systems provide context for detents, regardless of whether such detents are unique or specific to the providing system.” Sur-reply 6. This argument is confusing because it appears to contradict the “vary on a per-application basis” argument in the Response (*see* PO Resp. 55, quoted

above). The Sur-reply muddies the waters further, using the term “correlate” instead of “context” to explain that “each manipulated system can *correlate* detents to its own virtual, touch-based controls, which will often differ with respect to another system.” *Id.* at 4 (emphasis added).¹⁰ Vague words like “correlate” and “context” obfuscate, rather than illuminate, the claims’ meaning.

To the extent Patent Owner urges us to require virtual detents to vary on a system or application basis, we do not find this interpretation required by the claims or specification either. Although the claims refer to “a plurality of systems,” they do not recite different detent profiles for each of those systems. Claim 1, for example, recites “receiving *a* detent profile associated with *one* of the systems.” The other claims are similar. Patent Owner’s reliance on non-limiting specification language is also unavailing. *E.g.*, Ex. 1001, 8:38–46 (“can” and “may”), 4:30–44 (“embodiment” and “may”).

d. Prosecution history

We now address Patent Owner’s reliance on three portions of the prosecution history. PO Resp. 37–38.

Patent Owner first quotes a prior appeal decision by the Board, which allegedly “characterized the invention as a detent profile ‘corresponding to

¹⁰ Patent Owner argued at the hearing that “We’re not saying that you have to have multiple detent profiles. . . . Because it says one, right? What we’re saying is like the systems each have one and it could be the same, but each of the systems have one.” Tr. 84:8–11. It is difficult to reconcile Patent Owner’s position that the claims only recite one detent profile, yet must include a plurality of detent profiles (one for each of the plurality of systems).

one of the systems.” *Id.* at 37 (quoting Ex. 1002, 588). We agree with Petitioner, however, that the passage Patent Owner quotes is merely a description of the claimed invention, nothing more, and the Board’s treatment of claim 1 did not require system-specific detent profiles. Reply 22 (citing Ex. 1002, 590). As such, it does not limit the claims. We also question whether the Board’s statement would constitute a disclaimer by *the applicant*. *Cf. Biogen Idec, Inc. v. GlaxoSmithKline LLC*, 713 F.3d 1090, 1099–1100 (Fed. Cir. 2013) (“[I]t is the applicant, not the examiner, who disclaims claim scope . . .”).

Patent Owner’s next argues that the applicant distinguished the prior art “by explaining that different sub-systems provide the context for detent profiles:”

Instead, claim 1 recites in part, “*receiving a detent profile associated with one of the systems . . .*” Such functionality enables the claimed device to receive **one detent profile [that] may be associated with one system controlled by the input device (e.g., an audio system), and another type of profile [that] may be used when a different system (e.g., a temperature system) is being controlled by the input device.**

PO Resp. 37–38 (citing Ex. 1002, 214).¹¹

This passage does not limit the claims for multiple reasons. For instance, the applicant’s statement is not a clear and unmistakable disclaimer. *See Aylus Networks, Inc. v. Apple Inc.*, 856 F.3d 1353, 1359 (Fed. Cir. 2017) (requiring “clear and unmistakable” disclaimer). It can be read as simply asserting that amended claim 1, being open-ended and

¹¹ We include additional language from Ex. 1002 that precedes Patent Owner’s original quotation to show that this passage refers to claim 1. Ex. 1002, 213–14.

including multiple systems, had the advantage over the prior art that it could optionally encompass distinct detent profiles associated with each such system. *See* Ex. 1002, 214.

The statement also does not use the language Patent Owner wants to add to the claim, “where each system to be manipulated provides context for virtual detents.” Further, the statement did not result in allowance, and the applicant did not raise the same argument again. *See* Ex. 1002, 235 (applying new art, Grant and Nyyssonen); *Malvern Panalytical Inc. v. TA Instruments-Waters LLC*, 85 F.4th 1365, 1376 (Fed. Cir. 2023) (quotation omitted) (“We have previously declined to find prosecution disclaimer where an applicant made an allegedly disclaiming argument to overcome prior art, the examiner disagreed, and the applicant never repeated the allegedly disclaiming statements and instead offered alternative reasons to overcome the prior art.”).

The third prosecution history statement Patent Owner relies on is another passage from the Board’s appeal decision agreeing that the prior art did not sufficiently describe detent profiles for a particular system or device:

However, we agree with Appellant that merely providing a general disclosure of vibrotactile feedback (Grant and Nyyssonen) and a virtual knob (Nyyssonen) **does not sufficiently describe detent profiles for a particular system/device**.

PO Resp. 38 (citing Ex. 1002, 590). Again, we question whether the Board’s statement would constitute a disclaimer by the applicant. *See Biogen Idec*, 713 F.3d at 1099–1100. Regardless, the Board’s statement is consistent with the claim requiring only one detent profile associated with one particular system, and this passage bears no relation to Patent Owner’s

proposed addition, “each system to be manipulated provides context for virtual detents.”

e. Summary

In summary, then, we determine that “an input device configured to control a plurality of systems” has its plain and ordinary meaning and does not require “each system to be manipulated provides context for virtual detents.” Under the plain and ordinary meaning of this phrase, “systems” encompass software applications.

C. Challenge over Rosenberg I

Petitioner contends that claims 1–7 are unpatentable as anticipated by and obvious over Rosenberg I. *See* Pet. 14–35. After considering Patent Owner’s arguments to the contrary, we agree with Petitioner.

This challenge is dispositive, so we do not reach Petitioner’s other challenges. *See SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1359 (2018) (holding that a petitioner “is entitled to a final written decision addressing all of the claims it has challenged”); *Bos. Sci. Scimed, Inc. v. Cook Grp. Inc.*, 809 F. App’x 984, 990 (Fed. Cir. 2020) (non-precedential) (recognizing that the “Board need not address issues that are not necessary to the resolution of the proceeding” and, thus, agreeing that the Board has “discretion to decline to decide additional instituted grounds once the petitioner has prevailed on all its challenged claims”).

1. Independent Claim 1

We first present a brief overview of Petitioner’s positions and then address Patent Owner’s arguments.

Petitioner describes Rosenberg I as disclosing a touchpad with an actuator that outputs haptic sensations (e.g., vibrations). Pet. 49 (citing

Ex. 1003 ¶¶ 287–90). Petitioner refers to Figure 1 of Rosenberg I, reproduced below:

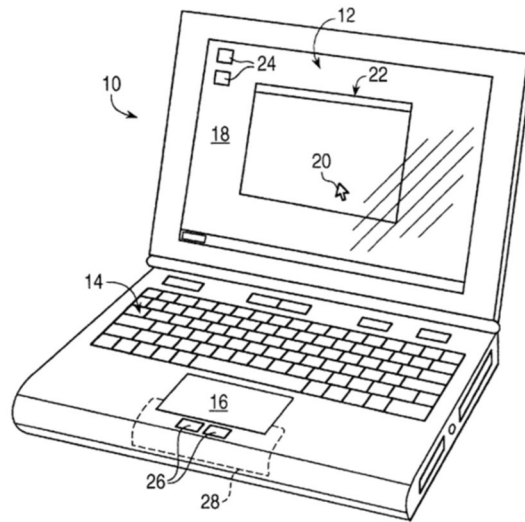


FIG. 1

Id. Figure 1 depicts a laptop having a touchpad 16. *Id.* (citing Ex. 1001, 1:65–2:5, 3:31–63).

For the preamble of claim 1, Petitioner points to Rosenberg I’s method for providing haptic feedback. *Id.* at 51 (citing Ex. 1003 ¶ 297). For limitation [1A], Petitioner relies on Rosenberg I’s disclosure of a touchpad that receives a position signal input and that controls multiple software applications on the laptop as disclosing “receiv[ing] an input signal comprising information associated with a manipulation of an input device configured to control a plurality of systems, wherein the input device comprises a touch-pad.” *Id.* at 51–53 (citing Ex. 1003 ¶¶ 298–302).

For limitation [1B], Petitioner points to Rosenberg I’s disclosure of haptic feedback that mimics a mechanical detent as disclosing “receiving a detent profile associated with one of the systems, the detent profile comprising haptic data associated with a virtual detent.” *Id.* at 53–56 (citing

Ex. 1003 ¶¶ 303–17). Petitioner further explains that Rosenberg I incorporates by reference Rosenberg II (Ex. 1010), which discloses a “force profile” that stores previously calculated force values, including one that provides a “detent sensation.” *Id.* at 50–51 (citing, e.g., Ex. 1009, 6:49–54). Petitioner relies on these force profiles for the claimed “detent profile,” arguing that either a POSITA would have used the force profiles in Rosenberg I’s system or that it would have been obvious to do so. *Id.* at 54–56.

Finally, for limitation [1C], Petitioner contends that Rosenberg I’s processor sends a command signal to actuators coupled to the touchpad to produce a vibrotactile effect, disclosing “generat[ing] a vibrotactile signal configured to cause an actuator to produce a vibrotactile effect to the input device, the vibrotactile effect comprising the virtual detent.” *Id.* at 57 (citing Ex. 1003 ¶¶ 318–20).

After considering Patent Owner’s arguments, which we address below, we agree with Petitioner that Rosenberg I discloses the preamble (whether or not limiting) and all the limitations of claim 1.

Patent Owner argues that Rosenberg I does not disclose claim 1’s “a plurality of systems,” a “virtual detent,” a “detent profile,” and “receiving a detent profile associated with one of the systems.” PO Resp. 52–63. We address each argument in turn.

a. a plurality of systems

Patent Owner contends that Rosenberg I does not disclose “a plurality of systems” under its proposed construction requiring “an input device configured to control a plurality of systems” to mean “an input device configured to control a plurality of systems, *where each system to be*

manipulated provides context for virtual detents.” PO Resp. 52–57. As we have not adopted this construction, Patent Owner’s arguments based on that construction are not persuasive.

We need not reach Petitioner’s argument that even under Patent Owner’s proposed construction, Rosenberg I still anticipates. *See* Reply 23–25. Under our interpretation of “systems” as including software applications, we agree with Petitioner that Rosenberg I discloses “a plurality of systems” because Rosenberg I’s computer “runs multiple different applications, including a web-browser and a gaming application, and the touchpad controls the user’s interaction with each application.” Pet. 52–53 (citing Ex. 1009, 6:7–23, 4:43–64; Ex. 1003 ¶¶ 300–302). Rosenberg I discloses, for example, that “software . . . running on the host computer 12 may be of a wide variety” and that various “application program[s] . . . utilize[] input from the touch pad 16 and output[] force feedback commands to the touchpad 16.” Ex. 1009, 6:9–18. These disclosures, as further supported by Mr. Ward’s testimony, are sufficient to meet the claimed “plurality of systems.” *See* Ex. 1003 ¶¶ 300–302.

b. virtual detent

Patent Owner next contends that Rosenberg I does not disclose a “virtual detent,” which the parties agree is a “vibrotactile feedback that simulates a mechanical detent.” PO Resp. 58; *see also id.* at 28; Reply 2; Sur-reply 3. Rosenberg I’s “ticks” or “pulses” are not virtual detents, Patent Owner argues, because they do not provide a sense of mechanical resistance. PO Resp. 58 (citing Ex. 2007 ¶¶ 136–39). Instead, these “pulses indicate information such as certain locations within a range or events,” not mechanical resistance. *Id.* (citing Ex. 1009, 12:53–59, 13:3–5, 13:39–40).

Petitioner responds that Rosenberg I “*explicitly* teaches” its pulses provide the “physical confirmation” users expect to feel when “pressing a physical button,” which is mechanical resistance. Reply 25–26 (citing, e.g., Ex. 1009, 13:41–54; Ex. 1090 ¶¶ 108–09). Petitioner cites the following passage of Rosenberg I, which explains that a pulse can act as physical confirmation without a user having to press a button:

A software designer may want to allow a user to be able to select options or a software function by positioning a cursor over an area on the screen using the touchpad, *but not require pressing a physical button or tapping the touchpad to actually select the option*. Currently, it is problematic to allow such selection because a user has physical confirmation of execution when pressing a physical button. *A pulse sent to the touchpad of the present invention can act as that physical confirmation without the user having to press a button or other control for selection*. For example, a user can position a cursor over a web page element, and once the cursor is within the desired region for a given period of time, an associated function can be executed. This is indicated to the user through a *tactile pulse* sent to the pad 16.

Id. at 26; Ex. 1009, 13:41–54 (emphasis added). Patent Owner interprets this passage differently, arguing that it refers to “when the user does *not* press a button,” thereby not simulating mechanical resistance. Sur-reply 9. Patent Owner also adds that “the passage explains that hovering, unlike physical buttons, completely *lack* detents to simulate.” *Id.* Thus, Patent Owner concludes, the disclosed pulse “serves as confirmation feedback as the cursor hovers over website elements, not a simulated detent.” *Id.*

We view Petitioner’s position as more correct because Rosenberg I describes simulating a button press, which is simulating a mechanical resistance. Ex. 1009, 13:47–50. Patent Owner’s argument that the passage refers to “when the user does *not* press a button” is unpersuasive because

claim 1 does not require a button press. *See* Sur-reply 9. All the claim requires is receiving a generic “input signal comprising information associated with manipulation of . . . a touch-pad” (limitation [1A]). And the Rosenberg I passage in question discloses such an input—a user “positioning a cursor over an area on the screen using the touchpad.” Ex. 1009, 13:42–43. Rosenberg I’s computer then sends a pulse to the touchpad, which “can act as that physical confirmation,” i.e., a “physical confirmation of execution when pressing a physical button.” *Id.* at 13:47–50. As Mr. Ward credibly testifies, “Rosenberg-I’s pulse simulates the mechanical detent (*i.e.*, resistance) that a user would expect to feel if a mechanical button were being pressed rather than a virtual button being pressed via a touchpad.” Ex. 1090 ¶ 109.

Finally, Patent Owner’s point that “the passage explains that hovering, unlike physical buttons, completely *lack* detents to simulate” is inapposite because Rosenberg I’s pulse simulates a button press, not hovering. *See* Sur-reply 9; Ex. 1009, 13:45–50. Accordingly, we agree with Petitioner that Rosenberg I’s “tactile pulse” discloses the “virtual detent” of claim 1.¹²

c. detent profile

Limitation [1B] recites, “receiving a detent profile associated with one of the systems, the detent profile comprising haptic data associated with a virtual detent.” Patent Owner contends that as Rosenberg I fails to teach a “virtual detent,” it therefore cannot teach a detect profile comprising haptic data associated with the virtual detent. PO Resp. 59. Petitioner correctly

¹² We do not address Petitioner’s “hill virtual detent” and “click effect” arguments because the argument we already addressed sufficiently establishes that Rosenberg I anticipates. *See* Pet. 53–54.

points out that this argument fails because Rosenberg I does, in fact, teach a virtual detent, as we determine above. *See* Reply 27.

Patent Owner also argues that Rosenberg II’s detent profile “does not disclose profiles that comprise haptic data associated with a virtual detent. PO Resp. 60. Instead, Rosenberg II’s force profiles “only store data for *force* feedback—not *vibrotactile* feedback,” Patent Owner argues. *Id.* (citing Ex. 2007 ¶ 143). Petitioner responds, and we agree, that Patent Owner does not dispute the Petition’s showing that a POSITA would have understood Rosenberg I to teach that its “*vibrational* ‘pulses’ are generated using [Rosenberg II’s] ‘profiles.’” Reply 27–28 (citing Pet. 54–56).

The Petition argues that Rosenberg I discloses *vibrational* haptic feedback by supplying “haptic feedback to . . . a touchpad” that “can include pulses [or] vibrations.” Pet. 53 (citing Ex. 1009, 2:54–55, 4:65–67, Abstract; Ex. 1003 ¶¶ 303–305). Further, the Petition posits that by incorporating Rosenberg II by reference, Rosenberg I discloses that its “haptic feedback, *i.e.*, simulated detents, is generated using ‘force *profiles*’” from Rosenberg II, “each of which comprises a ‘sequence of command parameters representing a force level to be applied to [an] actuator,’ *i.e.*, ‘haptic data.’” *Id.* at 54 (citing, e.g., Ex. 1010, claims 41–43, 18:46–67, 35:42–46; Ex. 1003 ¶ 311).

Patent Owner argues that Rosenberg II’s force profiles only store data for *force* feedback, not *vibrotactile* feedback. PO Resp. 60 (citing Ex. 2007 ¶ 143). But Patent Owner does not challenge Petitioner’s argument that Rosenberg I generates vibrational haptic feedback using Rosenberg II’s force profiles. *See id.*; Reply 27–28 (arguing that Patent Owner never disputes this); Sur-reply 12–14 (silence on this point). Consequently, Patent

Owner views the teachings of Rosenberg I and II too narrowly, overlooking that the force profiles of Rosenberg II are used to generate the vibrational haptic feedback in Rosenberg I. Thus, we agree with Petitioner and Mr. Ward that Rosenberg II's force profiles are detent profiles as claimed. *See* Ex. 1003 ¶ 311.

Petitioner also argues that Rosenberg II discloses force profiles, “including one that provides a ‘*detent sensation*.’” Pet. 51 (citing Ex. 1010, 5:46–62, 38:1–3) (emphasis added). Patent Owner does not address Petitioner's contention regarding Rosenberg II's “detent sensation” force profile. *See generally* PO Resp. Rosenberg II's disclosure of a “detent sensation” force profile strengthens our conclusion that Rosenberg II's force profile comprises haptic data. Mr. Ward's testimony further supports this point. Mr. Ward testifies that “[a] POSITA would thus understand that Rosenberg II's ‘profiles’ are substantively identical to the ‘virtual detent profiles’ depicted in Figures 9A to 9H in the '042 Patent.” Ex. 1003 ¶ 295. Given this testimony, which we find credible, and Patent Owner's silence on the “detent sensation” in Rosenberg II, we do not find credible Patent Owner and Dr. Akl's contention that Rosenberg II “only store[s] data for *force* feedback—not *vibrotactile* feedback.” PO Resp. 60; Ex. 2007 ¶ 142.

Patent Owner also views the teachings of Rosenberg I and II too narrowly, focusing on the word “force” to the exclusion of their other teachings, including explicit “haptic” teachings. To illustrate, Rosenberg I explicitly incorporates Rosenberg II to implement “control methods that can be used for . . . providing *haptic* feedback.” Ex. 1009, 6:49–50 (emphasis added). Rosenberg II also equates “haptic” feedback with “force feedback.” Ex. 1010, 1:46–48. Viewing these teachings together, we find that

Rosenberg II's force profiles are used to perform the haptic feedback in Rosenberg I and thus include the claimed "haptic data."

Further, Patent Owner overlooks that Rosenberg II's force profiles are not applied as a single "force," but rather, "the stored force values can be output *in sequence according to a particular time interval* that can vary depending on the desired force." Ex. 1010, 18:63–65 (emphasis added); *see also id.* at claim 41 (reciting "said command parameters collectively representing a digitized force profile, wherein each value in said sequence of command parameters represents a force level to be applied to said actuator for a given time interval")), *cited in* Pet. 54; *see also id.* at 19:56–63 (describing repetitively applying resistance, creating a feeling of dragging a stick over a grating). Successive applications of force would apply a *vibrotactile* effect. *Cf.* Ex. 1003 ¶ 71 (Mr. Ward testifying for a different ground that "a POSITA would know the teachings that haptic 'jolt' sensations can be produced by short bursts or periods of vibration."); *see also id.* n.20 (citing Ex. 1060 as teaching "a plurality of distinct tactile sensations can be created by varying the frequency, amplitude and waveform output by the actuator 6"). These teachings further undermine Patent Owner's view of Rosenberg II as storing data only for "***force*** feedback—not ***vibrotactile*** feedback." PO Resp. 60.

Finally, Patent Owner contends that Petitioner's use of the wording "***would have***" to describe the association between Rosenberg I's detents and Rosenberg II's profiles confirms that Rosenberg I does not disclose this element. PO Resp. 60 (citing Ex. 2007 ¶ 144). Petitioner responds that "the Petition was explaining how POSAs 'would have' understood Rosenberg I's teachings," which "is proper for anticipation, and certainly proper for the

Petitioner’s alternative obviousness argument.” Reply 28. We agree with Petitioner. Mr. Ward testifies, and we agree, “[a] POSITA would have understood Rosenberg I to incorporate Rosenberg II’s disclosures regarding force ‘profiles’ because those particular disclosures are ways to implement Rosenberg I’s ‘control method[s]’ for ‘providing haptic feedback.’” Ex. 1003 ¶ 296 (citing Ex. 1009, 6:49–54). In contrast with this credible testimony, Patent Owner’s argument against Petitioner’s wording (“would have”) does not dispute that one of ordinary skill in the art would *not* have understood Rosenberg I this way. *See* PO Resp. 60.

We, accordingly, agree with Petitioner that Rosenberg I, including the incorporated Rosenberg II, discloses the claimed “detent profile.” Because we agree with Petitioner that Rosenberg I anticipates, we do not reach Petitioner’s argument that it would have been obvious to use Rosenberg II’s force profiles to create Rosenberg I’s vibrotactile effects. *See* Pet. 55.

d. associated with one of the systems

Finally, Patent Owner contends that Rosenberg I does not disclose limitation [1B]’s “receiving a detent profile associated with one of the systems.” PO Resp. 60–61. Patent Owner argues that “one of the systems” has antecedent basis to the “plurality of systems.” *Id.* at 61. As such, Patent Owner reiterates arguments based on its claim construction positions, which we have already rejected above. *Id.* at 61–63. We therefore find these arguments unavailing.

e. Summary as to Claim 1

For the above reasons, Petitioner has shown by a preponderance of the evidence that claim 1 is anticipated by Rosenberg I.

2. Independent Claims 9, 10, 14, and 15

Petitioner also contends that independent claims 9, 10, 14, and 15 are anticipated by Rosenberg I. Pet. 61–65. Petitioner raises similar arguments for these claims as for claim 1, and Patent Owner does not raise separate arguments for these claims. *Id.*; PO Resp. 52–63. Based on our analysis above, we agree with Petitioner that claims 9, 10, 14, and 15 are anticipated by Rosenberg I.

3. Dependent Claims 2–8, 11–13, and 16–19

Petitioner also contends that claims 2–8, 11–13, and 16–19 are anticipated by Rosenberg I. Pet. 57–66. Patent Owner does not dispute these dependent claims. Petitioner provides detailed explanations indicating where Rosenberg I teaches the limitations of these claims supported by Mr. Ward’s testimony. *Id.* We determine that Petitioner has shown by a preponderance of the evidence that claims 2–8, 11–13, and 16–19 are anticipated by Rosenberg I.

D. Remaining Challenges

Because Petitioner’s challenge over Rosenberg I is dispositive of all claims, we do not reach Petitioner’s remaining challenges. *See SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1359 (2018) (holding that a petitioner “is entitled to a final written decision addressing all of the claims it has challenged”); *Bos. Sci. Scimed, Inc. v. Cook Grp. Inc.*, 809 F. App’x 984, 990 (Fed. Cir. 2020) (non-precedential) (recognizing that the “Board need not address issues that are not necessary to the resolution of the proceeding” and, thus, agreeing that the Board has “discretion to decline to decide additional instituted grounds once the petitioner has prevailed on all its challenged claims”).

V. CONCLUSION¹³

In summary:

Claim(s)	35 U.S.C. §	Reference(s)/Basis	Claim(s) Shown Unpatentable	Claim(s) Not Shown Unpatentable
1–19	103	Ichinose, Levin ¹⁴		
1–19	103	Wang, Ichinose ¹⁵		
1–19	102 ¹⁶	Rosenberg I	1–19	
1–19	103	Rosenberg I, Goldenberg ¹⁷		
Overall Outcome			1–19	

¹³ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner’s attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. § 42.8(a)(3), (b)(2).

¹⁴ We do not address this challenge because Petitioner’s challenge over Rosenberg I is dispositive of all claims.

¹⁵ We do not address this challenge because Petitioner’s challenge over Rosenberg I is dispositive of all claims.

¹⁶ We do not reach Petitioner’s Section 103 argument over Rosenberg I for reasons we explain above.

¹⁷ We do not address this challenge because Petitioner’s challenge over Rosenberg I is dispositive of all claims.

VI. ORDER

It is, therefore,

ORDERED that Petitioner has shown by a preponderance of the evidence that claims 1–19 of the '042 patent are unpatentable; and

FURTHER ORDERED that, because this is a Final Written Decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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