

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

VALVE CORPORATION,

Petitioner,

v.

IMMERSION CORPORATION,

Patent Owner.

Case IPR2024-00714

Patent 10,627,907

**PATENT OWNER'S PRELIMINARY RESPONSE
UNDER 35 U.S.C. §§ 311-19 AND 37 C.F.R. § 41.100, ET SEQ.**

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EXHIBIT LIST

Exhibit No.	Exhibit Description
2001	Declaration of Craig Rosenberg, Ph.D. in Support of Immersion Corporation's Patent Owner Preliminary Response, dated July 30, 2024
2002	<i>Curriculum Vitae</i> of Craig Rosenberg, Ph.D.
2003	<i>Immersion Corp. v. Valve Corp.</i> , 2:23-cv-000712-TL, Joint Claim Construction Statement (Exhibit A), Dkt. # 68-1

I. INTRODUCTION

Patent Owner Immersion Corporation (“Immersion”) respectfully requests that the Board deny institution of this Petition as it fails to demonstrate a reasonable likelihood that Petitioner Valve Corporation (“Petitioner”) will succeed in showing that the challenged claims of Immersion’s U.S. 10,627,907 (EX1001 or the “’907 patent”) are unpatentable.

The challenged ’907 patent is directed to devices, such as video game controllers, medical devices, automotive controls, remote controls, and other similar devices, that provide haptic feedback. As detailed in the Background section of the ’907 patent, Immersion’s inventors recognized that providing haptic feedback to a user enhances and simplifies the user’s experience. Such haptic feedback can provide the user with cues, alerts, or realistic feedback that provide greater sensory immersion within a simulated or virtual environment. To better provide these benefits, the ’907 patent discloses methods and devices that enable a user to customize their own experience by adjusting the haptic feedback of a controller or device themselves using software. The ’907 patent teaches that a user can adjust a primary range, a secondary range, and a boundary range of positions for a user input element (e.g., a control on a device such as a button, trigger, knob, etc.) which determines when a device renders a haptic effect. Thus, the invention lets the user change the controls of a haptic device according to their preference. By contrast,

Petitioner's asserted prior art discloses inventions with pre-defined or pre-existing force profiles that cannot be changed.

The only grounds asserted by Petitioner against the challenged independent claims of the '907 patent are Grounds 1, 3, and 6 based on anticipation by and/or obviousness over the Goldenberg, Rosenberg, and Levin references, respectively.¹ Petitioner has also asserted obviousness combinations against the dependent claims (Grounds 2, 4, 5), but each of those grounds rely on either Goldenberg or Rosenberg to meet the elements of the underlying independent claims. Since each Goldenberg, Rosenberg, and Levin fail to disclose at least one limitation of the challenged, independent claims, all of the asserted grounds fail.

¹ For each of Grounds 1, 3, and 6, Petitioner has asserted that certain claims, including the independent claims, of the '907 patent are "anticipated by and/or obvious over" the asserted reference. However, Petitioner has failed to provide any arguments or evidence of obviousness regarding the independent claims aside from unsupported, conclusory statements. Accordingly, Petitioner has not met its burden of proving obviousness with respect to the independent claims, and only anticipation is at issue for those claims.

A common theme across the Petitioner's anticipation grounds is that they fail to give full effect to all of the claim terms. Most notably, the Petitioner has failed to map where in all three anticipation references the “defining position and range information for the user input element associated with the haptic output device” is allegedly met. Petitioner repeatedly equates “defining” with the graphical depictions of force effects and/or pre-existing, pre-defined force profiles disclosed in the anticipation references. But “defining” is not the same as “describing” or “pre-defined.”

In the context of the '907 patent, “defining” is a discrete step or feature taken by, or allowing, a user to change the settings of their controller to adjust the ranges relative to when the controls on a device render a haptic effect. For example, claim 1 is directed to a method that requires the step of “defining position and range information,” whereas the other two independent claims, 8 and 15, require a computer program with instructions (i.e., software) for “defining position and range information.” The specification of the '907 patent also discloses that the user inputs the position and range information through software. The anticipatory references disclose a variety of force effects that cannot be changed by a user because they are pre-defined, which is the exact opposite of the flexibility provided to the user by the invention of the '907 patent. Petitioner fails to identify any disclosure from the three

references that gives a user the ability to define position and range information for a haptic effect as opposed to using pre-defined force profiles.

Accordingly, as detailed in this Preliminary Response, all grounds of the Petition commonly suffer from a key deficiency, which is the failure to disclose “defining position and range information” for a haptic effect as claimed by the '907 patent. The references also suffer from other deficiencies, as will be shown below. Therefore, the Board should deny institution of the Petition.

II. IMMERSION CORPORATION—A PIONEER IN HAPTICS TECHNOLOGY

Immersion Corporation is a publicly traded company, and, since its founding 30 years ago, has been the global leader in developing haptic technology as well as licensing software solutions and intellectual property for enabling haptic interfaces in a broad array of product markets including wearable devices, mobile ads and video, mobile devices, medical applications, automotive interfaces, gaming and virtual reality. Over 3 billion devices are licensed to use Immersion's haptic feedback software and intellectual property.

Started in 1993 by Louis Rosenberg, a pioneer in sensing interfaces and feedback technology, Immersion developed and commercialized haptic innovations, allowing devices to provide tactile sensations to enhance user interactions. Immersion was one of the first companies to release haptic joysticks, computer mice

and steering wheels for video games. This technology has been widely used in gaming controllers, medical simulators, and other applications to enhance realism and user engagement.

Immersion's industry-defining technology is used in over three billion devices worldwide, including tablets, smartphones, wearables, gaming controllers, and automotive interfaces. The Institute of Electrical and Electronics Engineers ("IEEE") has recognized Immersion in its annual IEEE Spectrum Patent Power scorecards, which evaluate the technology world's most valuable patent portfolios by quantitative benchmarks. Immersion's established and growing leadership in haptic technology is reflected by its consistent ranking in the top 20 in its industry segment.

Immersion's technological advances in the haptics space has generated over 3,500 issued patents world-wide. Immersion's patents have been proven novel through multiple challenges over the years. Exclusive of those brought by Petitioner,

Immersion's patents have been challenged in 50 IPRs² of which only two cases³ have resulted in determinations of unpatentability.

III. BACKGROUND

A. Summary of the '907 Patent

The '907 patent discloses systems and methods for controlling a boundary range of a user input element associated with a haptic output device. EX1001 at 2:39-41. Physical input devices, such as video game devices and controllers, typically use visual and auditory cues to provide feedback to a user, but some interface devices use haptic feedback or haptic effects, which sometimes include kinesthetic or tactile feedback. *Id.* at 1:21-27. Haptic feedback can provide cues that enhance and simplify a user's interaction with a video game controller, or other electronic device, for example by alerting the user to specific events, or providing realistic feedback to

² Ten of these IPRs were denied institution, 14 of them were terminated prior to an institution decision in light of settlements, while 21 of them were instituted with 17 of those terminated prior to a final written decision in light of settlements and 5 of those currently awaiting an institution decision.

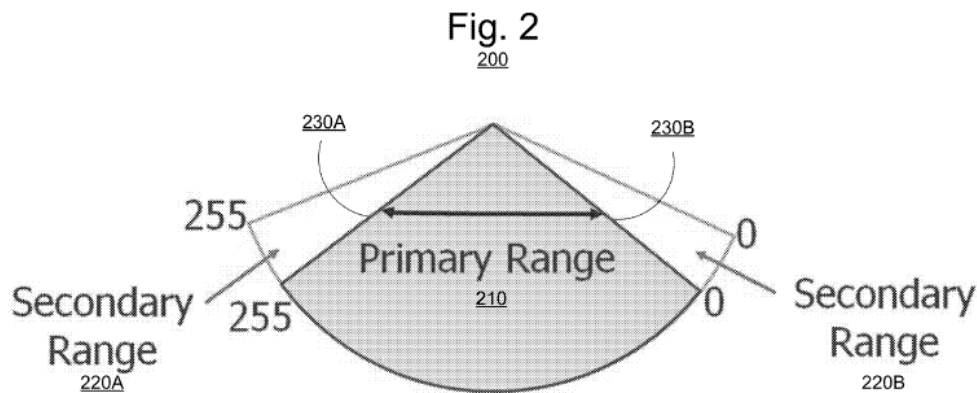
³ *Apple Inc. v. Immersion Corp.*, IPR2016-01372, Paper 35 (Jan. 10, 2018) and *Apple Inc. v. Immersion Corp.*, IPR2016-01381, Paper 36 (Jan. 10, 2018).

allow greater sensory immersion in a simulated or virtual environment. *Id.* at 1:28-33. Other types of devices may also benefit from haptic feedback, including medical devices, automotive controls, remote controls, and others. *Id.* at 1:34-38. The inventors of the '907 patent recognized that they could substantially improve upon prior art input devices by adding functionality allowing a user to define various ranges of positions for a user input element (e.g., a knob, joystick, etc.) such that when the user input element enters certain positions within a defined boundary range, the user input device renders a haptic effect. *Id.* at 1:41-58.

Generally, the claimed invention of the '907 patent provides for defining position and range information for the user input element of a haptic output device, including a primary, a secondary, and a boundary range of positions wherein the boundary range partially overlaps with each of the primary and secondary ranges, and a haptic effect is rendered in response to entry of the user input element into one or more positions within the boundary range of positions. *Id.* at cl. 1, 8, 15. This improves upon the prior art by extending the range and capabilities of the user input elements and enabling the user to experience a wider range of haptic effects. *Id.* at 9:36-39.

Fig. 2, shown below, depicts an embodiment of the invention with a range of motion 200 that includes a primary range 210 and two secondary ranges, 220A and 220B. *Id.* at 5:19-20. Figure 2 also shows two boundary ranges, 230A and 230B. *Id.*

at 5:20-21. The boundary ranges are represented by lines in Fig. 2, but the patent discloses that they are defined ranges that partially overlap with the primary range and the secondary range, and the primary range may also overlap with the secondary range in some instances. *Id.* at 5:21-25.



Id. at Fig. 2.

The specification explains that the “defining position and range information” element of the claims is carried out by a computer processor 120 that executes computer programs, including a boundary range module 142. *Id.* at 3:11-20. As shown in Fig. 1, the boundary range module 142 controls the boundary range of user input elements of the controller 150. *Id.* at 3:28-30. By permitting users to define position and range information for themselves, the invention of the '907 patent significantly improves upon the prior art which saddles users with pre-defined force profiles that cannot be adjusted.

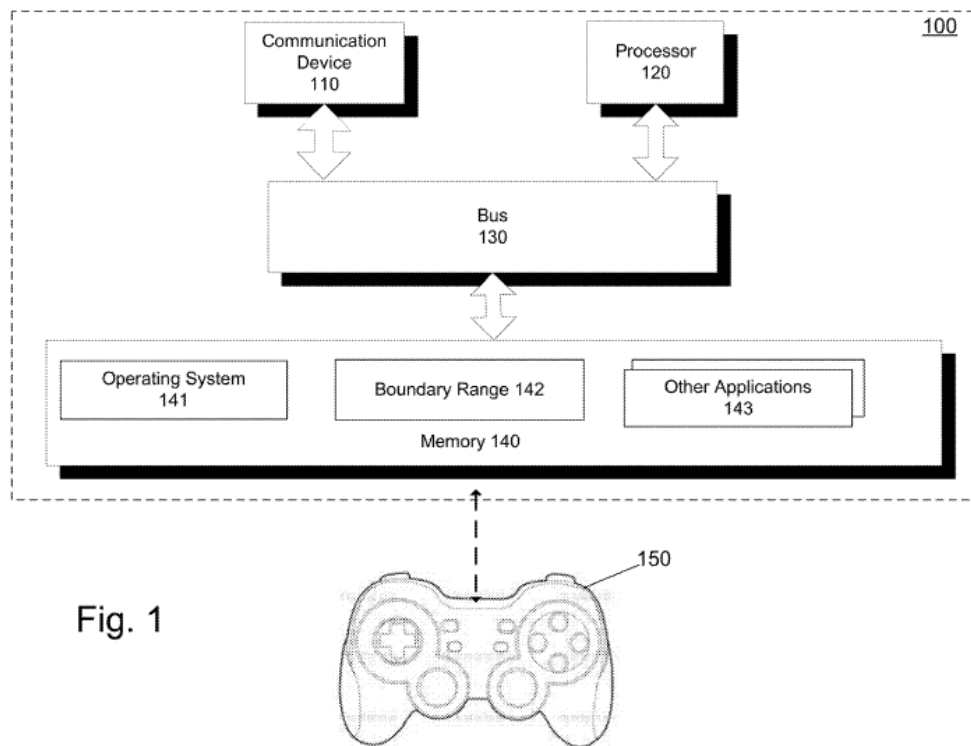
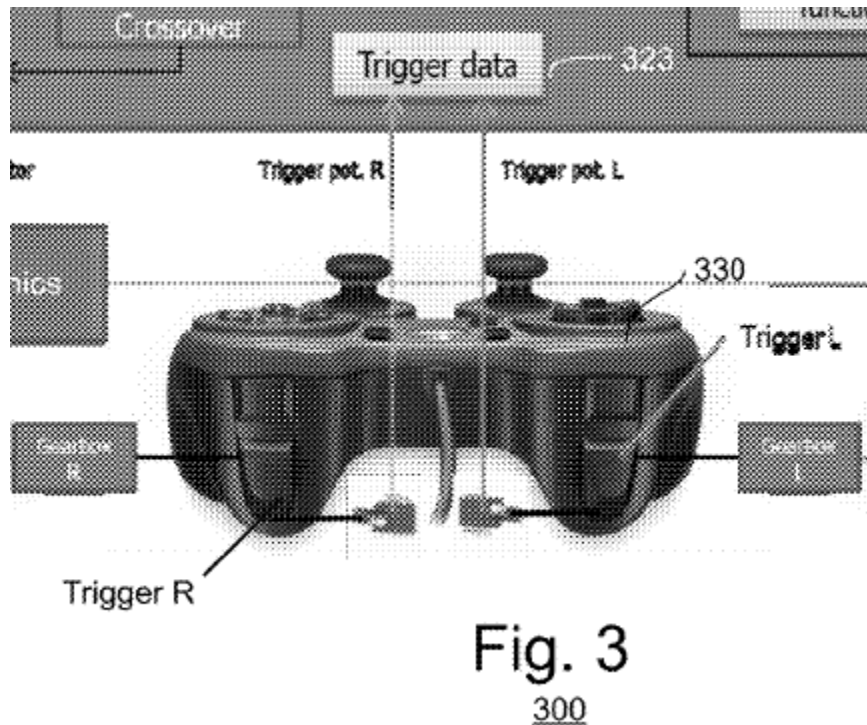


Fig. 1

Id. at Fig. 1.

The primary, secondary, and boundary ranges are software defined and may be fixed or variable. *Id.* at 5:29-30. As explained by the '907 patent, “[t]rigger engine 316 may receive haptic data, such as a haptic effect definition, and may **modify** the haptic data **based on user input data**, such as trigger data 323.” *Id.* at 7:1-3 (emphasis added). “Trigger data 323, as previously described, is data that includes one or more parameters that indicate a position and/or range of one or more triggers of controller 330 (e.g., triggers L and R of FIG. 3).” *Id.* at 8:10-13.



Id. at Fig. 3.

B. Claims

Petitioner challenges claims 1-20 of the '907 patent, including independent claims 1, 8, and 15. Independent claim 1 recites:

1. [1PRE] A method for controlling a user input element associated with a haptic output device, the method comprising:
 - [1A] Defining position and range information for the user input element associated with the haptic output device, including
 - [1A1] a primary range of positions,
 - [1A2] a secondary range of positions, and

[1A3] a boundary range of positions, wherein the boundary range of positions partially overlaps each of the primary range of positions and the secondary range of positions; and

[1B] rendering a haptic effect in response to an entry of the user input element to one or more positions within the boundary range of positions.

Id. at cl. 1.

Claim 8 of the '907 patent is substantially the same as claim 1, except that it has a different preamble (i.e., "A non-transitory computer readable storage medium storing a program configured to be executed by a processor, the program comprising instructions for:"). Claim 15 of the '907 patent includes substantially the same limitations as claim 1, but it also has a different preamble (i.e., "A device comprising:"), and it has two additional limitations immediately following the preamble (i.e., "a processor; and a memory storing a program for execution by the processor, the program including instructions for:").

The bracketing labels shown in claim 1 refer to the labels used in Petition for claim 1. Since independent claims 8 and 15 contain substantially the same limitations, all discussion below applies equally to claims 1, 8, and 15 unless otherwise stated.

C. Prosecution History

The application that matured into the '907 patent was filed on August 8, 2018, claiming benefit of priority to Provisional Application No. 62/096,251, filed December 23, 2014. The application originally contained a single claim, independent claim 1, but the applicant filed a Preliminary Amendment on July 22, 2019, adding new claims 2-20 and substantially amending claim 1.

On July 25, 2019, the Patent Office issued a Non-Final Office Action rejecting claim 1 on Section 102 grounds but not addressing newly added claims 2-20 or the amended version of claim 1. However, per an Applicant Initiated Interview Summary dated August 7, 2019, the Patent Office agreed to withdraw the July 25 Non-Final Office Action and the pending Section 102 rejection and submit a new first Office Action in view of the Applicant's timely-submitted Preliminary Amendment. The Patent Office subsequently rejected independent claims 1, 8, and 15 on the ground of non-statutory double patenting as being unpatentable over claims 1 and 7 of U.S. Patent No. 10,073,523 in an Office Action dated September 12, 2019. The Patent Office further noted that it objected to claims 2-7, 9-14, and 16-20 as being dependent on rejected base claims but stated that those dependent claims would be allowable if rewritten in independent form including all limitations of the base claims and any intervening claims.

On December 12, 2019, the Applicant submitted a terminal disclaimer to traverse the Patent Office's non-statutory double patenting rejection. Accordingly, the Patent Office issued a Notice of Allowability for claims 1-20 on January 15, 2020, and the '907 patent issued on April 21, 2020, subject to a terminal disclaimer.

IV. PERSON OF ORDINARY SKILL IN THE ART (POSA)

Petitioner identifies a person of ordinary skill in the art ("POSA") as one who would have possessed 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, or other relevant experience. Pet. at 6 (citing Declaration of Jean Renard Ward, EX1003 ("Ward") at ¶¶ 38-42).

Immersion submits that a POSA at the time of the '907 patent 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. EX2001 at ¶33. Also, a person could have qualified as a POSA with more formal education and less practical or industry experience, or vice versa. *Id.* at ¶34. Immersion reserves the right to propose a different level of skill in the art if trial is instituted. In any event, the

Petition fails to show that any challenged claim of the ’907 patent is unpatentable under either Petitioner’s or Immersion’s definition of a POSA. *Id.* at ¶36.

V. CLAIM CONSTRUCTION

In the current parallel district court proceeding, Immersion and Petitioner have agreed to the following constructions with respect to the claims of the ’907 patent.

Claim Term	Agreed Proposed Construction in District Court ⁴
“range” claims 1, 2, 5, 8, 9, 12, 15, 16, 18	“a sequence, series, or scale between limits”
“primary range” claims 1, 2, 8, 9, 15, 16	“range” as construed above, but otherwise plain and ordinary meaning
“secondary range” claims 1, 2, 5, 8, 9, 12, 15, 16, 18	“range” as construed above, but otherwise plain and ordinary meaning
“boundary range” claims 1, 2, 5, 8, 9, 12, 15, 16, 18	“range” as construed above, but otherwise plain and ordinary meaning

The parties have not proposed constructions for any other claim terms of the ’907 patent in the parallel district court proceeding. Here, Petitioner believes no

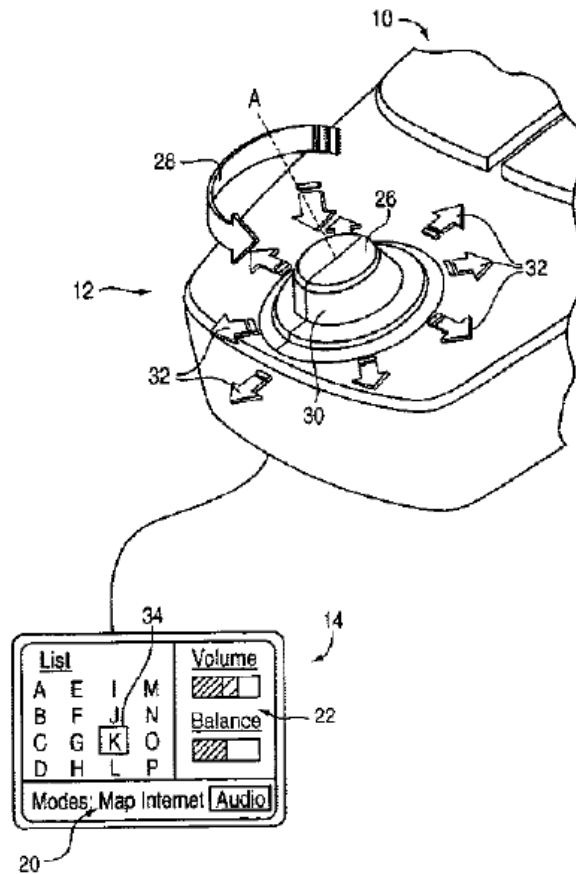
⁴ See EX2003; *Immersion Corporation v. Valve Corporation*, No. 2:23-cv-00712-TL, Dkt. No. 68-1 (W.D. Wash. Mar. 29, 2024).

terms require construction. Pet. at 7. For the purposes of this Preliminary Response, Patent Owner believes that the terms listed above may be given their agreed construction and all other terms may be given their ordinary and customary meaning, as understood by a POSA, in the context of the patent specification, and that no argument herein requires construction for any particular term.

VI. THE ASSERTED REFERENCES

A. Goldenberg (EX1016)

Goldenberg (U.S. Patent Application Publication No. 2004/0032395) describes “haptic sensations for a haptic feedback device and especially for a rotational device such as a knob.” EX1016, Abstract. According to Goldenberg, “force effects such as a hill force effect and barrier force effect allow easier selection of menu items, menus, values, or other options by the user.” *Id.* The knob is disclosed to be a rotatable thumbstick, as shown below:



Id. at Fig. 1.

In *Goldenberg*, force feedback is associated with events such as user interaction with menu items—e.g., “A detent force can be output when the cursor moves from one menu item to a different menu item.” *Id.* at [0012]. *Goldenberg* further states, “[f]or example, each successive item in a linear menu 306 can be provided with a detent, where the detent force profile overlaps with the beginning of the next items detent force profile as a way to provide a more compelling feel to the user and, in some cases, to reduce selection overshoot.” *Id.* at [0085]).

Goldenberg summarizes the problem that it is meant to address as follows:

many of the well known force feedback sensations, such as detents, are applied in simple ways that are often inadequate for dealing with some of the selection functions required from a knob, where often complex control over functions and options must be provided with limited knob motion. For example, selecting options from a menu and navigating between menus can be difficult for a user when only simple detents are output. The user may accidentally skip menus or selections or may have to move a cursor through many undesired selections to reach a desired selection.

Id. at [0009].

Goldenberg attempts to solve the problem using a pre-defined “‘force process’ that may be stored in local memory 206 and includes calculation instructions, formulas, force magnitudes (force profiles), and/or other data.” *Id.* at [0066]. The force profiles are meant to simulate physical or mechanical force effects such as a hill effect in which the knob encounters an increasing resistive force (i.e., moving up the slope of the hill) followed by an assistive force (i.e., moving down the slope of the hill). *Id.* at [0011]. Goldenberg also discloses a jog shuttle control model in which a first spring effect centered around an origin position applies over the knob’s entire range of motion and biases the knob back to an origin position, as well as a second spring effect that is also centered around, and biased toward, the origin

position, but it is stiffer and output only over a smaller range around the origin. *Id.* at [0014], [0116].

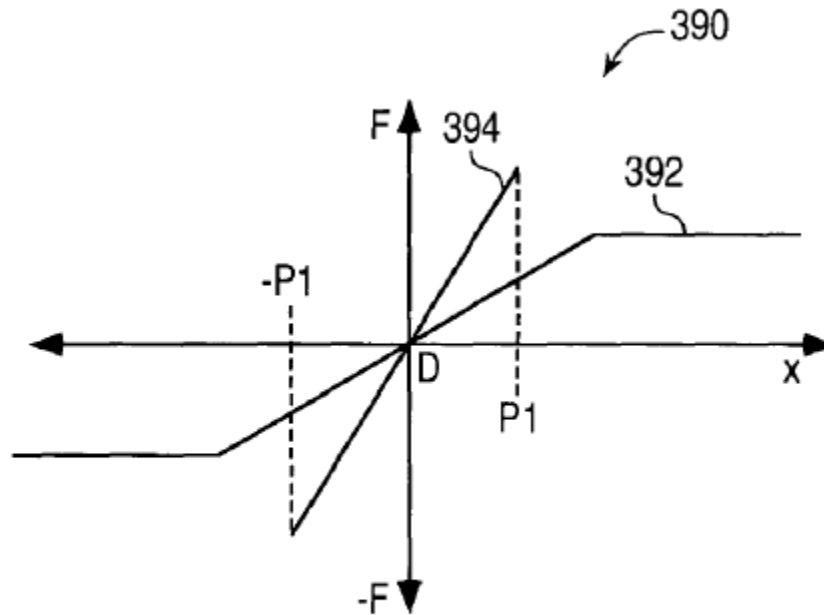


FIG. 8

Id. at Fig. 8

B. Rosenberg (EX1017)

Rosenberg (U.S. Patent Application Publication No. 2007/0139375) describes “a method and apparatus for providing force feedback to a user operating a human/computer interface device in conjunction with a graphical user interface (GUI) displayed by a host computer system.” Ex. 1017 at Abstract. More specifically, Rosenberg explains that, “[p]referably, the force sensation applied to the physical object is at least partially determined by a location of the cursor in the

GUI with respect to targets associated with the graphical objects in the GUI.” *Id.* at [0012]. Rosenberg discloses that, “[t]hese targets may include or be associated with such graphical objects as icons, windows, pull-down menus and menu items, scroll bars (‘sliders’), and buttons.” *Id.* According to Rosenberg, “[t]he force sensation output to the physical object is associated with targets that affect the cursor,” and the “force preferably assists the user to select the desired operating system function that is associated with the force.” *Id.* The physical “object” operated by the user may be a joystick, such as the one shown below in Figure 7, but it can also be a “mouse, trackball, stylus, steering wheel, medical instrument (laparoscope, catheter, etc.), pool cue, hand grip, knob, button, or other article. *Id.* at [0082]; *see also* [0026].

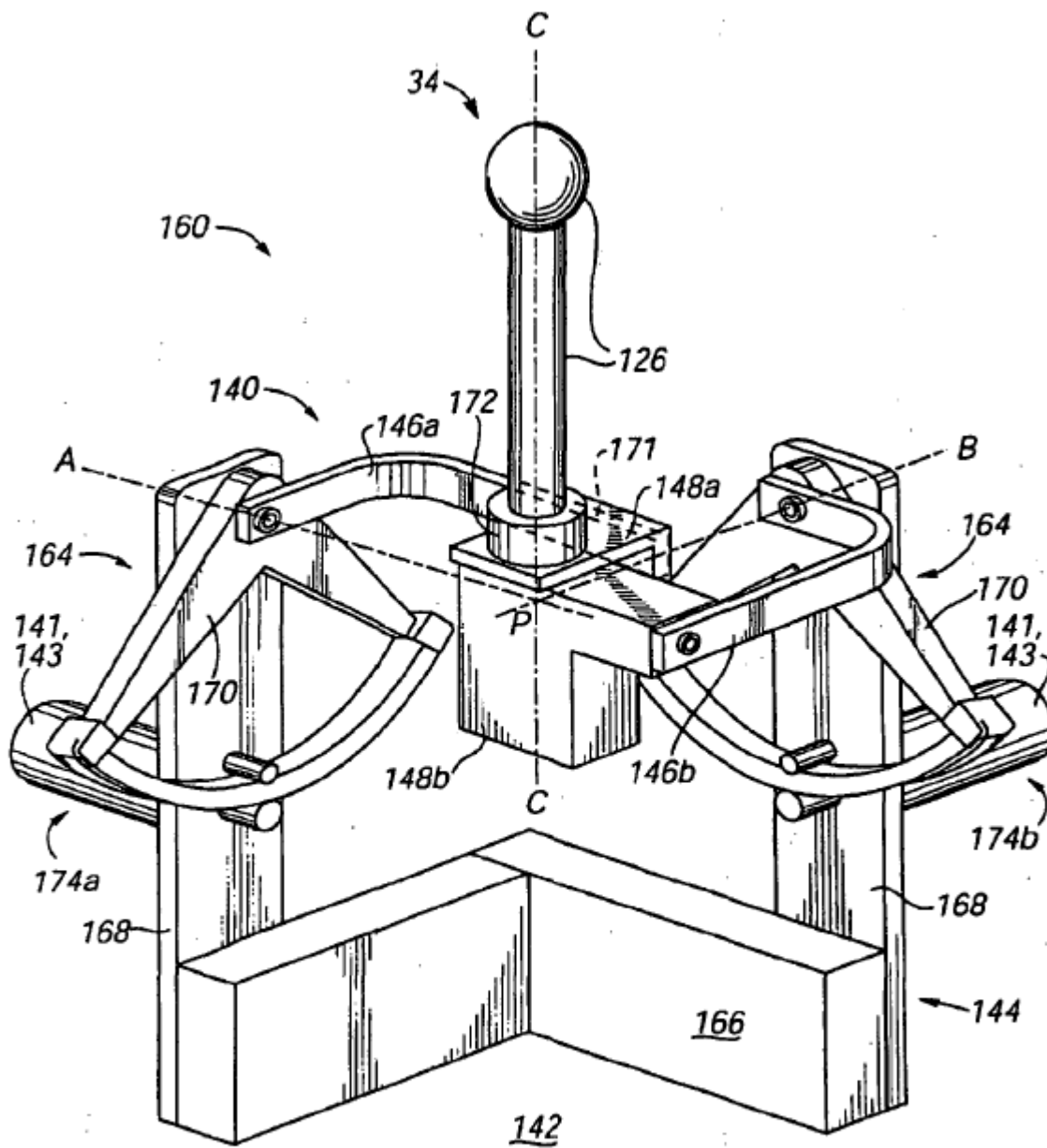


Figure 7

Id. at Fig. 7.

The problem that Rosenberg attempts to solve is in the context of moving a cursor of a GUI to a desired target, such as icon, window, etc. According to Rosenberg,

[t]he movement of a cursor onto various displayed graphical objects of a GUI may require significant dexterity. Users may move the cursor too far over an object and have to backtrack their cursor. Or, particular graphical objects might be mistakenly selected when the user does not wish to select the object due to pressing a button or moving the cursor by accident. In addition, a user may become confused as to which window a cursor is position in if the user is viewing other data on the screen at the same time as moving the cursor.

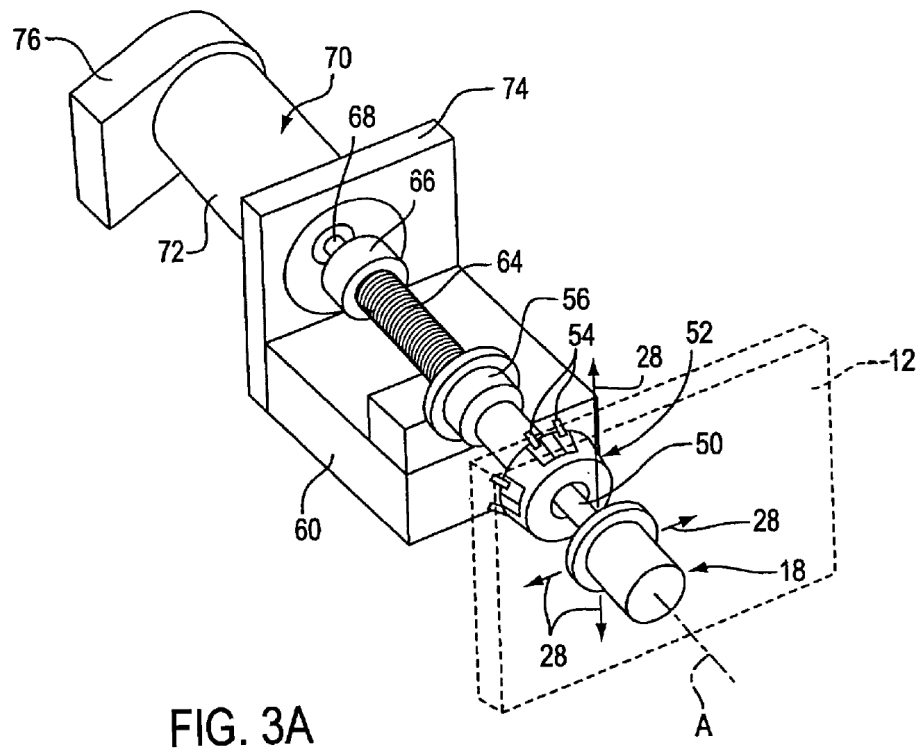
Id. at [0007]. Rosenberg states that interacting with a GUI may be particularly difficult for persons with neuromotor disabilities because they may “lack the fine motor coordination required to manually position the computer cursor accurately and efficiently.” *Id.* at [0008].

Rosenberg attempts to solve this problem by providing “a computer system and interface device that will allow all users to more accurately and efficiently perform cursor movement activities and manipulating operating system and other functions within a GUI.” *Id.* at [0009]. To that end, Rosenberg’s invention simulates force effects by using “force values that have been previously calculated or sampled and stored as a digitized ‘force profile’ in memory or other storage device. These

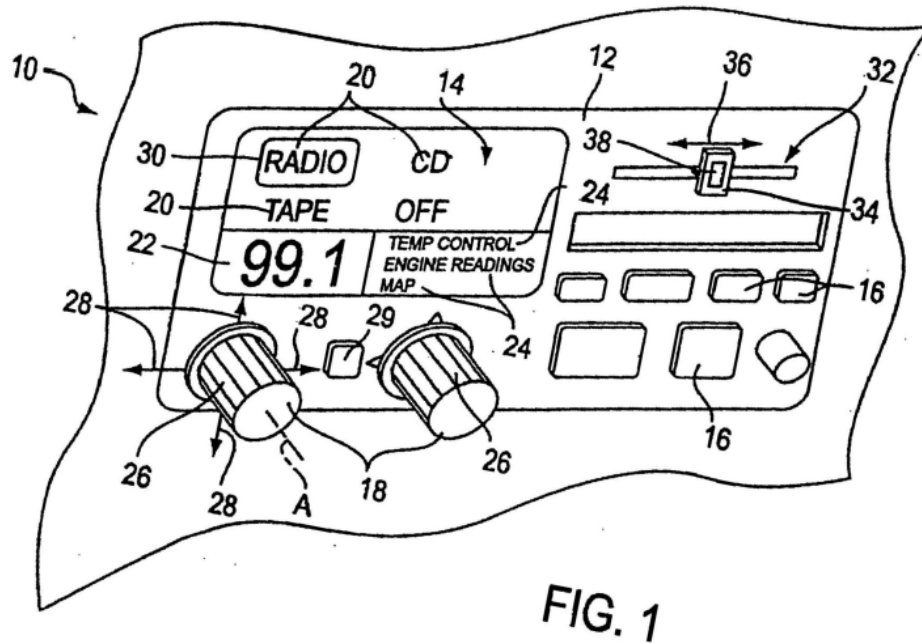
force values may have been previously generated using an equation or algorithm...or provided by sampling and digitizing forces.” *Id.* at [0103]. In other words, Rosenberg uses pre-existing, pre-defined force profiles to improve a user’s interactions with a GUI.

C. Levin (EX1006)

Levin (U.S. Patent Application Publication No. 2007/0152988) describes a “control knob on a device that allows a user to control functions of the device.” EX1006 at Abstract. The control knob is described to be “rotatable in a rotary degree of freedom and moveable in at least one transverse direction approximately perpendicular to the axis.” *Id.* Fig. 3A below shows an embodiment of a physical mechanism for implementing the control knob of Levin’s invention. *Id.* at [0015].

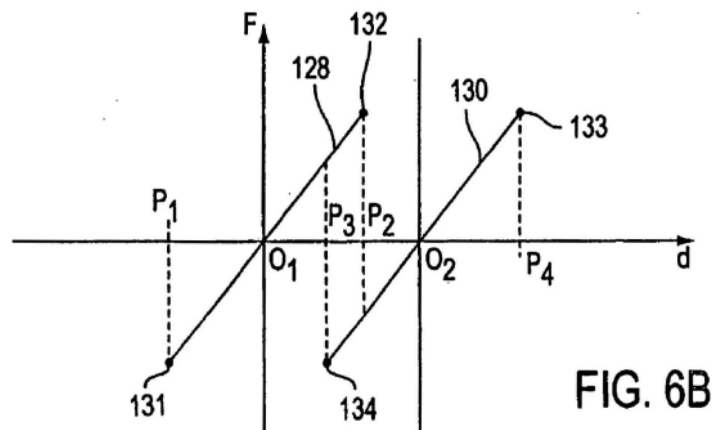


Id. at Fig. 3A. This mechanical knob could be used, for example, as part of a radio embodiment of Levin's invention, as shown below in Fig. 1.



Id. at Fig. 1, [0013]. Levin explains that in such an embodiment, moving the knob left or right controls the radio frequency, and it outputs force detents for each station or for each preset station. *Id.* at [0036].

According to Levin, “[o]ne problem occurring in control knobs of the prior art is that the knobs are limited to basic rotary motion. This limits the control options of the user to a simple, one-degree-of freedom device that does not allow a variety of selection options. In addition, if force feedback is provided on the knob, the limited control functionality of the knob limits the user from fully taking advantage of the force feedback to provide more control over desired functions.” *Id.* at [0004]. To address this problem, Levin discloses using pre-defined detent force profiles where the detents are centered around detent origins. *Id.* [0067]. Levin also discloses a detent profile “in which the detent forces of two successive detents are partially overlapped due to the detents, and provide a hysteresis-like force effect.” *Id.* at [0070]. The illustration below depicts a detent profile in which detent 128 centered around point O_1 overlaps detent 130 centered around point O_2 .



Id. at Fig. 6B.

VII. GROUND 1: GOLDENBERG DOES NOT ANTICIPATE OR RENDER OBVIOUS ANY OF THE CHALLENGED CLAIMS

In Ground 1, Petitioner relies on Goldenberg to allege anticipation of certain of the challenged claims, including all independent claims. As detailed below, Goldenberg does not disclose at least three key limitations of the challenged claims— (1) “defining position and range information for the user input element”; (2) “a secondary range of positions”; and (3) “wherein the boundary range of positions partially overlaps each of the primary range of positions and the secondary range of positions.” Goldenberg instead discloses pre-defined force profiles that cannot be adjusted by the user and only two ranges, one of which is entirely (not partially, as the claim requires) overlapped by the other.

A. Claim [1A]: Goldenberg Fails to Disclose “Defining Position and Range Information for the User Input Element”

Each of the independent claims of the '907 patent (i.e., claims 1, 8, and 15), and, therefore, each dependent claim, requires “defining position and range information for [the/a] user input element.” Claim 1 is a method claim that requires a user to perform the step of “defining position and range information.” Claims 8 and 15 are directed to devices that use software for “defining position and range information.” Goldenberg fails to disclose this element, as Goldenberg instead discloses pre-defined force profiles that merely describe various force effects that cannot be adjusted by the user. *See*, e.g., EX1016 at [0021], [0066]; EX2001 at ¶¶66-68. But a “description” of particular ranges is not the same as a process for “defining” those ranges, and the ranges and the process for defining them must be treated as separate terms. *See Bd. of Regents v. BENQ AM. Corp.*, 533 F.3d 1362, 1371 (Fed. Cir. 2008) (“Different claim terms are presumed to have different meanings.”). Identification of a range in a force profile does not disclose a method or device that enables defining that range. Petitioner cannot meet its burden because it has failed to properly map “defining position and range information.”

Petitioner improperly conflates the “defining position and range information” and the claimed “range” terms, mapping them to the same features. EX2001 at ¶69. The claims separately recite “*defining* position and range information,” which

includes “a **primary range** of positions, a **secondary range** of positions, and a **boundary range** of positions....” *See*, e.g., EX1001, Cl. 1, 8, 15. Each of these three “ranges” is a separate and distinct element, and the things that are defined (i.e., the “ranges”) are separate and distinct from the process of defining them. “Claims are interpreted with an eye toward giving effect to all terms in the claim.” *Bicon, Inc. v. Straumann Co.*, 441 F.3d 945, 950 (Fed. Cir. 2006). Accordingly, the “defining” element and the “range” elements should each be given effect. Petitioner has failed to do so.

As explained below, Petitioner maps the “defining” element to the jog force shuttle model shown at Fig. 8 of Goldenberg. Pet. at 10, citing Ward, ¶90. Similarly, Petitioner points to the jog force shuttle model shown at Fig. 8 of Goldenberg to map “a primary range of positions” (Pet. at 12-13), “a secondary range of positions” (*id.* at 13-14), and “a boundary range of positions...” *Id.* at 14-16. In other words, Petitioner treats the “defining” element as nothing more than a **description** of the three claimed ranges. EX2001 at ¶68.

Petitioner presumes that alleged disclosure of the claimed ranges is also disclosure of “defining position and range information,” as if the latter is merely a **description** or recitation of the former. EX2001 at ¶69. However, “[i]n the absence of any evidence to the contrary, we must presume that the use of these different terms in the claims connotes different meanings.” *CAE Screenplates, Inc. v. Heinrich*

Fiedler GmbH & Co. Kg, 224 F.3d 1308, 1317 (Fed. Cir. 2000). Here, nothing in the patent or file history suggests that the “defining” element is redundant with the claimed ranges or that the disclosure of one necessitates disclosure of the other, so they should be treated as distinct. *Becton, Dickinson & Co. v. Tyco Healthcare Group, LP*, 616 F.3d 1249, 1254 (Fed. Cir. 2010) (“Where a claim lists elements separately, the clear implication of the claim language is that those elements are distinct components of the patented invention.”) (internal citations and quotations removed); *see also* EX2001 at ¶70. Treating the “defining” element as superfluous would be improper since doing so would render the scope of the patent ambiguous. *Bicon*, 441 F.3d at 950; *see also* EX2001 at ¶71. Petitioner’s attempt to equate the “defining” limitation with a description of the claimed ranges fails to show that Goldenberg discloses that limitation.

1. Goldenberg’s Force Profiles Fail to Disclose “Defining Position and Range Information”

As explained in Section III.A, the ’907 patent discloses that a user “defining position and range information” according to the claims does so using software. Claims 8 and 15 expressly reference software. *See, e.g.*, EX1001 at 14:24-25 (“the program comprising instructions for: defining...”), 14:64-65 (“the program including instructions for: defining...”). Claim 1, a method claim, requires the step of “defining position and range information,” and the enabling disclosure describes

using software to perform this step. Rather than merely describing potential ***haptic effects***, the '907 patent discloses computer architecture and components (e.g., a “boundary range module 142”) for ***defining*** position and range information for rendering those haptic effects. EX1001 at 3:11-20, 28-30; EX2001 at ¶72. It also discloses that haptic effects may be ***modified*** “based on user input data” which includes position and range information for one or more buttons, triggers, etc. on a controller. EX1001 at 7:1-3, 8:10-13; EX2001 at ¶72.

By contrast, Petitioner fails to identify any such disclosure in Goldenberg for “***defining*** position and range information.” EX2001 at ¶73. Rather, Petitioner contends that “Goldenberg’s method uses ‘force profiles’ that define, *inter alia*, ‘position and range information’” (Pet. at 10, citing Ward, ¶89), but the force files are merely pre-defined, graphical ***descriptions*** of certain ***force effects***—they do not define position and range information as required by the claims because Goldenberg does not provide the user with any flexibility to adjust the pre-set force profiles. EX2001 at ¶73. Indeed, Petitioner’s citations to Goldenberg regarding the force profiles demonstrates that they are simply “graphs,” “illustration[s],” and “diagram[s]” of various force effects rather than disclosures of “defining position and range information.” See, e.g., Pet. at 10, citing EX1016 at [0021]-[0029]; EX2001 at ¶74. Goldenberg uses the phrase “force magnitudes (force profiles)”, which demonstrates that force profile is a synonym for force magnitude. EX1016 at

[0066]; EX2001 at ¶74. At most, Petitioner has identified the description of the “haptic effect” limitation—not the defining of position and range information that renders these effects. EX2001 at ¶74. Moreover, Petitioner makes no attempt to show how the line graphs that it points to disclose the method step of “defining position and range information.”

2. Goldenberg's Jog Shuttle Model Fails to Disclose “Defining Position and Range Information”

Petitioner devotes most of its attention to just one of Goldenberg's disclosed embodiments, the “jog shuttle model.” Petitioner claims “Goldenberg's jog shuttle model (‘force vs. position profile 390’) defines an ‘origin O’ position dividing the knob rotational positions into two ranges.” Pet. at 11; Ward, ¶93. But “force vs. position profile 390” cited by Petitioner is a graph of the jog-shuttle model shown in Fig. 8 of Goldenberg as shown below:

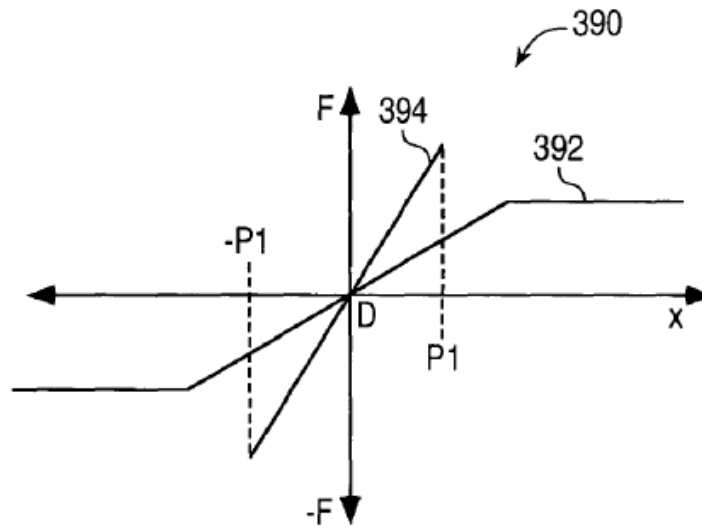


FIG. 8

Petitioner fails to explain how this abstract diagram *description* discloses the step of, or capacity for, “*defining* position and range information,” especially with regard to the specific ranges recited in the claims. EX2001 at ¶75. Moreover, despite Petitioner’s statement to the contrary (Pet. at 11), Goldenberg does not discuss “defining” an “origin O” for the jog shuttle model because it fails to provide the user with the ability to change the relevant values. EX1016 at [0115]-[0117]; EX2001 at ¶75. Goldenberg’s discussion refers to an “origin” or an “origin O” only with respect to *force effects* centered around the origin,” but they do not disclose defining the origin or any other position or range information. EX1016 at [0116]; EX2001 at ¶75.

Petitioner also claims that the jog force model of Figure 8 “further defines ‘positions -P1 and P1,’” (Pet. at 12; Ward, ¶94), but Figure 8 only *describe* those two

points in the abstract. EX2001 at ¶76. Neither Figure 8, nor the relevant paragraphs disclose *defining* those points or any others. See EX1016 at [0115]-[0117]; EX2001 at ¶76. Rather, since the jog shuttle model is meant to “best simulate a mechanical jog shuttle having mechanical springs,” -P1 and P1 appear to be a consequence of a simulated spring effect and are not themselves *defined*. EX1016 at [0116]; EX2001 at ¶76.

Finally, Goldenberg's express *description* of the jog shuttle model precludes disclosure of the “defining element.” EX2001 at ¶77. The claims require “defining position and range information ...including a primary range...a secondary range...and a boundary range.” EX1001, cl. 1, 8, 15. Therefore, if a reference does not disclose defining these three ranges, it does not disclose all elements of the claim. The jog shuttle model discloses two spring effects. See Section VI.A. As explained in greater detail in Section VII.B, Petitioner improperly argues that the range of the first spring effect corresponds to the “primary range of position” and the “secondary range of positions.” Pet. 12-14. Goldenberg discloses that “the spring force is output over the entire movement range of the knob.” EX1016 at [0115]; EX2001 at ¶77. Regardless of whether the first spring effect is deemed to have one range or two, the position and range information for the claimed ranges corresponding to the first spring effect cannot be defined, since the range of the first spring effect is preset to

cover the entire range of the knob. EX2001 at ¶77. Accordingly, Goldenberg's jog shuttle model precludes the "defining" element.

B. Claims [1A1], [1A2], and [1A3]: Petitioner Fails to Show that Goldenberg Discloses the Three Claimed Ranges

Petitioner argues that Goldenberg's jog shuttle model discloses all three of the claimed ranges, but its position conflicts with the plain language of Goldenberg. The challenged claims require three separate, distinct ranges: (1) "a primary range of positions," (2) "a secondary range of positions," and (3) "a boundary range of positions." Goldenberg's jog shuttle model discloses, at most, only *two* ranges corresponding to a first and second spring effect, both of which are centered around an origin point, so at least one of the alleged claim ranges is absent. EX2001 at ¶78. Petitioner attempts to mask this deficiency by dividing the range of the first spring effect into two ranges, while still treating the range of the second spring effect as a single, intact range. Pet. at 12-15. However, Petitioner's argument conflicts with Goldenberg's disclosure and is internally inconsistent for the reasons discussed below.

1. Goldenberg Discloses that the Range of the First Spring Effect Is a Single Range

The jog shuttle simulates two spring effects applied to a knob. Petitioner argues, in just two short paragraphs with little discussion or support, that the range of the first spring effect is actually two ranges. To justify dividing the range of the

first spring effect into multiple ranges, Petitioner relies on statements from the '907 patent's prosecution history, specifically from one page of a non-final office action, which Petitioner characterizes as "finding that 'distances in proximity to boundaries' are ranges and that any range can constitute first and second ranges.'" Pet. at 13-14, citing EX1002 at 100. These statements are taken out of context and should be given no weight because they were made by the Examiner, not the inventor, as part of an anticipation rejection based on U.S. Pat. Pub. No. 2006/0142657 to Quaid et al. in an office action that the Examiner *subsequently withdrew*. EX1002 at 114, 220. The '907 patent's application originally included only claim 1, which was written in a different form from the issued version of claim 1. EX1002 at 59. But *before* the applicant received that non-final office action, the applicant timely submitted a preliminary amendment that substantially revised claim 1 and added new claims. EX1002 at 91-94. Therefore, the Examiner agreed to issue a new first office action directed to the new claims (EX1002 at 114) which expressly *supersedes* the earlier filed office action. *Id.* at 220. In the new first office action, the Examiner did not reject any of the claims in view of Quaid or any other prior art, and he did not reiterate the language now relied on by Petitioner. In other words, the Petitioner relies on an Examiner's statements that appear only in a *superseded* office action regarding a prior art rejection asserted against only an *unprosecuted* version of claim 1. The applicant never had to traverse Quaid, never amended the claims to overcome

a rejection, and never made any statements adopting or conceding the Examiner's quoted language. Accordingly, the language quoted by Petitioner from the file history is irrelevant and should be disregarded.

Petitioner argues that the range of positions moving clockwise from the origin is "a primary range of positions" (Pet. 12-13, citing Ward, ¶¶95), and the range of positions moving counterclockwise from the origin is a "secondary range of positions." Pet. at 13-14, citing Ward, ¶¶ 96. Fig. 8 below shows the range of the first spring effect highlighted in yellow.

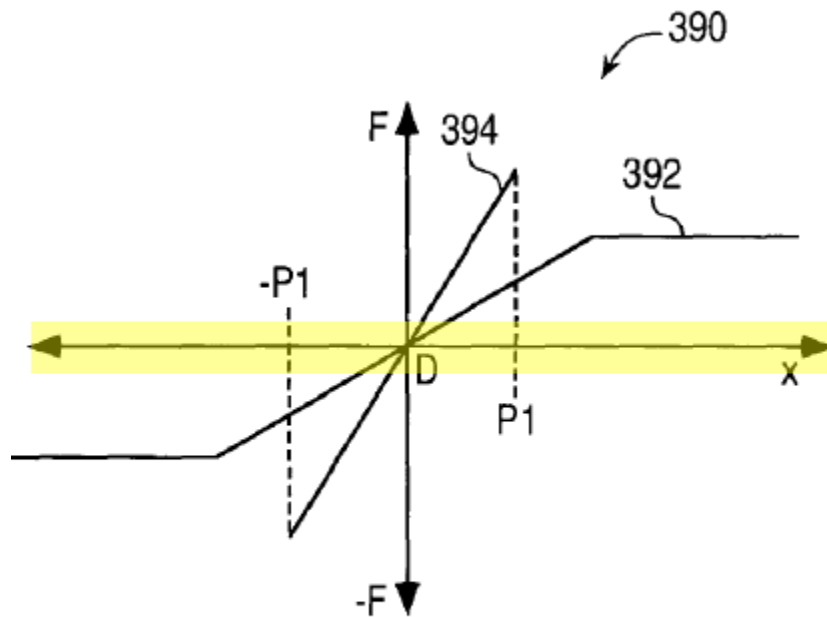


FIG. 8

Rather than describing the first spring effect as having separate ranges depending on the direction the knob is turned, Goldenberg describes the first spring

effect as having a single range centered on an origin point, that always biases the knob toward the origin point. EX2001 at ¶79. According to Goldenberg, “the knob is provided with a centering spring force at all points of its rotation, the spring force biasing the knob toward an origin rest position,” and the first spring effect is “preferably output when the knob is moved in either direction away from the origin position.” EX1016 at [0115]. Notably, Goldenberg describes the first spring effect as being output over a range equal to the entire range of the knob, rather than being divided between different ranges on either side of the origin. EX2001 at ¶79. Petitioner makes no attempt to explain why the range of the first spring effect, which is centered around and always biased toward an origin, should be divided through the origin into two separate ranges.

Petitioner also fails to address Goldenberg's statements that the range of the first spring force effect is one range that covers the “entire range” of the knob (i.e., not “part,” not “half,” etc.). *See, e.g.*, EX1016 at [0115] (“the spring force is output over the entire movement range of the knob”); [0116] (“The first spring effect, shown as curve 392, can be output over the entire range of the knob....”). Goldenberg does not disclose dividing that range into multiple ranges.

2. Claim [1A3]: Goldenberg Fails to Disclose “a Boundary Range of Positions, Wherein the Boundary Range of Positions Partially Overlaps Each of the Primary Range of Positions and the Secondary Range of Positions”

According to the Petitioner, the range of the second spring effect is the boundary range, and it would be entirely enveloped by the alleged primary and/or alleged secondary range as shown in the highlighted diagram on page 15 of the Petition. Pet. at 15; EX2001 at ¶78. Thus, in Petitioner's view, the jog shuttle model would not disclose a “boundary range” that “partially overlaps” each of the primary and secondary ranges because the overlap would be total. EX2001 at ¶¶85, 88.

Petitioner argues that “[t]he claimed ‘boundary range’ need not be a unique range of positions,” but rather can “be made up partially or exclusively of positions that are in the” primary or secondary ranges. Pet. at 14-15 (citing Ward, ¶¶97-98). For support, Petitioner and its expert quote from the '907 patent, which states, with respect to Fig. 2, the “primary range 210 may be extended to render haptic effects within secondary ranges 220A, 220B and/or boundary ranges 230A, 320 B.” Pet. at 15 (citing EX1001, 5:23-25, Fig. 2; Ward, ¶98). They conclude from this language that, for the primary range to extend into the secondary range, “it would need to extend through the entirety of boundary range 230A, making that boundary range of positions entirely within the primary range,” but this is incorrect for multiple reasons

as explained below. Pet. at 15 (citing EX1001, 5:23-25, Fig. 2; Ward, ¶98); EX2001 at ¶85.

First, the claim term “partially” must be given meaning and interpreting it to include “total” overlap would render this claim term superfluous. *See Intel Corp. v. Qualcomm, Inc.*, 21 F.4th 801, 809-810 (Fed. Cir. 2021) (refusing to adopt claim construction which would render claim language superfluous); EX2001 at ¶¶85, 89. Nothing in the patent or file history supports such an interpretation. EX2001 at ¶89. Moreover, the fact that the inventors chose to qualify “overlaps” with “partially” rather than “at least partially” or no qualification strongly indicates that total overlap of the boundary range is outside the intended claim scope. Accordingly, when the disclosed spring effects are treated consistently, Goldenberg does not disclose that the “boundary range of positions partially overlaps each of the primary range of positions and the secondary range of positions.”

Second, “boundary range” is also its own claim term separate from the “primary range” and the “secondary range,” and it too must be given effect such that the boundary range is not simply a part of the other two claimed ranges, regardless of the degree of overlap. *See* EX1001, 5:20-23 (“...boundary ranges 230A, 230B may be defined so as to partially overlap primary range 210 and secondary ranges 220A, 220B.”); EX2001 at ¶86; *see also, Bicon*, 441 F.3d at 950.

Third, Petitioner's and its expert's statement that the primary range "would need to extend through the entirety of [the] boundary range" for the primary range to extend into the second range is demonstrably false. EX2001 at ¶87. As an example, the Petition includes an image of Fig. 8 of Goldenberg which Petitioner has highlighted in an attempt to show a blue primary range, and orange secondary range, and a red boundary range. Pet. at 15; *see also, id.* at 12-14. For the sake of argument, if Petitioner's highlighting were to depict each of the claimed ranges (as explained elsewhere in this section, it does not), one could posit a primary range that extends slightly beyond the origin point into the secondary range, where the overlap between the primary and secondary ranges is represented by the purple area added to Petitioner's image:

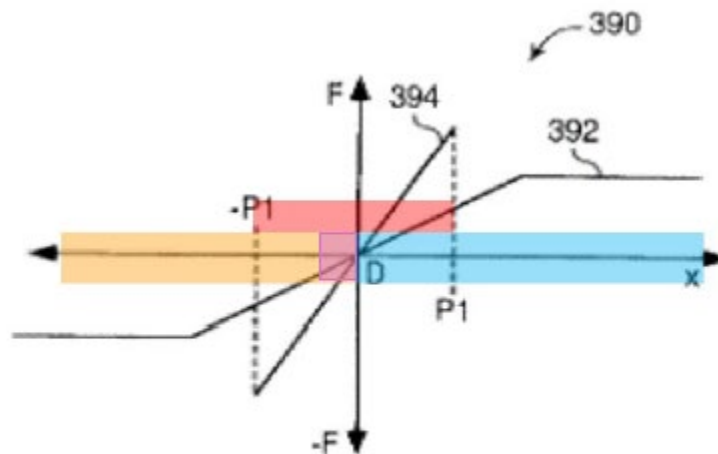


FIG. 8

EX2001 at ¶87. The revised figure clearly shows that, contrary to the arguments of Petitioner and its expert, the blue alleged primary range can easily overlap with the orange alleged secondary range in the purple zone without entirely overlapping the boundary range. EX2001 at ¶87. In such a scenario, the red boundary range still “partially overlaps” the primary and secondary ranges as required by the claims. EX2001 at ¶87.

3. Petitioner's Argument Is Internally Inconsistent

Petitioner's position as to what constitutes a range varies depending on its need at a given moment, which is best shown by how it characterizes the jog shuttle model's spring effects differently depending on which claim element it is trying to meet. As explained above, Goldenberg discloses that the jog shuttle model has two spring effects, both of which are centered around, and biased toward, an origin point. Section VI.A; EX1016 at [0115], [0116]; EX2001 at ¶80. The only differences between the two are that while the first spring effect is “output over the entire range of the knob” and has “a medium amount of stiffness,” the second spring effect “is only in effect over a small range between positions -P1 and P1 around the origin position” and “is preferably much stiffer than the first spring.” EX1016 at [0116]; EX2001 at ¶80. In other words, the first spring has one range that covers the entirety of the knob's range, and the second spring effect has one range that covers a small part of the knob's range. In Fig. 8 below, the range of the second spring effect is

highlighted in orange and is encompassed by the range of the first spring effect shown in yellow.

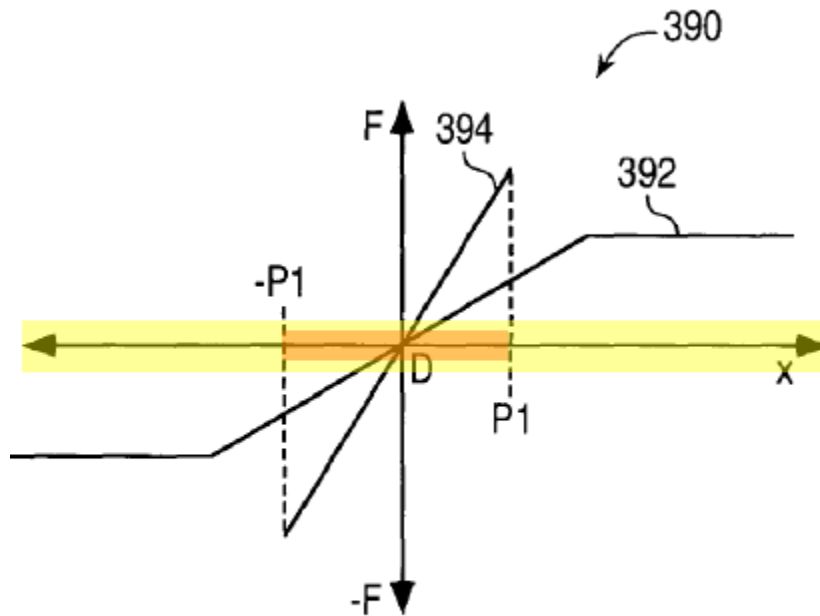


FIG. 8

As discussed above, Petitioner improperly attempts to divide the range of the first spring force into “a primary range of positions” to the right of the origin and “a secondary range of positions” to the left of the origin. *See* Section VII.B.1; Pet. 12-14, citing Ward, ¶¶95-96; EX2001 at ¶81. At the same time, Petitioner treats the range of the second spring force as a single, undivided range that it argues is the claimed “boundary range of positions.” Pet. 15-16, citing Ward ¶¶97-100; EX2001 at ¶81. Petitioner makes no attempt to explain why the first and second spring forces, which are both centered around and biased toward an origin, should be treated

differently. EX2001 at ¶81As explained in greater detail below, when the ranges of the two forces are treated consistently, Goldenberg fails to disclose the three required claimed ranges as well as a boundary range that “partially overlaps” each of the primary and secondary ranges.

If the first and second spring force effects are viewed as each having a single range centered around an origin as shown above in Fig. 8, Petitioner's argument fails for two reasons. EX2001 at ¶82. First, the jog shuttle model would not disclose “a primary range,” “a secondary range,” and “a boundary range” because it would disclose only two ranges (i.e., one range for each spring force). *Id.* Second, as explained in greater detail in Section VII.B.2, the jog shuttle model would not disclose the limitation “the boundary range partially overlaps each of the primary range of positions and the secondary range of positions” because there would be no secondary range for the boundary range to overlap, and the range of the second spring force would **completely**, not “partially,” overlap the range of the first spring effect. *Id.* Accordingly, Petitioner's argument fails if each spring force is treated as having a single range.

Petitioner's argument also fails if one were to divide both spring force ranges at the origin because any boundary range would be unable to partially overlap both the primary and secondary ranges, as required by the claims, as shown in the diagram below. EX2001 at ¶ 83. This is because, in Petitioner's view, the ranges do not

include the point of origin. *Id.* Petitioner contends that the “primary range” is “a range of the knob’s rotary positions moving clockwise from the origin which correspond to positions *to the right of the origin*” (Pet. at 12-13, citing Ward, ¶95 (emphasis added) and the “secondary range” is “a range of the knob’s rotary positions moving counterclockwise of the origin which correspond to positions *to the left of the origin position.*” *Id.* at 13-14, citing Ward, ¶96 (emphasis added). These alleged ranges are represented in the diagram below in yellow and blue, respectively. Petitioner alleges that “the knob’s rotary positions between ‘positions -P1 and P1’...that form ‘a small range...around the origin position’” corresponds to the claimed “a boundary range of positions.” Pet. at 15, citing Ward, ¶99. Splitting this range into a first range “which corresponds to positions to the right of the origin” (*see id.* at 12) and a second range “which corresponds to positions to the left of the origin position” (*id.* at 13) results in two more ranges separated by the origin. EX2001 at ¶83. These two ranges are represented below in red and green, respectively. Consistent with Petitioner’s treatment of the first spring effect range, the ranges of the second spring effect do not meet at the origin and, therefore, do not overlap. *Id.*

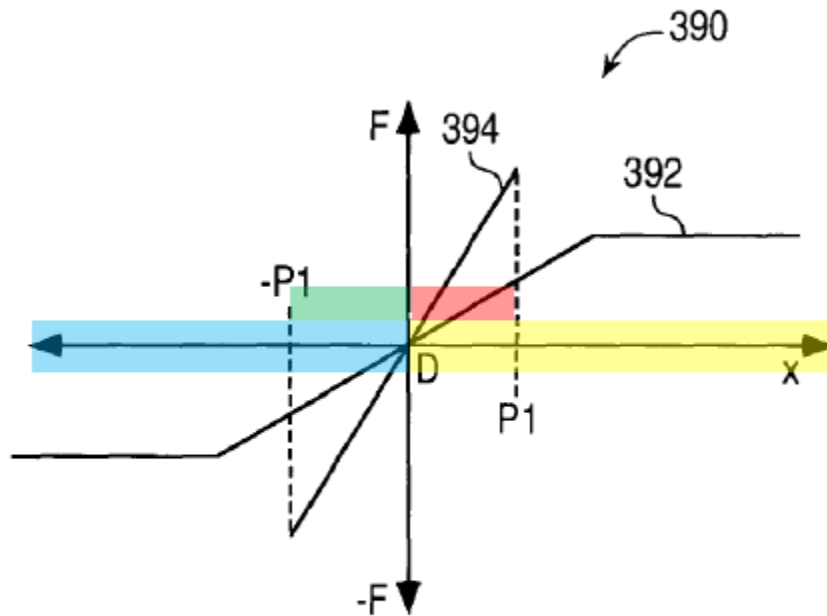


FIG. 8

EX1016 at Fig. 8.

The claims require that “the boundary range of positions partially overlaps each of the primary range of positions and the secondary range of positions,” but the diagram above, consistent with Petitioner’s methodology for the first spring effect range, demonstrates that each alleged boundary range entirely overlaps with either the alleged primary or secondary range of positions, but not both. EX2001 at ¶84. When the disclosed ranges of the jog shuttle are treated consistently, Petitioner’s argument fails.

VIII. GROUND 2: GOLDENBERG-CRUZ-HERNANDEZ DOES NOT RENDER OBVIOUS ANY OF THE CHALLENGED CLAIMS

Ground 2 pertains to claims 7, 14, and 20, which are dependent on independent claims 1, 8, and 15. For the reasons provided in Section VII with respect to claims 1, 8, or 15, the Goldenberg-Cruz-Hernandez combination does not disclose all required elements. EX2001 at ¶90. Accordingly, Petitioner has not met its burden of demonstrating obviousness as to claims 7, 14, and 20 in view of the Goldenberg-Cruz-Hernandez combination.

IX. GROUND 3: ROSENBERG DOES NOT ANTICIPATE OR RENDER OBVIOUS ANY OF THE CHALLENGED CLAIMS

In Ground 3, Petitioner relies on Rosenberg to allege anticipation of certain of the challenged claims, including independent claims. As detailed below, Rosenberg does not disclose “defining position and range information for the user input element.”

A. Claim [1A]: Petitioner Has Failed to Show that Rosenberg Teaches “Defining Position and Range Information for the User Input Element Associated with the Haptic Output Device”

Petitioner identifies the “defining” element as “Rosenberg’s restoring force command with a deadband region (Figure 10(c))” (Pet. at 36, citing Ward, ¶161; *id.* at 38, citing Ward, ¶166) or, in the alternative, “Rosenberg’s force restoring command without a deadband (Figure 10(a)).” Pet. at 40, citing Ward, ¶169; EX2001 at ¶96. However, Figs. 10(a) and 10(c) and their related disclosure merely describe

particularly force effects but do not disclose any functionality for “defining range and position information.” In other words, rather than explaining how or why either force restoring command permits “defining position and range information,” Petitioner and its expert merely describe the restoring force profiles, the forces exerted at various points, and the ranges shown therein. *See, e.g., id.* at 37-40, citing Ward, ¶¶161-162, 164-169); *see also* EX2001 at ¶96. Petitioner’s only discussion of “defining position and range information” are its unsupported assertions that the restoring force command defines an origin and the claimed ranges. Pet. at 36, 38, 40, citing Ward, ¶¶161, 166, 169; *see also* EX2001 at ¶96.

As an example of Petitioner’s misguided focus on describing rather than “defining,” Petitioner points to Paragraph [0165] and Fig. 10(c) of Rosenberg as disclosing a “restoring force command with a deadband region” that “defines an origin (neutral) O position for the user objection.” Pet. at 36, citing Ward, ¶161; EX2001 at ¶97. But while Paragraph [0165] and FIG. 10(c) describe a force effect with respect to an origin point, nowhere does it disclose how one would “defin[e] position and range information,” particularly by a user via software as in the claims of the ’907 patent. EX1017 at [0165]; *see also* Sections III.A and VII.A.1. EX2001 at ¶97. Similarly, FIG. 10(c) also fails to disclose any explanation of “defining position and range information.” EX2001 at ¶97. FIG. 10(c), shown below, is a “diagrammatic representation[] of [a] restoring force profile[]” (EX1017 at [0029]),

and Petitioner fails to explain how an abstract picture of a restoring force profile discloses “defining position and range information.” EX2001 at ¶97.

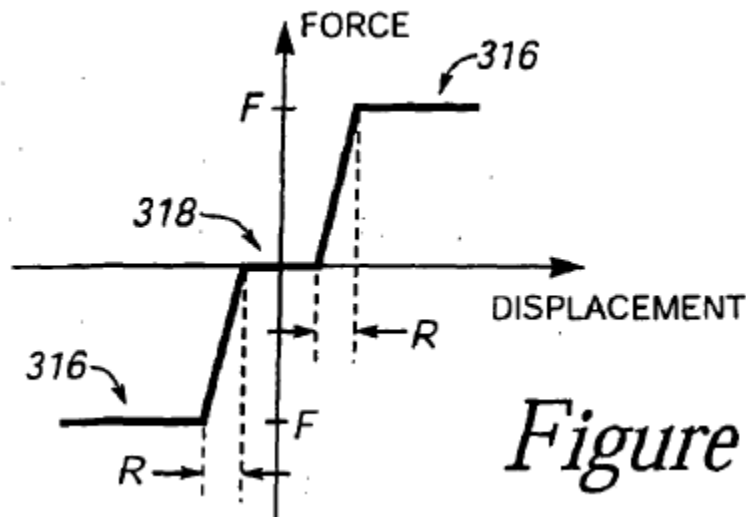


Figure 10c

Rosenberg does not disclose the “defining” element because its force commands, including the restoring force commands relied on by Petitioner and shown in Figs. 10a-c, are pre-defined commands stored in a table. EX2001 at ¶98. For example, Rosenberg states in the context of Figs. 10a-c that certain parameters are preferably “specified with...the style parameter 308 of the command 306 shown in table 300.” EX1017 at [0164]; EX2001 at ¶99. Rosenberg explains that its invention uses “force values that have been previously calculated or sampled and stored as a digitized ‘force profile’ in memory or other storage device,” not position and range information defined by a user. EX1017 at [0103]; EX2001 at ¶99. Thus, the force profiles identified by Petitioner do not disclose the “defining” element because they are pre-defined.

B. Claim [1A]: Petitioner Has Failed to Separately Map “Defining Position and Range Information for the User Input Element Associated with the Haptic Output Device”

Petitioner does not separately map “defining position and range information” and the claimed ranges, but rather maps both elements to the same figures in Rosenberg—i.e., Figs. 10a, 10c. Pet. 3744; EX2001 at ¶100. But each of the claimed ranges and the process or feature for defining them must be treated as separate terms. *See BENQ AM.*, 533 F.3d at 1371; EX2001 at ¶100. Petitioner cannot meet its burden because it has failed to properly map “defining position and range information” separately from the claimed ranges.

X. GROUND 4: THE ROSENBERG-ROBERTS COMBINATION DOES NOT RENDER ANY OF THE CHALLENGED CLAIMS OBVIOUS

Ground 4 pertains to claims 5, 7, 12, 14, 18, and 20, which are dependent on independent claims 1, 8, or 15. For the reasons provided in Section IX with respect to claims 1, 8, and 15, the Rosenberg-Roberts combination does not disclose all required elements. EX2001 at ¶101. Accordingly, Petitioner has not met its burden of demonstrating obviousness as to claims 5, 7, 12, 14, 18, and 20 in view of the Rosenberg-Roberts combination.

XI. GROUND 5: THE ROBERTS-ROSENBERG-CRUZ-HERNANDEZ COMBINATION DOES NOT RENDER ANY OF THE CHALLENGED CLAIMS OBVIOUS

Ground 5 pertains to claims 7, 14, and 20, which are dependent on independent claims 1, 8, or 15. For the reasons provided in Section IX with respect to claims 1,

8, and 15, the Rosenberg-Roberts-Cruz-Hernandez combination does not disclose all required elements. EX2001 at ¶102. Accordingly, Petitioner has not met its burden of demonstrating obviousness as to claims 7, 14, and 20 in view of the Rosenberg-Roberts-Cruz-Hernandez combination.

XII. GROUND 6: LEVIN DOES NOT ANTICIPATE OR RENDER OBVIOUS ANY OF THE CHALLENGED CLAIMS

In Ground 6, Petitioner relies on Levin to allege anticipation of certain of the challenged claims, including all of the independent claims. As detailed below, Levin does not disclose at least three key limitations of the challenged claims—(1) “defining position and range information for the user input element”; (2) “a boundary range of positions wherein the boundary range of positions partially overlaps each of the primary range of positions and the secondary range of positions”; and (3) “rendering a haptic effect in response to an entry of the user input element to one or more positions within the boundary range of positions.”

A. Claim [1A]: Levin Discloses Only Pre-Defined Force Effects, but the Claims Require “Defining Position and Range Information”

Levin fails to disclose “defining position and range information” because it uses pre-existing, pre-defined force detent profiles stored in memory. EX1006 at [0048]-[0049], [0070]; Pet. 69, citing Ward, ¶251; *see also* EX2001 at ¶105. Levin therefore cannot anticipate claim 1 of the '907 patent because it recites a method that

involves “defining position and range information,” not simply using pre-defined force effects stored in a memory. EX2001 at ¶105. Moreover, claims 8 and 15 of the '907 patent describe a non-transitory computer readable storage medium and a device, respectively, both of which require “instructions for...defining position and range information.” EX2001 at ¶105. The specification of the '907 patent also explains that the claimed boundary ranges can be variable and may be changed by a user. *See, e.g.,* EX1001 at 5:29-30, 7:1-3, 8:10-14; EX2001 at ¶105. While Levin discloses instructions for implementing detent force profiles, those profiles are pre-existing and pre-defined and cannot be changed or adjusted by a user. EX2001 at ¶105. Petitioner fails to point to any part of Levin disclosing instructions for actually “defining position and range information.”

In yet another instance of Petitioner failing to adequately give effect to the “defining position and range information” element, Petitioner begins its discussion of this element with respect to Levin by conceding that Levin’s force profiles are pre-defined: “Levin’s method uses ‘detent force profiles,’ which are pre-defined force effects stored in a memory.” Pet. at 69, citing Ward ¶251. Yet Petitioner fails to appreciate the difference between “defining” and “pre-defined.” EX2001 at ¶106. In the context of the claims of the '907 patent, “defining” is a verb that describes a step or a capability. *Id.* By contrast, pre-defined is an adjective that precludes “defining” since the profiles have already been defined. *Id.*

According to Petitioner, “Levin’s detent force profiles define ranges, including” a range around a first detent and a range around a second detent. Pet. at 70. Petitioner makes this unsupported statement in conclusory fashion, unable to point to any disclosure of “defining.” *Id.* at 69-70, Ward, ¶¶252-253; EX2001 at ¶107. As with its discussion of Goldenberg and Rosenberg, Petitioner’s cursory discussion of this element simply points to descriptions of the force profiles and makes no effort to show how they would permit a user to define position and range information. Pet. at 69-70, Ward, ¶¶252-253; EX2001 at ¶107.

B. Claim [1A3]: Petitioner Fails to Identify a Separate “Boundary Range of Positions, wherein the Boundary Range of Positions Partially Overlaps Each of the Primary Range of Positions and the Secondary Range of Positions”

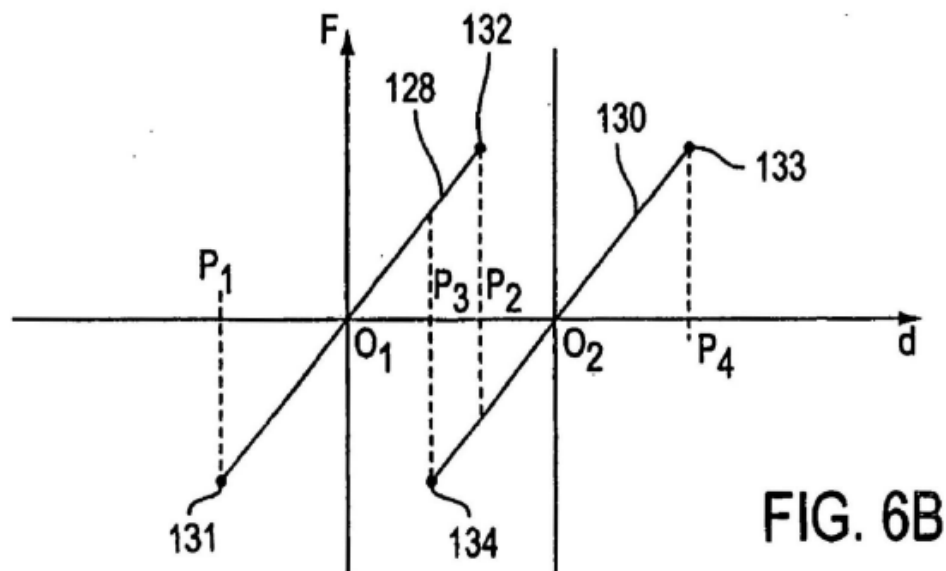
Petitioner wrongly identifies the overlap of two detents as the boundary range recited in the challenged claims. Petitioner’s contention fails because it effectively reads “boundary range” and “partially overlaps” out of the claims.

1. Equating “Boundary Range” with an Overlap between Two Detents Would Improperly Deprive that Term of Meaning

Petitioner admits that what it points to as the claimed “boundary range” is nothing more than “[a] portion of the range of the first detent overlap[ping] a portion of the range of the second detent.” Pet. at 73, citing EX1006 at [0009], Ward, ¶259; EX2001 at ¶108. Thus, in Petitioner’s view, any overlap between two ranges would

become a boundary range. EX2001 at ¶108. Petitioner's argument is inconsistent with Levin's disclosure and would render "boundary range" superfluous.

Petitioner repeatedly points to Fig. 6B of Levin and related disclosure to attempt to show alleged disclosure of most claim elements, including "a boundary range of positions" that "partially overlaps each of the primary range...and the secondary range." Pet. at 74, citing Ward, ¶¶ 259-260. Fig. 6B, shown below, shows a system with two detent points, O_1 and O_2 . EX1006 at [0070].



Lines 128 and 130 are the "detent curves," which show how the force of the detent changes with position. EX2001 at ¶¶109-110. Levin discloses that the "two successive detents are partially overlapped due to the detents and provide a hysteresis-like force effect." EX1006 at [0070]. Although Petitioner equates Levin's reference to an "overlapped zone" with the "boundary range" (Pet. at 74, citing

Ward, ¶¶ 259-260), Levin simply refers to the overlap between two detent ranges, and not a third, separate range. *See* EX1006 at [0070]; EX2001 at ¶110. Levin states that “[t]he overlapped zone is between positions P3 and P2,” which is simply the area where the first and second detents overlaps (i.e., P2 is the end of the first detent, and P3 is the beginning of the second detent). EX1006 at [0070]; EX2001 at ¶110.

Petitioner conflates any overlap between two ranges with the separate “boundary range” recited in the claims. EX2001 at ¶111. The claims are not directed simply to overlapping ranges of forces effects. *Id.* Rather they require three specific and distinct ranges of positions: a primary range, a secondary range, and a boundary range. EX1001 at cl. 1, 8, 15; EX2001 at ¶111. Nowhere does the ’907 patent equate the boundary range with the mere overlap of two other ranges. EX2001 at ¶111. Indeed, the ’907 patent discloses embodiments where the primary and secondary ranges overlap each other, but even those embodiments would still have a boundary range distinct from the overlap between the primary and secondary ranges: “primary range 210 may be extended to render haptic effects within secondary ranges 220A, 220B and/or boundary ranges 230A, 230B.” EX1001 at 5:23-25; EX2001 at ¶111.

Petitioner’s argument would improperly deprive the “boundary range” term of its meaning. *Cat Tech LLC v. TubeMaster, Inc.*, 528 F.3d 871, 885 (Fed. Cir. 2008) (refusing to adopt a claim construction that would render claim limitation meaningless). If a boundary range recited in the challenged claims is simply the

overlap between two other ranges, it would be an unnecessary claim term since it would add nothing to the claim that would be distinct from the primary and secondary ranges. EX2001 at ¶112. “Boundary range” is its own claim term that, according to the '907 patent specification and claims, is separate from, and has different functionality than, the primary and secondary ranges. *See, e.g.,* EX1001 at 3:28-34, 5:19-28, and 9:21-39; EX2001 at ¶112. Moreover, the fact that the claims require that the “boundary range...partially overlaps each of the primary range...and the secondary range” further indicates that the “boundary range” itself is more than just an overlap between the primary and secondary ranges. EX2001 at ¶112. By improperly conflating “boundary range” with any overlap between two detents, Petitioner’s argument would improperly render that term superfluous.

2. Petitioner Attempts to Read “Partially” out of the Claims

Even if the overlap between the first and second detents were deemed to be a boundary range, Levin would fail to disclose that the boundary range “partially overlaps” each of the primary and secondary ranges, as required by the claims. Petitioner contends that the overlap between the two detents is “a boundary range of positions,” and that it partially overlaps the primary and secondary ranges. Pet. at 74, citing Ward, ¶¶259-260. But, if the boundary range were comprised entirely of the overlap between the two detent ranges, it would entirely overlap the primary and secondary ranges, thus reading the term “partially” out of the claims. *See Apple Inc.*

v. Motorola, Inc., 757 F.3d 1286, 1305 (Fed. Cir. 2014) (refusing to construe claim in a way that would read expressly recited term out of the claim); EX2001 at ¶113. As discussed in Section VII.B.2, the inventors chose to recite “partially overlaps” as opposed to “at least partially overlaps” or just “overlaps,” which shows that *completely* overlaps would be outside the scope of the claim. Petitioner points to nothing in the '907 patent or its file history suggesting otherwise. EX2001 at ¶113. Accordingly, Petitioner has not met its burden of showing that Levin discloses that the boundary range “partially overlaps” the first and second ranges.

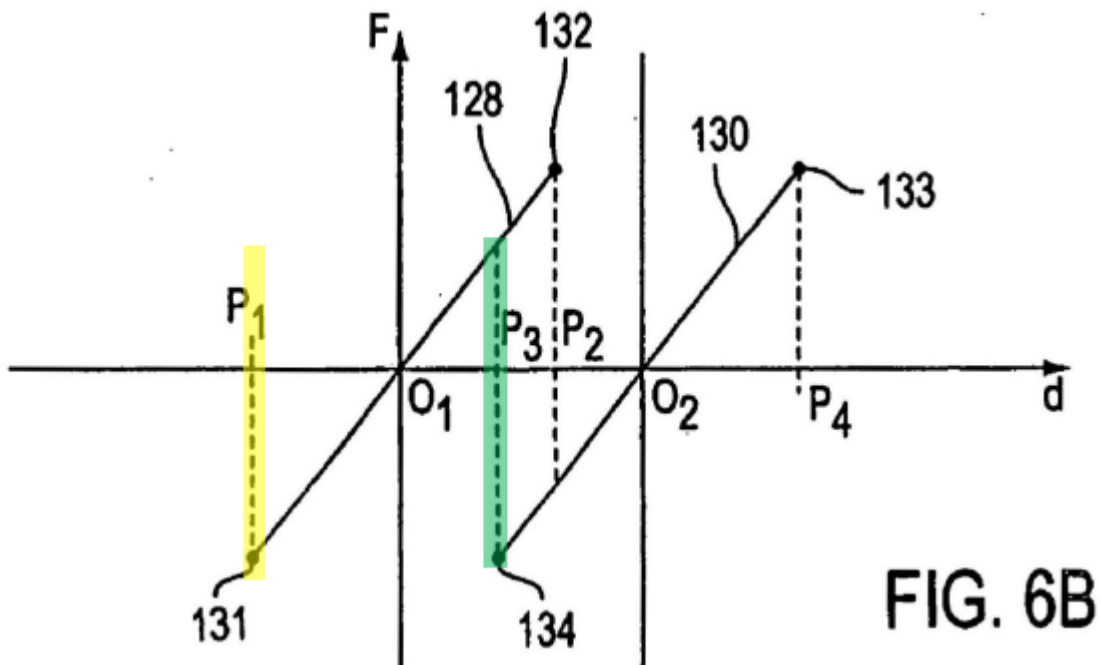
C. Claim [1B]: Levin Fails to Disclose “Rendering a Haptic Effect in Response to an Entry of the User Input Element to One or More Positions within the Boundary Range of Positions”

As explained in Section XII.B, Levin does not disclose a boundary range, and, therefore, it cannot disclose “rendering a haptic effect in response to an entry...to one or more positions within the boundary range of positions,” since that element includes a boundary range. But even if the overlap of the two detents were deemed to be a boundary range, Levin would still fail to disclose this element because Levin’s invention does not render a haptic effect in response to entry into the boundary range.

The challenged claims do not simply recite rendering a haptic effect on entry to one or more positions in the boundary range. Rather, they recite that the haptic

effect is rendered “in response to” entering a position of the boundary range. *See* EX1001, cl. 1, 8, 15; EX2001 at ¶114. The “in response to” claim term cannot be ignored and must be given effect. *Pause Tech., LLC v. TiVo, Inc.*, 419 F.3d 1326, 1334 (Fed. Cir. 2005) (“In construing claims, however, we must give each claim term the respect that it is due.”). Thus, disclosure of a haptic effect that coincides with entering the alleged boundary range but is rendered in response to some other event does not disclose this element of the challenged claims. EX2001 at ¶114. Petitioner virtually disregards the “in response to” claim term and only mentions it once in a sentence stating that Levin discloses that claim language. Pet. at 78, citing Ward, ¶266; EX2001 at ¶114.

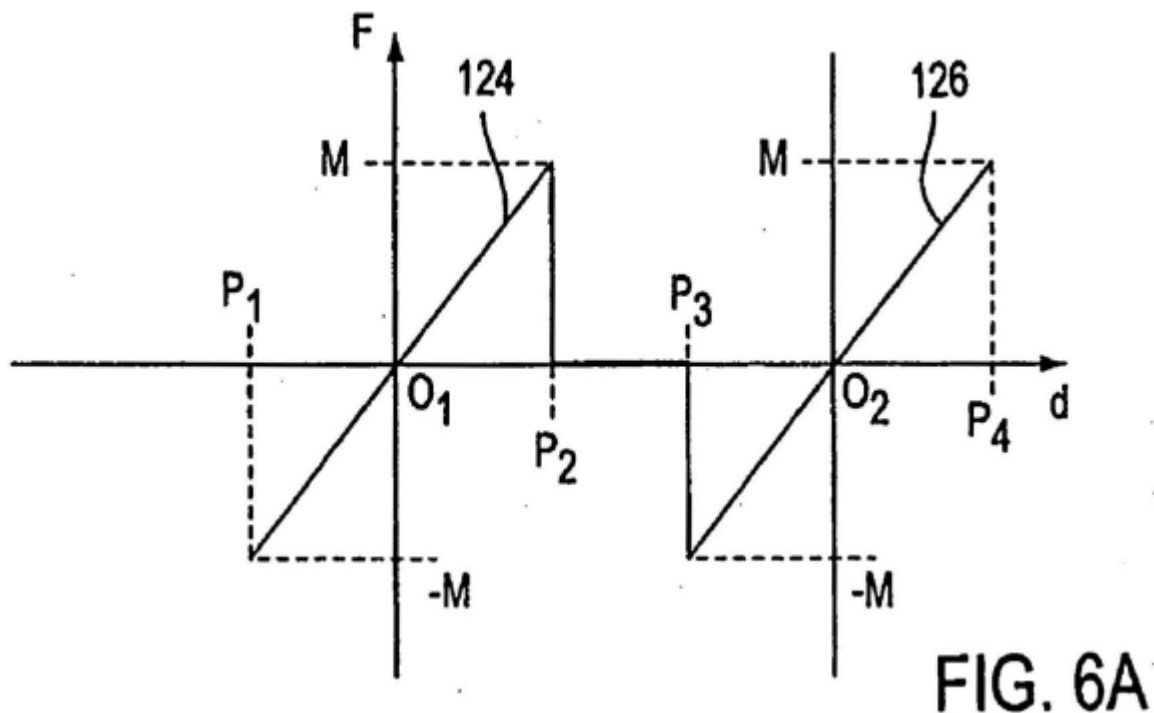
Levin discloses an invention with one or more detents, and moving a knob within the range of a detent results in a force effect—i.e., renders a haptic effect. EX1006 at [0067]. In Levin, the haptic effect happens in response to entering the range of each detent, regardless of overlap. *Id.*; EX2001 at ¶115. In Figure 6B below, the position at which the force associated with the first detent begins is highlighted in yellow, and the position at which the force associated with the second detent begins is highlighted in green. *See* EX1006 at [0070].



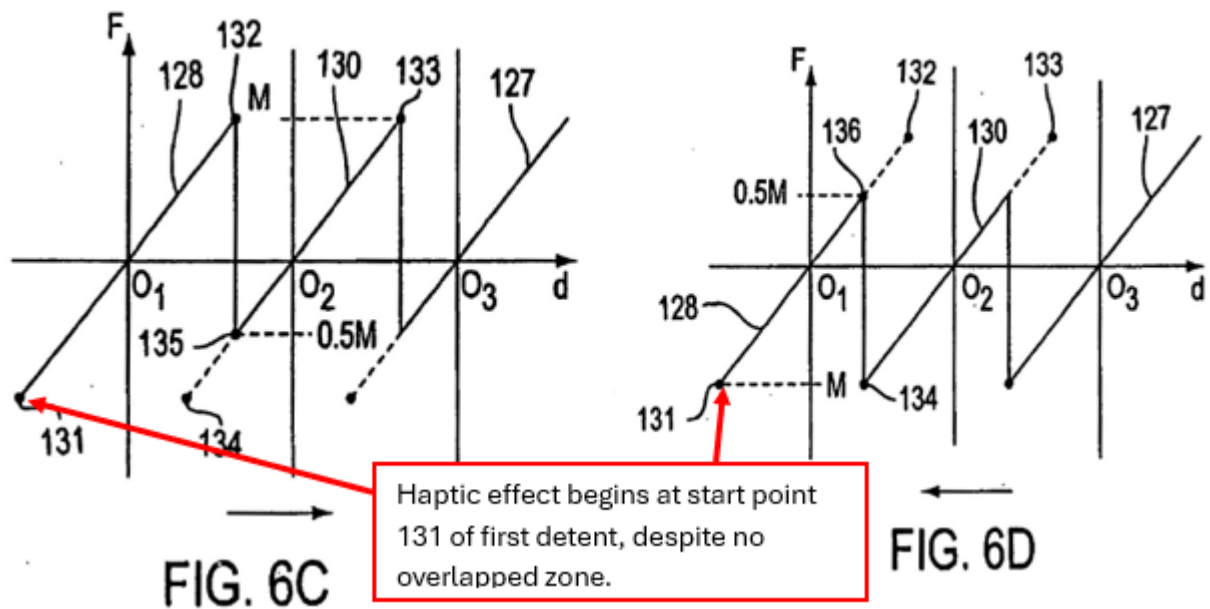
This diagram demonstrates that the invention renders a haptic effect for the first detent 132 starting at P₁, even though there are no prior detents overlapping with detent 132 at P₁. EX2001 at ¶116. Hence, the haptic effect of detent 132 is rendered at the entry into the range of the first detent, even in the absence of an overlap. EX2001 at ¶116. The same would be true for the second detent, because it is identical to the first. *Id.* As explained by Levin, “[t]he two detent curves 128 and 130 are identical, thus allowing a single force command to create the multiple detents if desired.” EX1006 at [0070]. Accordingly, the haptic effect of the second detent, as with the first detent, is rendered in response to entry into the range of the detent, regardless of the number of detents or whether they overlap. EX2001 at ¶116. The haptic effect rendered when the user control enters the second detent might coincide

with the overlaps, but it is not rendered in response to entry into the overlap. *Id.* Petitioner makes no attempt to show that Fig. 6B discloses that the haptic effect is rendered “in response to,” as opposed to coinciding with, the overlapped zone. *See* Pet. at 74-75, citing Ward ¶¶ 261-263; EX2001 at ¶116.

Other embodiments disclosed by Levin further demonstrate that it fails to disclose “rendering a haptic effect in response to an entry...to one or more positions of the boundary ranges.” For example, Fig. 6A below, which Petitioner references but does not specifically discuss (Pet. at 67, 79), shows a force profile with no overlapping detents which establishes that Levin’s invention renders haptic effects in response to entering the range of each detent, even without overlap. EX2001 at ¶117.



Figs. 6C and 6D, relied on by Petitioner and shown below, also demonstrate that the haptic effect is rendered when the user input control reaches the first point of the detent, and its rendered even when there is no overlap at all. EX2001 at ¶¶118-120.



Regarding Fig. 6C, Petitioner contends that the force of 0.5M at point 135 “is of a ‘lesser magnitude’ than the force that would be output at the start of the second force curve [i.e., end point 134] if there was no overlapped zone” (Pet. at 76, citing EX1006 at [0073], Ward, ¶264), but this is a misreading of Levin. In the embodiment of Fig. 6C, Levin is trying “[t]o solve the problem of unintentionally moving past a successive detent.” EX1006 at [0071]; EX2001 at ¶118. To provide a solution, “the range of the second or successive detent is adjusted such that a lesser magnitude is preferably output at the beginning of the successive detent that would normally be

output if the entire curve of the successive detent were used.” EX1006 at [0071]. In other words, successive detents shown in Fig. 6C have a shorter range than the first detent 128. EX2001 at ¶118. For example, the second detent 130 is not applied until the knob reaches end point 135, and the initial force of 0.5M would be rendered regardless of any overlap with the first detent 128. *Id.*

Petitioner argues that the embodiment of Fig. 6D discloses this element because it shows force changes in the alleged overlap. Pet. at 78, citing Ward, ¶266. However, Petitioner fails to point to anything in Fig. 6D or Levin's specification teaching a separate boundary range. EX2001 at ¶119. First, Levin discloses that “[t]he force output on the knob thus changes depending on the direction of the knob,” not a non-existent boundary range. EX1006 at [0072]; EX2001 at ¶119. Second, Levin describes force effects that begin or end at the endpoints of detent curves with no mention of haptic effects being rendered “in response to” the overlap between detents. EX1006 at [0072] (“In FIG. 6d, starting from origin O2, the force at the beginning of the range of detent curve 128 is at point 136 having a magnitude of 0.5M, which is one-half the magnitude M of the force at the other endpoint 131 of curve 128....”); EX1006 at [0073]; EX2001 at ¶119.

In addition, Figs. 6C and 6D with their shortened detent ranges show overlaps of just a single point at the end points of neighboring detents, but a single point would not qualify as a “boundary range.” EX2001 at ¶120. As stated in Section V,

the parties previously agreed that “range” in the context of the claims of the ’907 patent, means “a sequence, series, or scale between limits.” Under this construction, a claimed range is required to have more than one point. EX2001 at ¶120. Therefore, the embodiments depicted by Figs. 6C and 6D of Levin cannot disclose a “boundary range” and therefore cannot disclose “rendering a haptic effect in response to entry of the user input element to one or more positions within the boundary range of positions.”

Accordingly, Petitioner has failed to meet its burden as to anticipation or obviousness.

XIII. CONCLUSION

Petitioner has not established a reasonable likelihood of prevailing on Grounds 1-6, and institution of IPR should be denied.

Respectfully Submitted,

Dated: July 30, 2024

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CERTIFICATION UNDER 37 C.F.R. § 42.24(d)

Under the provisions of 37 C.F.R. § 42.24(d), the undersigned hereby certifies that the word count for all portions of the foregoing Patent Owner's Preliminary Response totals 11,479 words per Microsoft Word, which complies with the requirement of 14,000 words allowed under 37 C.F.R. § 42.24(d).

Dated: July 30, 2024

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CERTIFICATE OF SERVICE

As authorized by Patent Owner's Mandatory Notice, I hereby certify that on July 30, 2024, a copy of this document has been served in its entirety by electronic mail on Petitioner's lead and backup counsel.

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