

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

VALVE CORPORATION,
Petitioner,

v.

IMMERSION CORPORATION,
Patent Owner.

IPR2024-00556
Patent 8,749,507 B2

Before MICHAEL R. ZECHER, CHRISTOPHER L. OGDEN, and
MATTHEW J. McNEILL, *Administrative Patent Judges*.

ZECHER, *Administrative Patent Judge*.

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

I. INTRODUCTION

Petitioner, Valve Corporation (“Valve”) filed a Petition requesting an *inter partes* review (“IPR”) of claims 1–18 of U.S. Patent No. 8,749,507 B2 (Ex. 1001, “the ’507 patent”). Paper 2 (“Pet.”). Patent Owner, Immersion Corporation (“Immersion”), filed a Preliminary Response. Paper 6. Taking into account the arguments presented in Immersion’s Preliminary Response, we determined that the information presented in the Petition established that there was a reasonable likelihood that Valve would prevail with respect to challenging at least one of claims 1–18 of the ’507 patent as unpatentable. Pursuant to 35 U.S.C. § 314, we instituted this IPR on August 6, 2024, as to all challenged claims and all grounds raised in the Petition. Paper 11 (“Dec. on Inst.”).

During trial, Immersion did not file a Patent Owner Response. As a result, Valve did not file a Reply to the Patent Owner Response and Immersion did not file a Sur-reply to the Reply. No oral argument was held in this proceeding. Put simply, Valve’s arguments and evidence presented and developed in the Petition stand un rebutted during trial.

We have jurisdiction under 35 U.S.C. § 6. This decision is a Final Written Decision under 35 U.S.C. § 318(a) as to the patentability of claims 1–18 of the ’507 patent. For the reasons we identify below, we hold that Valve has demonstrated by a preponderance of the evidence that all challenged claims are unpatentable.

A. Real Party in Interest (“RPI”)

Valve identifies itself as an RPI. Pet. xiv. Immersion identifies itself as an RPI. Paper 4 (Immersion’s Mandatory Notices), 1.

B. Related Matters

The parties indicate that the '507 patent is the subject of a district court case titled *Immersion Corp. v. Valve Corp.*, No. 2:23-cv-00712 (W.D. Wash.). Pet. xiv; Paper 4, 1. The parties also indicate that the '507 patent was the subject of the following proceedings: (1) *Immersion Corp. v. Apple Inc.*, No. 1:16-cv-00325 (D. Del.); (2) *Mobile and Portable Electronic Device Incorporating Haptics (Including Smartphones and Laptops) and Components Thereof*, No. 337-TA-1004, USITC; (3) *Apple Inc. v. Immersion Corp.*, IPR2017-01310, Paper 1 (PTAB Apr. 21, 2017) (Petition); and (4) *Apple Inc. v. Immersion Corp.*, IPR2016-01777, Paper 1 (PTAB Sept. 12, 2016) (Petition). In both Board proceedings, institution was denied. *See Apple Inc. v. Immersion Corp.*, IPR2017-01310, Paper 8 (PTAB Nov. 2, 2017) (Decision Denying Institution); *Apple Inc. v. Immersion Corp.*, IPR2016-01777, Paper 7 (PTAB Mar. 23, 2017) (Decision Denying Institution).

C. The '507 Patent

The '507 patent, titled “Systems and Methods for Adaptive Interpretation of Input from a Touch-Sensitive Input Device,” issued from U.S. Patent Application No. 13/441,108 (“the '108 application”), filed on April 6, 2012. Ex. 1001, codes (54), (21), (22). The '507 patent is a continuation of U.S. Patent Application No. 10/723,778, filed on November 26, 2003—now U.S. Patent No. 8,164,573 B2. *Id.* at code (63).

According to the '507 patent, “a processor is programmed for receiving contact data from an input device; determining whether to output a haptic effect based on the contact data; and outputting the haptic effect based on the contact data.” Ex. 1001, code (57). Figure 2 of the '507 patent,

reproduced below, illustrates an embodiment that identifies an algorithm for detecting finger presses on a touchpad.

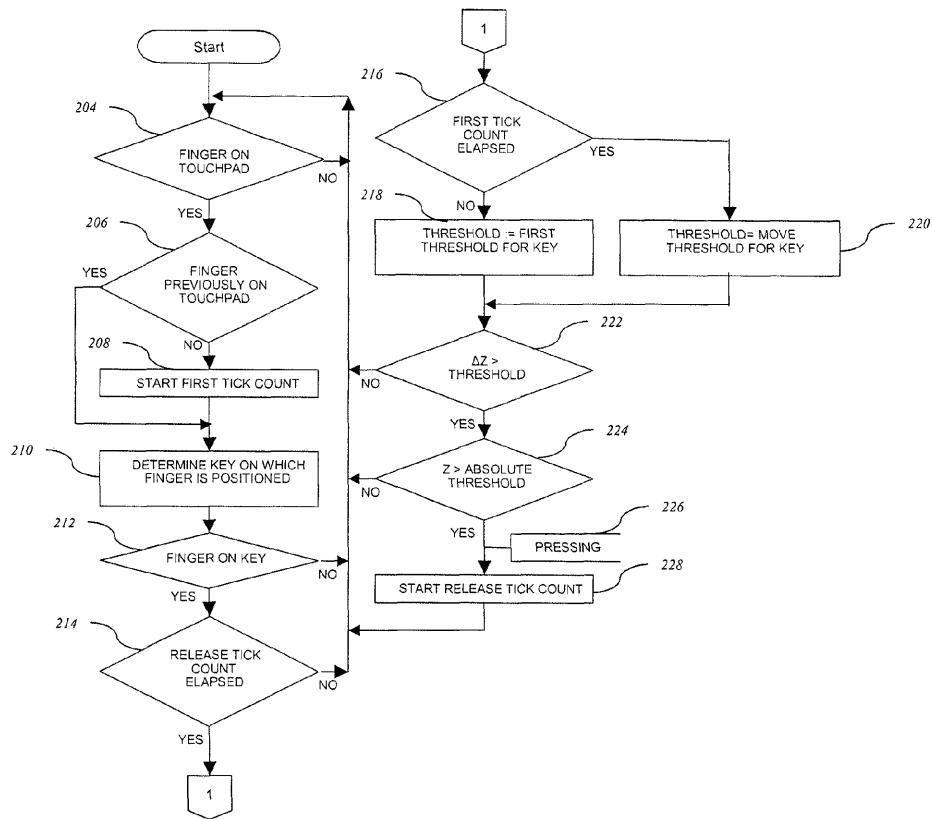


FIG. 2

Id. at 2:25–27, Fig. 2.

Figure 2 of the '507 patent illustrates a flowchart in which, when a finger has been on the touchpad for a sufficient amount of time (step 216, first tick count elapsed), a change in finger pressure is greater than a threshold value (step 222, $\Delta Z > \text{threshold}$), and a finger pressure is greater than a second threshold (step 224, $Z > \text{absolute threshold}$), then a press is determined to have occurred (226). Ex. 1001, 5:58–6:57. In addition, Figure 2 also illustrates another time interval that must elapse (step 214,

release tick count elapsed) before a press is determined to occur. *Id.* at 6:29–33.

Figure 3 of the '507 patent, reproduced below, illustrates another embodiment for detecting finger presses on a touchpad.

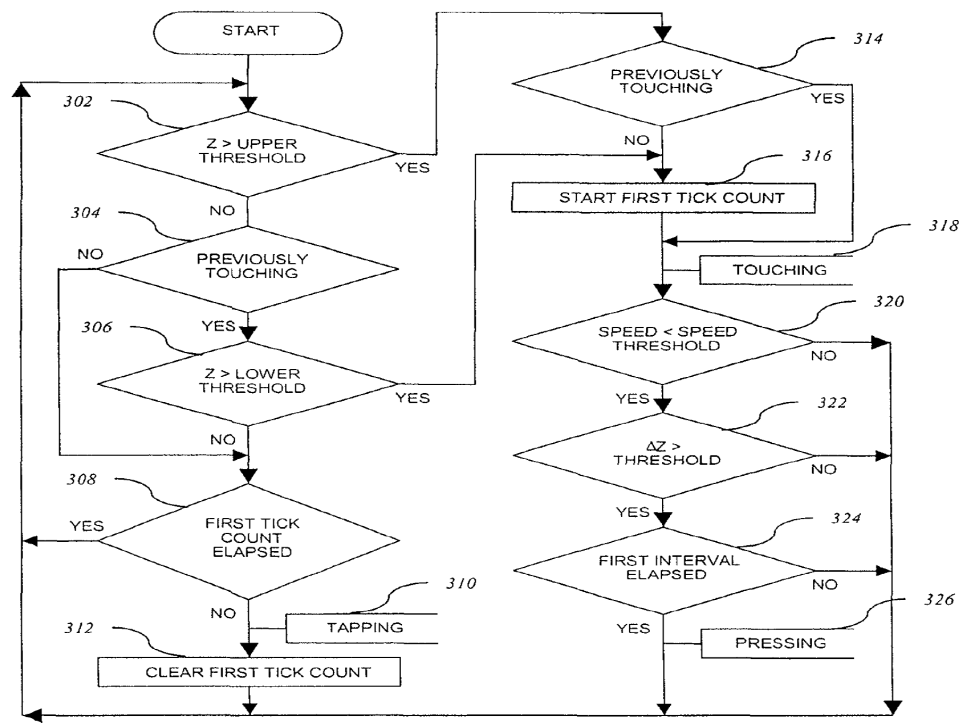


FIG. 3

Ex. 1001, 2:28–30, Fig. 3.

According to the '507 patent, Figure 3 is similar to the algorithm in Figure 2, but differs in that it includes a step of checking for a lower pressure threshold (step 306, $Z > \text{lower threshold}$) if the upper pressure threshold has previously been met (steps 302, $Z > \text{upper threshold}$, 304, previously touching), and includes a digital filter (not shown). Ex. 1001, 7:7–32.

D. Challenged Claims

Of the challenged claims, claims 1, 9, and 14 are independent. Independent claim 1 is directed to “[a] method,” independent claim 9 is directed to “[a] non-transitory computer-readable medium comprising program code for causing a processor to execute a method,” and independent claim 14 is directed to “[a] system.” Ex. 1001, 10:30, 11:1–3, 12:1. Claims 2–8 directly or indirectly depend from independent claim 1, claims 10–13 directly or indirectly depend from independent claim 9, and claims 15–18 directly or indirectly depend from independent claim 14. *Id.* at 10:45–67, 11:20–31, 12:20–29. Independent claim 1 is illustrative of the challenged claims and is reproduced below.

1. 1[PRE] A method comprising:
 - [1A] receiving contact data from an input device;
 - [1B] determining an interaction with a displayed object on a screen based on the contact data;
 - [1C] responsive to determining the interaction, determining a gesture based on the contact data comprising:
 - [1D] determining a pressure and a change in pressure based on the contact data, and
 - [1E] determining a press if:
 - [1E1] the pressure is greater than a pressure threshold,
 - [1E2] the change in pressure is greater than a change in pressure threshold, and
 - [1E3] a first interval has elapsed; and
 - [1F] responsive to determining the gesture, outputting the haptic effect.

Id. at 10:30–44 (with bracketed annotations provided by Valve in the Petition).

E. Asserted Prior Art References

Valve relies on the prior art references set forth in the table below.

Name¹	Reference	Dates	Exhibit Nos.
Astala	US 6,590,568 B1	issued July 8, 2003; filed Nov. 20, 2000	1005
Shahoian	US 2002/0033795 A1	published Mar. 21, 2002; filed July 26, 2001	1006
Keely	US 2002/0057263 A1	published May 16, 2002; filed Mar. 23, 2001	1007
Kolmykov-Zotov	US 7,256,773 B2	issued Aug. 14, 2007; filed June 9, 2003	1008

F. Asserted Grounds of Unpatentability

Valve challenges claims 1–18 of the ’507 patent based on the asserted grounds of unpatentability set forth in the table below. Pet. 2, 15–69.

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1–18	103(a) ²	Astala, Shahoian
1, 6–9, 13, 14, 18	103(a)	Keely, Kolmykov-Zotov
2–5, 10–12, 15–17	103(a)	Keely, Kolmykov-Zotov, Shahoian

Valve submits a Declaration of Jean Renard Ward to support its arguments presented and developed in the Petition. Ex. 1003 (Declaration of Mr. Ward in support of Petition).

¹ For clarity and ease of reference, we only list the first named inventor.

² The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284, 287–88 (2011), amended 35 U.S.C. § 103, effective March 16, 2013. Because the ’507 patent issued from the ’108 application, which was filed before this date, the pre-AIA version of § 103 applies. Ex. 1001, codes (21), (22).

II. ANALYSIS

A. Claim Construction

In this IPR, claim terms are construed using the same claim construction standard as in a civil action under 35 U.S.C. § 282(b). *See* 37 C.F.R. § 42.100(b). That is, claim terms generally are construed in accordance with their ordinary and customary meaning, as would have been understood by a person of ordinary skill in the art, in view of the specification and the prosecution history pertaining to the patent at issue. *See id.* The ordinary and customary meaning of a claim term “is its meaning to the ordinary artisan after reading the entire patent,” and “as of the effective filing date of the patent application.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313, 1321 (Fed. Cir. 2005) (en banc).

Independent claim 1 is a method that contains steps for “determining a press” if three conditions are met. Ex. 1001, 10:30–44. These conditions rely on contact data from an input device regarding pressure, change in pressure, and a time interval. *Id.* at 10:38–44.

Valve asserts that a previous Board panel in IPR2016-01777 incorrectly required the pressure and change in pressure conditions to “be maintained for the duration of the . . . interval.” Pet. 8 (emphasis omitted) (referring to IPR2016-01777, Paper 7 at 14–15 (Ex. 1023)); *see also* Ex. 1025, 15 (stating that “Patent Owner does not endorse the Board’s interpretation [in IPR2016-01777]”). Valve states that independent claim 1 merely requires that the three conditions in the “determining a press” step be met individually. Pet. 8; *see also id.* at 8–14 (further discussion).

As we explained in the Institution Decision, we have reviewed the Board’s prior decision in IPR2016-01777 and we disagree with Valve that

the previous Board panel actually construed the “determining a press” limitation. *See* Dec. on Inst. 9–10. The previous Board panel was merely making the point that the three conditions in the “determining a press” limitation had to be related in some way, and pointed to Figure 3 of the ’507 patent as an example of that relationship. IPR2016-01777, Paper 7 at 14–15 (Ex. 1023) (explaining that the interval in Figure 3 is “an integral part of the ‘determining a press imitation’”). The prior Board decision in IPR2016-01777 did not contain a claim construction because, in its Decision on Rehearing, the previous Board panel stated that it “did *not* expressly construe the ‘determining a press limitation’ or *interpret[]* the limitation to require the first two conditions recited in the limitation to be maintained for the duration of the first interval.” *Apple Inc. v. Immersion Corp.*, IPR2016-01777, Paper 9 at 3 (PTAB Apr. 27, 2017) (Decision Denying Petitioner’s Request for Rehearing). Thus, the prior Board decision outcome was not reliant on any particular claim interpretation or characterization of Figure 3; instead, it faulted the petitioner in that case for not considering the three conditions as a whole in the manner required by the claims. *Id.* at 3–4 (explaining that the petitioner needed to show the “‘first interval has elapsed’ condition *as a part of* the ‘determining a press limitation’” (emphasis added)).

Notwithstanding, and for the sake of clarity, to the extent the prior Board decision in IPR2016-01777 characterized Figure 3 of the ’507 patent to require the pressure and change in pressure conditions to be met *during the entire interval*, we agree with Valve that such a reading of Figure 3 is incorrect. As Valve points out in its analysis, with which we agree, the flowchart in Figure 3 allows for both the pressure and change in pressure

conditions to be met during some but not all of the entire time interval in certain circumstances. Pet. 12–14.³

In summary, we agree with Valve that the three conditions of the “determining a press” limitation are independent insofar as satisfaction of one condition is not predicated on the satisfaction of another condition. In our view, however, that point is merely reciting what the claim already requires—namely, that “determining a press” is defined as the satisfaction of the three conditions. Nothing more is required. Thus, we do not see the need to construe independent claim 1 beyond its plain language.

*B. Obviousness Over the Combined Teachings of
Astala and Shahoian*

Valve contends that claims 1–18 of the ’507 patent are unpatentable under 35 U.S.C. § 103(a) as obvious over the combined teachings of Astala and Shahoian. Pet. 15–42. Valve contends that the combined teachings of Astala and Shahoian account for the subject matter of each challenged claim, and provides reasoning as to why a person of ordinary skill in the art would have been prompted to modify the teachings of these references. *Id.* Valve submits the Declaration of Mr. Ward to support its positions. *See* Ex. 1003. As we explain above, Immersion did not file a Patent Owner Response during trial.

³ For example, refer to Figure 3 of the ’507 patent, reproduced above, and proceed through the flowchart in this order: step 302=yes, 314=no, 320=yes, 322=no, 302=yes, 314=yes, 320=yes, 322=yes, 324=yes. *See* Pet. 13–14 (discussing a marked-up copy of Ex. 1001, Fig. 3).

Based on the complete trial record, we determine that Valve has shown by a preponderance of the evidence that claims 1–18 of the ’507 patent are unpatentable as obvious over the combined teachings of Astala and Shahoian. We begin our analysis with the principles of law that generally apply to an asserted ground based on obviousness, we then assess the level of skill in the art, next we provide brief overviews of Astala and Shahoian, and then we address the parties’ contentions with respect to the challenged claims.

1. Principles of Law

A claim is unpatentable under § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, “would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) when in evidence, objective indicia of obviousness or non-obviousness (i.e., secondary considerations, such as commercial success, long-felt but unsolved needs, failure of others, etc.).⁴ *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17–18 (1966). We analyze the

⁴ During trial, Immersion did not file a Patent Owner Response. As a result, Immersion does not present arguments or evidence of secondary considerations.

asserted grounds based on obviousness with the principles we identify above in mind.

2. *Level of Skill in the Art*

In determining whether an invention would have been obvious at the time it was made, we consider the level of ordinary skill in the pertinent art at the time of the invention. *Graham*, 383 U.S. at 17. “The importance of resolving the level of ordinary skill in the art lies in the necessity of maintaining objectivity in the obviousness inquiry.” *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991). The “person having ordinary skill in the art” is a hypothetical construct, from whose vantage point obviousness is assessed. *In re Rouffet*, 149 F.3d 1350, 1357 (Fed. Cir. 1998).

Factors pertinent to a determination of the level of ordinary skill in the art include “(1) the educational level of the inventor; (2) type of problems encountered in the art; (3) prior art solutions to those problems; (4) rapidity with which innovations are made; (5) sophistication of the technology; and (6) educational level of active workers in the field.” *Envtl. Designs, Ltd. v. Union Oil Co. of Cal.*, 713 F.2d 693, 696 (Fed. Cir. 1983) (citing *Orthopedic Equip. Co. v. All Orthopedic Appliances, Inc.*, 707 F.2d 1376, 1381–82 (Fed. Cir. 1983)). “Not all such factors may be present in every case, and one or more of these or other factors may predominate in a particular case.” *Id.* at 696–97.

Relying on the testimony of Mr. Ward, Valve argues the following:

[a] person of ordinary skill in the art . . . on November 26, 2003 would have had a Bachelors’ degree in computer science, electrical engineering, or a related field, plus at least two years of industry or graduate level experience with

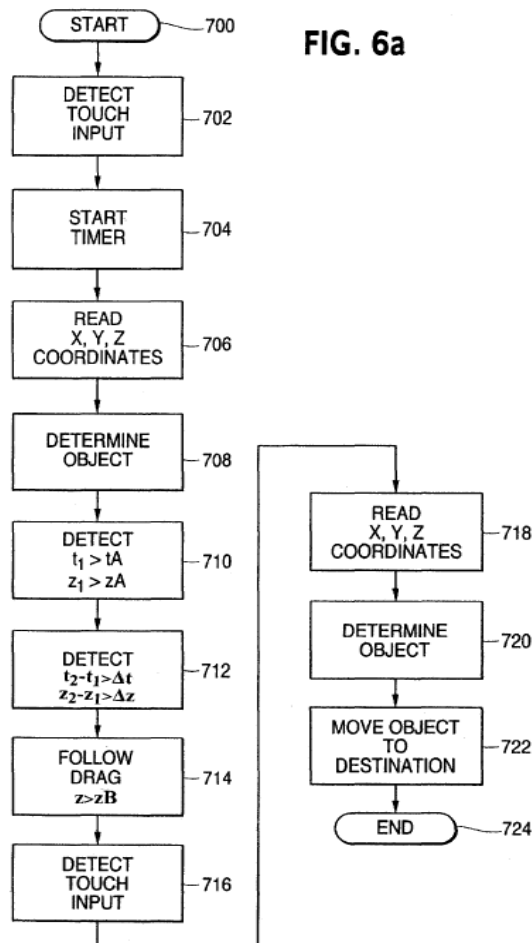
software engineering, haptics programming, and/or human-computer interaction, including experience with user-interfaces and applications involving touchscreens, touchpads, and related technologies.

Pet. 7 (citing Ex. 1003 ¶¶ 47–51).

Accordingly, we maintain our preliminary determination regarding the level of ordinary skill in the art. *See* Dec. on Inst. 8. That is, we adopt Valve’s proposed assessment of the level of ordinary skill in the art because (1) it is consistent with the ’507 patent and the asserted prior art; and (2) it is supported by the testimony of Mr. Ward. We apply this assessment of the level of ordinary skill in the art in our obviousness evaluations below.

3. Overview of Astala

Astala generally relates to “electronic devices” and, in particular, to “a touch screen input technique for allowing a user input to an electronic device having a touch screen.” Ex. 1005, 1:18–21. Figure 6a, reproduced below, illustrates one embodiment that identifies a technique that uses touch screen inputs to drag and drop objects displayed on the touch screen.



Id. at 3:11–14, Fig. 6a.

Figure 6a illustrates “a technique utilizing touch screen inputs for dragging and dropping objects displayed on the touch screen.” Ex. 1005, 9:3–5. In step 702, the touch input is detected, which starts a timer at step 704. *Id.* at 9:15–22. The method determines whether a threshold pressure and minimum time interval is met in step 710. *Id.* at 9:28–35. In step 712, the method determines whether a sufficient change in pressure has occurred. *Id.* at 9:36–39. This higher initial pressure followed by a change to a lower pressure is what it indicates to the system that a particular moving gesture is intended. *See id.* at code (57). The method proceeds to steps 714–724, where the movement is tracked and implemented. *Id.* at 9:40–65.

4. Overview of Shahoian

Shahoian generally relates to “interfacing with computer and mechanical devices by a user” and, in particular, to “devices . . . which provide haptic feedback to the user.” Ex. 1006 ¶ 2. According to Shahoian, haptic feedback “assist[s] and inform[s] the user of . . . control tasks within [a] graphical environment. *Id.* ¶ 6. As one example, “haptic feedback can . . . be useful to indicate to the user that a button has been pressed” (e.g., “a small vibration is output when a button is activated”). *Id.* ¶ 178. As another example, “[h]aptic feedback may also assist users in noisy environments . . . where sound may not be easily heard by the user.” *Id.*

5. Claims 1, 9, and 14

For consistency and added clarity, we address each limitation of independent claim 1 in turn by relying on the bracketed annotations provided by Valve in the Petition. *See* Pet. 17–31. With a few exceptions, our analysis below focuses on independent claim 1, but it equally applies to independent claims 9 and 14. *Compare id.* at 38–41, *with id.* at 17–31.

The preamble of independent claim 1 recites 1[PRE]—“[a] method comprising[.]” Ex. 1001, 10:30. To the extent the preamble should be treated as limiting, Valve contends that the combined teachings of Astala and Shahoian “perform[] a method that makes a gesture determination and provides haptic feedback.” Pet. 20 (citing limitations [1A]–[1F] below; Ex. 1003 ¶ 185).

Independent claim 1 recites limitation [1A]—“receiving contact data from an input device.” Ex. 1001, 10:31. Valve contends that the combined teachings of Astala and Shahoian account for this limitation because Astala’s input touch screen 70 amounts to the claimed “input device” that

detects “touch screen input” by “a finger or pointed stylus.” Pet. 21 (quoting Ex. 1005, 9:15–18) (citing Ex. 1005, 9:8–29, Fig. 6a, step 702; Ex. 1003 ¶ 189). According to Valve, a person of ordinary skill in the art would have understood that Astala’s touch screen controller monitors parameters and input that represent “contact data because they represent user contact with the touch screen.” *Id.* (citing Ex. 1005, 8:54–56; Ex. 1003 ¶ 190). Valve asserts that a person of ordinary skill in the art also would have understood that Astala’s touch screen controller receives contact data because it monitors and processes contact data to determine gestures. *Id.* at 22 (citing Ex. 1005, 6:23–27, 8:54–56, 9:21–65, Fig. 6a; Ex. 1003 ¶¶ 191, 192).

Independent claim 1 recites limitation [1B]—“determining an interaction with a displayed object on a screen based on the contact data.” Ex. 1001, 10:32–33. Valve contends that the combined teachings of Astala and Shahoian account for this limitation because Astala discloses determining user interaction with a displayed file object based on contact data providing X&Y coordinates of touch input on input touch screen 70. Pet. 22 (citing Ex. 1005, 9:3–8, 9:16–27, Figs. 6a, 6b). Notably, at step 708 in Figure 6a, Valve argues that “a determination is made that file 1 is the object, that is, the selected item, of touch input 732.” *Id.* at 23 (quoting Ex. 1005, 9:26–27) (citing Ex. 1005, code (57); Ex. 1003 ¶ 194).

Independent claim 1 recites limitation [1C]—“responsive to determining the interaction, determining a gesture based on the contact data comprising[.]” certain method steps. Ex. 1001, 10:34–35. Valve contends that the combined teachings of Astala and Shahoian account for this limitation because Astala discloses determining several gestures that the user performs when dragging and dropping objects. Pet. 23 (citing Ex. 1005,

Figs. 6(a) (steps 702–704, 710–724); Ex. 1003 ¶ 196). According to Valve, “[t]hese gestures are all determined ‘responsive to determining the interaction’ the user has with the displayed object, such as the file object” it notes above with respect to limitation [1B]. *Id.* (citing Ex. 1005, 9:3–27, Fig. 6a (steps 706–708); Ex. 1003 ¶ 197). Valve further argues that, by dragging and dropping, Astala moves a selected object from one location to another. *Id.* (citing Ex. 1005, 2:24–47; Ex. 1003 ¶ 198). Relying on the testimony of Mr. Ward, Valve asserts that a person of ordinary skill in the art would have understood this dragging and dropping functionality “includes at least three gestures: (1) pressing the object in a manner that designates the object for movement . . . ; (2) moving the object to a new location; and (3) dropping the object.” *Id.* (citing Ex. 1003 ¶ 199). Valve further assert that this type of gesture detection is performed in steps 710 and 712 of Astala’s Figure 6a. *Id.* at 23–24.

Independent claim 1 recites limitation [1D]—“determining a pressure and a change in pressure based on the contact data.” Ex. 1001:36–37. Valve contends that Astala teaches this limitation because, after determining contact with the file object at step 708 in Figure 6a, the gesture-determination method proceeds to step 710 where a determination is made as to whether the sensed pressure (z_1) exceeds a threshold pressure (z_A). Pet. 24 (citing Ex. 1005, 9:28–29, Fig. 6a; Ex. 1003 ¶ 201). Valve argues that Astala’s disclosure of determining whether the pressure exceeds a threshold involves determining the sensed pressure (z_1). *Id.* (citing Ex. 1003 ¶ 202). Valve asserts that, in its proposed combination, Shahoian’s sensors may be used to determine the pressure exerted on Astala’s input touch screen 70. *See id.* (citing Ex. 1006 ¶¶ 5, 7, 41; Ex. 1003 ¶ 204). Valve also

argues that Astala disclosure determining a change in pressure at step 712 in Figure 6a. *Id.* at 24–25 (citing Ex. 1005, 9:28–29, 9:36–39; Ex. 1003 ¶¶ 205, 206).

Independent claim 1 recites limitations [1E], [1E1], [1E2] and [1E3]—“determining a press if: the pressure is greater than the a pressure threshold, the change in pressure is greater than a change in pressure threshold, and a first interval has elapsed.” Ex. 1001, 10:38–42. Valve contends that the combined teachings of Astala and Shahoian teaches limitation [1E]—“determining a press if”—because this proposed combination meets limitations [1E1]–[1E3]. Pet. 25 (citing Ex. 1003 ¶ 207). Valve argues that Astala teaches limitation [1E1]—“the pressure is greater than the a pressure threshold”—at step 710 in Figure 6a by checking if $z_1 > z_A$ (pressure 1 greater than predetermined pressure A). *Id.* (citing Ex. 1005, 9:28–29, 32–34; Ex. 1003 ¶ 208). Valve argues that Astala teaches limitation [1E2]—“the change in pressure is greater than a change in pressure threshold”—at step 712 of Figure 6a by checking if $z_2 - z_1 > \Delta z$ (the difference between pressures 1 and 2 is greater than a pressure differential). *Id.* at 26–28 (citing, e.g., Ex. 1005, 9:36–42; Ex. 1003 ¶¶ 212–213, 219–223). Valve argues that Astala teaches limitation [1E3]—“a first interval has elapsed”—at step 710 of Figure 6a by checking if $t_1 > t_A$ (time 1 is greater than a time threshold). *Id.* at 29 (citing Ex. 1005, Fig. 6a, 9:26–35, 10:28–31; Ex. 1003 ¶ 231). Alternatively, Valve argues that Astala teaches this limitation at step 712 of Figure 6a by checking if $t_2 - t_1 > \Delta t$ (the difference between times 1 and 2 is greater than a threshold time interval). *Id.* at 30 (citing Ex. 1003 ¶¶ 232–233). Astala does not provide further details regarding the time interval checked in step 712. *See* Ex. 1005, 9:36–

39. To that end, relying on the testimony of Mr. Ward, Valve asserts that a person of ordinary skill in the art would have understood step 712 as requiring that the change in pressure must exist for a certain amount of time. Pet. 30 (citing Ex. 1003 ¶ 233).

Independent claim 1 recites limitation [1F]—“responsive to determining the gesture, outputting a haptic effect.” Ex. 1001, 10:43–44. Valve contends that the combined teachings of Astala and Shahoian account for this limitation because Shahoian discloses outputting a haptic effect to a touch-sensitive device. Pet. 31 (citing Ex. 1006 ¶¶ 7, 13, 178, 189; Ex. 1003 ¶¶ 238, 239).

Turning to rationale to combine, Valve contends that, because Shahoian recognizes that “[o]ne problem with existing touchpads is that there is no haptic feedback provided to the user” to “assist and inform the user” when interpreting gestures, a person of ordinary skill in the art would have recognized that Astala’s input touch screen 70 was ready for the improvement that Shahoian provides—namely, “haptic feedback associated with touchpad/touchscreen input gestures.” Pet. 17–18 (quoting Ex. 1006 ¶ 6) (citing Ex. 1003 ¶¶ 158–160). Valve argues that a person of ordinary skill in the art would have recognized that incorporating Shahoian’s haptic feedback into Astala’s input touch screen 70 would have introduced certain benefits taught by Shahoian, including, but not limited to, using haptic feedback to inform users of touchpad gestures by “assist[ing] users in noisy environments . . . where sound may not be easily heard by the user.” *Id.* at 18 (quoting Ex. 1006 ¶ 178) (citing Ex. 1006 ¶¶ 6, 187, 188, 193; Ex. 1003 ¶ 161). Valve also argues that a person of ordinary skill in the art would have been motivated to use Shahoian’s pressure-sensing components in

Astala’s input touch screen 70 because, among other reasons, using actual pressure sensors in a touchpad would have provided more accurate determinations of user input. *Id.* at 19 (citing Ex. 1006 ¶ 41; Ex. 1003 ¶¶ 164–166).

Valve asserts there was a reasonable expectation of success in making the proposed combination because it involves “us[ing] Shahoian’s haptic feedback and pressure sensors for their intended use.” Pet. 19–20 (citing Ex. 1003 ¶¶ 180, 181). In addition, Valve asserts that a person of ordinary skill in the art would have reasonably expected Shahoian’s haptic feedback and pressure sensors to succeed in Astala because “Shahoian demonstrates that algorithms for haptic feedback were known and predictable.” *Id.* at 20 (citing Ex. 1003 ¶ 182).

In summary, upon reviewing Valve’s unrebutted arguments and evidence explaining how the combined teachings of Astala and Shahoian account for all the limitations of independent claims 1, 9, and 14, we agree with and adopt Valve’s analysis. *See* Pet. 17–31, 38–41. Accordingly, Valve has demonstrated by a preponderance of the evidence that the subject matter of these independent claims would have been obvious over the combined teachings of Astala and Shahoian.

6. Claims 2–8, 10–13, and 15–18

As one example, claim 2 directly depends from independent claim 1, and further recites “wherein the contact data comprises actual pressure and a pseudo pressure.” Ex. 1001, 10:45–46. Claims 10 and 15 each recite the same limitation, but they directly depend from independent claims 9 and 14, respectively. *Id.* at 11:20–22, 12:20–21.

Valve contends that the combined teachings of Astala and Shahoian teaches this additional limitation of dependent claims 2, 10, and 15 because Shahoian discloses detecting actual and pseudo pressure. Pet. 30 (citing Ex. 1003 ¶ 240). More specifically, Valve argues that, like the pseudo pressure and capacitance change described in the '507 patent, Shahoian's capacitive sensors provide contact data that includes "pseudo pressure." *Id.* at 31–32 (citing Ex. 1001, 3:10–31; Ex. 1003 ¶¶ 241, 242). For example, Valve asserts that Shahoian identifies another prior art reference titled Martinelli⁵ that discloses a type of capacitance touchpad sensing. *Id.* at 32 (citing Ex. 1006 ¶ 41). According to Valve, "Martinelli's capacitive sensors measure what the '507 patent calls pseudo pressure." *Id.* (citing Ex. 1009, 2:1–3:1; Ex. 1003 ¶¶ 244).

Valve also argues that Shahoian's "[r]esistive touchpads [that] are typically pressure-sensitive" detect actual pressure. Pet. 32 (quoting Ex. 1006 ¶ 41). Relying on the testimony of Mr. Ward, Valve asserts that a person of ordinary skill in the art would have understood that resistive sensing measures actual pressure. *Id.* (citing Ex. 1003 ¶ 245). Valve argues that Martinelli reinforces this understanding because Shahoian identifies Martinelli as an example of resistive sensing and Martinelli's resistive touchpad "ha[s] the ability to measure the *actual pressure* applied by an object" and "the graduation of pressure applied on the touchpad and offer dynamic pressure-sensing features." *Id.* (quoting Ex. 1009, 4:40–53) (citing Ex. 1009, 5:3–7; Ex. 1003 ¶ 246),

⁵ Martinelli et al., U.S. Patent No. 5,943,044, filed May 15, 1997, issued Aug. 24, 1999 (Ex. 1009, "Martinelli").

Once again, Immersion did not file a Patent Owner Response during trial. Upon reviewing Valve's un rebutted arguments and evidence explaining how the combined teachings of Astala and Shahoian account for the additional limitations of dependent claims 2–8, 10–13, and 15–18, we agree with and adopt Valve's analysis. *See* Pet. 31–38, 40, 42. Accordingly, Valve has demonstrated by a preponderance of the evidence that the subject matter of these dependent claims would have been obvious over the combined teachings of Astala and Shahoian.

*C. Obviousness Over the Combined Teachings
Keely and Kolmykov-Zotov*

Valve contends that claims 1, 6–9, 13, 14, and 18 of the '507 patent are unpatentable under 35 U.S.C. § 103(a) as obvious over the combined teachings of Keely and Kolmykov-Zotov. Pet. 42–66. Valve contends that the combined teachings of Keely and Kolmykov-Zotov account for the subject matter of each challenged claim, and provides reasoning as to why a person of ordinary skill in the art would have been prompted to modify the teachings of these references. *Id.* Valve submits the Declaration of Mr. Ward to support its positions. *See* Ex. 1003. As we explain above, Immersion did not file a Patent Owner Response during trial.

Based on the complete record, we determine that Valve has shown by a preponderance of the evidence that claims 1, 6–9, 13, 14, and 18 of the '507 patent are unpatentable as obvious over the combined teachings of Keely and Kolmykov-Zotov. We begin our analysis with brief overviews of Keely and Kolmykov-Zotov, and then we address the parties' contentions with respect to the challenged claims.

1. Overview of Keely

Keely generally relates to “simulating various gestures of a pointing device” and, in particular, “simulating gestures such as the left click of a mouse, the right click of a mouse, and mouse dragging by manipulation of a stylus in conjunction with a touch-sensitive computer display.” Ex. 1007 ¶ 2. Kelly discloses “a need for providing helpful feedback to the user of the stylus to indicate whether gestures made with the stylus are those that are intended by the user.” *Id.* ¶ 6. Keely meets this need by using tablet personal computer (“PC”) 201 that includes large touch-sensitive display surface 202 that allows a user to select, highlight, or write in the display area using stylus 204. *Id.* ¶ 21, Fig. 2. When tablet PC 201 detects stylus 204 on display surface 202, the tablet begins “counting time” (e.g., “by using a timer, up to at least a threshold amount of time”). *Id.* ¶ 23. “A timeout condition is defined responsive to the threshold amount of time having passed” (e.g., “the threshold amount of time is about 600 milliseconds”). *Id.*

2. Overview of Kolmykov-Zotov

Kolmykov-Zotov generally relates to “determining whether [a] gesture is intended to constitute a ‘press-and-hold’ action” for users of electric pens on devices like tablet computers. Ex. 1008, 5:53–57; *see also id.* at 1:29–37 (disclosing that “pen-based computer systems (also called ‘stylus-based computing systems’ or ‘tablet PCs’ . . .) have become increasingly popular”). Kolmykov-Zotov measures first, second, and additional parameters, and determining whether a “press-and-hold” event has occurred based on the parameters. *Id.* at 7:15–38 (disclosing use of two parameters), 13:53–57 (disclosing use of more than two parameters). The parameters include, among other options, pressure and change in pressure.

Id. at 13:27–52. The values of the parameters are measured over predetermined time periods. *Id.* at 19:32–40.

3. Claims 1, 9, and 14

For consistency and added clarity, we address each limitation of independent claim 1 in turn by relying on the bracketed annotations provided by Valve in the Petition. *See* Pet. 47–59. With a few exceptions, our analysis below focuses on independent claim 1, but it equally applies to independent claims 9 and 14. *Compare id.* at 64–66, *with id.* at 47–59.

The preamble of independent claim 1 recites 1[PRE]—“[a] method comprising[.]” Ex. 1001, 10:30. To the extent the preamble should be treated as limiting, Valve contends that the combined teachings of Keely and Kolmykov-Zotov account for the preamble because “it implements Keely’s gesture-determination method modified based on Kolmykov-Zotov.” Pet. 47 (citing Ex. 1007, code (57), ¶ 8, claims 1–13; Ex. 1008, code (57), claims 1–10).

Independent claim 1 recites limitation [1A]—“receiving contact data from an input device.” Ex. 1001, 10:31. Valve contends that the combined teachings of Keely and Kolmykov-Zotov account for this limitation because Keely discloses touch-sensitive display surface 202 that detects and responds to stylus interactions using digitizers capable of sensing user contact, generating data representing the user contact, and providing that data to a processor for interpretation. Pet. 47–49 (citing Ex. 1007 ¶¶ 4, 7, 9, 21, 23, Fig. 1; Ex. 1008, 7:8–15, 9; 19–38, 10:8–18; Ex. 1003 ¶¶ 58–62, 314–316).

Independent claim 1 recites limitation [1B]—“determining an interaction with a displayed object on a screen based on the contact data.” Ex. 1001, 10:32–33. Valve contends that the combined teachings of Kelly

and Kolmykov-Zotov account for this limitation because Kolmykov-Zotov’s techniques improve Keely by simulating mouse clicks in a system using a graphical user interface (“GUI”) and stylus. Pet. 49 (citing Ex. 1007 ¶¶ 8, 24, 25, 29, Fig. 2; Ex. 1003 ¶ 317). Valve argues that Keely allows a user to interact with “*objects* through use of the stylus,” and Kolmykov-Zotov discloses that pen interaction with a digitizer may correspond to “tapping on a user interface element (such as a toolbar item)” to perform a gesture “allow[ing] performance of the function(s) associated with that interface element.” *Id.* at 49–50 (first quoting Ex. 1007 ¶ 7, then quoting Ex. 1008, 2:3–18) (citing Ex. 1007 ¶¶ 4, 30; Ex. 1008 2:29–39, 5:11–14, 9:33–38, 10:8–13; Ex. 1003 ¶¶ 319, 320). According to Valve, both Keely and Kolmykov-Zotov use contact data from an input device to determine user interactions with an object displayed on a screen, such as a toolbar or other objects. *Id.* at 50 (citing Ex. 1007 ¶¶ 4, 30; Ex. 1008, 2:3–28; Ex. 1003 ¶ 322).

Independent claim 1 recites limitation [1C]—“responsive to determining the interaction, determining a gesture based on the contact data comprising[.]” certain method steps. Ex. 1001, 10:34–35. Valve contends that the combined teachings of Keely and Kolmykov-Zotov account for this limitation because “[this proposed combination] responds to determining user interaction with the input device by analyzing the contact data to determine a press-and-hold gesture that simulates a right mouse click based on the contact data.” Pet. 50 (citing limitations [1D]–[1E3] below; Ex. 1003 ¶ 323).

Independent claim 1 recites limitation [1D]—“determining a pressure and a change in pressure based on the contact data.” Ex. 1001:36–37. Valve

contends that Kolmykov-Zotov teaches this limitation because it discloses “determining whether a specific gesture constitutes a press-and-hold” action by measuring certain parameters, such as “pen pressure” and “change in pen pressure.” Pet. 51 (first quoting Ex. 1008, 13:27–29, then quoting *id.* at 13:27–57) (citing Ex. 1008, 5:57–66, 10:53–62, claims 1, 9; Ex. 1003 ¶ 324). Valve argues that Kolmykov-Zotov teaches that parameter selection amongst a list of parameters was a design choice. *Id.* (citing Ex. 1008, 13:27–29; Ex. 1003 ¶ 325). According to Valve, a person of ordinary skill in the art would have understood that “evaluating pressure and change in pressure together was a known ‘suitable . . . combination[]’ for determining user intent,” and pressure and change in pressure would be the first and second parameters used in determining a press-and-hold gesture. *Id.* at 51–52 (quoting Ex. 1008, 13:47–57) (citing Ex. 1008, code (57), 6:8–43, 13:27–57, claims 1, 9; Ex. 1003 ¶¶ 326, 327).

Independent claim 1 recites limitations [1E], [1E1], [1E2] and [1E3]—“determining a press if: the pressure is greater than the a pressure threshold, the change in pressure is greater than a change in pressure threshold, and a first interval has elapsed.” Ex. 1001, 10:38–42. Valve contends that the combined teachings of Keely and Kolmykov-Zotov teaches limitation [1E]—“determining a press if”—because this proposed combination determines a “press-and-hold” gesture if certain criteria in limitations [1E1]–[1E3] are met. Pet. 53 (citing Ex. 1003 ¶ 336). Valve then relies on the disclosures in Kolmykov-Zotov of a pen pressure and change in pen pressure to teach limitations [1E1] and [1E2]. *Id.* at 53–55. Valve asserts that a person of ordinary skill in the art would have understood that the “predetermined parameter values” used in Kolmykov-Zotov teach

the claimed “threshold” values. *Id.* at 54 (citing Ex. 1008, 19:41–43; Ex. 1003 ¶ 339). To account for the time-interval condition of limitation [1E3], Valve points to the disclosure in Kolmykov-Zotov stating that the parameters are measured “over the first predetermined time period.” *Id.* at 55–57 (quoting Ex. 1008, 19:32–40).

Independent claim 1 recites limitation [1F]—“responsive to determining the gesture, outputting a haptic effect.” Ex. 1001, 10:43–44. Valve contends that the combined teachings of Keely and Kolmykov-Zotov account for this limitation because Keely provides tactile feedback in response to the press-and-hold gesture, thereby indicating “that the intended gesture has been made properly.” Pet. 58–59 (quoting Ex. 1007 ¶ 30; Ex. 1003 ¶¶ 368, 369). Valve argues that Keely’s way of providing tactile feedback amounts to the claimed “outputting a haptic effect” that is performed “responsive to determining the gesture.” *Id.* at 59 (citing Ex. 1007 ¶¶ 6, 9, 31; Ex. 1018, 245 (defining “haptics”); Ex. 1003 ¶¶ 368, 370).

Turning to rationale to combine, Valve contends that a person of ordinary skill in the art would have had at least two reasons to use Kolmykov-Zotov’s gesture-determination techniques in Keely. Pet. 45. First, Valve argues that Kolmykov-Zotov discloses that its techniques for determining “press-and-hold” are more accurate than Keely’s techniques for holding a pen down during a specific time interval. *Id.* (citing Ex. 1008, 3:12–15, 10:37–52; Ex. 1003 ¶¶ 303, 304). Second, Valve argues that using Kolmykov-Zotov’s techniques for determining “press-and-hold” to address known shortcomings with Keely’s gesture-determination “simply uses prior art elements according to their established functions, which would have been

obvious.” *Id.* at 45–46 (citing Ex. 1003 ¶ 305; *KSR*, 550 U.S. at 417–18). According to Valve, there were known problems with Keely’s gesture-determination for which Kolmykov-Zotov would have provided an obvious solution, and a person of ordinary skill in the art would have recognized the benefit of using Kolmykov-Zotov’s techniques for determining “press-and-hold” to remedy the known shortcomings in Keely. *Id.* at 46 (citing Ex. 1008, 2:29–43, 10:37–52; Ex. 1027 ¶ 10; Ex. 1003 ¶¶ 306, 307; *KSR*, 550 U.S. at 420, 424).

Valve asserts there was a reasonable expectation of success in making the proposed combination because both Keely and Kolmykov-Zotov “disclose techniques for determining user intent from interaction with a touchpad to simulate mouse gestures,” and “[they] describe the same type of touch-sensitive input devices that have a software-programmed processor that receives contact data and interprets user gestures.” Pet. 46 (citing Ex. 1007 ¶¶ 21, 22; Ex. 1008, 9:19–55; Ex. 1003 ¶ 309). Relying on the testimony of Mr. Ward, Valve asserts that it would have been simple and straightforward for a person of ordinary skill in the art to modify Keely’s software to use Kolmykov-Zotov’s known techniques for determining “press-and-hold.” *See id.* (citing Ex. 1003 ¶¶ 310, 311).

In summary, upon reviewing Valve’s unrebutted arguments and evidence explaining how the combined teachings of Keely and Kolmykov-Zotov account for the limitations of independent claims 1, 9, and 14, we agree with and adopt Valve’s analysis. *See* Pet. 47–59, 64–66. Accordingly, Valve has demonstrated by a preponderance of the evidence that the subject matter of these independent claims would have been obvious over the combined teachings of Keely and Kolmykov-Zotov.

4. *Claims 6–8, 13, and 18*

As one example, claim 6 directly depends from independent claim 1, and further recites “wherein the determining a gesture comprises determining a tapping gesture.” Ex. 1001, 10:56–57. Claims 13 and 18 each recite a similar limitation, but they directly depend from independent claims 9 and 14, respectively. *Id.* at 11:29–31, 12:27–29.

Valve contends that Keely teaches this additional limitation of dependent claims 6, 13, and 18 because Keely incorporates by reference U.S. Provisional Application No. 60/247,841 (Ex. 1012, “the ’841 provisional application”) in its entirety, which teaches determining a tapping on a GUI to select an item. Pet. 60 (citing Ex. 1007 ¶ 1; Ex. 1012,⁶ 2:19–41, 4:1–4, 4:9–10, 9:15–20, 10:17–22, 12:10–13:20, Fig. 3 (tap 307), Fig. 5A (tap 502), Fig. 5B; Ex. 1003 ¶ 373). Valve also argues that Kolmykov-Zotov “**confirms** that it was conventional in a press-and-hold system to select items via a tap.” *Id.* (citing Ex. 1008, 10:8–13, 18:11–19; Ex. 1003 ¶ 374).

Once again, Immersion did not file a Patent Owner Response during trial. Upon reviewing Valve’s unrebutted arguments and evidence explaining how the combined teachings of Keely and Kolmykov-Zotov account for the additional limitation of dependent claims 6–8, 13, and 18, we agree with and adopt Valve’s analysis. *See* Pet. 59–66. Accordingly, Valve has demonstrated by a preponderance of the evidence that the subject matter

⁶ All references to the page numbers in the ’841 provisional application refer to the native page numbers that appear in the bottom, middle portion of each page in Exhibit 1012.

of these dependent claims would have been obvious over the combined teachings of Keely and Kolmykov-Zotov.

*D. Obviousness Over the Combined Teachings
Keely, Kolmykov-Zotov, and Shahoian*

Valve contends that claims 2–5, 10–12, and 15–17 of the ’507 patent are unpatentable under 35 U.S.C. § 103(a) as obvious over the combined teachings of Keely, Kolmykov-Zotov, and Shahoian. Pet. 66–69.

Valve contends that the combined teachings of Keely, Kolmykov-Zotov, and Shahoian account for the subject matter of each challenged claim, and provides reasoning as to why a person of ordinary skill in the art would have been prompted to modify the teachings of these references. *Id.* Valve submits the Declaration of Mr. Ward to support its positions. *See* Ex. 1003. As we explain above, Immersion did not file a Patent Owner Response during trial.

Based on the complete record, we determine that Valve has shown by a preponderance of the evidence that claims 2–5, 10–12, and 15–17 of the ’507 patent are unpatentable as obvious over the combined teachings of Keely, Kolmykov-Zotov, and Shahoian. We address the parties’ contentions with respect to the challenged claims.

As one example, claim 2 directly depends from independent claim 1, and further recites “wherein the contact data comprises actual pressure and a pseudo pressure.” Ex. 1001, 10:45–46. Claims 10 and 15 each recite the same limitation, but they directly depend from independent claims 9 and 14, respectively. *Id.* at 11:20–22, 12:20–21.

Valve relies on the same arguments and evidence it identifies above with respect to the obvious ground based on Astala and Shahoian to explain

how Shahoian teaches this additional limitation of dependent claims 2, 10, and 15. Pet. 67. That is, Valve asserts that “Shahoian’s sensors generate contact data comprising actual and pseudo pressure as required by [dependent] claim 2.” *Id.*; *see also id.* at 69 (arguing the same for dependent claims 10 and 15).

Once again, Immersion did not file a Patent Owner Response during trial. Upon reviewing Valve’s un rebutted arguments and evidence explaining how the combined teachings of Keely, Kolmykov-Zotov, and Shahoian account for the additional limitations of dependent claims 2–5, 10–12, and 15–17, we agree with and adopt Valve’s analysis. *See* Pet. 66–69. Accordingly, Valve has demonstrated by a preponderance of the evidence that the subject matter of these dependent claims would have been obvious over the combined teachings of Keely, Kolmykov-Zotov, and Shahoian.

III. CONCLUSIONS⁷

Based on the complete record, Valve has demonstrated by a preponderance of the evidence that claims 1–18 of the ’507 patent are unpatentable. A summary of our conclusions is set forth in the table below.

⁷ Should Immersion wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding after the issuance of this decision, we draw Immersion’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 Immersion chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Immersion 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).

Claims	35 U.S.C. §	Reference(s)/ Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1–18	103(a)	Astala, Shahoian	1–18	
1, 6–9, 13, 14, 18	103(a)	Keely, Kolmykov- Zotov	1, 6–9, 13, 14, 18	
2–5, 10– 12, 15–17	103(a)	Keely, Kolmykov- Zotov, Shahoian	2–5, 10–12, 15–17	
Overall Outcome			1–18	

IV. ORDER

In consideration of the foregoing, it is

ORDERED that claims 1–18 of the ’507 patent have been shown to be unpatentable; and

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

IPR2024-00556
Patent 8,749,507 B2

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