

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner,

v.

IMMERSION CORPORATION,
Patent Owner.

Case IPR2016-01884
Patent 7,336,260 B2

Before BRYAN F. MOORE, PATRICK R. SCANLON, and
MINN CHUNG, *Administrative Patent Judges*.

SCANLON, *Administrative Patent Judge*.

DECISION
Institution of *Inter Partes* Review
35 U.S.C. § 314 and 37 C.F.R. § 42.108

I. INTRODUCTION

Apple Inc. (“Petitioner”) filed a Corrected Petition (Paper 3, “Pet.”) requesting an *inter partes* review of claims 1 and 2 of U.S. Patent No. 7,336,260 B2 (Ex. 1001, “the ’260 patent”). Immersion Corporation (“Patent Owner”) filed a Preliminary Response (Paper 7, “Prelim. Resp.”). Pursuant to our authorization (*see* Paper 8), Petitioner filed a Reply to Patent Owner Preliminary Response (Paper 9, “Reply to POPR”), and Patent Owner filed a Sur-Reply in Support of Patent Owner’s Preliminary Response (Paper 10, “Sur-Reply”).

We have jurisdiction under 35 U.S.C. § 314, which provides that *inter partes* review may not be instituted unless “the information presented in the petition . . . and any [preliminary] response . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a).

Upon consideration of the Petition, the Preliminary Response, and the additional briefing, and for the reasons discussed below, we determine that Petitioner has established a reasonable likelihood of prevailing in showing the unpatentability of the challenged claims. Accordingly, we institute *inter partes* review of claims 1 and 2.

II. BACKGROUND

A. Related Matters

The parties indicate that the ’260 patent is at issue in the following related cases: *Immersion Corp. v. Apple Inc.*, Nos. 1:16-cv-00077 and 1:16-cv-00325 (D. Del.); and *In the Matter of: Certain Mobile Electronic Devices Incorporating Haptics (Including Smartphones and Smartwatches) and Components Thereof*, ITC Investigation No. 337-TA-990 (USITC),

which has been consolidated with *In the Matter of: Certain Mobile and Portable Electronic Devices Incorporating Haptics (Including Smartphones and Laptops) and Components Thereof*, ITC Investigation No. 337-TA-1004 (USITC). Pet. 1; Paper 5, 2. Petitioner has also filed other IPRs challenging other patents owned by Patent Owner, including IPR2016-01907 involving related U.S. Patent No. 7,808,488 B2.

B. The '260 patent

The '260 patent, titled “Method and Apparatus for Providing Tactile Sensations,” issued on February 26, 2008. The '260 patent describes a system and method for providing tactile sensations to input devices, including non-mechanical input devices, such as soft-keys displayed on a screen. *See* Ex. 1001, Abstract, 2:66–3:4. In particular, the '260 patent describes different tactile sensations to users manipulating an input device such as a touchscreen, based in part on varying levels of pressure applied to the input device by the users. *Id.* at 5:38–57. Figure 2 of the '260 patent is reproduced below.

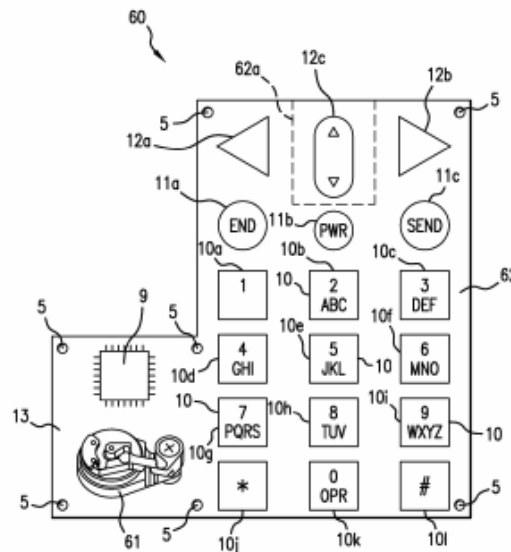


FIG.2

Figure 2 depicts apparatus 60 with multiple input devices arranged as keys in a key pad for a telephone or mobile telephone, including twelve fixed or pre-assigned alphanumeric input buttons 10*a-l*, three pre-assigned function buttons 11*a-c*, and three assignable function buttons 12*a-c*. *Id.* at 5:39–47. Each of alphanumeric buttons 10 is capable of receiving multiple levels of pressure, such as button 10*i* capable of resolving five levels of increasingly greater pressure. *Id.* at 5:62–6:9. Pre-assigned function buttons 11 are capable of resolving three levels of increasingly greater pressure. *Id.* at 6:51–55. Actuator 61 is in communication with input devices and with controller 9 and is configured to provide vibrations of varying frequencies to the input devices in response to signals transmitted from the controller. *Id.* at 7:65–8:25.

Figure 4 of the '260 patent is reproduced below.

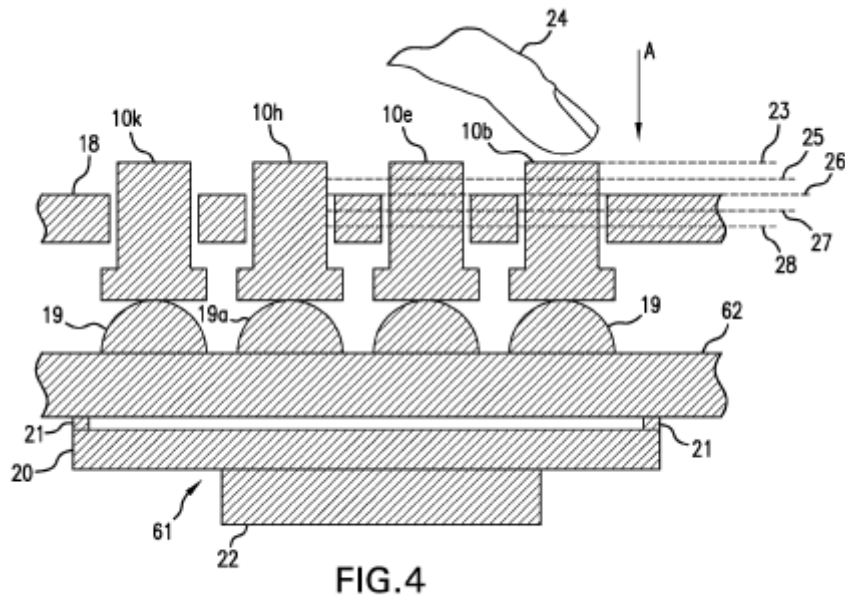


Figure 4 depicts alphanumeric input buttons or keys 10 in a mobile telephone, passing through case 18 of the telephone and contacting a

plurality of switches 19 that are in communication with controller 9 and disposed on printed circuit board (PCB) 62. *Id.* at 8:38–43. PCB 62 in turn is in communication with actuator 61, which is a piezo-electric actuator having metal diaphragm 20 in contact with piezo-ceramic element 22. *Id.* at 8:54–59.

Object 24, for example a user's finger, selects one or more of keys 10 by applying pressure in direction of arrow A, causing the selected key to progress through a plurality of positions such as rest position 23, second position 25, third position 26, fourth position 27, and fifth position 28, as greater pressure is applied to button 10. *Id.* at 8:65–9:5. Figure 3 of the '260 patent is reproduced below.

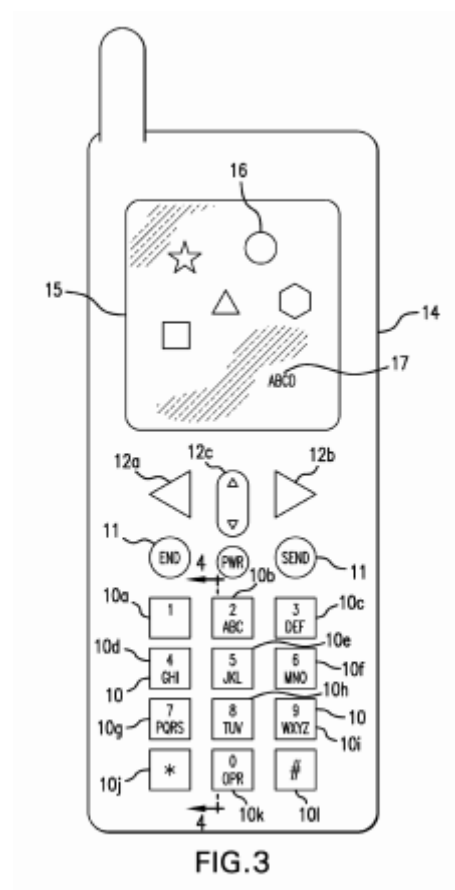


Figure 3 depicts mobile telephone 14, with controller 9, actuator 61, and PCB 62 of apparatus 60 from Figure 2 encased in case 18. *Id.* at 8:26–30. Display screen 15 displays graphical objects 16 and alphanumeric information 17. *Id.* at 8:30–32. When a user presses the “9” key/button 10*i*, button 10*i* applies pressure to switch 19*a*, which transmits signals to controller 9. *Id.* at 9:19–30. Controller 9 then transmits a signal to actuator 61 which provides a vibration of a first pre-selected frequency to metal diaphragm 20, in turn causing PCB, switches 19, and button 10 to vibrate at that frequency. *Id.* at 9:30–44.

If a user applies further pressure sufficient to cause button 10*i* to move from second level 25 to third level 26, switch 19*a* then transmits a second signal to controller 9, which transmits a second signal to actuator 61. *Id.* at 9:45–56. Actuator 61 provides a vibration of a second pre-selected frequency that is communicated through PCB 62 and switches 19 to button 10*i*. *Id.* at 9:56–64. Different signals are transmitted by switch 19*a* for each level of pressure 25, 26, 27, and 28. *Id.* at 10:1–3.

C. Illustrative Claim

Of the challenged claims in the '260 patent, claim 1 is the sole independent claim and is reproduced below.

1. A computer-readable medium having instructions, the instructions including instructions that cause a processor to:
 - detect a first pressure on a first input device;
 - provide a first tactile sensation to the first input device, the first tactile sensation based at least in part on the first pressure;
 - detect a second pressure on the first input device, the second pressure greater than the first pressure; and

provide a second tactile sensation to the first input device, the second tactile sensation based at least in part on the second pressure;

detect a third pressure on the first input device, the third pressure greater than the second pressure; and

provide a third tactile sensation to the first input device.

Ex. 1001, 20:33–46.

D. The Prior Art

Petitioner relies on the following prior art:

1. U.S. Patent Application Publication No. 2001/0008849 A1, published July 19, 2001 (Ex. 1007, “Komata”);
2. Japanese Unexamined Patent Application Publication No. 11-212725, published Aug. 6, 1999 (certified English translation) (Ex. 1009, “JP725”);
3. *Synaptics TouchPad Interfacing Guide*, Document No. 510-000080-A, Rev. 2.5, (Jan. 22, 2001) (Ex. 1011, “Synaptics”);¹ and
4. Hui Tang et al., *A Multi-Level Input System with Force-Sensitive Elements*, J. Human-Computer Studies, (2001) 54, 495–507 (Ex. 1012, “Tang”).

E. Asserted Grounds of Unpatentability

Petitioner challenges claims 1 and 2 of the ’260 patent on the following grounds:²

¹ Petitioner asserts that “Synaptics indicates that it was published on January 22, 2001,” and the reference “was publicly available via the synaptics.com website no later than June 5, 2001.” Pet. 53, 54–55 (citing Ex. 1011, 5, Ex. 1017).

² Section 3(c) of the Leahy-Smith America Invents Act (“AIA”) amended 35 U.S.C. § 103. Pub. L. No. 112-29, 125 Stat. 284, 287–288 (2011). Because the ’260 patent has a filing date before March 16, 2013 (effective

Reference(s)	Basis	Claim(s) Challenged
Komata	§ 103	1 and 2
Tang	§ 103	1 and 2
Tang and Synaptics	§ 103	2
JP725	§ 103	1 and 2

III. ANALYSIS

A. Claim Construction

In an *inter partes* review, “[a] claim in an unexpired patent shall be given its broadest reasonable construction in light of the specification of the patent in which it appears.” 37 C.F.R. § 42.100(b); *see also* *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016) (upholding the use of the broadest reasonable interpretation standard). Under the broadest reasonable interpretation standard, claim terms are given their ordinary and customary meaning in view of the specification, as would be understood by one of ordinary skill in the art at the time of the invention. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007).

The Board, however, may not “construe claims during IPR so broadly that its constructions are *unreasonable* under general claim construction principles. . . . ‘[T]he protocol of giving claims their broadest reasonable interpretation . . . does not include giving claims a legally incorrect interpretation.’” *Microsoft Corp. v. Proxyconn, Inc.*, 789 F.3d 1292, 1298 (Fed. Cir. 2015). Rather, “claims should always be read in light of the

date of § 3), the pre-AIA version of § 103 applies in this proceeding. *See id.* § 3(n)(1), 125 Stat. at 293.

specification and teachings in the underlying patent.” *Id.* An inventor may provide a meaning for a term that is different from its ordinary meaning by defining the term in the specification with reasonable clarity, deliberateness, and precision. *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). In the absence of such a definition, limitations are not to be read from the specification into the claims. *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993).

Petitioner proposes constructions for four terms or phrases: “pressure,” “input device,” “detect a . . . pressure on a . . . input device,” and “tactile sensation based at least in part on the first pressure.” Pet. 9–15. In general, Petitioner asserts that Patent Owner should be held to claim constructions “at least as broad as the constructions” expressly stated or implied from its infringement allegations in ITC Investigation No. 337-TA-1004. *Id.* at 8–9. Patent Owner does not dispute Petitioner’s proposed constructions or explicitly offer its own construction for any claim term. Prelim. Resp. 1–24.

For purposes of this Decision, we find it necessary to construe only the term “input device.” Petitioner argues that this term should be construed

to encompass at least two types of devices: (1) a touchscreen that is deflected in small, microscopic amounts upon the application of pressure to the touchscreen surface, and (2) an assembly of components such as a mouse or a keyboard that include a sub-component, such as a switch or button, that can be moved to first and second positions upon the application of first and second pressures.

Pet. 9. We decline to adopt this proposed construction.

The Specification of the ’260 patent does not provide an express lexicographic definition for the term “input device” but does provide

guidance as to how the term should be interpreted. First, the '260 patent provides a broad range of examples of input devices. Such examples include “computer mice, joysticks, trackballs, steering wheels, styl[i], tablets, pressure-sensitive spheres, scroll wheels, keyboards, and keypads” (Ex. 1001, 1:23–26), mechanical switches and touchpads (*id.* at 2:18–20), soft-keys (*id.* at 3:1–4), and “an analog switch, a force sending resistor, a strain gauge based sensor, a capacitative touch switch, a scroll wheel, a mini-joystick, a touchpad, a touch screen, a 3-way switch, a 4-way switch, a 5-way switch, or other input device” (*id.* at 3:27–31). Specific embodiments on input devices disclosed in the '260 patent include the rocker-type switch 2 of Figure 1 (*id.* at 3:15–19), alphanumeric input buttons 10*a-l*, pre-assigned function buttons 11*a-c*, and assignable function buttons 12*a-c* of Figure 2 (*id.* at 5:39–43), and pressure-sensitive touchpad 30 of Figure 5 (*id.* at 11:12–13).

Second, the '260 patent discloses that “[c]onventional electronic devices, such as mobile telephones and Personal Digital Assistants (PDAs), include visual displays. A user of such devices interacts with the visual display using any one of a number of input devices,” and “[t]he user provides instructions, responses, and other input to the device using such input devices.” *Id.* at 1:19–22, 1:26–27.

Therefore, applying the broadest reasonable interpretation of the claims in light of the Specification, we interpret “input device,” for purposes of this Decision, to mean a device by which a user can interact with an electronic device to provide instructions, responses, and other input to the electronic device.

B. Asserted Obviousness Based on Komata

Petitioner challenges claims 1 and 2 as obvious under 35 U.S.C. § 103(a) over Komata. Pet. 3, 15–36. To support this assertion, Petitioner relies on the Declaration of Dr. Majid Sarrafzadeh (Ex. 1002).

1. Overview of Komata

Komata relates to controllers used in video game machines. Ex. 1007, Abstract. In one embodiment, controller 200 “has buttons connected to pressure-sensitive devices and a vibration generator.” *Id.* ¶ 31. Figure 6 of Komata is reproduced below.

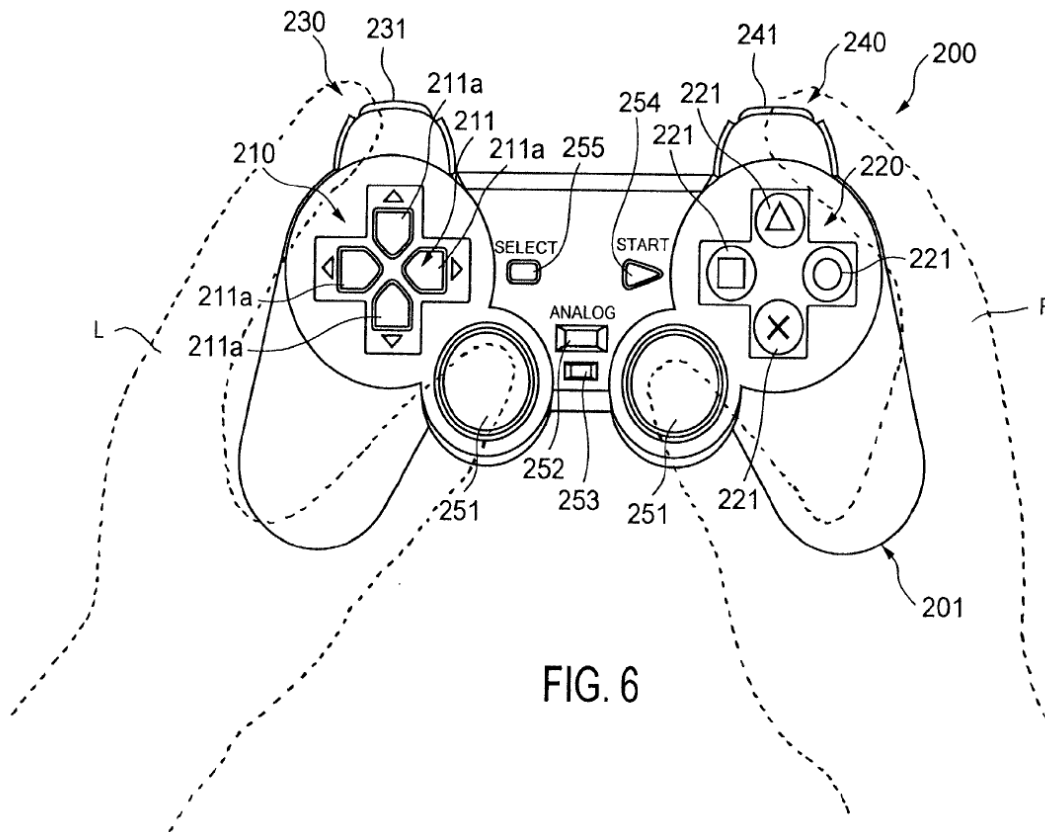


Figure 6 is a top view of controller 200. *Id.* ¶ 67. Controller 200 includes body 201 having first, second, third, and fourth control parts 210, 220, 230, 240. *Id.* Second control part 220 has four cylindrical control buttons 221,

and the functions of the second control part are set by a game program recorded on an optical disc. *Id.* ¶ 69.

Figures 7 and 8A–8C of Komata are reproduced below.

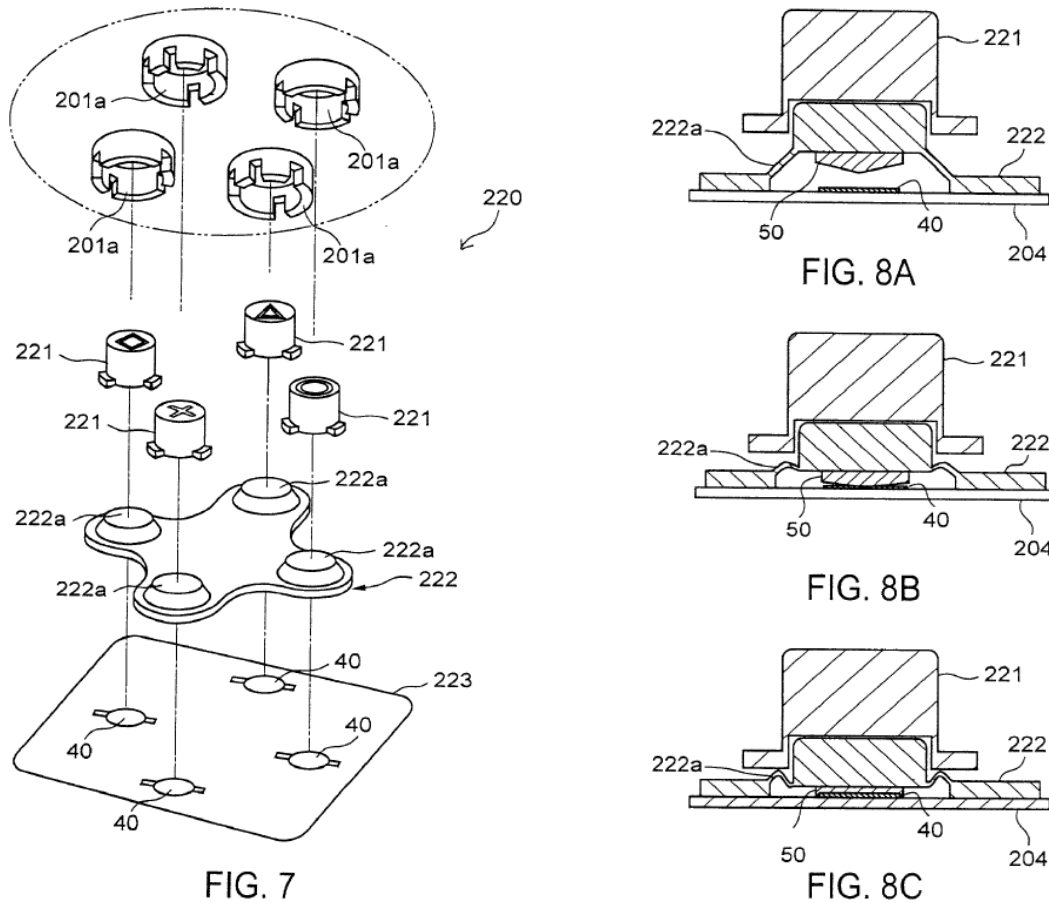


Figure 7 is an exploded perspective view of the second control part of controller 200, and Figures 8A–8C depict cross-sectional views of the second control part. *Id.* ¶ 75. The second control part includes control buttons 221, elastic body 222, and sheet member 223, which is provided with resistors 40. *Id.* ¶ 76. Elastic body 222 includes protruding elastic areas 222a that support control buttons 221 and flex when the control buttons are pressed. *Id.* ¶ 77.

Conducting members 50 are attached to the rear surface of elastic body 222 such that resistors 40 and conducting members 50 form pressure-sensitive devices having resistance values that vary depending on how much pressure is applied to the corresponding control button. *Id.* ¶¶ 78–79. More specifically, each conducting member 50 is made of a conductive elastic material that contacts a corresponding resistor 40 when the control button is pressed downward sufficiently. *Id.* ¶¶ 80–81. The tip of conducting member 50 deforms as it is pressed against resistor 40 such that the surface area contacting resistor 40 depends on the amount of pressure applied. *Id.* ¶ 82. As shown in Figures 8B and 8C, a stronger pressing force on the control button causes the surface area contacting resistor 40 to expand. *Id.* The “resistance value of the pressure-sensitive device varies depending on the surface area of contact.” *Id.* ¶ 83. Namely, the resistance value decreases as the surface area of contact increases. *Id.* ¶ 84.

Figure 10 of Komata is reproduced below.

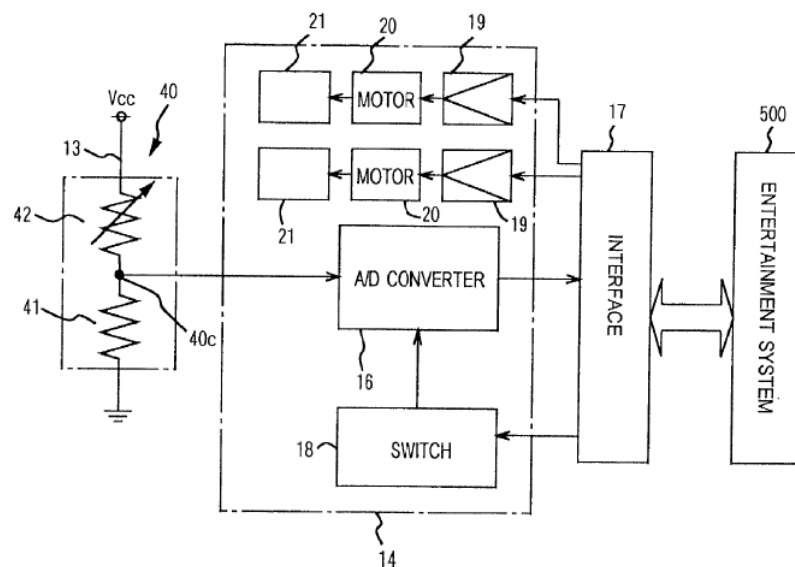


FIG. 10

Figure 10 depicts a block diagram of controller 200. Controller 200 includes MPU³ 14, which is provided with A/D converter 16, switch 18, and two vibration generation systems. *Id.* ¶ 89. The signal from the output terminal of resistor 40 is input to A/D converter 16. *Id.* The digital signal output from A/D converter 16 corresponds to the pushing pressure on control button 221 and is sent to entertainment system 500 via interface 17. *Id.* ¶¶ 90–91. Each vibration generation system comprises a driver 19, motor 20, and eccentric member 21 attached to the shaft of the motor. *Id.* ¶ 93. Each motor 20 is driven by drive signals supplied by entertainment system 500. *Id.* ¶ 117.

The drive signals are selected from “a pressure-sensed value-drive signal conversion table” that correlates drive signals to several pressure-sensed values. *Id.* ¶ 36, Fig. 2. “The drive signals . . . corresponding to each of the pressure-sense values are supplied from the entertainment system 500 to the controller 200, and after conversion to analog signals by the A/D converter of the controller 200, they are given as drive-signals for the motor of the vibration generator.” *Id.* ¶ 36.

2. *Independent Claim 1*

a) *Petitioner’s Assertions*

i. *Preamble*

Petitioner argues that “Komata discloses that ‘the program for generating vibration depending on pressure-sensed values may be supplied either recorded alone on an optical disc or other recording medium, or

³ Although not specified in Komata, “MPU” presumably refers to a microprocessor unit. *See* Pet. 67 (citing Ex. 1002 ¶ 135, Ex. 1010, 3).

recorded on the recording medium together with the game software as part of the game software,[']” and that this program “is run by the entertainment system 500 and executed by its CPU.” Pet. 22 (quoting Ex. 1007 ¶ 41).

According to Petitioner, one of ordinary skill in the art would have understood “CPU” to be an abbreviation for “central processing unit,” which is a type of processor, or at least would have found it obvious to use a processor to execute Komata’s software. *Id.* (citing Ex. 1002 ¶ 66). For these reasons, Petitioner argues that Komata either discloses or renders obvious the preamble of claim 1.

We agree with Petitioner that Komata’s teaching of a program for generating vibration depending on pressure-sensed values being recorded on an optical disc or other recording medium discloses a computer-readable medium having instructions. In addition, we agree that an ordinarily skilled artisan would have recognized the term “CPU” to refer to a processor, and that this processor executes the program (i.e., the instructions) stored on the computer-readable medium. Therefore, we are persuaded that Petitioner has demonstrated sufficiently that Komata discloses the preamble of claim 1.

ii. detect a first pressure on a first input device

First, Petitioner argues that, “under any reasonable construction” of the term, either Komata’s controller 200 or each one of Komata’s buttons 221 is an input device. *Id.* at 22–23. Komata discloses that “controller 200 is configured such that, when a plurality of buttons provided thereupon are pushed, it gives instructions to the entertainment system 500.” Ex. 1007 ¶ 63. Thus, a user can use controller 200 to interact with entertainment system 500—an electronic device—by providing instructions to the entertainment system. Moreover, control buttons 221 of controller 200 are

described as “control elements” having “allocated functions” for changing the state of game characters. *Id.* ¶¶ 69–70; *see also id.* ¶¶ 89–90 (describing that resistor 40 of the control button outputs an analog signal to A/D converter 16, and the converter outputs a digital signal to entertainment system 500, which executes actions of game characters based on the digital signal). Hence, a user can use buttons 221 to provide instructions or other input to entertainment system 500. We thus agree with Petitioner that either controller 200 or anyone of its buttons 221 can be an input device consistent with our interpretation. *See supra* Section III.A.

Next, Petitioner asserts that Komata discloses detecting a first pressure because “controller 200 includes ‘buttons connected to pressure-sensitive devices,’” and “the analog output from the pressure-sensitive devices is converted by an A/D converter to digital values in the range [of] 0–255 and provided to the entertainment system 500.” Pet. 26 (quoting Ex. 1007 ¶¶ 31, 32). According to Petitioner, the

digital values 0-255 represent pressures applied to the button on the input device by a user because . . . : (1) the resistance value of the pressure-sensitive device varies depending on the surface area of the conducting member 50 in contact with the resistor 40 (*Id.* ¶ [0083]); (2) the surface area of the conducting member 50 in contact with the resistor 40 varies depending on the pressure (*Id.* ¶ [0082]); and (3) the circuit to which the pressure-sensitive device is connected is configured such that it produces “an analog signal corresponding to the pressure by the user on the control button 221” (*Id.* ¶ [0085]).

Id. Petitioner further contends that it would have been obvious “that one possible value from the A/D converter 16 of Figure 10 that could be reported by the controller 200 is ‘252,’” in which case “entertainment system 500 *detects* a first pressure on the input device, such as the pressure associated

with pressure-sense value 252 in Table 2.” *Id.* at 26–27 (citing Ex. 1002 ¶ 72).

We are persuaded by Petitioner’s arguments. Komata discloses “pressure-sensitive devices consisting of resistors 40 and conducting members 50 [and having] resistance values that vary depending on the pushing pressure received from the control buttons 221.” Ex. 1007 ¶ 79. These pressure-sensitive devices output “an analog signal corresponding to the pressure by the user on the control button 221,” which is converted to a digital signal is sent to entertainment system 500. *Id.* ¶¶ 85, 89–90. Entertainment system 500 then supplies drive signals for actuating the vibration generation systems in controller 200. *Id.* ¶¶ 93, 117. Komata’s Figure 2 “shows a pressure-sensed value-drive signal conversion table for selecting a drive signal corresponding to each of the *pressure-sensed values* ‘0’-‘255’”. Using this table, each *pressure-sensed value* is converted to a drive signal.” *Id.* ¶ 36 (emphases added). In other words, a pressure exerted on one of the control buttons 221 of controller 200 causes the corresponding pressure-sensitive device to produce a signal representative of the amount of pressure exerted. By receiving this signal and outputting a unique drive signal, entertainment system 500 effectively detects the exerted pressure. The fact that Komata also refers to the signal representative of the amount of pressure as a *pressure-sensed value* further indicates that pressure is sensed or detected.

Therefore, we are persuaded that Petitioner has demonstrated sufficiently that Komata discloses this limitation.

- iii. *provide a first tactile sensation to the first input device, the first tactile sensation based at least in part on the first pressure*

Petitioner argues that “[t]he drive signal[s] from Table 2 corresponding to the pressure values [are] supplied from the entertainment system 500 to the controller 200, and . . . are applied as drive signals for the motor 20 of Fig. 10 to cause the controller 200 to vibrate.” Pet. 28 (citing Ex. 1007 ¶ 36). Petitioner also argues that one of ordinary skill in the art “would understand that the vibrations caused by the actuator would cause the entire controller 200 including the buttons 221 to vibrate because of the unitary nature of the plastic housing forming the top part of the controller 200 on which the buttons 221 are mounted.” *Id.* at 31 (citing Ex. 1002 ¶ 75). Thus, Petitioner contends that Komata discloses vibrations to the “input device,” regardless of whether controller 200 or button 221 is construed as the input device. *Id.* at 31–32. Last, Petitioner contends that the vibrations are a first tactile sensation because they correspond to one of the input signals, such as signal 252 from the table of Figure 2. *Id.* at 32 (citing Ex. 1002 ¶ 76).

We are persuaded by Petitioner’s argument because Komata’s drive signals are based on the pressure-sensed values, and the drive signals cause the vibration generating systems to create vibrations (which are a tactile sensation) in controller 200. Ex. 1007 ¶¶ 36, 93, 117. The vibrations provide a first tactile sensation to the controller 200. Furthermore, we credit Dr. Sarrafzadeh’s testimony that these vibrations would cause the entire controller 200, including buttons 221, to vibrate. *See* Ex. 1002 ¶ 75.

For these reasons, we are persuaded that Petitioner has demonstrated sufficiently that Komata discloses or renders obvious this limitation.

- iv. *detect a second pressure on the first input device, the second pressure greater than the first pressure*

Petitioner argues that Komata teaches this limitation because the reference “discloses receiving a signal from the controller 200 with a range of possible values from 0–255 representing the pressure applied to a button of the controller 200,” and a person having ordinary skill in the art would understand that “252” is one possible value in this range that could be received and “that another possibility is receiving a signal with a value of 253, which represents a second pressure greater than the first pressure represented by a value of ‘252.’” Pet. 32 (citing Ex. 1002 ¶ 77).

We agree with Petitioner that Komata discloses a range of signals representing different pressures applied to a button of controller 200. We also agree that Komata’s pressure signal values differ such that there would be a second value that is greater than a first value. Accordingly, we are persuaded that Petitioner has demonstrated sufficiently that Komata discloses this limitation.

- v. *provide a second tactile sensation to the first input device, the second tactile sensation based at least in part on the second pressure*

Petitioner argues that Komata discloses or renders obvious this limitation for reasons similar to those presented in connection with the recitation of providing a first tactile sensation based at least in part on the first pressure. *Id.* at 33 (citing Ex. 1007 ¶ 78). We found those arguments persuasive in that context (*see supra* Section III.B.2.iii.) and agree that Komata discloses providing a second tactile sensation based at least in part on a second pressure because Komata describes multiple drive signals

corresponding to various pressure-sensed values for creating vibrations in controller 200. Ex. 1007 ¶¶ 36, 93, 117.

- vi. *detect a third pressure on the first input device, the third pressure greater than the first pressure*

For this limitation, Petitioner again argues that “Komata discloses receiving a signal from the controller 200 with a range of possible values from 0–255 representing the pressure applied to a button of the controller 200,” and, in this instance, a person having ordinary skill in the art would understand that “252” and “253” are possible values in this range that could be received and “that another possibility is receiving a signal with a value of 254, which represents a third pressure greater than the pressures represented by a value of ‘252’ and ‘253.’” Pet. 33–34 (citing Ex. 1002 ¶ 79).

We agree with Petitioner’s argument for the same reasons discussed above in connection with the limitation of detecting a second pressure. *See supra* Section III.B.2.iv.

- vii. *provide a third tactile sensation to the first input device*

Petitioner again relies on Komata’s disclosure of using Table 2 to select a drive signal corresponding to the detected pressure value to assert that Komata discloses providing a third tactile sensation. Pet. 34 (citing Ex. 1007 ¶ 80). Just as we were persuaded that Komata discloses providing a second tactile sensation (*see supra* Section III.B.2.v.), we agree that Komata’s description of multiple drive signals corresponding to various pressure-sensed values would include providing a third tactile sensation.

b) *Discussion*

Patent Owner presents arguments contending that the challenged claims would not have been obvious in view of Komata. Prelim. Resp.

8–14. To support these arguments, Patent Owner relies on the Declaration of Sigurd Meldal, Dr. Sc. (Ex. 2001).

For instance, Patent Owner argues that the claims of the '260 patent recite a processor that provides first, second, and third tactile sensations *during an interaction*. Prelim. Resp. 8 (emphasis added). Relying on the testimony of Dr. Meldal, Patent Owner asserts that “[a]s a user applies pressure to an input device to the second pressure level, the processor may first detect a first pressure.” *Id.* (citing Ex. 2001 ¶ 24). According to Patent Owner, “first, second and third tactile sensations are provided as the user progresses through the multiple different pressure levels *during a single touch interaction*.” *Id.* at 8–9 (emphasis added).

In view of these assertions, Patent Owner argues that “Komata does not disclose or suggest a processor that detects three or more levels of pressure applied to an input device *during an interaction* and provides first, second, and third tactile sensations to the input device as the user varies the pressure.” *Id.* at 8 (emphasis added). Patent Owner adds that “Komata does not disclose or suggest the concept of providing a set of tactile sensations to the input device as the user applies varying levels of pressure or providing intermediate sensations as the user progresses through pressure levels” and “Komata lacks any intermediate tactile sensations provided based on the user varying pressure throughout the interaction.” *Id.* at 12. According to Patent Owner, Komata fails “to continuously monitor and detect three or more different pressure levels as the user varies pressure on the switch, and provide a tactile sensation that corresponds to each pressure level.” *Id.*

All of these arguments depend on Patent Owner’s assertion that the claims require detecting the first, second, and third pressures and/or

providing the first, second, and third tactile sensations *during a single touch interaction*. To fully address this issue, we allowed additional briefing by the parties. *See* Paper 8. In its Reply, Petitioner argues

Claim 1 does not recite the limitation “interaction” much less “during a single touch interaction.” Ex. 1001, 20:33–46. Nor are there any terms in claim 1 that could reasonably be construed as meaning “during a single touch interaction.” Claim 1 is an open-ended claim that requires the detection of three distinct pressures, but does not specify any other temporal or logical relationship between the detections. *Id.*

Reply to POPR 1. Petitioner adds that nothing in the open-ended claims precludes detecting or applying additional pressures “before, between, or after the claimed detections.” *Id.* at 1–2.

Petitioner further argues that “the word ‘interaction’ is entirely absent from the specification,” which indicates that there is no basis for importing a “during a single touch interaction” requirement into the claims. *Id.* at 2. In addition, Petitioner contends that importing a “during a single touch interaction” requirement into the claims improperly would exclude several embodiments disclosed in the Specification of the ’260 patent. *Id.* at 3–7.

Patent Owner, on the other hand, argues “[i]t is axiomatic that this process of detecting multiple pressures on an input device, each having a specific relationship to the others, and providing corresponding tactile sensations occurs during an interaction with the input device.” Sur-Reply 2. The specific relationships Patent Owner refers to are that the second pressure is greater than the first pressure and the third pressure is greater than the second pressure. These relationships, however, do not define any temporal relationship between the detections and thus fail to require that detecting the

first, second, and third pressures must occur at the same time, continuously, or as part of a single touch interaction.

Patent Owner also argues that “Petitioner identifies no disclosure in the ’260 patent of an apparatus or method in which three pressures are detected during three separate interactions.” *Id.* This argument is not persuasive because Petitioner’s position is that the challenged claims do not preclude detecting the three pressures during three separate interactions. Moreover, Patent Owner’s argument that multiple embodiments of the ’260 patent disclose providing tactile sensations as a user varies pressure multiple times in an interaction (*id.* at 2–3) is unpersuasive. Even assuming that the ’260 patent does disclose providing tactile sensations as a user applies varying pressure *during an interaction*, it would be improper to read such disclosure into the claims. *Van Geuns*, 988 F.2d at 1184.

Next, Patent Owner argues that “Petitioner’s argument that the word ‘interaction’ does not appear in these embodiments or the claims . . . exalts form over substance.” Sur-Reply 4. This argument is inapposite. Concentrating on the claim language is not a mere matter of form. Rather, “a claim construction analysis must begin and remain centered on the claim language itself.” *Innova/Pure Water, Inc. v. Safari Water Filtration Sys., Inc.*, 381 F.3d 1111, 1116 (Fed. Cir. 2004).

Last, Patent Owner argues that, by stating the prior art did not disclose detecting a third pressure that was greater than the second pressure, the Notice of Allowability “provides further evidence in favor of the Patent Owner’s position, as it makes clear that the relationship between the detected pressures is an important part of the invention.” Sur-Reply 7 (citing Ex. 2003, 2). We do not find this argument persuasive. Rather, we agree

with Petitioner that “the examiner’s statement of reasons for allowance has nothing to do with any ‘during an interaction’ requirement,” and “the distinction drawn by the examiner was that the closest prior art only involves two pressures.” Reply to POPR 7.

Upon review of the arguments of both parties, we agree with Petitioner that the challenged claims do not require detecting the three pressures during a single touch interaction. Thus, Patent Owner’s argument that Komata fails to disclose or suggest a processor that detects three or more levels of pressure applied to an input device during an interaction is not persuasive.

Patent Owner also argues that Komata discloses a two-person game using two controllers wherein the output from the pressure-sensitive device in one controller can be used to cause vibration in the other controller. Prelim. Resp. 11–12 (citing Ex. 1007 ¶¶ 34, 36). In view of this disclosure, Patent Owner argues that “[m]odifying Komata in accordance with the present invention to provide intermediate tactile sensations as the user progresses through pressure levels would serve no purpose and could render the game nonfunctional.” *Id.* at 13 (citing Ex. 2001 ¶ 32).

This argument is not persuasive. First, Komata is not limited to the two-player game in which the pressure signal output from one controller is used to cause vibration in the other controller only. Rather, Komata discloses that the output of a controller can be used to cause vibrations in the same controller or another controller. Ex. 1007 ¶ 6. Furthermore, contrary to Patent Owner’s position, there is no need to modify Komata to provide intermediate tactile sensations because the challenged claims do not require

providing intermediate tactile sensations during a single interaction for the reasons discussed above.

3. *Claim 2*

Claim 2 depends from claim 1 and further recites instructions for causing the processor to detect a fourth pressure on the first input device, the fourth pressure greater than the third pressure, and provide a fourth tactile sensation to the first input device. Ex. 1001, 20:47–53.

Petitioner argues that “Komata discloses receiving a signal from the controller 200 with a range of possible values from 0–255 representing the pressure applied to a button of the controller 200,” and a person having ordinary skill in the art would understand that “252,” “253,” and “254” are possible values in this range that could be received and “that another possibility is receiving a signal with a value of 255, which represents a fourth pressure greater than the pressures represented by a value of ‘252,’ ‘253,’ and ‘254.’” Pet. 35 (citing Ex. 1002 ¶ 82).

We agree with Petitioner’s argument for the same reasons discussed above in connection with the limitation of detecting a second pressure. *See supra* Section III.B.2.iv.

Also, Petitioner again relies on Komata’s disclosure of using Table 2 to select a drive signal corresponding to the detected pressure value to assert that Komata discloses providing a third tactile sensation. Pet. 35–34 (citing Ex. 1007 ¶ 83). Just as we were persuaded that Komata discloses providing a second tactile sensation (*see supra* Section III.B.2.v.), we agree that Komata description of multiple drive signals corresponding to various pressure-sensed values would include providing a fourth tactile sensation.

Patent Owner relies on the same arguments it advanced with respect to claim 1. Prelim. Resp. 8–14. These arguments are unpersuasive for the same reasons discussed with respect to claim 1 above. *See supra* Section III.B.2.B.

Therefore, we are persuaded that Petitioner has demonstrated sufficiently that Komata discloses or suggests the limitations of claim 2.

4. *Conclusion*

On the record before us, we are persuaded that Komata discloses or suggests all the limitations of claims 1 and 2. As discussed above, Petitioner provides analysis purporting to show where each limitation recited in claims 1 and 2 is disclosed or suggested by Komata. Petitioner’s contentions are supported by Dr. Sarrafzadeh’s testimony. Moreover, at this point in the proceeding, we do not find Patent Owner’s arguments to the contrary persuasive for the reasons discussed above. Accordingly, we are persuaded that Petitioner has established a reasonable likelihood of prevailing in its challenge of claims 1 and 2 under 35 U.S.C. § 103(a) as unpatentable over Komata.

C. Asserted Obviousness Based on JP725

Petitioner challenges claims 1 and 2 as obvious under 35 U.S.C. § 103(a) over JP725. Pet. 3, 62–73.

1. *Overview of JP725*

JP725 “relates to an information display device and an operation input device used in, for example, factory automation (FA) devices, automatic vending machines, automatic ticket vending machines, automatic teller machines, home appliances, medical operating equipment, information equipment, handheld terminals, game devices, and the like.” Ex. 1009 ¶ 1.

In one embodiment, information display device 100 includes housing 101 having display operating unit DP and control circuit unit CT. *Id.* ¶ 43, Fig. 2. Operating surface 11 is disposed on a main surface of housing 101, and the contents displayed on information display surface 21 can be viewed through the operating surface. *Id.* ¶ 44, Fig. 2.

Figures 3 and 4 of JP725 are reproduced below.

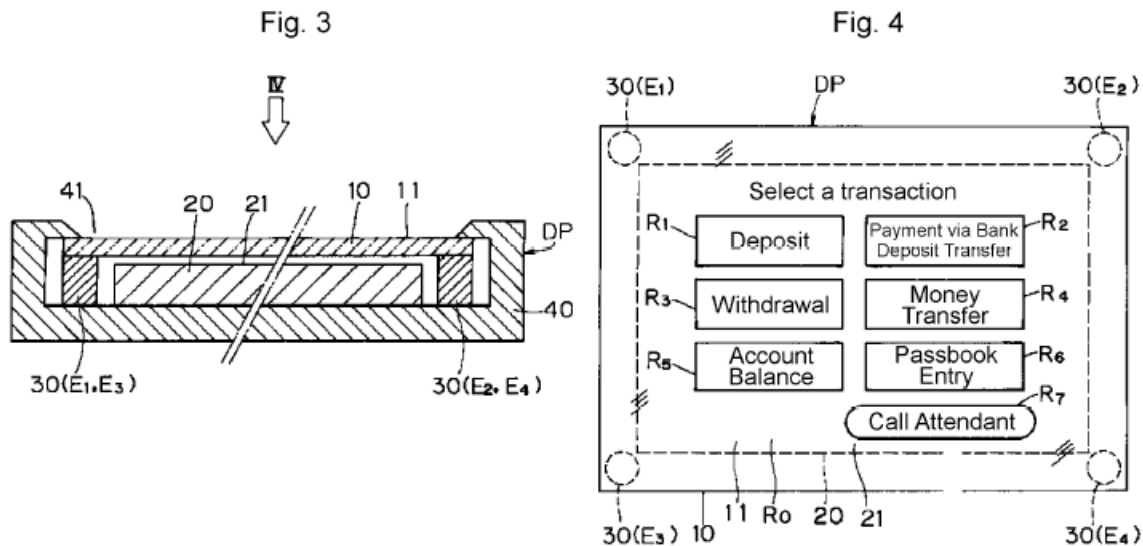


Figure 3 is a partial cross-sectional view of display operating unit DP, and Figure 4 is a plan view of display operating unit DP. *Id.* ¶ 45. Liquid crystal display panel 20, housed in case 40, provides information display surface 21. *Id.* Four piezoelectric elements E1–E4 are disposed in case 40, each one located adjacent to a respective corner of liquid crystal display panel 20. *Id.* ¶ 46. Figure 4 shows seven operating regions R1–R7, representing menus of a “bank automated cashier,” displayed liquid crystal display panel 20. *Id.* ¶ 47. A user can press one of the regions to activate the corresponding function. *Id.* Piezoelectric elements E1–E4 function as sensing means for sensing when a user presses one of the operating regions and as driving

means for vibrating operating panel 10 in response to a region being pressed.
Id. ¶ 48.

Figure 7 is reproduced below.

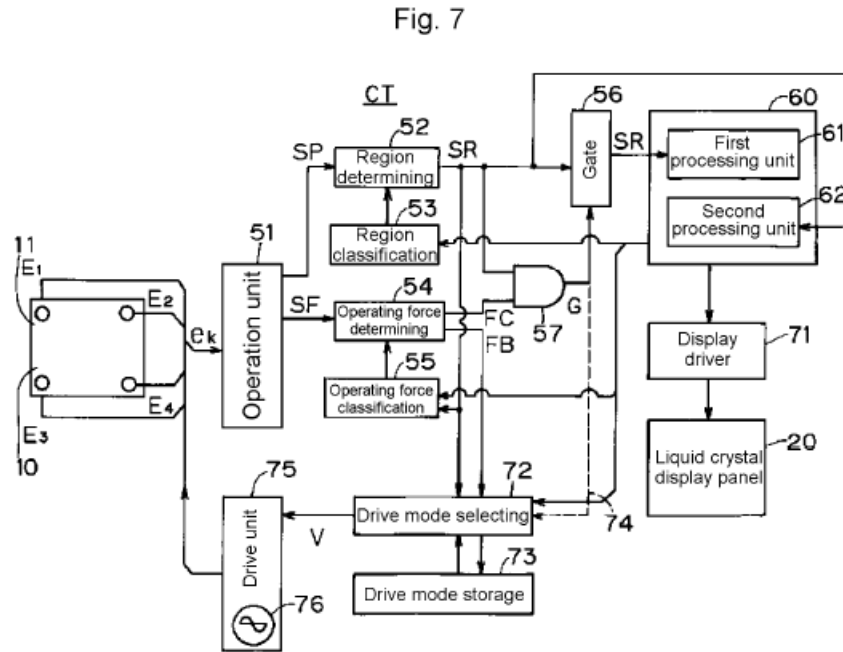


Figure 7 is a block diagram of control circuit CT. *Id.* ¶ 48. Element voltages e_k ($k = 1$ to 4) from each piezoelectric element E1–E4 are applied in parallel to operation unit 51. *Id.* ¶ 82. Based on the forces derived from element voltages e_k , operation unit 51 determines and outputs operating signal position SP and operating force signal SF. *Id.* ¶¶ 83–86.

Operating force signal SF, indicating the operating force F, is applied to operating force determining unit 54. *Id.* ¶ 92. Thresholds Fh1–Fh4 are provided for defining operating force classifications F0–F4. *Id.* More specifically,

With the four operating force classifications F1 through F4, in ranges at or above the minimum threshold Fh1, referred to as “effective operating force classifications,” the operating force determining unit 54

uses the comparing and determining unit 54a housed therein (FIG. 12) to compare the operating force F, denoted at a given time by the operating force signal SF, to the operating force thresholds Fh1 through Fh4 to determine which of the effective operating force classifications F1 through F4 the operating force F is in at a given time.

Id. ¶ 95.

Operating force determining signal FB, indicating the effective operating force classifications F1–F4, is sent to drive mode selecting unit 72, where it is used for selecting a drive mode for operating surface 11 using piezoelectric elements E1–E4, and based on the classification of operating force F. *Id.* ¶ 102. Drive mode selecting unit 72 “selects a drive mode based on the classifications of the in-operation region and the operating force.” *Id.* ¶ 108. This selection is accomplished using the matrix depicted in Figure 13, where signals S11, S12, etc. “are codes for selecting and defining any of a variety of drive modes.” *Id.* ¶ 109.

2. *Independent Claim 1*

a) *Petitioner’s Assertions*

i. *Preamble*

Petitioner argues that “JP725 discloses a control circuit and further discloses that the control circuit can be implemented by hardware or by **software** using a microcomputer,” and “when the control circuit is realized using software and a microcomputer, the circuits described in JP725 such as the operating force detecting unit and the operating force determining unit are ‘functionally realized using the MPU and memory of said microcomputer.’” Pet. 67 (citing Ex. 1009 ¶ 81). According to Petitioner, one of ordinary skill in the art would have found it obvious that the

referenced software would be stored in the microcomputer memory and such memory is a computer readable medium. *Id.* (citing Ex. 1002 ¶ 135).

ii. detect a first pressure on a first input device

Petitioner argues that JP725 discloses that its control circuit includes an operating force detecting unit that detects a total force based on forces reported by individual piezoelectric elements. *Id.* (citing Ex. 1009 ¶¶ 82–85). Petitioner contends that the control circuit also includes an operating force determining unit that decides into which of five classifications or ranges F0, F1, F2, F3, F4 the total force belongs based on four inputted thresholds. *Id.* 67–68 (citing Ex. 1009 ¶¶ 92–97). According to Petitioner, the five force classifications would have suggested to one of ordinary skill in the art that JP725’s control circuit is capable of detecting at least a first force, such as a force in the F1 classification. *Id.* at 68 (citing Ex. 1002 ¶ 136). Petitioner further argues that the forces output by the force detecting unit “are pressures because they represent the application of force from a contact by the user’s finger.” *Id.* (citing Ex. 1002 ¶ 137). Petitioner also contends that the touchscreen of JP725 is an input device. *Id.* (citing Ex. 1002 ¶ 137).

iii. provide a first tactile sensation to the first input device, the first tactile sensation based at least in part on the first pressure

Petitioner argues that “JP725 discloses that, when the total pressure belongs to ranges F1–F4, the control circuit selects a drive mode for vibrating the touch panel (the first input device) according to the matrix of [JP725’s] Fig. 13.” *Id.* at 68–69 (citing Ex. 1009 ¶¶ 107–108). Petitioner contends that the drive modes selected from the matrix “correspond to

different vibrations having different properties such as different frequencies, amplitudes and/or lengths of time.” *Id.* at 69 (citing Ex. 1009 ¶¶ 109–110). According to Petitioner, one of ordinary skill in the art would understand that these vibrations are tactile sensations. *Id.* (citing Ex. 1002 ¶ 139).

- iv. *detect a second pressure on the first input device, the second pressure greater than the first pressure*

For this limitation, Petitioner argues that, because JP725 discloses detecting forces or pressures that fall into five classifications F0, F1, F2, F3, F4, a pressure in the F2 classification would be a second pressure. *Id.* at 70 (citing Ex. 1002 ¶ 140). Petitioner contends that the classifications or ranges are “arranged in increasing order such that pressures in the F2 range are greater than those in the F1 range” and a pressure in the F2 range is a second pressure greater than the first pressure. *Id.* (citing Ex. 1002 ¶ 140, Ex. 1009 ¶ 96).

- v. *provide a second tactile sensation to the first input device, the second tactile sensation based at least in part on the second pressure*

Petitioner argues that “JP725 discloses that, when the total pressure belongs to ranges F1–F4, the control circuit selects a drive mode for vibrating the touch panel according to the matrix of [JP725’s] Fig. 13.” *Id.* Petitioner contends that a second drive mode would be selected from the matrix for a pressure in the F2 range (i.e., a second pressure). *Id.* (citing Ex. 1002 ¶ 141). This selection would result in a second tactile sensation based at least in part on the second pressure. *Id.* (citing Ex. 1002 ¶ 141).

- vi. *detect a third pressure on the first input device, the third pressure greater than the first pressure*

Petitioner argues that, because JP725 discloses detecting forces or pressures that fall into five classifications F0, F1, F2, F3, F4, a pressure in the F3 classification would be a third pressure. *Id.* at 71 (citing Ex. 1002 ¶ 142). Petitioner contends that the classifications or ranges are “arranged in increasing order such that pressures in the F3 range are greater than those in the F2 range” and a pressure in the F3 range is a third pressure greater than the second pressure. *Id.* (citing Ex. 1002 ¶ 142, Ex. 1009 ¶ 96).

- vii. *provide a third tactile sensation to the first input device*

Petitioner argues that “JP725 discloses that, when the total pressure belongs to ranges F1–F4, the control circuit selects a drive mode for vibrating the touch panel according to the matrix of [JP725’s] Fig. 13.” *Id.* Petitioner contends that a third drive mode would be selected from the matrix for a pressure in the F3 range (i.e., a third pressure). *Id.* (citing Ex. 1002 ¶ 143). This selection would result in a third tactile sensation based at least in part on the third pressure. *Id.* (citing Ex. 1002 ¶ 143).

b) *Discussion*

At this stage of the proceeding, we agree with Petitioner’s analysis described above and adopt it as our own for purposes of this Decision. In response to Petitioner’s assertions, Patent Owner argues that JP725 fails to “disclose or suggest the concept of providing intermediate tactile sensations at different pressure levels as the user varies the pressure on an input device.” Prelim. Resp. 20. The challenged claims, however, do not require “the concept of providing intermediate tactile sensations.” The claims do not specify any temporal or other relationship between the three tactile

sensations that would require one of the sensations to be an “intermediate” sensation. This argument is akin to Patent Owner’s previous argument that the challenged claims require detecting the first, second, and third pressures and providing the first, second, and third tactile sensations during a single touch interaction, which we found unpersuasive. *See supra* Section III.B.2.b. Accordingly, we find this argument unpersuasive for the same reasons.

Patent Owner also argues that “JP725 provides a single vibration in response to a specific force measurement and region.” Prelim. Resp. 23. Relying on the testimony of Dr. Meldal, Patent Owner asserts that “JP725 will continue to apply the same vibration even if the user varies the input pressure,” and “[i]f the user varies the input pressure to another threshold there is no disclosure or suggestion in JP725 to provide yet another vibration.” *Id.* (citing Ex. 2001 ¶ 47).

We do not agree entirely with the notion that JP725 discloses continually applying the same vibration even if the user varies the input pressure. First, Dr. Meldal’s testimony is a conclusory statement not supported sufficiently by objective evidence or analysis. Merely repeating an argument from the Preliminary Response in the declaration of a proposed expert does not give that argument probative value. Dr. Meldal’s opinion lacks sufficient support. For this reason, we do not credit the testimony of Dr. Meldal on this issue. *See* 37 C.F.R. § 42.65(a) (“Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.”).

Furthermore, JP725 discloses, in one instance, that operating panel 10 is vibrated for a predetermined amount of time. Ex. 1009 ¶ 125.

Presumably, this vibration would not change during the predetermined interval even if the user changed or even removed the pressure applied. Nevertheless, once the predetermined interval elapsed, the user would then be able to apply a different pressure resulting in a different vibration. In addition, JP725 also discloses that a vibration can continue “as long as the operator applies an operating force F that is larger than the minimum threshold F_{h1} ,” and “[w]hen the operator weakens the operating force F or removes his/her finger from the operating surface 11, . . . the operating surface 11 stops vibrating.” *Id.* ¶ 126. In this case, the user could remove his or her finger to stop the vibration and then immediately contact the operating surface with a different pressure to cause a different vibration.

For these reasons, we are not persuaded by Patent Owner’s argument.

3. *Claim 2*

Petitioner argues that, because JP725 discloses detecting pressures that fall into five classifications F_0 , F_1 , F_2 , F_3 , F_4 , a pressure in the F_4 classification would be a fourth pressure. Pet. at 72 (citing Ex. 1002 ¶ 145). Petitioner contends that the classifications or ranges are “arranged in increasing order such that pressures in the F_4 range are greater than those in the F_3 range” and a pressure in the F_4 range is a fourth pressure greater than the third pressure. *Id.* (citing Ex. 1002 ¶ 145, Ex. 1009 ¶ 96).

Petitioner also argues that “JP725 discloses that, when the total pressure belongs to ranges F_1 – F_4 , the control circuit selects a drive mode for vibrating the touch panel according to the matrix of [JP725’s] Fig. 13.” *Id.* Petitioner contends that a fourth drive mode would be selected from the matrix for a pressure in the F_4 range (i.e., a fourth pressure). *Id.* (citing Ex.

1002 ¶ 146). This selection would result in a third tactile sensation based at least in part on the fourth pressure. *Id.* at 72–73 (citing Ex. 1002 ¶ 146).

At this stage of the proceeding, we agree with Petitioner’s analysis described above and adopt it as our own for purposes of this Decision. Patent Owner relies on the same arguments it advanced with respect to claim 1. Prelim. Resp. 20–23. These arguments are unpersuasive for the same reasons discussed with respect to claim 1 above. *See supra* Section III.C.2.B.

4. *Conclusion*

On the record before us, we are persuaded that JP725 discloses or suggests all the limitations of claims 1 and 2. As discussed above, Petitioner provides analysis purporting to show where each limitation recited in claims 1 and 2 is disclosed or suggested by JP725. Petitioner’s contentions are supported by Dr. Sarrafzadeh’s testimony. Moreover, at this point in the proceeding, we do not find Patent Owner’s arguments to the contrary persuasive for the reasons discussed above. Accordingly, we are persuaded that Petitioner has established a reasonable likelihood of prevailing in its challenge of claims 1 and 2 under 35 U.S.C. § 103(a) as unpatentable over JP725.

D. Remaining Asserted Grounds of Obviousness

Petitioner challenges claims 1 and 2 as obvious under 35 U.S.C. § 103(a) over Tang and claim 2 as obvious over Tang and Synaptics. Pet. 3, 36–62. Petitioner does not explain adequately why these asserted grounds of unpatentability are better than the asserted grounds based on Komata and JP725, stating only that these grounds are “based on a reference with a 102(a) date later than the 102(e) date of [Komata],” the primary reference

“uses the word ‘detect’ when referring to a pressure,” and the primary reference “explicitly refers to ‘pressure.’” *Id.* at 73–74. We do not find these reasons convincing. Thus, as we have decided to institute *inter partes* review of challenged claims 1 and 2 for the asserted grounds based on Komata and JP725, we exercise our discretion and decline to institute a review based on these other grounds of unpatentability. *See* 35 U.S.C. § 314(a); 37 C.F.R. § 42.108(a).

E. Conclusion

For the foregoing reasons, we determine that the information presented in the Petition establishes that there is a reasonable likelihood that Petitioner would prevail with respect to claims 1 and 2 of the ’260 patent.

Any discussion of facts in this Decision are made only for the purposes of institution and are not dispositive of any issue related to any ground on which we institute review. The Board has not made a final determination on the patentability of any challenged claim. The Board’s final determination will be based on the record as fully developed during trial.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that *inter partes* review is authorized on the following grounds of unpatentability asserted in the Petition:

Claims 1 and 2 under 35 U.S.C. § 103(a) as unpatentable over Komata; and

Claims 1 and 2 under 35 U.S.C. § 103(a) as unpatentable over JP725;

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(a), *inter partes* review of the '260 patent is hereby instituted commencing on the entry date of this Order, and pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial; and

FURTHER ORDERED that the trial is limited to the grounds identified above, and no other ground set forth in the Petition as to any challenged claim is authorized.

IPR2016-01884
Patent 7,336,260 B2

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