

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner

v.

IMMERSION CORPORATION,
Patent Owner

U.S. Patent No. 8,749,507
Filing Date: April 6, 2012
Issue Date: June 10, 2014

Title: Systems And Methods For Adaptive Interpretation Of
Input From A Touch-Sensitive Input Device

Inter Partes Review No.: (Unassigned)

**PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 8,749,507
UNDER 35 U.S.C. §§ 311-319 AND 37 C.F.R. §§ 42.1-100, ET SEQ.**

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EXHIBIT LIST

Exhibit No.	Description
1001	U.S. Patent No. 8,749,507 (the “ ’507 patent ”)
1002	File History of U.S. Patent No. 8,749,507
1003	U.S. Patent No. 5,673,066 to Toda (“ Toda ”)
1004	U.S. Pat. App. Pub. No. 2002/0033795 to Shahoian (“ Shahoian ”)
1005	U.S. Patent No. 6,072,474 to Morimura (“ Morimura ”)
1006	Patent Owner Immersion’s claim chart regarding alleged infringement of the ’507 patent by certain Apple iPhone products (Exhibit 20 to Immersion’s complaint in ITC Investigation. No. 337-TA-1004).
1007	Patent Owner Immersion’s preliminary proposed claim constructions in ITC Investigation No. 337-TA-1004.
1008	U.S. Patent No. 5,488,204 to Mead.
1009	Declaration of expert Dr. Andy Cockburn (“ Cockburn Decl. ”).

I. INTRODUCTION

The claims of Immersion’s U.S. Patent No. 8,749,507 (the “’507 patent”) challenged in this Petition are invalid over the prior art. During prosecution of the ’507 patent, Immersion overcame multiple rejections of the claims by adding limitations reciting various criteria used to detect the occurrence of a gesture on a pressure-sensitive device. This gesture detection algorithm, however, was known in the art, and is disclosed by the both the Toda and Morimura references discussed below. Additional limitations of the challenged claims are disclosed by Shahoian, a prior art Immersion patent publication that discusses at length providing haptic feedback in response to a gesture.

II. COMPLIANCE WITH FORMAL REQUIREMENTS

A. Mandatory Notices Under 37 C.F.R. §§ 42.8(b)(1)-(4)

1. Real Party-In-Interest

Apple Inc. is the real party-in-interest.

2. Related Matters

The ’507 patent is subject to the following actions: 1) Certain Mobile and Portable Electronic Devices Incorporating Haptics (Including Smartphones and Laptops) and Components Thereof, Inv. No. 337-TA-1004 and 2) *Immersion Corporation v. Apple Inc., et al.*, Case No. 1:16-cv-00325 (D. Del.).

3. Lead and Backup Counsel

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4. Service Information

Service information for lead and back-up counsel is provided in the designation of lead and back-up counsel above.

B. Proof of Service on the Patent Owner

As identified in the attached Certificate of Service, a copy of this Petition in its entirety is being served to the Patent Owner's attorney of record at the address listed in the USPTO's records by overnight courier pursuant to 37 C.F.R. § 42.6.

C. Power of Attorney

Powers of attorney are being filed with designation of counsel in accordance with 37 C.F.R. § 41.10(b).

D. Standing

In accordance with 37 C.F.R. §42.104(a), Petitioner certifies that the '507 patent is available for *inter partes* review and that Petitioner is not barred or estopped from requesting an *inter partes* review challenging the patent claims on the grounds identified in this Petition.

E. Fees

The undersigned authorizes the Director to charge the fee specified by 37 C.F.R. § 42.15(a) and any additional fees that might be due in connection with this Petition to Deposit Account No. 50-3266.

III. STATEMENT OF PRECISE RELIEF REQUESTED

In accordance with 35 U.S.C. § 311, Petitioner requests cancelation of claims 1-5, 9-12 and 14-17 of the '507 patent in view of the following grounds:

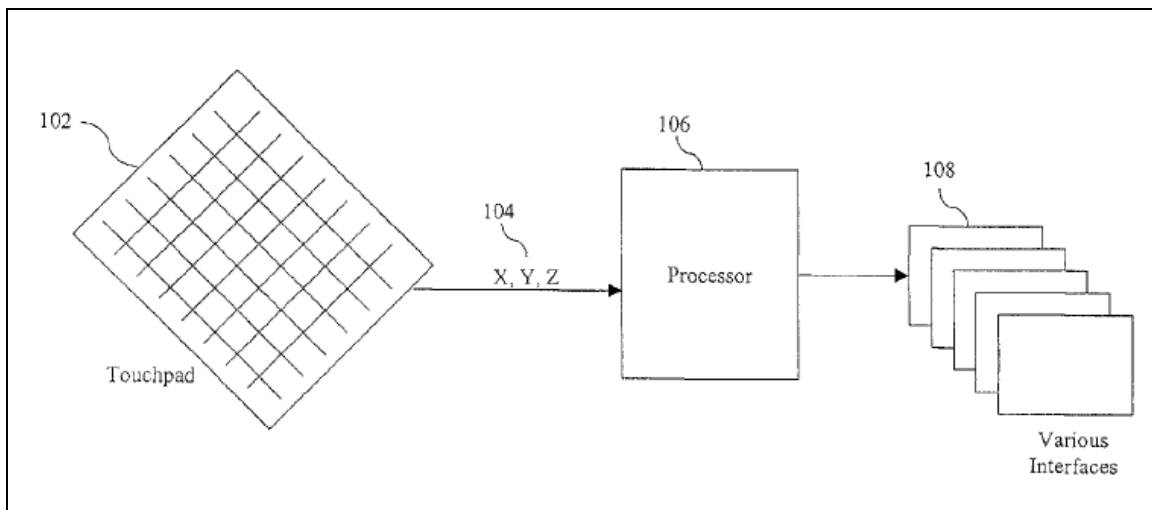
A. Claims 1-5, 9-12, and 14-17 are rendered obvious under 35 U.S.C. § 103(a) (pre-AIA) by U.S. Patent No. 5,673,066 (Ex. 1003, "**Toda**") in view of U.S. Pat. App. Pub. No. 2002/0033795, (Ex. 1004, "**Shahoian**") and the knowledge of one of ordinary skill in the art at the time of the alleged invention.

B. Claims 1, 9, and 14 are rendered obvious under 35 U.S.C. § 103(a) (pre-AIA) by U.S. Patent No. 6,072,474 (Ex. 1005, "**Morimura**") in view of Shahoian and the knowledge of one of ordinary skill in the art at the time of the alleged invention.

IV. FULL STATEMENT OF REASONS FOR REQUESTED RELIEF

A. Summary of the '507 Patent

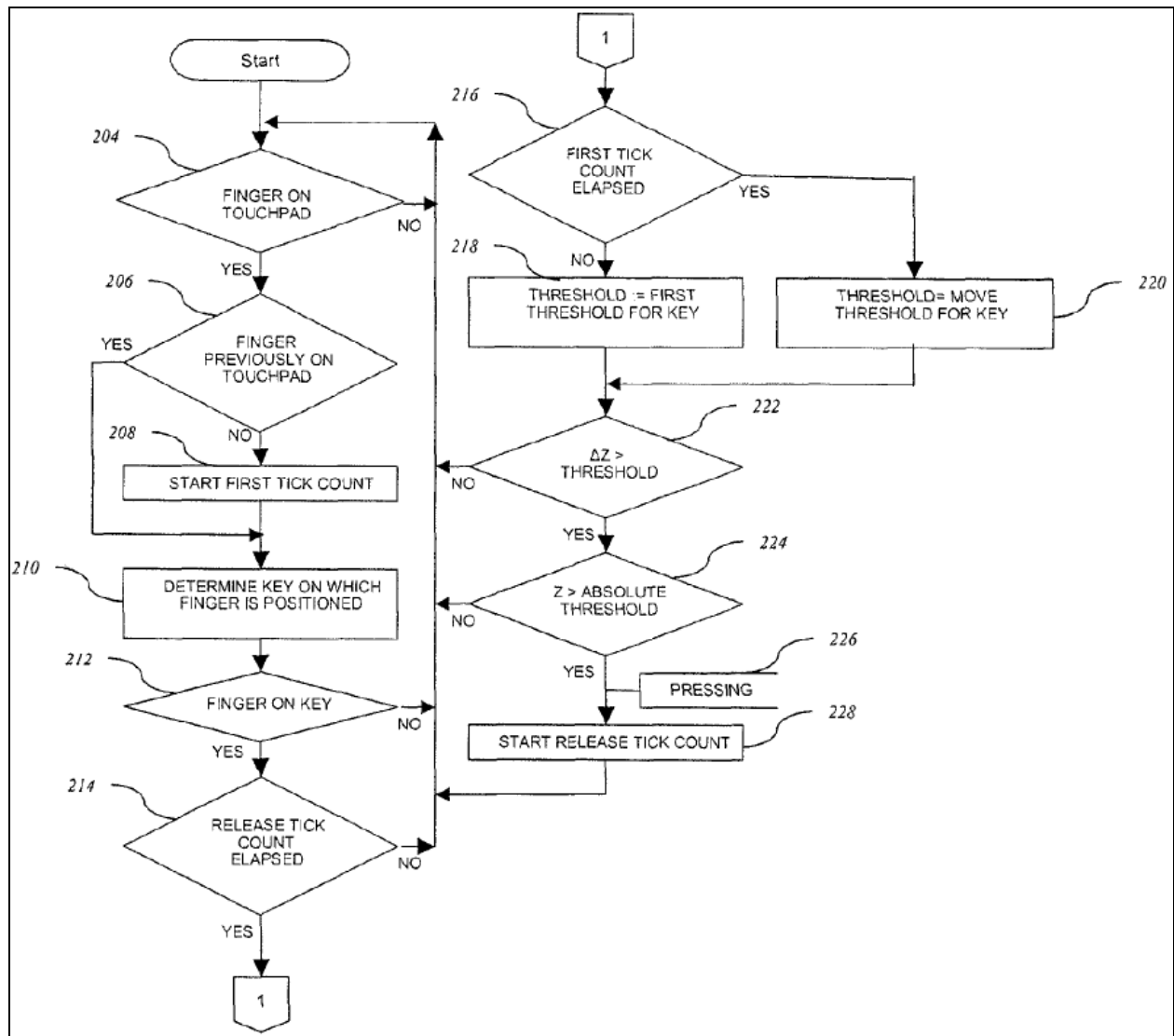
The '507 patent is directed to systems and methods for interpreting inputs received from a touch-sensitive input device. Ex. 1001 at 1:25-27. In the only illustrated embodiment of the system, the touch-sensitive input device is a touchpad 102. *Id.* at 2:39-41, Fig. 1 (shown below). The '507 patent states that other embodiments may use other touch-sensitive input devices, such as a touch panel or touch screen. *Id.* at 2:50-52. The illustrated embodiment may be implemented in personal computers, handheld organizers, cellular telephones, handheld communicators, MP3 players, GPS receivers, etc. *Id.* at 4:41-46.



According to the '507 patent, the touchpad 102 senses the position of a conductor (e.g., a finger) on the surface of the touchpad 102, and provides parameters for the determined position (X and Y) and pressure (Z) of the conductor to a processor 106. Ex. 1001 at 2:41-45; 3:51-52. In the illustrated embodiment,

because the touchpad 102 senses capacitance, it “does not sense an actual pressure.” *Id.* at 2:53. “Instead, the pressure reading from the touchpad 102 is a pseudo pressure” based on the amount of capacitance resulting from the conductor touching the touchpad 102. *Id.* at 2:54-60; 3:10-12. The touchpad 102 could be “implemented with any touch-sensitive input device, including resistive and membrane-switch touchpads,” which also determine pseudo pressure. *Id.* at 2:54-60. “In other embodiments, actual pressure may be sensed.” *Id.* at 2:60-61. “For example, in one embodiment, a touch screen with an attached explicit pressure sensor is utilized.” *Id.* at 2:61-63.

According to the '507 patent, the disclosed embodiments purportedly “address the difficulties faced in attempting to determine the intent of a user based on the X, Y, and Z parameters supplied by the touchpad 102.” Ex. 1001 at 4:56-58, 2:1-3. “Examples of determining a user’s intent include determining when a user is tapping or pressing on a specific portion of a touch-sensitive input device that corresponds to a control displayed on the input device or displayed on a separate, synchronized display.” *Id.* at 4:59-63. In an example process, illustrated below, the processor 106 uses the parameters received from the touchpad 102 to detect and interpret finger presses on a touchpad where a keypad is displayed on the touchpad or a corresponding display. *Id.* at 5:21-25, 5:58-63.



Id. at Fig. 2.

The processor 106 determines that a finger is on the touchpad 102 by evaluating the pseudo pressure (Z) parameter (e.g., when $Z > 0$). Ex. 1001 at 5:65-6:1. In the illustrated example, the input X and Y coordinates are used to determine whether the position of the user's finger is on a location corresponding to a key. *Id.* at 6:18-21. If so, the processor 106 compares the pseudo pressure (Z) against a threshold value, and compares the change in pseudo pressure (ΔZ) against

another threshold to make various decisions required to determine whether the user is pressing the key or not. *Id.* at 5:27-30, 6:37-47. Counters are used to determine the length of time the finger remains on a key. *Id.* at 6:9-15, 6:34-7:6.

The '507 patent also states that the disclosed embodiments may implement haptic effects. Ex. 1001 at 4:47-49. "In such an embodiment, the haptic effects result from various actions by a user interfacing with a touch-sensitive input device, and the effects may be based on the user's intent as determined by the processor 106. Haptic effects may also result from interaction with software executing on a device in communication with the touch-sensitive input device." *Id.* at 4:49-55. The '507 patent contains no other disclosure regarding how haptic effects are generated or used.

B. The '507 Patent Prosecution History

Immersion filed the application that became the '507 patent on April 6, 2012 (application serial no. 13/441,108 (the "'108 application")). Ex. 1002 at 414. The '108 application claimed priority to an earlier non-provisional application that allegedly has a filing date of November 26, 2003. *Id.* at 417. During the prosecution of the '108 application, the applicant amended the claims from their original form to overcome various rejections. *See, e.g.*, Ex. 1002 at 135-38, 102-106, 43-46.

C. Person of Ordinary Skill in the Art

A person of ordinary skill in the art (“POSITA”) at the time of the alleged invention of the ’507 patent (i.e., November 26, 2003) would have had a Bachelors’ degree in computer science, electrical engineering, or a comparable field of study, plus approximately two to three years of professional experience with software engineering, touch sensitive input devices, or other relevant industry experience. Additional graduate education could substitute for professional experience and significant experience in the field could substitute for formal education. Ex. 1009 (Declaration of Dr. Andy Cockburn) (“Cockburn Decl.”), ¶ 47.

D. Apple Products Accused of Infringing the ’507 Patent

In the ITC investigation referenced above in “Related Matters,” Patent Owner Immersion alleges that Petitioner Apple’s iPhone 6s and iPhone 6s Plus products infringe claims 1-5, 9-12, and 14-17 of the ’507 patent. To allegedly support these contentions, Patent Owner provided a public claim chart purporting to show how these Apple products allegedly practice claims 1, 9, and 14 of the ’507 patent. Ex. 1006.

E. Claim Construction

In accordance with 37 C.F.R. § 42.104(b)(3), Petitioner provides the following statement regarding construction of the ’507 patent claims. A claim subject to *inter partes* review receives the “broadest reasonable interpretation”

(“BRI”) in light of the specification. 37 C.F.R. § 42.100(b). Because the BRI standard is different from that used in district court litigation, *PPC Broadband, Inc., v. Corning Optical Comms. RF, LLC*, 815 F.3d 747, 756 (Fed. Cir. 2016), the interpretation of the claims presented either implicitly or explicitly herein should not be viewed as constituting Petitioner’s own interpretation and/or construction of such claims for the purposes of the underlying litigation. Instead, such constructions in this proceeding should be viewed only as constituting an interpretation of the claims under the “broadest reasonable construction” standard.

In the ITC investigation referenced above, Patent Owner Immersion has proposed constructions of certain claim terms in the ’507 patent. For purposes of this proceeding, Petitioner respectfully requests that the Patent Owner be held to constructions of the ’507 patent claim terms at least as broad as Patent Owner’s proposed constructions. Patent Owner’s constructions are set forth in Exhibit 1007.

In the ITC investigation referenced above, Patent Owner Immersion also has submitted to the ITC a claim chart showing how it believes that the ’507 patent’s independent claims allegedly encompass certain aspects of Patent Owner Apple’s products, as described above. Ex. 1006. For the purposes of this proceeding, Petitioner respectfully requests that the Patent Owner be held to constructions of the ’507 patent claim terms at least as broad as those set forth by the Patent Owner

in this claim chart.

In particular, based on Patent Owner Immersion’s public infringement contentions and public proposed constructions, Immersion should be held to a construction of “**pressure**” that encompasses both pressure and force. Ex. 1007 at 2 (Immersion contending that “pressure” in the ’507 patent should be construed as “application of force from a contact”); Ex. 1006 at 39-40, 57-58, 66-67 (Immersion contending that “force” satisfies the limitations reciting “determining a pressure,” “the pressure is greater than a pressure threshold,” and “the change in pressure is greater than a change in pressure threshold”).

In addition, based on Immersion’s public proposed construction of “**determining a press if ... the change in pressure is greater than a change in pressure threshold**” in claims 1, 9, and 14, Immersion should be held to a construction of this limitation that encompasses “determine a press if ... the change in pressure is greater than a static or adaptive threshold for the change in pressure.” Ex. 1007 at 3 (Immersion contending that this limitation should be construed as set forth above).

Next, with regard to the claim term “**gesture**” (claims 1, 9, and 14), the ’507 patent states that a user of the claimed system may be interacting with the system using “a pointing device,” such as “a stylus.” Ex. 1001 at 3:48-50, 5:54-57. Accordingly, the broadest reasonable interpretation of “gesture” should include

interactions with the input device made using a pointing device or stylus.

Cockburn Decl., ¶ 52.

Third, with regard to the claim term “**pseudo pressure**” in claims 2, 10, and 15, the ’507 patent states that “the pseudo pressure is based on the amount of capacitance resulting from the conductor touching the touchpad 102” and that “the amount of capacitance is not a direct measure of pressure but rather a pseudo pressure.” Ex. 1001 at 3:10-14. Accordingly, “pseudo-pressure” should be construed to include any measure of pressure based on capacitance. Cockburn Decl., ¶ 52. In addition, Patent Owner Immersion has proposed in the ITC investigation that “pseudo-pressure” be construed as “a measure of the area of the screen contacted by the object.” Ex. 1007 at 2. Thus, Patent Owner Immersion should be held to a construction of “pseudo-pressure” that also includes a measure of such area.

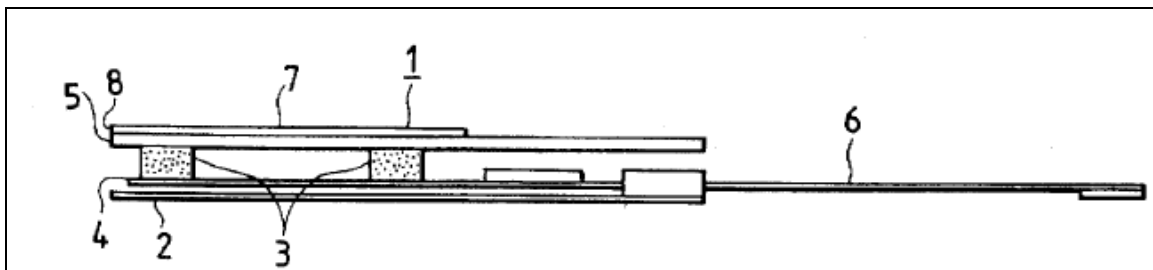
Finally, with regard to the claim term “**softkey**” (claim 5), the ’507 patent describes a keypad displayed on a corresponding display. Ex. 1001 at 5:23-25. Accordingly, the broadest reasonable interpretation of “softkey” should include programmatically generated graphical buttons. Cockburn Decl., ¶ 52.

F. Ground 1: Claims 1-5, 9-12 And 14-17 Are Obvious Under 35 U.S.C. § 103(a) (pre-AIA) In Light Of Toda In View Of Shahoian.

1. Toda is § 102(a) and (b) Prior Art

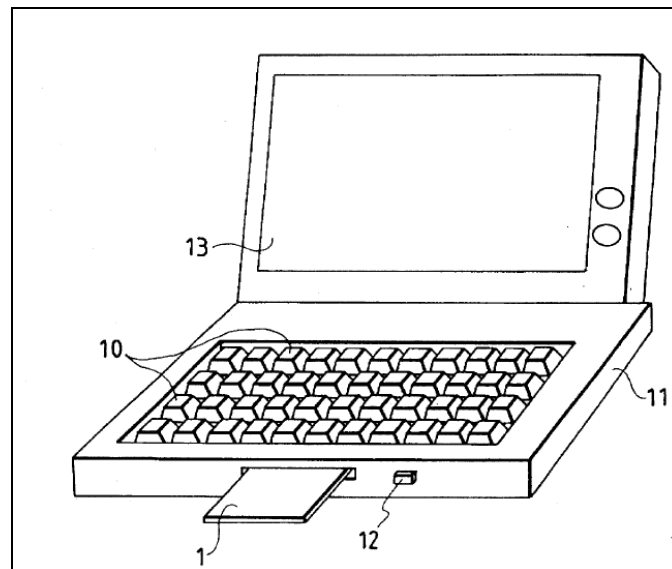
U.S. Patent No. 5,673,066 (“Toda”) is a printed publication within the meaning of 35 U.S.C. §§ 102(a) and (b) (pre-AIA) because it issued on September 30, 1997, more than one year before the priority date of the ’507 patent (Nov. 26, 2003). Ex. 1003 at cover page.

Toda relates to a touch sensitive pointing device 1, also referred to as a cursor control device or input device, for controlling the movement of a cursor on a display screen when, for example, an “operator touches his finger against the operation surface [of the device] and moves in a predetermined direction.” Ex. 1003 at 6:16-24; *see also id.* at 2:27-45. The device 1 comprises pressure sensitive sensors 3 between a printed circuit board 4 and an operation plate 5. *Id.* at 5:50-55. The operation plate 5 has a surface 7 “where an operator can touch with and drag on it with a control member such as a finger.” *Id.* at 5:57-59, Fig. 1 (shown below).



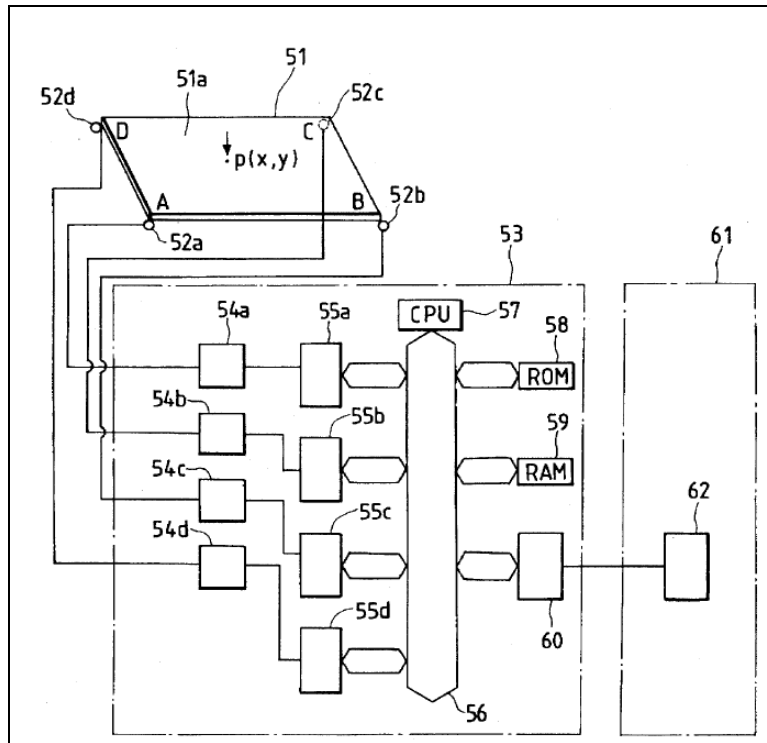
In one embodiment, the device 1 is inserted into a keyboard case 11 of a

computer. Ex. 1003 at 6:1-3, Fig. 3 (shown below).



According to Toda, when an operator touches his finger against the surface 7 of the plate 5 and moves it along the surface 7, “each of the pressure sensitive sensors 3 transmits a signal corresponding to the finger pressure through the operation plate 5 to the computer.” *Id.* at 6:16-23. “Hence the position of the cursor displayed on a display screen can be controlled.” *Id.* at 6:23-25.

Additional details of the Toda structure and circuitry of the input device (labeled 51 below) are shown in Figure 8, shown below.



Toda discloses that piezoelectric elements 52a, 52b, 52c, 52d are arranged at four corners (A, B, C, and D) of the operation surface 51a of the rigid plate 51. Ex. 1003 at 7:37-40. The piezoelectric elements 52a, 52b, 52c, and 52d convert the pressure applied thereto into respective voltages, which are digitized by analog-to-digital (a/d) convertors 54a, 54b, 54c, and 54d in a processing circuit 53. *Id.* at 7:37-43, 7:51-55.

The outputs of the a/d converters 54a, 54b, 54c, and 54d are connected to a CPU 57 via input ports 55a, 55b, 55c, and 55d, and a bus 56. Ex. 1003 at 7:43-47. A read-only memory (ROM) 58, random access memory (RAM) 59, and an output port 60 of the processing 53 are also connected to the bus 56. *Id.* at 7:45-49. The output port 60 is connected to an input port 62 of a personal computer 61. *Id.* at

7:49-50.

Toda teaches a processor (e.g., CPU 57) and corresponding memory (e.g., ROM 58, RAM 59) for implementing, among other things, the cursor control functionality. Ex. 1003 at 7:35-8:22, Fig. 8. The processor is able to determine X and Y coordinates, movement, and movement rate of the user's touch based on the outputs of the four pressure sensitive sensors. *Id.* at 6:25-7:2; *see also id.* at 7:60-8:22. Toda discloses determining a switch input and/or a dragging mode of the cursor based on the outputs a, b, c, and d from the respective pressure sensitive sensors 3, and the determined position (x, y), pressure P, movement S, and moving rate V of the detected contact. Ex. 1003 at 7:66-8:29, 8:59-9:3; *see also id.* at 6:28-7:24, 12:21-28, Figs. 11, 17.

2. Shahoian is § 102(a) and (b) Prior Art

U.S. Pat. App. Pub. No. 2002/0033795 ("Shahoian") also qualifies as prior art under 35 U.S.C. § 102(a) and (b) (pre-AIA) because it was published on March 21, 2002, more than one year before the priority date of the '507 patent (Nov. 26, 2003). Ex. 1004 at cover page.

Shahoian relates to touch sensitive input devices that "output haptic feedback such as tactile sensations to the user who is physically contacting [a] touchpad." Ex. 1004, ¶ 43. Shahoian teaches outputting a haptic effect in response

to the detection of gesture, such as a dragging mode, for a touch sensitive device.

Ex. 1004, ¶ 189. Specifically, Shahoian teaches that:

Other embodiments of touchpads and touchscreens allow the user to enter “gestures” or shortcuts by tracing a symbol on the cursor control region or other region, which is recognized as a command or data by a processor. Haptic sensations can be associated with or dependent on particular gestures. For example, a confirmation of modes can be conveyed haptically with a particular haptic sensation when a mode confirmation gesture is recognized. Characters recognized from gestures also may each have a particular haptic sensation associated with them. In most touchpad embodiments, a user can select a graphical object or menu item by “tapping” the touchpad. Some touchpads may recognize a “tap-and-a-half” or double tap, which is the user doing a tap and then again touching the pad and maintaining the finger or object on the pad while moving the finger. For example, such a gesture can provide a “drag” mode in which objects may be moved with the cursor. When the user is in such a drag mode, a vibration or other haptic sensation can be output to indicate to the user that this mode is active.

Ex. 1004, ¶ 189.

3. Detailed Analysis

Claim 1:

[1.0] A method comprising:

Toda combined with Shahoian discloses and renders obvious a method comprising the claimed steps, as established below.

[1.1] receiving contact data from an input device;

Toda discloses this limitation because it teaches, for example, that “when an operator touches his finger against the operation surface of the operation plate 5 and moves in a predetermined direction by a predetermined movement, each of the pressure sensitive sensors 3 transmits a signal corresponding to the finger pressure through the operation plate 5 to the computer.” Ex. 1003 at 6:16-23. According to Toda, the outputs a, b, c, and d from the respective pressure sensitive sensors 3 are used to determine “the coordinate position (x, y) of a finger on the operation surface 7.” *Id.* at 6:28-39; *see also id.* at 7:60-8:22. In addition, Toda discloses a formula for determining the touch pressure P using these outputs a, b, c, and d. *Id.* at 6:43-47; *see also id.* at 7:60-8:22.

Regarding the details illustrated in Figure 8, Toda discloses “[i]f the point P (x, y) on the operation surface 51a is depressed with a touch pressure F, while the partial pressures at various points are fa, fb, fc, and fd the touch pressure F is ... $F = fa + fb + fc + fd$.” Ex. 1003 at 7:66-8:3 (equation 1). This information can be used to determine the x and y coordinates of the point. *Id.* at 8:5-22.

The same data is used to determine the “movement S of a finger on the pressure surface 7 ... as a perpendicular coordinate component corresponding to a moving direction.” *Id.* at 6:39-41. “Furthermore, the moving rate V of a finger can be detected by the detected results.” *Id.* at 6:42-43.

[1.2] determining an interaction with a displayed object on a screen based on the contact data;

Toda discloses this limitation because it teaches controlling the movement of a cursor on the computer’s display screen when the “operator touches his finger against the operation surface [of the device].” Ex. 1003 at 6:16-18; *see also id.* at 2:27-45 (controlling the position of a cursor on a display by moving a finger on the operation surface), Abstract (same). Specifically, Toda discloses that “when an operator touches his finger against the operation surface of the operation plate 5 ... each of the pressure sensitive sensors 3 transmits a signal corresponding to the finger pressure through the operation plate 5 to the computer Hence the position of the cursor displayed on a display screen can be controlled.” Ex. 1003 at 6:16-24; *see also id.* at 2:29-31 (“a signal corresponding to the direction and movement thereof are issued to a computer body to control the position of a cursor on a display”); 3:11-14 (“[a]n operator’s natural motion depends on qualified values, thus controlling the position of the cursor easily in comparison with the conventional device”).

The outputs a, b, c, and d from the respective pressure sensitive sensors 3 are used to determine the coordinate position (x, y), pressure P, movement S and moving rate V of the detected contact on the operation plate 5, which are used in, among other things, a “cursor position control method.” *Id.* at 6:25-47; *see also id.* at 7:60-8:22 (determining touch pressure and x, y coordinates). Toda discloses that “[w]hen the movement S, moving rate V, and touch pressure P of a finger on the operation surface 7 are detected ... the movement D of a cursor is obtained” by a formula using this information and “sent to the display 13 to move the cursor.” Ex. 1003 at 6:49-7:2. Accordingly, Toda discloses “determining an interaction with a displayed object on a screen based on the contact data.”

Petitioner notes that the claims do not require a user to press on the “displayed object” itself to interact with that object. In a preferred embodiment of the ’507 patent, “a keypad is displayed on the touchpad (102) *or on a corresponding display.*” Ex. 1001 at 5:21-25 (emphasis added). Thus, the “displayed object on a screen” of this limitation may be on a screen that is separate from the recited “input device.” Cockburn Decl., ¶ 70. Accordingly, Toda discloses this limitation for the reasons cited above.

Obviousness: In addition, it would have been obvious to a POSITA to practice this limitation. For example, interacting with a displayed object was well known at the time of the ’507 patent’s alleged invention. Cockburn Decl., ¶ 71.

As disclosed in Shahoian, it was well known that a “user can select graphically-displayed buttons or other graphical objects by pressing a finger or a stylus to the screen ... at the exact location where the graphical object is displayed.” Ex. 1004 at ¶ 56; Cockburn Decl., ¶ 71. Such objects may include “text, images, animations, etc.” and the touch may be detected using appropriate sensors, such as those that “detect pressure.” Ex. 1004 at ¶ 55. Accordingly, it would have been obvious to a POSITA at the time of the alleged invention of the ’507 patent to, for example, modify the system of Toda so that the touch-sensitive input device was a touchscreen rather than a touchpad. Cockburn Decl., ¶ 71. In such a system, the system would determine the user’s interaction with a displayed object on the touchscreen based on contact data (e.g., sensor data) from the touchscreen, as described above in the disclosure of Shahoian and as was well known. *Id.*

Motivation to do so arises at least from a desire to minimize the size of the device by combining the touch-sensitive input with the display screen, as described above in the disclosure of Shahoian and as was well known. *Id.*

[1.3] responsive to determining the interaction, determining a gesture based on the contact data comprising:

Toda discloses this limitation at least because it teaches that in response to the operator touching the operating surface to control the displayed cursor, which Toda detects using pressure sensitive sensors 3, the Toda system determines a dragging gesture based on the outputs a, b, c, and d from the respective pressure

sensitive sensors 3 and the determined position (x, y), pressure P, movement S, and moving rate V of the detected contact. Ex. 1003 at 1:8-15 (controlling a cursor by dragging a finger), 3:38-41 (detecting the dragging gesture), 5:57-59 (the dragging gesture), 12:16-28 (detecting a dragging gesture and entering dragging mode), 12:49-65 (detecting a dragging gesture and entering dragging mode), Fig. 19B at step 152 (“Enter Drag Mode”); *see also id.* at 6:28-7:24 (determining a pressure, position, movement, and a moving rate), Fig. 19 (detection algorithm, discussed further below). Moreover, “when an operator carries out a moving operation during a switching input, it is possible to shift to a switch input continuing mode (dragging mode).” *Id.* at 12:21-25.

Obviousness: In addition, it would have been obvious to a POSITA at the time of the alleged invention of the ’507 patent application to practice this limitation, especially in light of the teachings of Toda. For example, it would have been obvious to a POSITA to use gesture detection algorithms, such as those disclosed by Toda in Figure 19, to determine the type of gesture the user is performing on the operating surface. Cockburn Decl., ¶ 73. Motivation to do so arises from a desire to determine the intent of the user based on the user’s touch of the operating surface, which motivation arises at least from the disclosure of Toda. *Id.*; Ex. 1003 at 5:57-59 (a user may perform a dragging gesture), 12:16-18 (“the present invention can judge accurately an operator’s intention”), 2:7-19 (the Toda

invention overcomes problems of poor operability). It also would have been obvious to use the contact data to do so, because Toda teaches that from the pressure sensor information, one can determine information about the user's touch, such as location, movement, and movement rate, as established above. Cockburn Decl., ¶ 73; *see also* Ex. 1003 at 6:28-7:24 (determining a pressure, position, movement, and a moving rate), 7:60-8:22 (determining touch pressure and x, y coordinates), Fig. 19 (detecting a dragging gesture based on pressure, change in pressure, movement, etc.). Motivation to use the contact data in such a manner arises at least from Toda itself, as described above. Cockburn Decl., ¶ 73. It also would have been obvious to a POSITA to determine a gesture in response to determining the interaction with a displayed object in order to, for example, determine what type of gesture the user is performing to interact with the displayed object. *Id.* Motivation to do so arises at least from Toda, which discloses detecting touches for a “switching input” and dragging gestures, as discussed above. *Id.*; Ex. 1003 at 5:57-59 (a user may perform a dragging gesture), Fig. 19 (detecting a dragging gesture), 11:7-9 (the user presses to perform a “switching input”), Figs. 17, 19 (detecting a pressure to perform a “switching input”). Performing this limitation in the manner described above would have been well within the skill of a POSITA, could have been accomplished with minimal effort, and would have led to predictable results. Cockburn Decl., ¶ 73.

[1.4] determining a pressure and a change in pressure based on the contact data, and

Toda discloses this limitation because it teaches determining the pressure P using the outputs a, b, c, and d from the respective pressure sensitive sensors 3 as follows:

$$p=K(a+b+c+d)$$

Ex. 1003 at 6:43-48 (where K is a proportional constant). Similarly, regarding the details illustrated in Figure 8, Toda discloses “[i]f the point P (x, y) on the operation surface 51a is depressed with a touch pressure F, while the partial pressures at various points are fa, fb, fc, and fd the touch pressure F is ... $F = fa + fb + fc + fd$.” Ex. 1003 at 7:66-8:3 (equation 1).

Moreover, Toda teaches the use of “a variation δF of touch pressure” in determining if there was a switch input or not. Ex. 1003 at 8:23-29; *see also id.* at 11:30-52; Fig. 17, step 121 (determining whether the variation δF is greater than zero). The variation δF of touch pressure is also used in determining the dragging mode. *Id.* at 12:49-13:5; Fig. 19A, step 121 (determining whether the variation δF is greater than zero). Because the touch pressure F is determined based on the pressure sensor outputs a, b, c, and d (contact data), the variation δF of touch pressure is also based on such contact data. Cockburn Decl., ¶ 75.

Toda also discloses that the pressure sensors may be “[p]iezoelectric elements 52a, 52b, 52c, and 52d for converting a pressure into a voltage.” Ex.

1003 at 7:37-40. When using such piezoelectric elements, the voltage output of the piezoelectric elements also would be a contact data from which the disclosed pressure and change in pressure necessarily would be determined. Cockburn Decl., ¶ 76.

Obviousness: In addition, it would have been obvious to a POSITA at the time of the alleged invention of the '507 patent application to practice this limitation, especially in light of the teachings of Toda, which disclose determining a “pressure” and a “variation ... of touch pressure.” Cockburn Decl., ¶ 77.

Motivation to do so arises from the teachings of Toda referenced above, and doing so in light of these teachings would have been within the skill of a POSITA and led to predictable results. *Id.*

[1.5] determining a press if:

Toda discloses this limitation at least because it teaches determining if there is a “switching input” press as part of the process for determining whether to activate the dragging mode (i.e., determining whether there is a dragging gesture). Ex. 1003 at 2:20-26 (reliably detecting a “switching input” operation), 8:32-50 (the user presses to perform a “switching input”), Fig. 9(a) (a pressure versus time plot of the press), 11:7-9 (the user presses strongly to perform a “switching input”), Fig. 15(a) (a pressure versus time plot of the press), 11:30-12:15 (detecting a press that performs a “switching input”), Fig. 17, step 129 (“Switch Inputting On”), Figs. 18-

19 (including a “switching input” detection algorithm), Fig. 19B, step 129 (“Switch Inputting On”). Determining the “switch inputting on” condition corresponds to a determination that the user has purposefully pressed on Toda’s touch sensitive input device to perform a “switching input” operation (i.e., a selection). *Id.* at 8:32-50 (the user presses to perform a “switching input”), Fig. 9(a) (a pressure versus time plot of the press), 11:7-9 (the user presses strongly to perform a “switching input”), Fig. 15(a) (a pressure versus time plot of the press), Figs. 11, 17, 18-19 (detecting a “switching input” press based on certain criteria); Cockburn Decl., ¶ 78.

[1.6] the pressure is greater than a pressure threshold,

Toda discloses this limitation because it teaches comparing the touch pressure F to threshold values such as 15 g and 150 g during the processes illustrated in Figures 11, 17, and 18-19. Ex. 1003 at 9:9-36, Fig. 11 (steps 101, 104, and 106), 11:35-39, 11:61-67, Fig. 17 (steps 122 and 127), Fig. 18A (steps 101, 104, and 106), Fig. 19A (steps 122 and 127).

[1.7] the change in pressure is greater than a change in pressure threshold, and

Toda discloses this limitation because it discloses determining whether the variation δF of touch pressure is greater than zero during the processes illustrated in Figures 17 and 19. Ex. 1003 at 11:30-35, 11:39-42, Fig. 17 at step 121 (“ $\delta F > 0$ ”), Fig. 19A at step 121 (“ $\delta F > 0$ ”). If the result of this comparison is yes, then

the value of δF must be, for example, 10g, 20g, 30g, etc., and the magnitude of the change in pressure (*i.e.*, 10, 20, 30) therefore is greater than the threshold of 0. If the result of this determination is yes, the algorithms of Figures 17 and 19A continue toward determining a switch input (determining a press). *Id.* at Fig. 17 (step 121), Fig. 19A (step 121).

Toda also discloses this limitation because it teaches determining whether the variation δF of touch pressure is greater than 10g. *Id.* at 11:42-45, 11:47-52, Fig. 17 (step 123), Fig. 19A (step 123). If the result of this comparison is yes, then the value of δF must be, for example, 20g, 30g, 40g, etc., and the magnitude of the change in pressure (*i.e.*, 20, 30, 40) is greater than the threshold of 10. If the result of this determination is yes, the algorithms of Figures 17 and 19A continue toward determining a switch input (determining a press). *Id.* at Fig. 17 (step 123), Fig. 19A (step 123). Moreover, Toda discloses determining whether the variation δF has exceeded 10g not just once, but three times sequentially. *Id.* at 11:42-45, 11:47-52.

[1.8] a first interval has elapsed; and

Toda discloses this limitation because it teaches determining whether the variation of touch pressure δF has or has not “sequentially exceeded 10 g three times by comparing data on the touch pressure F sampled currently with the two previous sampling times (step 123).” Ex. 1003 at 11:42-45, Fig. 17 (step 123),

Fig. 19A (step 123). The three sampling times taught by Toda correspond to a first interval that must elapse in order to make the determination of step 123. Cockburn Decl., ¶ 82.

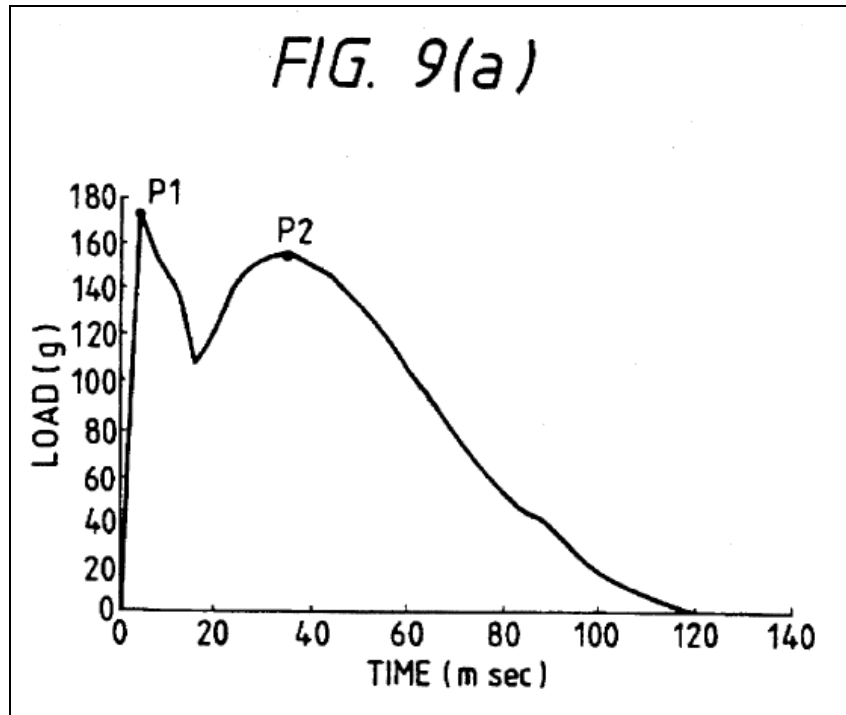
Moreover, Toda also teaches detecting whether peak point of the pressure P1 occurs within a time interval of, for example, 30 ms. Ex. 1003 at 9:13-18, Fig. 11 (step 103), Fig. 18A (step 103). If the time interval of 30 ms has elapsed, the process follows the “no” branch of Fig. 11, step 103, towards routine “3” (i.e., Fig. 17), where “Switch Inputting On” is eventually determined and, likewise, follows the “no” branch of Fig. 18A, step 103, towards routine “3” (i.e., Figs. 19A-B), where “Switch Inputting On” also is eventually determined. *Id.* at Figs. 11, 17, 18A, 19A-B. Thus, Toda teaches determining the “Switch Inputting On” operation based in part on a time interval of 30 ms having passed. Such time interval taught by Toda also corresponds to a first interval. Cockburn Decl., ¶ 83.

Obviousness: In addition, it would have been obvious to a POSITA at the time of the alleged invention of the ’507 patent application to practice this limitation, especially in light of the teachings of Toda. Motivation to do so arises from Toda, which teaches determining whether the variation of touch pressure δF has exceeded 10 g three times sequentially, as established above. Cockburn Decl., ¶ 84. To do so, it would have been obvious to a POSITA to wait until the passage of a time interval necessary to have enough sequential data to do so. *Id.* A

POSITA would have recognized that obtaining such sequential readings from the pressure sensors necessarily requires the passage of a time interval because the pressure sensors would provide such data at certain intervals. *Id.*

Additional motivation to do so arises from the fact that not waiting a sufficient time interval for purposes of making such measurements will result in the variation δF never exceeding 10 g three times sequentially because not enough time has passed in order to allow the user to apply such an increasing amount of pressure. Cockburn Decl., ¶ 85.

Further motivation to do so arises from Toda's teaching that a finger touching the operation surface 51a to perform a switching input may result in a pressure that changes with particular characteristics over the course of, for example, approximately 120 milliseconds. Ex. 1003 at 8:41-50 (the user touches to perform a "switching input"), Fig. 9a (showing the touch's pressure over time, shown below); *see also id.* at 11:7-15 (the user touches strongly to perform a "switching input"), Fig. 15(a) (showing the touch's pressure over time of approximately 600 milliseconds); Cockburn Decl., ¶ 86.



A POSITA would have recognized that one characteristic of such a finger touch is the passage of some interval of time to allow for a rise and fall in pressure, and that determining that such a time interval has passed would therefore be one factor to consider in determining whether the user intends to perform a switching input. Cockburn Decl., ¶ 86. A POSITA would have recognized that such an increase and decrease in pressure that occurs before a minimum time interval has passed may indicate a false positive or other exceptional condition that should not result in the “Switch Inputting On” state. *Id.*

Conditioning the detection of such a press on the passage of a time interval in any of these manners would have been well within the skill of a POSITA, could have been accomplished with minimal effort, and would have led to predictable

results. Cockburn Decl., ¶ 87. For example, Toda already considers various passages of time (e.g., 30 milliseconds, 60 milliseconds) in its detection algorithms. *Id.*; Ex. 1003 at Fig. 11 (steps 103, 108), Fig. 18A (step 103, 108).

[1.9] responsive to determining the gesture, outputting a haptic effect.¹

Toda combined with Shahoian discloses and renders obvious this limitation.

Toda: As established above, Toda teaches detecting a dragging gesture for the displayed cursor based on the outputs a, b, c, and d from the pressure sensitive sensors 3 and the determined position (x, y), pressure P, movement S, and moving rate V of the detected contact. Ex. 1003 at 8:23-29, 8:59-9:3; *see also id.* at 6:28-7:24, 12:21-28, Figs. 11, 17, 18-19. Moreover, “when an operator carries out a moving operation during a switching input, it is possible to shift to a switch input continuing mode (dragging mode).” *Id.* at 12:21-25; *see also* the discussion above for limitation [1.3].

Toda does not explicitly disclose the obvious limitation of outputting a haptic effect in response to determining the dragging gesture / dragging mode.

Shahoian: Shahoian teaches outputting a haptic effect in response to the detection of gesture, such as a dragging gesture, for a touch-sensitive device. Ex. 1004 at ¶ 189. Specifically, Shahoian teaches that:

¹ Immersion changed “outputting the” to “outputting a” in this claim language via certificate of correction.

Other embodiments of touchpads and touchscreens allow the user to enter “gestures” or shortcuts by tracing a symbol on the cursor control region or other region, which is recognized as a command or data by a processor. Haptic sensations can be associated with or dependent on particular gestures. For example, a confirmation of modes can be conveyed haptically with a particular haptic sensation when a mode confirmation gesture is recognized. Characters recognized from gestures also may each have a particular haptic sensation associated with them. In most touchpad embodiments, a user can select a graphical object or menu item by “tapping” the touchpad. Some touchpads may recognize a “tap-and-a-half” or double tap, which is the user doing a tap and then again touching the pad and *maintaining the finger or object on the pad while moving the finger*. For example, *such a gesture can provide a “drag” mode in which objects may be moved with the cursor. When the user is in such a drag mode, a vibration or other haptic sensation can be output to indicate to the user that this mode is active.*

Id. at ¶ 189 (emphasis added); *see also id.* at ¶ 57 (providing haptic feedback to the user’s finger via a touchpad), ¶ 87 (an actuator to provide haptic sensations in touchpads), ¶ 97 (providing haptic feedback by moving the touchpad in the Z-axis), ¶ 99 (providing haptic sensations to the entire touchpad or only a particular

portion of the touchpad), ¶¶ 141-142 (providing haptic feedback by moving the touchpad in the x- and/or y-direction), ¶¶151-155 (same). Thus, Shahoian discloses outputting a haptic effect in response to determining a gesture on a touch-sensitive device, including doing so in response to a dragging gesture.

Obviousness: It would have been obvious for a POSTIA at the time of the alleged invention of the '507 patent to combine these teachings of Shahoian with Toda. Cockburn Decl., ¶ 92. Specifically, a POSTIA at the time of the alleged invention of the '507 patent, upon reading Toda and its disclosure of determining a dragging gesture and dragging mode on a touch sensitive device, would find it obvious to combine with Toda the teachings of Shahoian, which describes outputting a haptic effect in response to the detection of gestures, including a dragging gesture, on a touch sensitive device. Ex. 1003 (Toda) at, *e.g.*, 1:8-15 (controlling a cursor by dragging a finger), 3:38-41 (detecting the dragging gesture), 5:57-59 (the dragging gesture), 12:16-28 (detecting a dragging gesture and entering dragging mode), 12:49-65 (detecting a dragging gesture and entering dragging mode), Fig. 19B at step 152 (“Enter Drag Mode”); Ex. 1004 (Shahoian), ¶ 189; Cockburn Decl., ¶ 92.

Shahoian provides the rationale for doing so. Specifically, according to Shahoian:

One problem with existing touchpads is that there is no

haptic feedback provided to the user. The user of a touchpad is therefore not able to experience haptic sensations that assist and inform the user of targeting and other control tasks within the graphical environment. The touchpads of the prior art also cannot take advantage of existing haptic-enabled software run on the portable computer.

Ex. 1004, ¶ 6 (emphasis added); *see also id.* at ¶ 7 (“The haptic sensations output on the touch control enhance interactions and manipulations”). As such, Shahoian provides the motivation that would have led a POSITA to modify Toda’s device to output a haptic effect in response to the detection of a gesture, such as a dragging gesture, to overcome a known potential problem with such a device (lack of haptic feedback). Cockburn Decl., ¶ 93.

Another rationale for the combination of Toda and Shahoian is applying a known technique (i.e., Shahoian’s providing haptic output in response to a user gesture on a touch-sensitive device) to a known device (i.e., the one disclosed by Toda) that was ready for improvement (as taught by Shahoian) to yield predictable results (i.e., outputting a haptic effect in response to the detection of gesture, such as a dragging gesture, for a touch sensitive device). Cockburn Decl., ¶ 94.

Additional rationale for doing so also includes combining prior art elements (e.g., the haptic effect of Shahoian to the device of Toda) according to known methods to yield predictable results and the use of known techniques (providing a haptic

effect) to improve a similar device (a touch-sensitive input device) in the same way. *Id.*

Additional motivation for such a combination comes from the fact that Shahoian describes adding haptic feedback not only to gestures generally, but to a “drag” mode in particular. Ex. 1004, ¶189 (“[w]hen the user is in such a drag mode, a vibration or other haptic sensation can be output”); Cockburn Decl., ¶ 95. This is the same mode that corresponds to the dragging gesture of Toda, as discussed above and for limitation [1.3], which would further encourage a POSITA to combine the references in this manner. Cockburn Decl., ¶ 95.

Furthermore, the ’507 patent specification’s description of providing a haptic effect in response to detection of a gesture confirms that doing so at the time of the ’507 patent’s alleged invention required no special insight or inventiveness. The ’507 patent specification (excluding the Abstract and claims) discusses providing a haptic effect in only 9 lines of its approximately 630 total lines. Ex. 1001 at 4:47-55. The ’507 patent’s exceedingly brief discussion of providing haptic effects does little more than acknowledge that they can be provided in response to user actions. *Id.* It does not recite any challenge in doing so, any failure of the prior art to do so, or any other reason why it would not be obvious to a POSITA to do so. *Id.* In short, the ’507 patent specification treats the providing of a haptic effect as an obvious afterthought. Cockburn Decl., ¶ 96. The ’507

patent itself therefore further confirms that it would have been obvious to provide a haptic effect in response to the gesture detection. *Id.*

Finally, combining Shahoian with Toda in this manner would have been obvious to try because it amounts to merely choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success.

Cockburn Decl., ¶ 97. This combination would have been well within the skill of a POSITA, could have been accomplished with minimal effort, and would have led to predictable results. *Id.*

Claim 2: The method of claim 1, wherein the contact data comprises an actual pressure and a pseudo pressure.

Toda combined with Shahoian discloses and renders this limitation obvious.

Toda: Toda discloses that when an operator touches his finger against the surface 7 of the plate 5 and moves it along the surface 7, “each of the pressure sensitive sensors 3 transmits a signal corresponding to the finger pressure.” Ex. 1003 at 6:16-21. Toda teaches determining the pressure P using the outputs a, b, c, and d from the respective pressure sensitive sensors 3 as follows:

$$p=K(a+b+c+d)$$

Id. at 6:43-48 (where K is a proportional constant); *see also id.* at 7:66-8:4 (also calculating pressure using equation 1).

Toda, however, does not explicitly disclose that its contact data comprises both an actual pressure and a pseudo pressure.

Shahoian: As discussed in the section above regarding claim construction, “pseudo-pressure” in the ’507 patent should be construed to include a measure of pressure based on capacitance.

Shahoian discloses that its touchpad 16 may use capacitive sensing. Ex. 1004, ¶ 41. Specifically, Shahoian discloses that, “[a]s with many touchpads of the prior art, touchpad 16 can be capacitive” and that “capacitive touchpads that do not require significant pressure” (i.e., capacitive touchpads that operate with light pressure) “may be better suited for the present invention in some embodiments.” *Id.* In other words, Shahoian recognizes that touchpads can recognize pressure using capacitance. *Id.*; Cockburn Decl., ¶ 102. Thus, Shahoian discloses the recited “pseudo pressure.”

As also discussed in the section above regarding claim construction, based on Immersion’s proposed construction in the ITC investigation, “pseudo-pressure” should be construed to include “a measure of the area of the screen contacted by the object.” Shahoian discloses computing the “contact area made by the conductive object (finger, palm, arm, etc.)” on a touchpad. Ex. 1004, ¶ 51. A POSITA would have recognized that in order to perform such computation, the contact data from the input device necessarily would have included “a measure of the area of the screen contacted by an object.” Cockburn Decl., ¶ 103.

Shahoian also discloses, in contrast to “capacitive sensors,” “pressure

sensors that detect pressure applied to the touchpad.” Ex. 1004, ¶ 5; *see also id.* at ¶ 188 (sensing “the amount of pressure the user is exerting on the touchpad”). The ’507 patent states that such an “explicit pressure sensor” is an example of a sensor that provides an actual pressure. Ex. 1001 at 2:60-63. Shahoian’s disclosure of “pressure sensors that detect pressure” (which it contrasts to capacitive sensors) therefore discloses the “actual pressure” portion of this limitation. Ex. 1004, ¶ 5; Cockburn Decl., ¶ 104. Thus, Shahoian discloses both a “pseudo pressure” and an “actual pressure.”

Obviousness: It would have been obvious to a POSTIA at the time of the alleged invention of the ’507 patent to practice this limitation, such as by combining the teachings of Shahoian, especially its disclosure of a pseudo pressure and an actual pressure, with the Toda system. Cockburn Decl., ¶ 105.

Specifically, a POSITA would have found it obvious to have a touch sensitive input device, such as the one taught by Toda, provide contact data comprising an actual pressure and a pseudo pressure, such as those disclosed by Shahoian.

Cockburn Decl., ¶ 105.

Motivation to include both an actual pressure and a pseudo pressure arises from the known advantages and disadvantages of each. The ’507 patent acknowledges that a known disadvantage of pseudo pressure (such as an estimate of pressure based on capacitance) was that “pseudo pressure may not accurately

represent the amount of pressure actually exerted on the touchpad” for various reasons. *See, e.g.*, Ex. 1001 at 3:19-39; Cockburn Decl., ¶ 106. For example, it was known that capacitance changes based on factors other than pressure, such as the makeup of the conductor (e.g., a user’s finger), and humidity. Ex. 1001 at 3:19-50; Ex. 1008 Mead (U.S. Patent No. 5,488,204 to Mead) at 21:23-24 (changing capacitance due to humidity); Cockburn Decl., ¶ 106. On the other hand, Shahoian discloses that capacitive sensors “do not require significant contact pressure” to operate. Ex. 1004, ¶ 41. Thus, by providing both an actual pressure and a pseudo pressure, the touch sensitive input device can compensate for the disadvantages of using only sensors that provide an actual pressure (e.g., potentially requiring significant contact pressure) or using sensors that provide only a pseudo pressure (e.g., potentially providing inaccurate data). Cockburn Decl., ¶ 106.

A related motivation to do so arises simply from a desire to accurately detect the characteristics of a user’s touch on a touchpad in order to determine the user’s intent. Such motivation is acknowledged by, for example, Toda. Ex. 1003 at 3:21-27, 12:16-20. A POSITA would realize that detecting the characteristics of a user’s touch most accurately would be accomplished using more than one type of pressure sensor at least for the reasons identified above. Cockburn Decl., ¶ 107.

Further motivation to practice this limitation, including by incorporating the

teachings of Shahoian into the Toda system as described above, arises from Shahoian's disclosure that a touchpad surface contacted by the user can include "different sensor[s]." Ex. 1004 at ¶ 197 (emphasis added). A POSITA would have recognized, as Shahoian discloses and as was known, that such different sensors included those that provide a pseudo pressure and those that provide an actual pressure, and that selecting such sensors to be the "different sensor[s]" taught by Shahoian was a mere design choice with predictable results. Cockburn Decl., ¶ 108.

Additional motivation to practice this limitation includes applying known techniques (i.e., providing a pseudo pressure and providing an actual pressure, as disclosed by, for example, Shahoian) to a known device, such as the Toda system, that was ready for improvement (e.g., in order to more accurately gauge the touchpad user's intent) to yield predictable results (i.e., receiving contact data comprising both actual and pseudo pressure in response to the detection of a user's contact on the touch sensitive device). Cockburn Decl., ¶ 109. The rationale for doing so also includes combining prior art elements according to known methods to yield predictable results and the use of known techniques to improve a similar device in the same way. *Id.* Moreover, it would have been obvious to try this combination as it amounts to merely choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success. *Id.*

Claim 3: The method of claim 2, wherein the pseudo pressure is based on a change in capacitance resulting from the contact.

Toda combined with Shahoian discloses and renders this limitation obvious. Shahoian discloses a touchpad “that can be capacitive,” and that such “[c]apacitive touchpads” “do not require significant pressure.” Ex. 1004, ¶ 41. According to the ’507 patent, touch sensitive input devices that provide capacitance data in response to a user input provide a “pseudo pressure.” Ex. 1001 at 2:64-3:14. Accordingly, Shahoian discloses this limitation.

Moreover, a POSITA would understand that the pseudo pressure of Shahoian discussed above with respect to claim 2 is based on a change in capacitance that results from the user’s contacting the touchpad with his or her finger, a conductor. Cockburn Decl., ¶ 111.

Obviousness: It would have been obvious to a POSITA to practice this limitation, including by combining these teachings of Shahoian with the Toda system, for all of the same reasons set forth above for claim 2, which reasons Petitioner incorporates here by reference. Because the pseudo pressure of Shahoian discussed above for claim 2 is based on a change in capacitance, those reasons apply with equal force to this claim. Cockburn Decl., ¶ 112. Indeed, certain of the motivations to combine set forth above for claim 2 are based on the fact that the pseudo pressure of Shahoian is based on a change in capacitance.

Claim 4: The method of claim 3, wherein the contact data is based on a contact on a specific portion of a touch-sensitive input device.

Toda discloses and renders this limitation obvious. Toda discloses that the outputs a, b, c, d from the four pressure sensitive sensors 3 are used to determine “the coordinate position (x, y) of a finger on the operation surface 7,” which is expressed by arithmetic formulas that include outputs a, b, c, and d. Ex. 1003 at 6:28-39; *see also id.* at 7:60-8:22 (calculating the x and y coordinates of the point touched using equations (4) and (5), which also are based on data from the pressure sensitive sensors), 5:60-62 (the pressure sensitive sensors are arranged beneath the four corners of the rectangular operation surface). Thus, the contact data (the outputs a, b, c, and d) are based on the specific portion of the touch-sensitive input device that the user touched. Cockburn Decl., ¶ 113. A POSITA would have recognized that if this were not the case, it would be impossible to calculate the (x, y) location of the finger using such contact data, as Toda discloses. *Id.*

Claim 5: The method of claim 4, wherein the contact information comprises position data, and further comprising determining whether a contact is made on a softkey based on the position data.

Toda combined with Shahoian discloses and renders this limitation obvious.

As described in the section regarding claim construction, the broadest reasonable interpretation of “softkey” should include programmatically generated graphical buttons.

Shahoian: Shahoian discloses “a touch input device ... operative to input a

position signal to a processor of said computer based on a location of user contact on the touch surface.” Ex. 1004, ¶ 8; *see also id.* at ¶ 41 (“Capacitive touchpads typically sense the location of an object on or near the surface of the touchpad based on capacitive coupling between capacitors in the touchpad and the object.”), ¶ 49 (“appropriate sensors ... are used to report the position of the user’s finger on the touchpad”). Thus, Shahoian discloses that the contact information (contact data) includes position data.

Shahoian also discloses that a user can move his or her finger on the touchpad to control the direction of the cursor and, in turn, use the cursor “to select and/or manipulate icons, windows, menu items, graphical buttons, slider bars, scroll bars, or other graphical objects in a graphical user interface or desktop interface.” Ex. 1004, ¶ 53. The “graphical buttons” of such a graphical user interface are programmatically generated and therefore “softkeys” under the construction set forth above. Cockburn Decl., ¶ 117. A POSITA would understand that allowing the user to select and/or manipulate such buttons by using his or her finger on the touchpad to control a cursor necessarily requires considering the position data so that, for example, the cursor moves to the left when the user moves his or her finger to the left, and so on. *Id.*

Obviousness: It would have been obvious to a POSITA at the time of the ’507 alleged invention to practice this limitation in light of the teachings of Toda

and Shahoian, especially by combining the teachings of Shahoian referenced above with the system of Toda, at least because both references disclose using a touchpad to manipulate a cursor on a device that would have a graphical user interface. Ex. 1004, ¶ 53; Ex. 1003, 2:27-45 (controlling a cursor), 6:1-24 (controlling a cursor on a laptop), Fig. 3 (a laptop); Cockburn Decl., ¶ 118. Motivation to do so arises from allowing a user of the Toda system to select an element that might appear in a graphical user interface, such as the graphical buttons of Shahoian or graphical keys, which were known in the art. Cockburn Decl., ¶ 118. Additional motivation to do so arises from having the movement of the cursor reflect the user's contact with the touchpad, which would necessarily require using position data from the touchpad. Moreover, it would have been obvious to try such a combination because it amounts to merely choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success. *Id.* Doing so would have been well within the skill of a POSITA, could have been accomplished with minimal effort, and would have led to predictable results. *Id.*

Claim 9:

[9.0] A non-transitory computer-readable medium comprising program code for causing a processor to execute a method, the program code comprising:

Toda discloses this limitation because it teaches a processor (CPU 57) and corresponding non-transitory memory (e.g., ROM 58) for implementing its functionality described above in connection with claim. Ex. 1003 at 7:35-8:29 (the

CPU calculates touch location, detects the presence of a “switching input,” etc.), Fig. 8; Cockburn Decl., ¶ 119. A POSITA would understand that the CPU necessarily executes program code from the non-transitory computer-readable medium (ROM 58) in order to do so. Cockburn Decl., ¶ 119. It also would have been obvious to a POSITA to practice this limitation in light of Toda’s disclosure of the CPU 57 and ROM 58 at least as a matter of common sense. *Id.*

[9.1] program code for receiving contact data from an input device;

See limitation [1.1].

[9.2] program code for determining an interaction with a displayed object on a screen based on the contact data;

See limitation [1.2].

[9.3] program code for, responsive to determining the interaction, determining a gesture based on the contact data comprising:

See limitation [1.3].

[9.4] program code for determining a pressure and a change in pressure based on the contact data, and

See limitation [1.4].

[9.5] program code for determining a press if:

See limitation [1.5].

[9.6] the pressure is greater than a pressure threshold,

See limitation [1.6].

[9.7] the change in pressure is greater than a change in pressure threshold, and

See limitation [1.7].

[9.8] a first interval has elapsed; and

See limitation [1.8].

[9.9] program code for, responsive to determining the gesture, outputting a haptic effect.

See limitation [1.9].

Claim 10: The non-transitory computer-readable medium of claim 9, wherein the contact data comprises an actual pressure and a pseudo pressure.

See claim 2.

Claim 11: The non-transitory computer-readable medium of claim 10, wherein the pseudo pressure is based on a change in capacitance resulting from the contact.

See claim 3.

Claim 12: The non-transitory computer-readable medium of claim 11, wherein the contact data is based on a contact on a specific portion of a touch-sensitive input device.

See claim 4.

Claim 14:

[14.0] A system comprising:

Toda combined with Shahoian make obvious a system comprising the claimed elements as established below.

[14.1] a computer-readable medium; and

See limitation [9.0].

[14.2] a processor in communication with the computer-readable medium, the processor configured to:

See limitation [9.0].

[14.3] receive contact data from an input device;

See limitation [1.1].

[14.4] determine an interaction with a displayed object on a screen based on the contact data;

See limitation [1.2].

[14.5] responsive to determining the interaction, determine a gesture based on the contact data comprising:

See limitation [1.3].

[14.6] determining a pressure and a change in pressure based on the contact data, and

See limitation [1.4].

[14.7] determining a press if:

See limitation [1.5].

[14.8] the pressure is greater than a pressure threshold,

See limitation [1.6].

[14.9] the change in pressure is greater than a change in pressure threshold, and

See limitation [1.7].

[14.10] a first interval has elapsed; and

See limitation [1.8].

[14.11] responsive to determining the gesture, output a haptic effect.

See limitation [1.9].

Claim 15: The system of claim 14, wherein the contact data comprises an actual pressure and a pseudo pressure.

See claims 2 and 10.

Claim 16: The system of claim 15, wherein the pseudo pressure is based on a change in capacitance resulting from the contact.

See claims 3 and 11.

Claim 17: The system of claim 16, wherein the contact data is based on a contact on a specific portion of a touch-sensitive input device.

See claims 4 and 12.

* * *

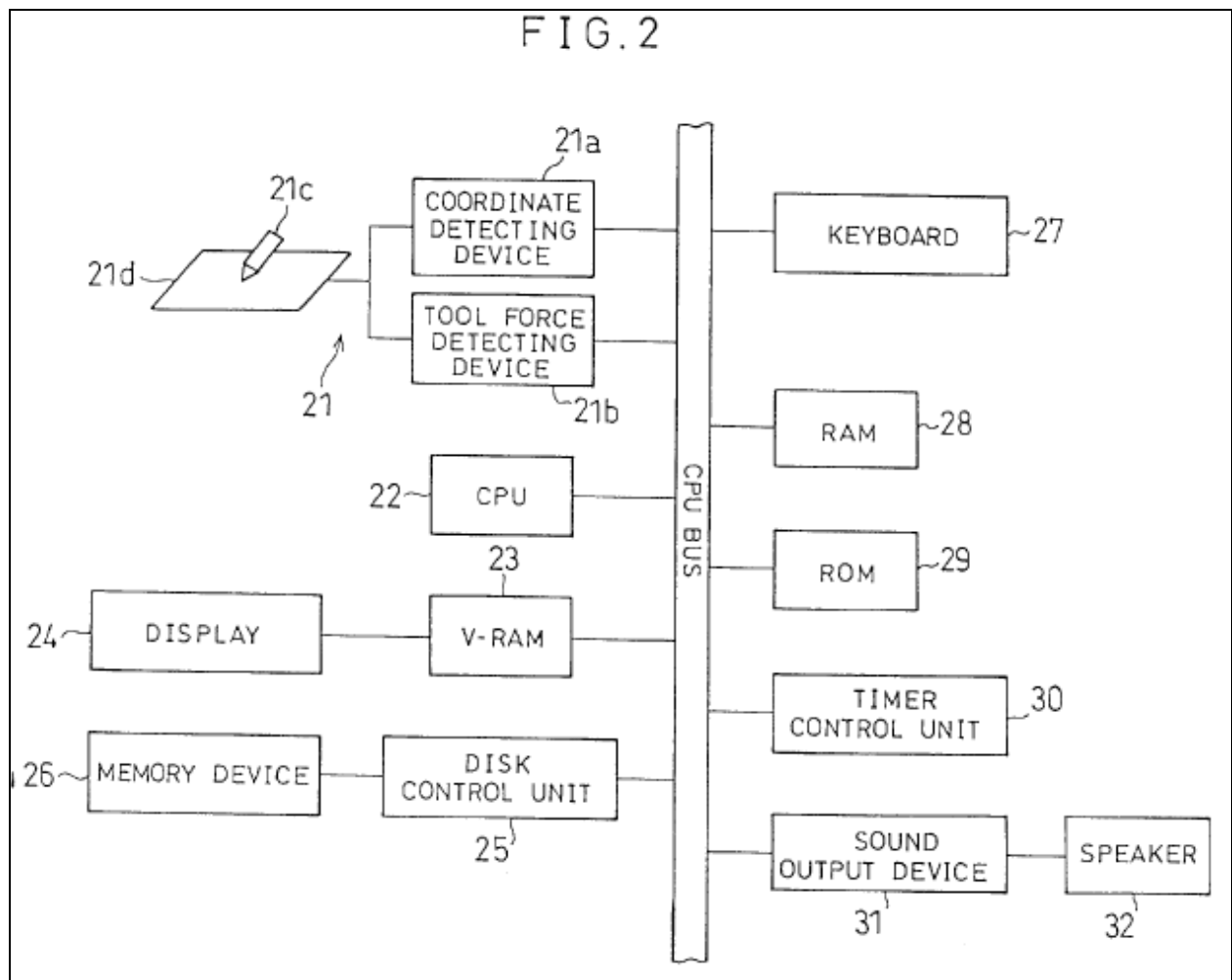
To the extent that Patent Owner Immersion may argue that the portions of Toda cited above relate to different, incompatible embodiments (which they do not), it would have been obvious to a POSITA to combine such embodiments into a single system. Cockburn Decl., ¶ 147. For example, all of the embodiments in Toda are based on a single touch sensitive pointing device shown in Toda's Figures 1-3 and 8. *See also* Ex. 1003 at 5:50-6:24, 7:35-8:20. Moreover, Toda's various detection algorithms are all related to, and compatible with, detecting various types of touch events on a touch sensitive input device. *E.g.*, Ex. 1003 at 8:51-9:9, 11:20-29, 12:16-28; Cockburn Decl., ¶ 147.

G. Ground 2: Claims 1, 9, and 14 Are Obvious Under 35 U.S.C. § 103(a) (pre-AIA) In Light Of Morimura In View Of Shahoian.

1. Morimura is § 102(a) and (b) Prior Art

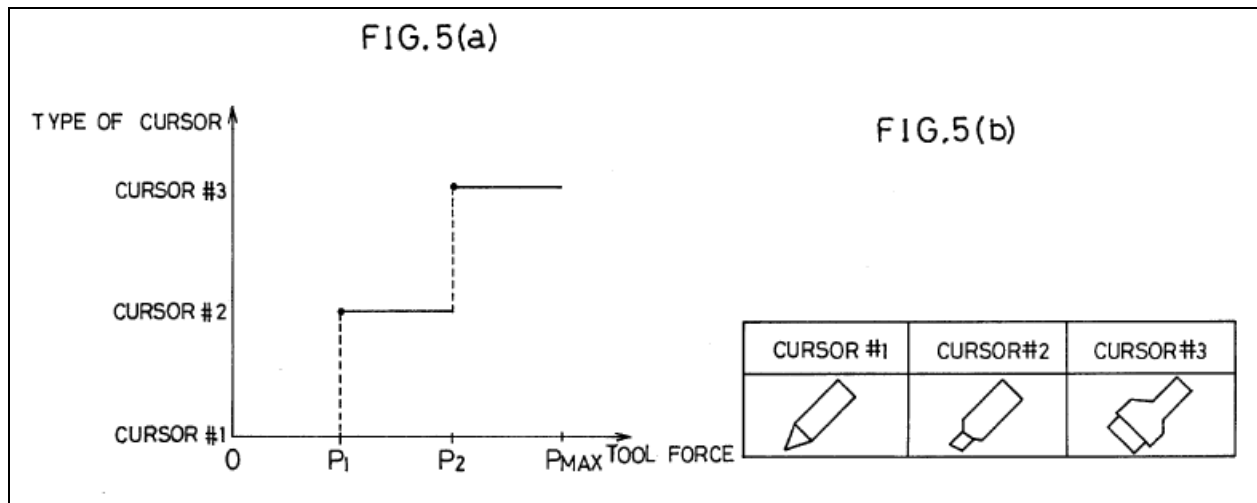
U.S. Patent No. 6,072,474 to Morimura (Ex. 1005, “**Morimura**”) is a printed publication within the meaning of 35 U.S.C. §§ 102(a) and (b) (pre-AIA) because it issued on June 6, 2000, more than one year before the priority date of the ’507 patent (Nov. 26, 2003). Ex. 1005 at cover page.

Morimura relates to a document processing device that includes a tablet with which a user can interact using a pen. Ex. 1005 at 5:48-57, Fig. 2, 15:27-34, Fig. 20. Morimura’s Figure 2 is shown below and illustrates such a device.



The tablet can detect the amount of force the user is applying with the pen.

Id. The user may use the tablet and pen for purposes of, for example, drawing. *Id.* at 21:46-49. Depending on the amount of force that the user applies, the system changes the width of a line being drawn. *Id.* at 7:2-4, 7:51-55. The system also displays one of various cursors, such as a pencil, marker, or paint brush, depending on the applied force. *Id.* at 7:51-61; Figs. 5(a)-(b). Morimura's Figures 5(a) and 5(b) are shown below and illustrate this concept.



To determine how to respond to the user's touching the touchpad with a pen, Morimura discloses an algorithm that considers, among other factors, the amount of force applied, the change in force, the amount of time that has passed, the position of the touch, the movement of the touch, and so on. Ex. 1005 at 7:33-61, 9:54-11:19, Figs. 4, 8.

2. Shahoian is § 102(a) and (b) Prior Art

Shahoian also qualifies as prior art under 35 U.S.C. § 102(a) and (b) (pre-AIA) for the reasons set forth in Ground 1, incorporated here by reference.

3. Detailed Analysis

Claim 1:

[1.0] A method comprising:

Morimura in view of Shahoian disclose and render obvious a method comprising the claimed steps, as established below.

[1.1] receiving contact data from an input device;

Morimura discloses this limitation at least inherently. Morimura discloses a “tool force detecting device,” that detects tool force when a user touches it with a pen 21c. Ex. 1005 at 5:51-57, FIG 2. Morimura also discloses that a “tool force detecting unit” such as a tablet may detect force using “piezoelectric elements,” which can be bent by applying “a pressure” to them. Ex. 1005 at 18:41-48, Fig. 20; *see also id.* at 6:41-42 (“the tool force [is] obtained in the form of numeral values”). A POSITA would have understood that a piezoelectric element outputs voltage in response to an applied pressure. Cockburn Decl., ¶ 153. The voltage data from the piezoelectric element therefore is contact data from an input device (e.g., the tool force detecting unit).

Obviousness: It also would have been obvious to a POSITA to use the piezoelectric elements of the “tool force detecting unit” in the “tool force detecting device 21b,” at least because a purpose of both is to detect the force a user is applying to a tablet with a pen. Ex. 1005 at 5:50-57, 15:30-32; Cockburn Decl., ¶ 154. Because a piezoelectric element outputs voltage data in response to applied pressure, the piezoelectric elements are particularly suited for such a purpose, as Morimura acknowledges. Ex. 1005 at 15:41-48; Cockburn Decl., ¶ 154. Motivation to do so therefore arises from Morimura’s disclosure of detecting the tool force. Cockburn Decl., ¶ 154. Thus, using the piezoelectric elements of the

“tool force detecting unit” in the “tool force detecting device 21b” would have been a mere design choice with predictable results, would have been well within the skill of a POSITA, and could have been accomplished with minimal effort. *Id.*

[1.2] determining an interaction with a displayed object on a screen based on the contact data;

Morimura discloses this limitation because Morimura discloses, for example, interacting with a displayed cursor to, for example, change the cursor from a marker image to a paint brush image, change the width of the line that is plotted with the cursor, and change the cursor’s color, density, and/or brightness. Ex. 1005 at 7:2-4, 7:51-55, 7:62-64, 9:1-3, 10:25-29, Figs. 5(a)-(b). Morimura discloses that these variations in the cursor are based in part on the applied tool force, and thus result from the contact data described above for limitation [1.1]. *Id.* Morimura also discloses “a drawing process” based on the detected tool force, which a POSITA would have recognized necessarily involved interacting with the displayed object on which the user is drawing. Ex. 1005 at 21:46-49; Cockburn Decl., ¶ 155. *See also* Ex. 1005 at 7:19-22 (plotting characters, graphics, etc. on the display according to detected tool force). Morimura discloses that such interaction may begin with a “pen down” event, which occurs when the tablet is touched with a pen. Ex. 1005 at 6:27-29.

[1.3] responsive to determining the interaction, determining a gesture based on the contact data comprising:

As discussed in the section regarding claim construction, the broadest reasonable interpretation of “gesture” includes interactions made with the input device using a pointing device or stylus.

Morimura discloses this limitation. Morimura discloses determining a “pen drag” gesture, which occurs “when the pen 21c is moved without losing a contact with the tablet 21d.” Ex. 1005 at 6:27-30; *see also id.* at 23:7 (“the user drags with the pen”). A POSITA would have recognized that detection of the “pen drag” gesture (or any pen event) is necessarily based on the contact data from the touch-sensitive input device described above. Cockburn Decl., ¶ 157.

Morimura discloses that “the main routine” occurs during a pen drag gesture, and that executing “the main routine” when the fixed state flag is off results in executing the “variable plotting/editing process.” Ex. 1005 at 6:25-30, 6:47-55, Fig. 2 (S5). The “variable plotting/editing process” is set forth in Morimura’s Figure 8, and is discussed in more detail below.

Obviousness: It also would have been obvious to a POSITA to practice this limitation where the gesture does not use a stylus, and is instead made with the user’s finger. Motivation to do so arises from supporting different types of input tools, including the user’s fingers. Such touch sensitive input devices were well

known and are described in, for example, Shahoian 1. E.g., Ex. 1004 at ¶ 5 (“the user contacts the touchpad ... with a fingertip”).

It also would have been obvious to a POSITA to practice this limitation by, for example, determining that a pen drag gesture is occurring in response to a user’s interaction with the cursor as part of a drawing process. Motivation to do so arises from the disclosure of Morimura, which discloses all of these things, as established above for limitations [1.2] and [1.3]. Practicing this limitation in the manners described above would have been well within the skill of a POSITA, could have been accomplished with minimal effort, and would have led to predictable results. Cockburn Decl., ¶ 160.

[1.4] determining a pressure and a change in pressure based on the contact data, and

Morimura inherently discloses this limitation under Immersion’s interpretation of “pressure,” which includes force, as described above in the section regarding claim construction. In particular, Morimura discloses that the tool force detecting unit may include “piezoelectric elements,” which one of skill in the art would have understood output voltage data in response to applied pressure. Ex. 1005 at 15:41-48; Cockburn Decl., ¶ 161; *see also* Ex. 1003 (Toda) at 7:37-38 (piezoelectric elements convert an applied pressure into voltage). Morimura also discloses an algorithm that analyzes the user’s touch and that considers both force and change in force. Ex. 1005 at 6:39-41 (“the tool force ... P”), 7:33-49

(determining the cursor based on the tool force P), Fig. 4, 5(a)-(b), 10:42-44 (considering the change in tool force at step S31 in Fig. 8). A POSITA would have recognized that in order to use these values, they must be determined from the voltage data output (contact data) of the piezoelectric elements or other pressure-sensitive sensors. Cockburn Decl., ¶ 161.

Obviousness: First, it would have been obvious to a POSITA to practice this limitation in light of Morimura by, for example, determining a pressure and a change in pressure instead of the force and change in force disclosed by Morimura. A POSITA would understand that pressure refers to force over area, and therefore determining a pressure and change in pressure would require only dividing the force and change in force disclosed by Morimura by the area to which that force is applied. Morimura discloses that force is applied with a pen (e.g., Ex. 1005 at 5:53-57, 15:29-32), and the area of the tip of the pen would be known in advance because the pen typically would be supplied to the user with the tablet device. Cockburn Decl., ¶ 162. Thus, dividing the applied force by this known area could be one way that a POSITA could readily determine pressure. A POSITA could also determine pressure using the piezoelectric elements disclosed by Morimura (Ex. 1005 at 15:41-48), discussed above for limitation [1.1]. Such techniques were well known in the art. Cockburn Decl., ¶ 162; *see also* Ground 1, limitation [1.1], discussing Toda's disclosure of determining pressure from piezoelectric elements.

In addition, one of skill in the art would recognize that the Morimura gesture-detection and press-detection algorithms could function in substantially the same way using pressure instead of force at least because pressure is a measure of force over area, and the area typically would remain substantially constant when using a style or pen input device. Cockburn Decl., ¶ 162.

Motivation to determine pressure instead of force arises from a desire to more accurately determine the nature of the user's gesture. Cockburn Decl., ¶ 163. For example, a force applied over a larger area than normal may indicate that the user is interacting with the device using his or her finger rather than the pen. *Id.* Additional motivation arises from Morimura's disclosure of applying a "pressure" to the piezoelectric elements (Ex. 1005 at 15:44-47), which would lead a POSITA to use the voltage output by those elements to determine the pressure applied to those elements. Cockburn Decl., ¶ 163. More motivation arises from Morimura's use of the letter "p" to denote the strength of the user's touch, which suggests "pressure" rather than "force." Ex. 1005 at 7:45-47, 10:42-44, Figs. 4, 5(a), 8.

Second, it also would have been obvious to a POSITA to determine a pressure and change in pressure based on contact data from a pressure sensitive sensor, such as the disclosed piezoelectric elements discussed above. Cockburn Decl., ¶ 164. Because the purpose of piezoelectric elements is to output voltage based on an applied pressure, motivation for determining a pressure (and change in

pressure) based on such contact data arises from such elements' intended use. Additional motivation to do so arises from all of the motivations to determine pressure and change in pressure set forth above.

Overall, practicing this limitation as described above would have been well within the skill of a POSITA, could have been accomplished with minimal effort, and would have led to predictable results. Cockburn Decl., ¶ 165.

[1.5] determining a press if:

Morimura discloses this limitation because it discloses determining whether the user is pressing the tablet 21d with pen 21c in a certain manner using an algorithm that includes the steps shown in its Figures 4 and 8. Ex. 1005 at 5:53-57, 7:33-49, 9:55-11:1, Figs. 4, 8. When the Morimura algorithm detects a press with certain characteristics, described further for the limitations below, it will display “cursor #3” (a paint brush). Ex. 1005 at 7:45-54, Figs. 5(a)-(b), 8; *see also id.* at 9:1-3 (“when the tool force is increased, as shown in FIG. 7(b), the image of the cursor changes from the marker to the paint brush”); Cockburn Decl., ¶ 166.

[1.6] the pressure is greater than a pressure threshold,

Morimura discloses this limitation under Patent Owner Immersion's interpretation of “pressure” because it discloses that in the algorithm of Figure 8, the “cursor plotting process” of Figure 4 is executed in S27. Ex. 1005 at 10:66-11:1, 7:33-35. In the cursor plotting process, “the cursor is selected according to

the value of p ,” where, for example, a p value greater than P_2 results in cursor #3.

Ex. 1005 at 7:41-49; *see also id.* at Figs. 4, 5(a)-(b).

Obviousness: It also would have been obvious to a POSITA to practice this limitation in light of Morimura at least because it would have been obvious to a POSITA to practice the cursor plotting process using pressure instead of force for the reasons set forth for limitation [1.4]. Cockburn Decl., ¶ 168.

[1.7] the change in pressure is greater than a change in pressure threshold, and

Morimura discloses this limitation under Patent Owner Immersion’s interpretation of “pressure” because it discloses that in the algorithm of Figure 8, “it is further determined whether or not an amount of change in tool force from tool force P_0 to the current tool force P is within ΔP (S31).” Ex. 1005 at 10:42-44; *see also id.* at Fig. 8, S31 (“ $|P-P_0| \leq \Delta P$?”). “If the result of [the determination in S31] is NO ... the processes in S27 and S28 are executed.” *Id.* at 10:66-11:1, Fig. 8. A POSITA would have understood that when the result is NO, the magnitude of the change in tool force is greater than the threshold ΔP . Cockburn Decl., ¶ 169.

Obviousness: It also would have been obvious to a POSITA to practice this limitation in light of Morimura at least because it would have been obvious to a POSITA to practice the algorithm of Figure 8 using pressure instead of force for the reasons set forth for limitation [1.4]. Cockburn Decl., ¶ 170.

[1.8] a first interval has elapsed; and

Morimura inherently discloses this limitation because it discloses that in the algorithm of Figure 8, the previous tool force P_0 is subtracted from the “current tool force P .” Ex. 1005 at 10:42-44. A POSITA would have recognized that these two tool forces must represent the tool force at different points in time, otherwise it would have been meaningless to compare their values. Cockburn Decl., ¶ 171. A POSITA also would have recognized that obtaining the tool force at two different points in time necessarily requires waiting for a first time interval to elapse after the determination of the first tool force and before the determination of the second tool force. *Id.*

Obviousness: It would have been obvious to a POSITA to practice this limitation in light of Morimura at least because it would have been obvious to a POSITA to make sure that a minimum time interval had elapsed after determining the first force value described above before determining the second force value described above. Cockburn Decl., ¶ 172. Otherwise, the two force values may not vary enough to be of any practical use in determining the nature of the press or, in turn, the user’s intent. *Id.* Similarly, Morimura discloses waiting an “elapsed time” between taking two position measurements (Ex. 1005 at 10:38-42), and it would have been obvious to a POSITA in light of this disclosure to also wait an elapsed time between force measurements. Cockburn Decl., ¶ 172. Waiting some

time interval between the two force determinations would be a matter of common sense, would have been well within the skill of a POSITA, could have been accomplished with minimal effort, and would have led to predictable results. *Id.*

[1.9] responsive to determining the gesture, outputting a haptic effect.

Morimura combined with Shahoian discloses and renders this limitation obvious.

Morimura: As discussed above for limitation [1.3], Morimura discloses and renders obvious determining a gesture and, in response to the gesture and the press described above, changing the cursor from, for example, a marker to a paintbrush. Morimura does not expressly disclose the obvious step of outputting a haptic effect in response to determining such a gesture.

Shahoian: Shahoian teaches outputting a haptic effect in response to the detection of gesture for a touch-sensitive device. Ex. 1004 at ¶ 189. Specifically, Shahoian teaches that “[o]ne problem with existing touchpads is that there is no haptic feedback provided to the user” and that “[h]aptic sensations can be associated with or dependent on particular gestures.” *Id.* at ¶¶ 6, 189; *see also* the discussion of Shahoian’s extensive teachings regarding providing haptic feedback in response to determining gestures in limitation [1.9] of Ground 1, incorporated here by reference. Thus, Shahoian discloses this limitation.

Obviousness: It would have been obvious for a POSITA at the time of the alleged invention of the '507 patent to combine these teachings of Shahoian with Morimura. Cockburn Decl., ¶ 176. For example, it would have been obvious to a POSITA to use Shahoian's teachings of providing haptic sensations for gestures to provide a haptic sensation to a user of the Morimura system upon detection of the gesture discussed above for limitation [1.3] in which the cursor changes from, for example, a marker to a paintbrush. Cockburn Decl., ¶ 176. Motivation to do so arises from the disclosures of Shahoian discussed above, which characterize the lack of such haptic feedback as a "problem," and from Shahoian's disclosure that "haptic sensations output on the touch control enhance interactions and manipulations." Ex. 1004 at ¶ 7; Cockburn Decl., ¶ 176. Further motivation to do so arises from Shahoian's teaching of providing a haptic effect in response to a drag mode and Morimura's disclosure of a drag event. Ex. 1004 at ¶ 189; Ex. 1005 at 6:27-29; Cockburn Decl., ¶ 176. Additional motivation to do so arises from Morimura disclosure of making a "beeping sound" corresponding to each tool force level. Ex. 1005 at 19:26-28; Cockburn Decl., ¶ 176. Morimura therefore teaches providing feedback to the user based on characteristics of the user's gesture, and a POSITA would recognize that haptic feedback instead of or in addition to audible feedback would accomplish the same purpose of providing feedback to the user.

Furthermore, the '507 patent specification's exceedingly short description of providing a haptic effect in response to detection of a gesture confirms that doing so at the time of the '507 patent's alleged invention required no special insight or inventiveness, as discussed for limitation [1.9] of Ground 1, which discussion is incorporated here by reference. Cockburn Decl., ¶ 177.

Finally, combining Shahoian with Morimura in this manner would have been obvious to try because it amounts to merely choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success. Cockburn Decl., ¶ 178. This combination would have been well within the skill of a POSITA, could have been accomplished with minimal effort, and would have led to predictable results. *Id.*

Claim 9:

[9.0] A non-transitory computer-readable medium comprising program code for causing a processor to execute a method, the program code comprising:

Morimura discloses this limitation. Morimura discloses that the document processing device includes a CPU 22, which “executes a program on a RAM 28 and a ROM 29.” Ex. 1005 at 5:58-60. The RAM and ROM store programs that are “controlled directly by the CPU 22.” *Id.* at 6:15-17. Morimura also discloses that for every occurrence of a pen event (i.e., pen down, pen drag, or pen up), the device executes “a main routine” under the control of the CPU. *Id.* at 6:21-32. A POSITA would understand that the CPU necessarily executes program code from a

non-transitory computer-readable medium (e.g., ROM) in order to perform the functionality of claim 1 described above. Cockburn Decl., ¶ 179. It also would have been obvious to a POSITA to practice this limitation in light of Morimura's disclosure of a CPU executing a program from ROM and as a matter of common sense. *Id.*

[9.1] program code for receiving contact data from an input device;

See limitation [1.1].

[9.2] program code for determining an interaction with a displayed object on a screen based on the contact data;

See limitation [1.2].

[9.3] program code for, responsive to determining the interaction, determining a gesture based on the contact data comprising:

See limitation [1.3].

[9.4] program code for determining a pressure and a change in pressure based on the contact data, and

See limitation [1.4].

[9.5] program code for determining a press if:

See limitation [1.5].

[9.6] the pressure is greater than a pressure threshold,

See limitation [1.6].

[9.7] the change in pressure is greater than a change in pressure threshold, and

See limitation [1.7].

[9.8] a first interval has elapsed; and

See limitation [1.8].

[9.9] program code for, responsive to determining the gesture, outputting a haptic effect.

See limitation [1.9].

Claim 14:

[14.0] A system comprising:

Morimura combined with Shahoian render obvious a system comprising the claimed elements as established below.

[14.1] a computer-readable medium; and

See limitation [9.0].

[14.2] a processor in communication with the computer-readable medium, the processor configured to:

See limitation [9.0].

[14.3] receive contact data from an input device;

See limitation [1.1].

[14.4] determine an interaction with a displayed object on a screen based on the contact data;

See limitation [1.2].

[14.5] responsive to determining the interaction, determine a gesture based on the contact data comprising:

See limitation [1.3].

[14.6] determining a pressure and a change in pressure based on the contact data, and

See limitation [1.4].

[14.7] determining a press if:

See limitation [1.5].

[14.8] the pressure is greater than a pressure threshold,

See limitation [1.6].

**[14.9] the change in pressure is greater than a change in pressure threshold,
and**

See limitation [1.7].

[14.10] a first interval has elapsed; and

See limitation [1.8].

[14.11] responsive to determining the gesture, output a haptic effect.

See limitation [1.9].

* * *

To the extent that Patent Owner Immersion may argue that the portions of Morimura cited above relate to different, incompatible embodiments (which they do not), it would have been obvious to a POSITA to combine such embodiments into a single system. Cockburn Decl., ¶ 201. For example, it would have been obvious to incorporate the piezoelectric elements disclosed by Morimura at 15:41-48 into the document processing device described at 5:48-57 at least because Morimura already discloses that the piezoelectric elements can be used in a document processing device for purposes of detecting tool force, such as the tool

force applied by a pen. Ex. 1005 at 15:27-34; Cockburn Decl., ¶ 201.

V. CONCLUSION

For the foregoing reasons, Petitioner requests that the Board institute trial and cancel claims 1-5, 9-12 and 14-17 of the '507 patent.

In addition, Petitioner has presented only two grounds, yet in doing so has demonstrated how various prior art references disclose the independent claims differently. For example, Toda and Morimura disclose touch analysis algorithms that are significantly different. *Compare* Ex. 1003 (Toda), Figs. 18-19 *with* Ex. 1005 (Morimura), Fig. 8. Moreover, the limited grounds presented in this petition do not impede “the just, speedy, and inexpensive resolution of [this] proceeding,” as required by 37 C.F.R. § 42.1(b). Because Petitioner has already limited its petition to just two grounds based on three prior art references, and has addressed only the challenged independent claims in Ground 2, Petitioner respectfully requests that the Board institute rejections on all grounds presented in this petition in order to avoid prejudicing Petitioner. If the Board nonetheless institutes fewer than the limited number of presented grounds, Petitioner respectfully requests that the Board institute at least Ground 1.

Dated: September 12, 2016

Respectfully Submitted,

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CERTIFICATION UNDER 37 CFR § 42.24(d)

Under the provisions of 37 CFR §42.24(d), the undersigned hereby certifies that the word count for the foregoing Petition for *Inter Partes* Review totals 13,936 as calculated by Microsoft Word, which is less than the 14,000 allowed under 37 CFR § 42.24(a)(i).

Dated: September 12, 2016

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the foregoing Petition for Inter Partes Review and all Exhibits and other documents filed together with the petition were served on September 12, 2016, via United Parcel Service, directed to the attorneys of record for the patent at the following address:

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