

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. 8,581,710

Filing Date: September 5, 2012

Issue Date: November 12, 2013

Title: System and Methods For Haptic Confirmation of Commands

Inter Partes Review No.: (Unassigned)

**PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 8,581,710
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
1101	U.S. Patent No. 8,581,710.
1102	Declaration of expert Dr. Tony Givargis (“Givargis Decl.”).
1103	Microsoft Computer Dictionary (5th ed. 2002).
1104	U.S. Patent No. 6,505,159 to Theodore (“Theodore”).
1105	U.S. Pat. App. Pub. No. 2002/0033795 (“Shahoian”).
1106	U.S. Patent No. 7,336,260 to Martin et al. (“Martin”).
1107	U.S. Patent Application Publication No. 2009/0164207 to Makela et al. (“Makela”).
1108	MSC1200, MSC1201, MSC1202 Datasheet.
1109	U.S. Patent No. 7,496,481 to Kovacevich.
1110	Patent Owner Immersion’s claim chart regarding alleged infringement of the ’710 patent by certain Apple iPhone products (Exhibit 23 to Immersion’s ITC Complaint in ITC Investigation No. 337-TA-1004).
1111	Immersion’s Complaint in ITC Investigation No. 337-TA-1004 (the “Complaint”).
1112	File History of U.S. Patent No. 8,581,710.
1113	Merriam-Webster’s Collegiate Dictionary (11th ed. 2003).
1114	World Intellectual Property Organization’s publication of PCT/US2010/054967
1115	U.S. Patent No. 5,999,168 to Rosenberg, et al. (“Rosenberg”)

I. INTRODUCTION

Apple Inc. (“Apple” or “Petitioner”) hereby petitions for *inter partes* review of U.S. Patent No. 8,581,710 owned by Immersion (Ex. 1101, the “’710 patent”). The ’710 patent generally relates to confirmation of commands using haptic effects. The claims of the ’710 patent challenged in this Petition are invalid over the prior art.

II. COMPLIANCE WITH FORMAL REQUIREMENTS

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

1. Real Party-In-Interest

Apple is the real party-in-interest.

2. Related Matters

The ’710 patent is subject to the following actions: 1) *Certain Mobile and Portable Electronic Devices Incorporating Haptics (Including Smartphones and Laptops) and Components Thereof*, U.S. International Trade Commission Investigation No. 337-TA-1004 (the “ITC Investigation”); 2) *Immersion Corporation v. Apple Inc., et al.*, Case Nos. 1:16-cv-00077 and 1:16-cv-00325(D. Del.). The ’710 patent is also the subject of IPR2016-01603, in which Apple is the petitioner.

3. Lead and Backup Counsel

Lead counsel is James M. Heintz, Reg. No. 41,828, of DLA Piper LLP (US), 11911 Freedom Drive, Suite 300; Reston, VA 20190; Apple-Immersion-

IPRs@dlapiper.com, 703-773-4148 (phone), 703-773-5200 (fax). Backup counsel is Brian Erickson, Reg. No. 48,895, of DLA Piper LLP (US), 401 Congress Avenue, Suite 2500, Austin, TX 78701; brian.erickson@dlapiper.com, 512-457-7059 (phone), 512-457-7001 (fax).

4. Service Information

Please address all correspondence to the lead and back-up counsel as shown above. Apple consents to electronic service to lead and back-up counsel and to Apple-Immersion-IPRs@dlapiper.com.

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 '710 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. 071896.

III. STATEMENT OF PRECISE RELIEF REQUESTED

In accordance with 35 U.S.C. § 311, Petitioner requests cancelation of claims 13, 18, 19, and 20 of the '710 patent in view of the following grounds:

A. Ground 1: Claims 13, 19, and 20 are obvious under 35 U.S.C. § 103(a) (pre-AIA) over U.S. Patent No. 7,336,260 ("Martin") in view of U.S. Patent Pub. No. 2009/0164207 ("Makela").

B. Ground 2: Claims 13, 18, and 19 are obvious under 35 U.S.C. § 103(a) (pre-AIA) over U.S. Patent No. 6,505,159 ("Theodore") in view of U.S. Patent 2002/0033795 ("Shahoian").

IV. FULL STATEMENT OF REASONS FOR REQUESTED RELIEF

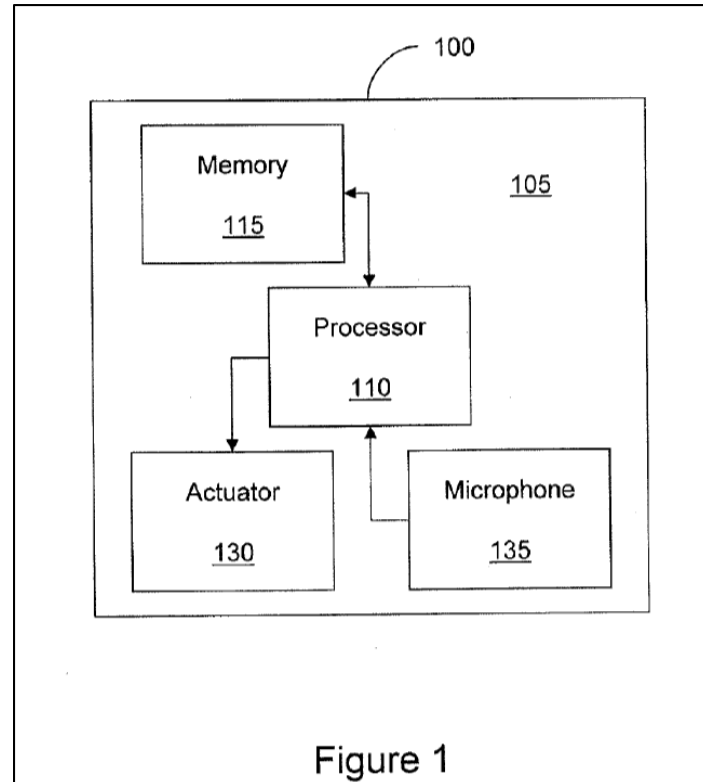
A. Summary of the '710 Patent

The '710 patent is titled "Systems and Methods for Haptic Confirmation of Commands." Ex. 1101, Cover. The '710 patent explains that "[c]ommands to electronic devices have typically been issued by pressing a button or flipping a switch. However, voice and other types of commands are becoming more prevalent in user interfaces, such as voice-commanded dialing of cell phones." Ex.

1101, 1:21-25. The '710 patent further explains that audio and visual cues may not always be possible in electronic devices such as smart phones. *Id.*, 1:25-32.

“Thus, it may be desirable to provide other mechanisms for providing responses to the user.” *Id.*, 1:32-33.

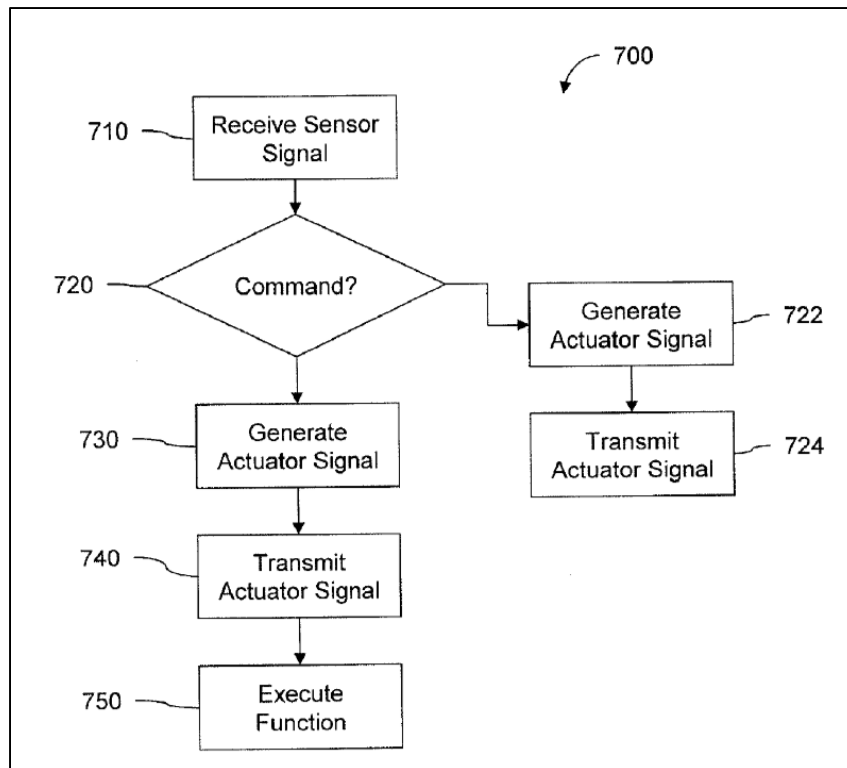
The '710 patent discloses embodiments in which a user speaks commands into a microphone, such as the PDA shown in the block diagram of Fig. 1 reproduced below:



Ex. 1101, 4:47-50. Other embodiments involving voice recognition include desktop computers (*id.*, 5:17-20) and Bluetooth headsets attached to cell phones (*id.*, 6:9-10). Also disclosed in the '710 patent are embodiments comprising a

haptically-enabled medical alert device in communication with a communications device (*id.*, 7:4-11), a display worn by a user such as goggles with an integrated display and a sensor that detects the orientation of a user's eye to select a command on the display that allows a user to control a wheelchair (*id.*, 11:27-41 and 12:6-24), and a user device with a touchscreen in which a user selects commands by touching locations on the touchscreen (*id.*, 7:25-34).

An example of processing associated with confirmation of commands is shown in Fig. 7, reproduced below, in which the path from the bottom of decision diamond 720 indicates that the command was determined, and the path leading from the right of the decision diamond 720 indicates that a command was not determined:



Id., 12:38-45. The '710 patent discloses generating and transmitting an acuator signal for a haptic effect that indicates that the command is recognized if the command is recognized, and “otherwise” generating and transmitting an acutator signal for another haptic effect that indicates that the command was not recognized. *Id.*, 12:38-52.

B. 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 '710 patent 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, haptics

programming, 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. 1102, ¶ 39.

C. Claim Construction

In accordance with 37 C.F.R. § 42.104(b)(3), Petitioner provides the following statement regarding construction of the '710 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).

In the ITC investigation referenced above, Immersion has submitted to the ITC claim charts showing how Immersion believes that the '710 patent's claims allegedly encompass certain of Petitioner Apple's products. Ex. 1110. For the purposes of this proceeding, Petitioner respectfully requests that Immersion be held to constructions at least as broad as those implied in these claim charts, or according to their plain and ordinary meaning if such plain and ordinary meaning is broader.

1. “signal” (all challenged claims)

The term “signal” should be broadly construed according to its plain and ordinary meaning as reflected by the Microsoft Computer Dictionary (5th ed. 2002) as “any electrical quantity, such as voltage, current, or frequency, that can be

used to transmit information.” Ex. 1103 at 3; Ex. 1102, ¶ 43. This construction is not limited to either analog or digital, but rather encompasses both. *Id.*

2. “haptic effect configured to emulate the command” (claim 20)

The term “haptic effect is configured to emulate the command” should be broadly construed in accordance with Immersion’s infringement contentions in the ITC such that a haptic effect in the form of a short vibration is found to emulate a command to display a menu. In the ITC, Immersion has accused Apple’s iPhone 6s product of infringing claim 12. Ex. 1111 at 19, Table 1 and 21. Apple’s iPhone 6s product displays a Quick Action menu (Ex. 1110 at 28-29 and 32) and outputs a haptic effect in the form of a tap of a duration of 10 milliseconds (Ex. 1110 at 39-40) when the user presses an icon having associated Quick Action functionality with a sufficient level of pressure (Ex. 1110 at 39). While Apple does not agree that this construction is correct under the *Phillips* standard, the broadest reasonable interpretation of the phrase should encompass the interpretation Immersion has asserted in litigation against Apple.

3. “otherwise...” (claim 13)

In its Institution Decision of the first petition based on the ’710 patent (IPR2016-01603), the Board found that “under the broadest reasonable interpretation standard, a prior art reference need not satisfy the ‘otherwise’ portion to render claim 1 obvious.” IPR2016-01603, Paper 7 at 19 (citing *Ex Parte*

Schulhauser, No. 2013-0007847, 2016 WL 6277792 (PTAB April 28, 2016)

(precedential)). The Board noted that in *Ex Parte Schulhauser*, the Board determined that the broadest reasonable interpretation of a claim encompassed situations in which conditional method steps “need not be reached.” *Id.* Applying the analysis in *Ex Parte Schulhauser*, the Board determined that “in an instance where ‘the user input is recognized and the command is determined,’ the ‘otherwise’ portion of the ‘if . . . otherwise . . .’ conditional limitations need not and will not be performed.” *Id.*, p. 20. Therefore the Board determined that “the broadest reasonable interpretation of claim 1 encompasses an instance where ‘the user input is recognized and the command is determined’ and the ‘otherwise’ portion of the steps need not be reached.” *Id.* The Board further determined that the prior art “need not teach the steps recited in the ‘otherwise’ portion, which are not required to be performed under a broadest reasonable interpretation, to render claim 1 obvious.” *Id.*

Challenged claim 13 includes substantially identical “if” and “otherwise” conditional limitations as claim 1, as illustrated in the table below:

'710 claim 1	'710 claim 13
... if the user input is recognized and the command is determined: generate a first actuator signal configured to cause the actuator to output a first haptic effect; and	... if the user input is recognized and the command is determined: generating a first actuator signal configured to cause an actuator to output a first haptic effect; and

transmit the first actuator signal to the actuator; otherwise: generate a second actuator signal configured to cause the actuator to output a second haptic effect; and transmit the second actuator signal to the actuator.	transmitting the first actuator signal to the actuator; otherwise: generating a second actuator signal configured to cause the actuator to output a second haptic effect; and transmitting the second actuator signal to the actuator.
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Accordingly, in the instant petition, Petitioner applies the same analysis, *i.e.* that the prior art need not teach the steps recited in the “otherwise” portion of claim 13 to render the claim obvious.

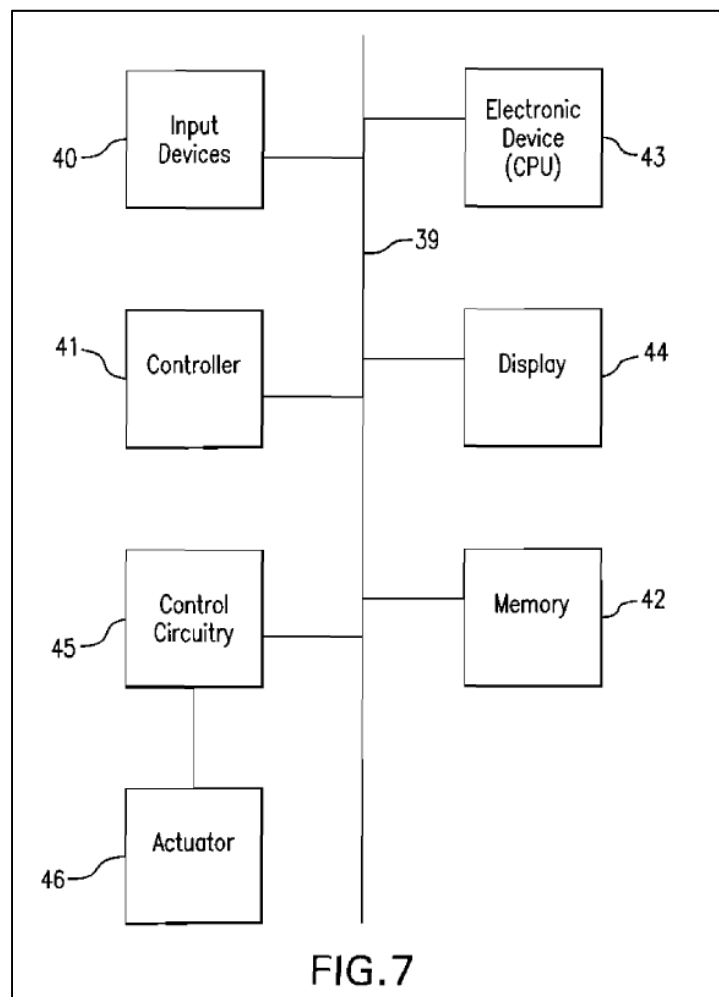
D. Ground 1: Claims 13, 19, and 20 are Obvious Under 35 U.S.C. § 103(a) (pre-AIA) in View of Martin in light of Makela

1. Martin is § 102(b) Prior Art

Martin was issued on February 26, 2008 (Ex. 1106, cover), which is more than one year before the earliest possible priority date of the ’710 patent (November 4, 2009). Martin is therefore prior art to the ’710 patent under 35 U.S.C. § 102 (b) (pre-AIA).

Martin is titled “Method and Apparatus for Providing Tactile Sensations.” Ex. 1106, Cover. More particularly, Martin discloses providing tactile feedback associated with user input on devices such as smartphones and PDAs (personal digital assistants). *Id.* at 2:16-35. In one embodiment, Martin discloses an electronic device including a CPU 43, a display 44, input devices 40, a controller

41, and an actuator 46 controlled by control circuitry 45 as shown in block diagram form in Fig. 7 reproduced below:



Martin discloses that the “input devices 40 produce input signals in accordance with the present invention, and the input signals are communicated to the controller 41 across the communication bus 39.” Ex. 1106 at 13:28-31. “In some embodiments, the input signal includes pressure data, or data from which the pressure applied to the input device can be calculated, position data, or a

combination of pressure and position data.” *Id.* at 14:17-21. “Based upon the received input signal, pressure and position data, the controller accesses a memory 42 to obtain the necessary data regarding the functionality and tactile feedback associated with the received input signal.” *Id.* at 13:33-37. “Based upon the received functionality, the controller delivers a function signal to the electronic device 43 to which the apparatus is connected. In addition, the controller 41 modifies the output on the display 44 in particular where the display is part of the input device, such as when a touchpad is used.” *Id.* at 13:41-46. “The controller uses the tactile feedback information received from the memory to provide the necessary input to control circuitry 45 to drive the actuator 46 to produce the desired tactile sensation in the appropriate input device.” *Id.* at 13:54-58.

In one embodiment, the information stored in the memory “is in the form of associations among the detected input data, the functions of the electronic device or apparatus, and the tactile sensations.” *Id.* at 14:28-31. An example of such associations is represented in tabular form in Fig. 9 shown below:

INPUT DEVICE	INPUT SIGNAL	POSITION DATA	PRESSURE DATA	FUNCTION	TACTILE SENSATION
1	--	Location 1	< Pressure 1	Search	Sensation 1
	Input 1	Location 1	Pressure 1 <=	Select	Sensation 2
2	--	Position 1	--	On	Sensation 3
	--	Position 2	--	Off	Sensation 4
3	Input 2A	--	Pressure 1	9	Sensation 5
	Input 2B	--	Pressure 2	W	Sensation 6
	Input 2C	--	Pressure 3	X	Sensation 7
	Input 2D	--	Pressure 4	Y	Sensation 8
	Input 2E	--	Pressure 5	Z	Sensation 9
4	Input 3	--	Pressure 1	Menu 1	Sensation 10
		--	Pressure 2	Menu 2	Sensation 11
		--	Pressure 3	Menu 3	Sensation 12
5	--	--	Pressure 1	2	Sensation 13
		--	Pressure 2	A	Sensation 14
		--	Pressure 3	B	Sensation 15
		--	Pressure 4	C	Sensation 16
6	Input 4	Position 1	Pressure 1	Function 1	Sensation 17
	Input 5	Position 2	Pressure 2	Function 2	Sensation 18
	Input 6	Position 3	Pressure 3	Function 3	Sensation 19
7	Input 7	Location 1	Pressure 1	Function 1	Sensation 20
	Input 8	Location 2	Pressure 2	Function 2	Sensation 21
--	AMBIGUOUS	--	--	--	Sensation 22
--	Function Failure	--	--	--	Sensation 23

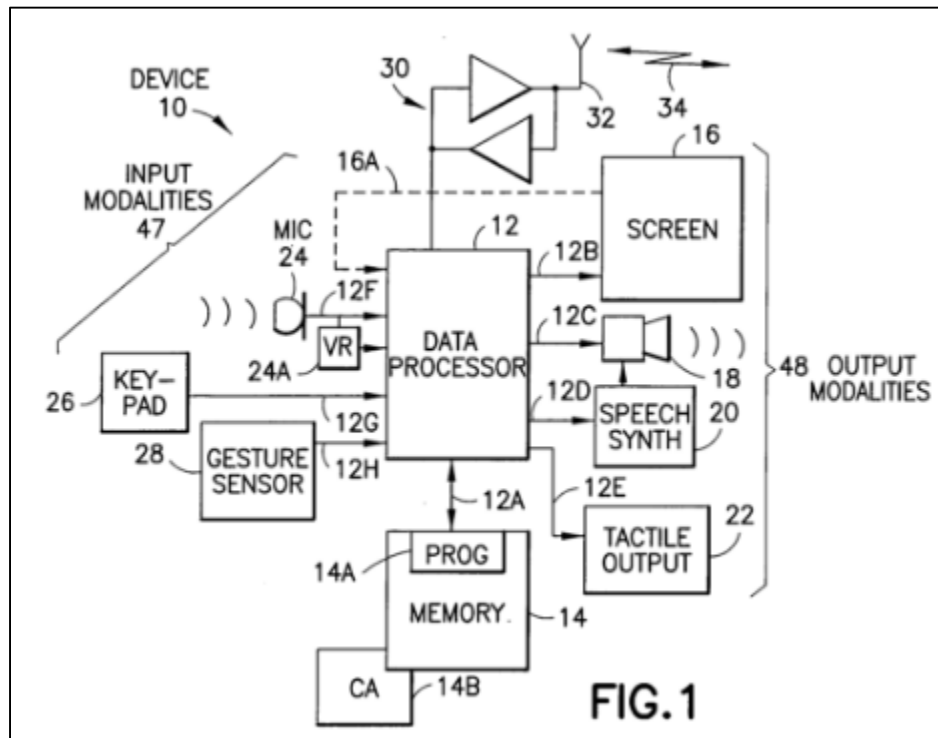
FIG. 9

2. Makela is §§ 102(a) & (e) Prior Art

Makela was filed on December 20, 2007 and published on June 25, 2009 (Ex. 1107, cover), which is before the earliest possible priority date of the '710 patent (November 4, 2009). Makela is therefore prior art to the '710 patent under 35 U.S.C. §§ 102 (a) and (e) (pre-AIA).

Makela is titled "User Device Having Sequential Multimodal Output User Interface." Ex. 1107, cover. Specifically, Makela discloses "a user interface that contains a plurality of input modalities and a plurality of output modalities, and a data processor coupled with the user interface and configurable to present a user with a content item that includes a plurality of attributes." Ex. 1107, Abstract. The input modalities can include one or more of a microphone, keypad, keyboard, and

gesture sensor. *Id.*, ¶ 17. Output modalities can include display screen, speaker, and tactile output device. *Id.* Fig. 1, reproduced below, is a block diagram depicting the various input and output modalities.



* * *

As demonstrated below, this and other information in Martin and Makela renders each of the challenged claims obvious. Ex. 1102, ¶¶ 53-83. With respect to any particular feature required by the challenged claims of the '710 patent that is not expressly disclosed in Martin with respect to the embodiment of Fig. 7 and 9 but is disclosed in connection with another embodiment of Martin, the disclosure in Martin at 20:26-30 (emphasis added) that “variations and modifications of each of the disclosed embodiments, including combinations thereof, can be made within

the scope of this invention” in combination with the knowledge and skill of a POSITA would have rendered obvious modification of the embodiment of Figs. 7 and 9 to include such features. Such modifications would be nothing more than a combination of familiar elements according to known methods, and a POSITA would recognize the desirability of such a modification. Such modifications would also be within the skill of a POSITA. Ex. 1102, ¶ 51.

3. Detailed Analysis

13.a “A computer-implemented method comprising the steps of:”

The preamble is not a claim limitation because the body of the claim defines a complete and operative system, and nothing in the body of the claim relies on the preamble for antecedent basis. Nevertheless, Martin discloses the preamble.

For example, Martin discloses “methods and systems for providing tactile sensations.” Ex. 1106, 2:66-67. These methods and systems can include “for example soft-keys that are computer generated and displayed on a screen.” *Id.*, 3:2-4. Martin further discloses that its invention can be implemented in “wide variety of electronic devices including telephones, mobile telephones, remote controls, gamepads, joystick handles, automotive controls (radios, Compact Disc (CD) players, automobile functions, etc.), consumer electronics devices, Personal Digital Assistants (PDAs), personal computers, laptop computers, portable gaming devices, pagers, I-pagers, audio equipment, televisions, security or alarm systems,

Automated Teller Machines (ATM), calculators, home appliances, and white goods.” *Id.*, 3:4-13. Thus, one skilled in the art would understand that the methods disclosed by Martin are “computer-implemented.” Ex. 1102, ¶ 54.

13.b “receiving, from a sensor, a sensor signal associated with a user input”

Martin discloses sensors, including input devices 40 depicted in Fig. 7. *See* Ex. 1106, Fig. 7; Ex. 1102, ¶ 55. Martin teaches that an input device “can be any device capable of transmitting an input signal.” Ex. 1106, 3:17-18. Martin discloses that input signals produced by the input device 40 (the sensor) “are communicated to the controller 41 across the communication bus 39.” *Id.*, 13:28-31; Ex. 1102, ¶ 55. Accordingly, Martin discloses that the controller 41 receives sensor signals from input devices 40 (sensors) associated with the user input.

Martin does not expressly disclose the input device (sensor) as comprising a sensor for sensing user inputs comprising speech information, as recited in limitation 13.c (emphasis added): “recognizing the user input and determining a command associated with the speech information.” However, Martin contemplates that the electronic device may include a wide variety of potential input devices. For example, Martin discloses that input devices “may include an analog switch, a force sending resistor, a strain gauge based sensor, a capacitive 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.*, 3:27-31.

Makela likewise discloses a variety of input devices for use in an electronic device such as a mobile phone or PDA, including specifically input devices for sensing speech input. For example, Makela discloses input devices including “one or more of an acoustic input transducer such as a microphone 24, an associated speech or voice recognition function (VR) 24A, a keypad or keyboard 26 and a gesture sensor 28...” Ex. 1107, ¶ 17 (emphasis added). A POSITA would appreciate that an acoustic input transducer such as a microphone is a sensor that senses audible signals, such as speech. Ex. 1102, ¶ 57.

It would have been obvious for a POSITA at the time of the alleged invention of the ’710 patent to combine these teachings of Makela with Martin. Specifically, a POSITA would have found it obvious to use an acoustic input transducer such as a microphone as described by Makela as the input device of Martin. Ex. 1102, ¶ 58. In this regard, Martin contemplates an electronic device, such as a mobile phone or PDA, that includes a number of different types of input devices. *See, e.g.*, Ex. 1106, 3:27-31 (the input device “may include an analog switch, a force sending resistor, a strain gauge based sensor, a capacitive 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.”) (emphasis added); *id.*,

1:19-21 (describing the inventive system as including electronic devices such as “mobile telephones and Personal Digital Assistants (PDAs)”). Makela similarly discloses an electronic device, such as a mobile phone or PDA, with multiple input modalities, specifically including a microphone. *See, e.g.*, Ex. 1107, ¶ 28 (“...the user may activate one of the input modalities 47, such as the microphone 24, the keypad or keyboard 26, the gesture sensor 28 or the touch screen 16...”); *id.*, ¶ 1 (describing the inventive system as including “mobile devices suitable for use in a wireless communication system”); Ex. 1102, ¶ 58. Because both references disclose the use and desirability of various types of input modalities in similar types of devices (*i.e.* mobile phones and PDAs), it would have been obvious to a POSITA to consider the teachings of Makela in designing a system according to the teachings of Martin. *Id.*, ¶ 58.

Furthermore, Makela provides express motivation for using a microphone as an input device in an electronic device, such as a mobile phone or PDA. For example, Makela discloses the benefits of using a microphone for input in a mobile device, noting that “[a]s it is typically the case that a mobile device used in a certain context cannot continuously be attended by the user, those modalities that enable eyes-free reception and hands-free interaction can be particularly useful.” Ex. 1107, ¶ 3; Ex. 1102, ¶ 59. As such, Makela provides the motivation that would have led a POSITA to modify Martin’s device to use an acoustic sensor, such as a

microphone, for speech input. Ex. 1102, ¶ 59. In this regard, Martin teaches that the embodiment of Figures 7 and 9 may be implemented in a mobile device with the capability to place and receive phone calls. Ex. 1106, 16:33-37 (describing Function 1 in the Table of Fig. 9 being associated with various operating modes including “missed phone calls”); 16:59-61 (“In an embodiment of the apparatus of the present invention, for example, the apparatus is incorporated into a mobile phone...”). A POSITA would appreciate that a mobile phone capable of placing and receiving calls would include a microphone. Ex. 1102, ¶ 59. And, it would have been obvious to a POSITA that the same microphone could be used as an input device for spoken commands, as taught by Makela. Ex. 1102, ¶ 59.

A POSITA would have been further motivated to combine the teachings of Martin and Makela, because applying a known technique (*i.e.*, Makela’s microphone as an input device) to a known device (*i.e.*, the one disclosed by Martin) that was ready for improvement (as taught by Makela) would yield predictable results (*i.e.*, to provide the user with another input method). Ex. 1102, ¶ 60. In addition, combining Martin with Makela in this manner would have been obvious to try because it amounts to merely choosing from a finite number of identified, predictable solutions for providing input to a mobile device, such as a mobile phone or PDA, with a reasonable expectation of success. Ex. 1102, ¶ 60. 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.

Ex. 1102, ¶ 60.

13.c “recognizing the user input and determining a command associated with the speech information”

As discussed above in claim limitation 13.b, the combination of Martin and Makela results in the system of Martin having an acoustic sensor, such as a microphone.

Makela discloses speech recognition software for recognizing speech input from the microphone and determining an associated command. For example, Makela explains that “[t]he microphone 24 may be coupled with the speech recognition functionality of the device 10 (the VR 24A) whereby a word or words spoken by the user can be interpreted by the data processor 12 as representing a command.” Ex. 1107, ¶ 17. Makela further discloses an exemplary use case in the context of incoming phone call: “In this case assume the user receives a call in a mobile context via the transceiver 30, and the incoming call is indicated with a ringing tone. To hear the caller name via the speech synthesizer 20 the user triggers a voice output token with a speech command: ‘who’. If the user does not speak the voice command, then the caller's name is not enunciated, and the device remains quiet.” *Id.*, ¶ 38.

Martin likewise discloses recognizing user input and determining a command associated with the user input. For example, in one embodiment, Martin discloses a memory storing associations between user input and functions and tactile sensations associated with the user input. *Id.*, 14:28-31 (the information in memory “is in the form of associations among the detected input data, the functions of the electronic device or apparatus, and the tactile sensations.”). An example of such associations is represented in tabular form in Fig. 9 shown below:

INPUT DEVICE	INPUT SIGNAL	POSITION DATA	PRESSURE DATA	FUNCTION	TACTILE SENSATION
1	--	Location 1	< Pressure 1	Search	Sensation 1
	Input 1	Location 1	Pressure 1 <=	Select	Sensation 2
2	--	Position 1	--	On	Sensation 3
	--	Position 2	--	Off	Sensation 4
3	Input 2A	--	Pressure 1	9	Sensation 5
	Input 2B	--	Pressure 2	W	Sensation 6
	Input 2C	--	Pressure 3	X	Sensation 7
	Input 2D	--	Pressure 4	Y	Sensation 8
	Input 2E	--	Pressure 5	Z	Sensation 9
4	Input 3	--	Pressure 1	Menu 1	Sensation 10
		--	Pressure 2	Menu 2	Sensation 11
		--	Pressure 3	Menu 3	Sensation 12
5	--	--	Pressure 1	2	Sensation 13
		--	Pressure 2	A	Sensation 14
		--	Pressure 3	B	Sensation 15
		--	Pressure 4	C	Sensation 16
6	Input 4	Position 1	Pressure 1	Function 1	Sensation 17
	Input 5	Position 2	Pressure 2	Function 2	Sensation 18
	Input 6	Position 3	Pressure 3	Function 3	Sensation 19
7	Input 7	Location 1	Pressure 1	Function 1	Sensation 20
	Input 8	Location 2	Pressure 2	Function 2	Sensation 21
--	AMBIGUOUS	--	--	--	Sensation 22
--	Function Failure	--	--	--	Sensation 23

FIG. 9

Martin further explains that “[h]aving obtained the input data from the input device, or from a plurality of input devices, the controller then accesses a memory device 54 in which is stored at least one database containing information necessary to produce the desired function in the electronic device and the predetermined

tactile sensation.” Ex. 1106, 14:22-27. From this disclosure, a POSITA would understand or at least have found obvious that Martin’s controller would be configured to recognize that an input signal (*e.g.* “Input 3”) from an input device (*e.g.* Input Device 4) is associated with a user input intended to invoke a command in the form of “Menu 1” and associated with a “Sensation 10” as shown in the middle of Fig. 9 above. Ex. 1102, ¶ 64. Invoking a set of menus should be found to constitute a command in light of Immersion’s infringement contentions in the ITC (Ex. 1110 at 35-38) alleging that displaying a menu as a result of a user pressing an icon on a touchscreen satisfies this claim element. Ex. 1102, ¶ 64.

Moreover, a POSITA would understand and found obvious that to implement the Martin system with a microphone input device, by modifying the table depicted in Figure 9 to include a microphone as an input device. Ex. 1102, ¶ 65. For the reasons discussed above in connection with claim element 13.b, A POSITA would have been motivated to utilize a microphone as an input device. *See also* Ex. 1102, ¶ 65.

Furthermore, a POSITA would appreciate that input signals from the microphone corresponding to spoken commands likewise could be associated with corresponding Functions and Tactile Sensations in the table of Figure 9, in the same way that input signals from other input devices are associated with corresponding Functions and Tactile Sensations in the table of Figure 9. Ex. 1102,

¶ 66. Such a modification would have been well within the skill of a POSITA, as it would simply involve applying Martin’s teachings regarding the use of a table to associate user input from an input device with corresponding functions and tactile sensations with a particular type of input device, *i.e.* a microphone. *Id.* And, such a modification could have been accomplished with minimal effort, and would have led to predictable results. *Id.*, ¶ 66.

13.d “if the user input is recognized and the command is determined: generating a first actuator signal configured to cause an actuator to output a first haptic effect; and ...”

As discussed in the preceding section, a POSITA would understand or at least have found obvious that Martin’s controller 41 would be configured to recognize that an input signal “Input 3” from an input device 4 was associated with a user input intended to invoke a command in the form of “Menu 1” and associated with a “Sensation 10” as shown in the middle of Fig. 9 above. Ex. 1102, ¶ 67.

Martin further discloses that the information from the table in the memory is used by the controller 41 to generate a signal to be transmitted to the control circuitry 45 via the communications bus 39 that will cause the actuator 46 to generate “Sensation 10.” Ex. 1106 at 13:54-58 (the controller 41 “uses tactile feedback control information received from the memory to provide the necessary input to the control circuitry 45 to drive the actuator 46 to produce the desired tactile sensation”) and at 14:22-27 (“[h]aving obtained the input data from the

input device, or from a plurality of input devices, the controller then accesses a memory device 54 in which is stored at least one database containing information necessary to produce the desired function in the electronic device and the predetermined tactile sensation.”) (emphasis added). Martin then discloses that the function information is delivered to the electronic device and that the controller 41 then causes the actuator to produce the predetermined tactile sensation. *Id.* at 14:50-57. Thus, a POSITA would understand or at least find obvious that Martin discloses a controller that generates a first actuator signal when the user input is recognized and command is determined. Ex. 1102, ¶ 68.

13.e “if the user input is recognized and the command is determined: ... transmitting the first actuator signal to the actuator;”

As discussed above in element 13.d, the controller generates and transmits a signal that causes the actuator to produce the desired haptic effect (*e.g.*, “Sensation 10”). Although Martin does not disclose that the signal generated by the controller is transmitted to the actuator, Martin does disclose that the signal generated by the controller is transmitted to control circuitry 45, which in turn generates an actuator signal for driving actuator 46. Ex. 1106, 13:54-58 and 14:22-27. Thus, to the extent the broadest reasonable interpretation of this limitation encompasses transmitting the first actuator signal to control circuitry, which in turn generates an actuator signal for driving the actuator, Martin discloses or at least renders obvious this limitation. Ex. 1102, ¶ 69.

To the extent this limitation is construed as requiring generating a first actuator signal and transmitting this generated signal to the actuator, a POSITA would have found it obvious to employ an actuator 46 that could accept a digital control signal directly from the controller 41 via the bus 39. Ex. 1102, ¶ 70. Alternatively, a POSITA would have found it obvious to utilize a controller such as one selected from the MSC120x family that includes a digital-to-analog converter (*see* Ex. 1108 at 1) and connect the actuator 46 to the output of that digital-to-analog converter.¹ Ex. 1102, ¶ 70. In both cases, a POSITA would have been motivated to do so in order to reduce the number of components and save space in the electronic device of Fig. 7. *Id.*

13.f “otherwise: generating a second actuator signal configured to cause the actuator to output a second haptic effect; and ...”

As discussed above in Section V.D.3, the PTAB determined in IPR2016-01603 that under the broadest reasonable interpretation of the conditional

¹ Literature for products in the MSC120X family were available at least as early as February 24, 2009, and earlier, as evidenced by the citation of such literature in Ex. 1109, front cover. To the extent that the limitation 13.e is construed as requiring generating the signal to drive the actuator and transmitting this generated signal to the actuator, Petitioner respectfully requests consideration of Ground 1 as including Martin, Makela, and Ex. 1108.

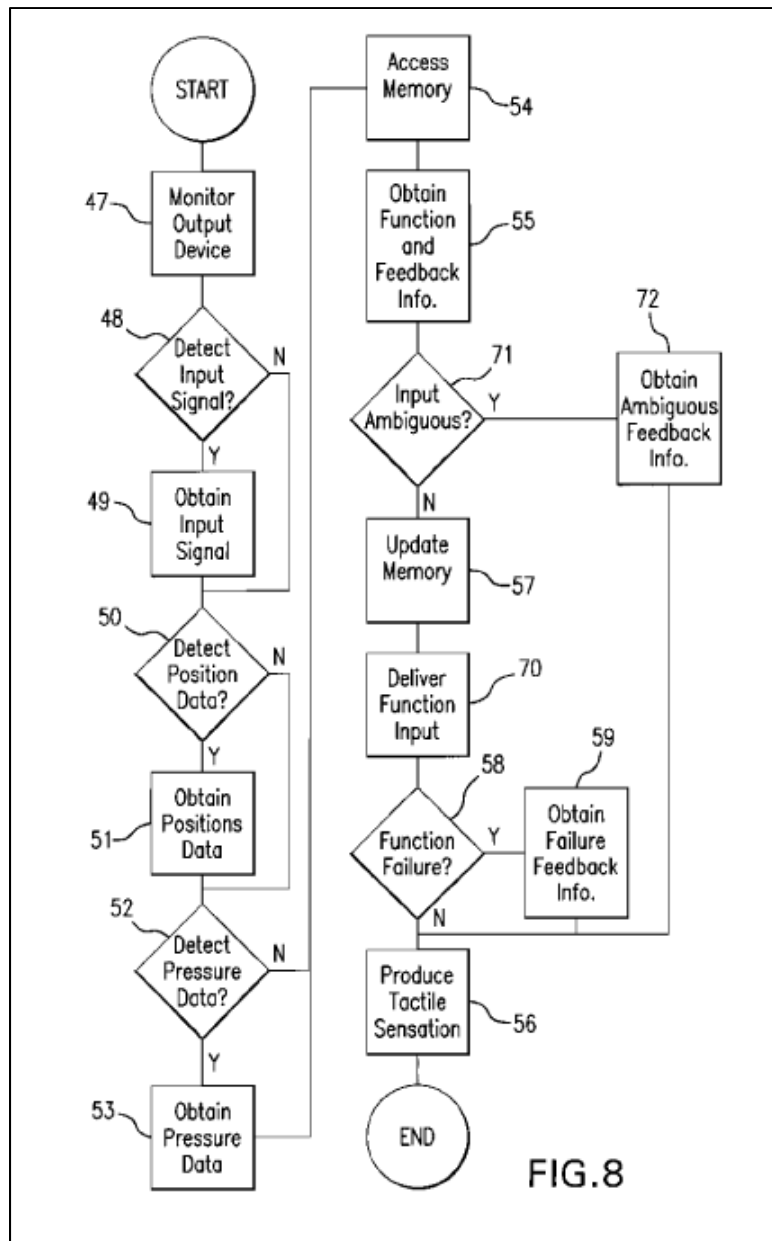
limitations of claim 1, a prior art reference does not need to teach the steps recited in the “otherwise” portion of the claim in order to render the claim obvious.

IPR2016-01603, Paper 7 at 19 (citing *Ex Parte Schulhauser*, 2016 WL 6277792 (PTAB April 28, 2016)). For the same reasons, Martin need not teach the steps following the otherwise limitation of claim 13 in order to render the claim obvious.

Id.

Regardless, Martin discloses this limitation. For example, Martin discloses that the “controller can also determine if [] an ambiguous input is received.” Ex. 1106, 16:3-4. “The ambiguous input can represent... an input... that is not associated with an input device.” *Id.*, 16:4-10. “In response to receiving an ambiguous input signal, the controller obtains the associated ambiguous tactile sensation, Sensation 22, in one or more input devices associated with the ambiguous input.” *Id.* at 16:10-14. Thus, as discussed above, a POSITA would understand or at least find obvious that when the user input is recognized as an input listed in the table of Fig. 9 and a command (i.e. the associated function listed in the table of Fig. 9) is determined, then the associated tactile sensation is provided. Otherwise, the input is considered ambiguous and the associated ambiguous tactile sensation is provided. Ex. 1102, ¶ 72.

The “if... otherwise...” conditional structure of claim 13 is further illustrated in Figure 8, reproduced below.



Ex. 1106, Fig. 8, 13:59-16:21. In the left-hand column of the flowchart, the device first obtains signals from the input device. *Id.* at 14:1-21. Then, at blocks 54 and 55, the device accesses memory (*e.g.*, the table of Figure 9), to determine whether the user input is associated with a corresponding function and tactile sensation. *Id.* at 14:22-32. At block 71, the device determines whether the input is ambiguous.

Id. at 16:3-21. If the input is not ambiguous (*i.e.*, the user input is recognized and a corresponding function determined in the table of Figure 9), the device proceeds downward and eventually produces the tactile sensation associated with the user input at block 56. Ex. 1106, 14:47-57. Otherwise (*i.e.*, the input is ambiguous), the flowchart proceeds to the right to block 72. *Id.* At block 72, there is a second access to the table to obtain the tactile sensation associated with an ambiguous input in the row labeled “AMBIGUOUS,” and the ambiguous tactile sensation is generated. Ex. 1106, 16:3-14, Fig. 9; Ex 1102, ¶ 74.

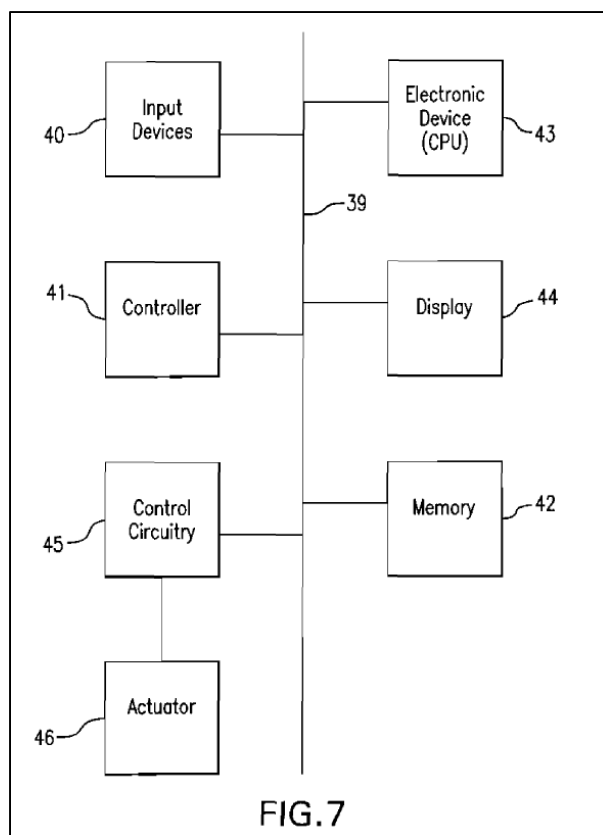
13.g “otherwise: ... transmitting the second actuator signal to the actuator.”

As discussed above in element 13.f, the controller generates and transmits a signal that causes the actuator to produce the AMBIGUOUS haptic effect (*e.g.*, “Sensation 22”). Although Martin does not disclose that the signal generated by the controller is transmitted to the actuator, Martin does disclose that the signal generated by the controller is transmitted to control circuitry 45, which in turn generates an actuator signal for driving actuator 46. Ex. 1106, 13:54-58 and 14:22-27. Thus, to the extent the broadest reasonable interpretation of this limitation encompasses transmitting the first actuator signal to control circuitry, which in turn generates an actuator signal for driving the actuator, Martin discloses or at least renders obvious this limitation. Ex. 1102, ¶ 75.

To the extent this limitation is construed as requiring generating a first actuator signal and transmitting the generated signal directly to the actuator, it would have been obvious to modify the Martin system to do so for the same reasons discussed above in connection with claim element 13.e. Ex. 1102, ¶ 76. For example, a POSITA would have found it obvious to employ an actuator that could accept a digital signal, or alternatively utilize a controller that generates an analog signal. *See* discussion of claim element 13.e, above. In both cases, a POSITA would have been motivated to do so in order to reduce the number of components and save space in the electronic device of Fig. 7. Ex. 1102, ¶ 76.

Claim 19: “The computer-implemented method of claim 13, further comprising: generating a display signal configured to cause a display to display an image; and transmitting the display signal to the display.”

Martin discloses a display 44 in communication with the controller 41 via the communications bus 39 as shown in Fig. 7 below:



Ex. 1106, 13:26-28. Martin discloses that the controller is in communication with the display 44 as Martin discloses that “[i]n addition, the controller 41 modifies the output on the display 44 in particular where the display is part of the input device, such as when a touchpad is used.” *Id.*, 13:43-46; Ex. 1102, ¶ 78.

Martin does not expressly disclose that the embodiment of Figs. 7 and 9 generates a display signal that causes the display to generate an image. However, Martin discloses that:

In addition, the controller 41 modifies the output on the display 44 in particular where the display is part of the input device, such as when a touchpad is used. Alternatively, the electronic device

controls and updates the display. In addition, the controller can be the CPU associated with the electronic device and the memory can be the memory associated with the electronic device. The arrangement of the controller, memory and display depends on whether or not the apparatus is constructed as a standalone device that can be retrofitted into an existing electronic device or is incorporated into the electronic device itself.

Id., 13:46-50. The first part of this passage appears confusing at first blush because Martin uses “electronic device” in this passage to refer to both the CPU 43 individually and the device that incorporates the CPU 43 as a whole. Nonetheless, a POSITA would understand this passage. Ex. 1102, ¶ 80. In particular, the statement that “alternatively, the electronic device controls and updates the display” would be understood by a POSITA to mean that, in the non-alternative embodiment, the display is both controlled and updated by the controller 41, and that the Electronic Device (CPU) 43 instead of the controller 41 controls and updates the display in the alternate embodiment. *Id.*

To the extent this is found not to be disclosed in Martin, a POSITA would have found it obvious. A POSITA would further understand, or at least would have found obvious, that the controller 41 would control the display by generating and transmitting to the display a display signal configured to cause the display to generate an image, such as an icon or graphical menu as discussed above in

connection with element 13.c, as graphical user interfaces were well known in the art at the time of the '710 patent. *Id.*

Claim 20: “The computer-implemented method of claim 13, wherein the first haptic effect is configured to emulate the command.”

As discussed above in Section V.D.3, based on Immersion’s infringement allegations in the ITC action, the term “haptic effect is configured to emulate the command” should be broadly construed such that a haptic effect in the form of a short vibration is found to emulate a command to display a menu. As further discussed above in connection with limitation 13.c of Ground 1, Martin discloses that the command associated with the user input “can represent one set of menus from a list of menus or one operating mode out of a plurality of operating modes.” *See also* Ex. 1106, 16:33-35. Martin further discloses a haptic effect in the form of a “pop.” *Id.*, 18:33-34. Although not explicitly disclosed in Martin, a POSITA would understand that a “pop” is of generally short duration based on the plain and ordinary meaning of this word, and based on experience in haptics would understand that a vibration of, e.g., 10 milliseconds could constitute a haptic “pop.” Ex. 1102, ¶ 82. In determining what type of haptic effect should accompany a command that results in the display of a menu, a POSITA would find it obvious to select a “pop” haptic effect when “popping up” a menu, to, for example, avoid the intermingling of haptic effects if the user quickly makes a menu selection

associated with another command that results in the generation of another haptic effect. *Id.*

Martin also discloses in another embodiment that “the number of occurrences of a distinct vibrotactile sensation, such as a pop, corresponds to the index number of the menu option within a list of options. In such an embodiment, one pop signifies the first option, two pops signifies the second option.” Ex. 1106, 18:33-37. It would have been obvious to a POSITA to incorporate this disclosure of Martin into embodiments which display menus with lists of multiple options. Ex. 1102, ¶ 83. In such an embodiment, the number of pops emulates the command because the number of pops corresponds to the position of the command in the menu. *Id.*

E. Ground 2: Claims 13, 18, and 19 are Obvious Under 35 U.S.C. § 103(a) (pre-AIA) Over Theodore in View of Shahoian

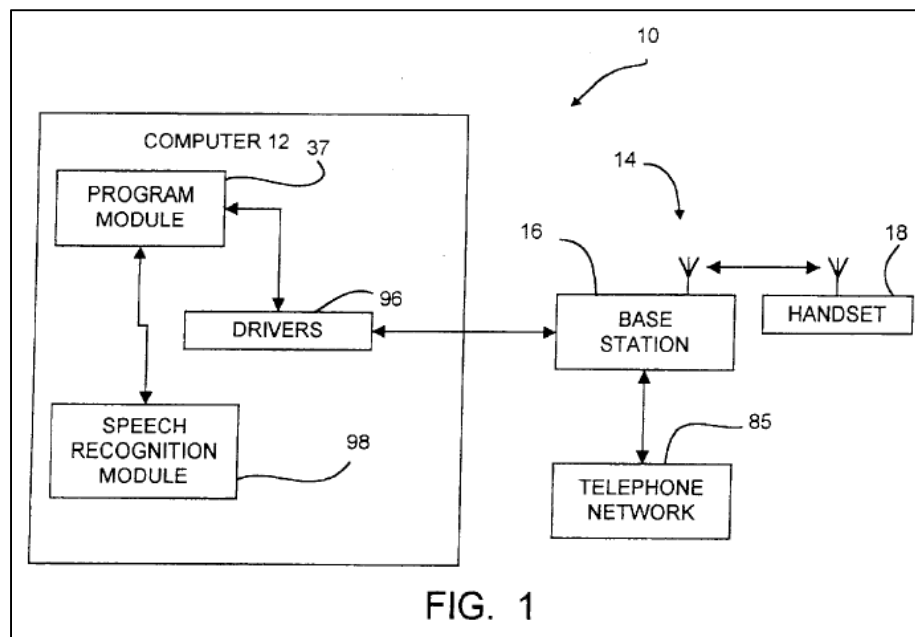
1. Theodore is § 102 (b) Prior Art

Theodore issued on January 7, 2003 (Ex. 1104, cover), which is more than one year before the earliest possible priority date of the ’710 patent (November 4, 2009). Theodore is therefore prior art to the ’710 patent under 35 U.S.C. § 102 (b) (pre-AIA).

Theodore is titled “Apparatus and Method for Providing Speech Input to a Speech Recognition System.” Ex. 1104, cover. Theodore is generally directed to an apparatus and method for providing speech input to a computer with speech

recognition capabilities. *Id.*, Abstract. More particularly, Theodore discloses that the apparatus is “programmed to carry out voice recognition based on voice data produced from sounds spoken by a user” through an input device such as cordless phone or portable handset. *Id.*, 2:20-26.

One embodiment of the Theodore system is depicted in Figure 1, reproduced below.



Ex. 1104, Fig. 1. In the embodiment depicted in Fig. 1, Theodore discloses an apparatus 10 comprising a computer 12 and an input device 14. *Id.*, 1:18-23. The input device 14 may consist of a cordless phone with a base station 16 and a handset 18. *Id.*, 2:23-26. The input device includes a switch which allows the user to indicate to the computer when input speech is going to be provided by the user. *Id.*, 2:37-40; 5:53-55. When activated by the user, an “Activation Signal” is sent

from the input device to the computer and the computer transmits a “Computer Waiting Signal” to the handset. Ex. 1104, 5:56-67. The computer also prepares a speech recognition module and transmits a “Speech Recognition Ready Signal” to the input device which indicates that the computer is ready to accept speech input. *Id.*, 6:33-38. The user can then enter voice instruction. *Id.*, 6:44-46.

Upon receiving voice input, the speech recognition module evaluates the input. *Id.*, 6:62-7:4. If the voice input is recognized, then the speech module transmits a “Recognized Signal” to the handset, which provides an indication to the user that the voice input has been recognized. *Id.*, 7:11-18. Otherwise, if the voice input is not recognized, a “Not Recognized Signal” is transmitted to the handset, which provides an indication to the user that the voice input was not recognized. *Id.*, 6:62-7:4.

Theodore discloses that the input device 14 provides indications of whether the voice input was “Recognized” or “Not recognized” in the form of audible tones. Ex. 1104, 6:62-7:18. However, Theodore also contemplates various other means for providing these indications to the user in place of or in addition to audible tones, including, for example, lights or tactile buzzers. *Id.*, 7:30-36 (“other types of indications can be used in addition or in place of the audible tones described above for the Activation Signal, the Speech Recognition Ready Signal, the Computer Error Signal, the Recognized Signal and the Not Recognized Signal.

For example, each of these signals can initiate visual indicators such as lights, or tactile indicators such as buzzers.”) (emphasis added).

Notably, the European Patent Office found that the PCT application of Theodore (WO 99/45531 A1) anticipated all claims of the ’710 patent’s corresponding PCT application (PCT/US2010/054967, Ex. 1114), including claims substantially similar to the ’710 patent claims challenged in this petition. *See* Ex. 1112, Patent Cooperation Treaty, International Search Report, Application No. PCT/US2010/054967. *See also id.*, Written Opinion of International Searching Authority (finding claims 10, 14, and 15 as lacking novelty and/or inventive step over Theodore’s PCT publication). The chart below provides a comparison of the rejected PCT application claims and the challenged claims in this petition.

PCT/US2010/054967	’710 Patent
10. A computer-implemented method comprising the steps of: receiving speech information from a microphone; recognizing the speech information and determining a command associated with the speech information; if the speech information is recognized and the command is determined: generating a first actuator signal configured to cause an actuator to output a first haptic effect; and transmitting the first actuator signal to	13. A computer-implemented method comprising the steps of: receiving, from a sensor, a sensor signal associated with a user input; recognizing the user input and determining a command associated with the speech information; if the user input is recognized and the command is determined: generating a first actuator signal configured to cause an actuator to output a first haptic effect; and transmitting the first actuator signal to

the actuator; otherwise: generating a second actuator signal configured to cause the actuator to output a second haptic effect; and transmitting the second actuator signal to the actuator.	the actuator; otherwise: generating a second actuator signal configured to cause the actuator to output a second haptic effect; and transmitting the second actuator signal to the actuator.
14. The computer-implemented method of claim 10, further comprising: generating an audio signal configured to cause a speaker to output a sound; and transmitting the audio signal to the speaker.	18. The computer-implemented method of claim 13, further comprising: generating an audio signal configured to cause a speaker to output a sound; and transmitting the audio signal to the speaker.
15. The computer-implemented method of claim 10, further comprising: generating a display signal configured to cause a display to display an image; and transmitting the display signal to the display.	19. The computer-implemented method of claim 13, further comprising: generating a display signal configured to cause a display to display an image; and transmitting the display signal to the display.

2. Shahoian is § 102 (b) Prior Art

U.S. Patent Application Publication No. 2002/0033795 (“Shahoian”)

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 ’710 patent (Nov. 4, 2009). Ex. 1105, cover page.

Shahoian relates to touch sensitive input devices that “output haptic feedback such as tactile sensations” to users. Ex. 1105, ¶ 43. The disclosure of Shahoian is applicable to a range of input devices “such as gamepads, joysticks, steering wheels, touchpads, spherical controllers, finger pads, knobs, track balls, remote control device, cell phone, personal digital assistant, etc.” *Id.*, ¶ 74.

* * *

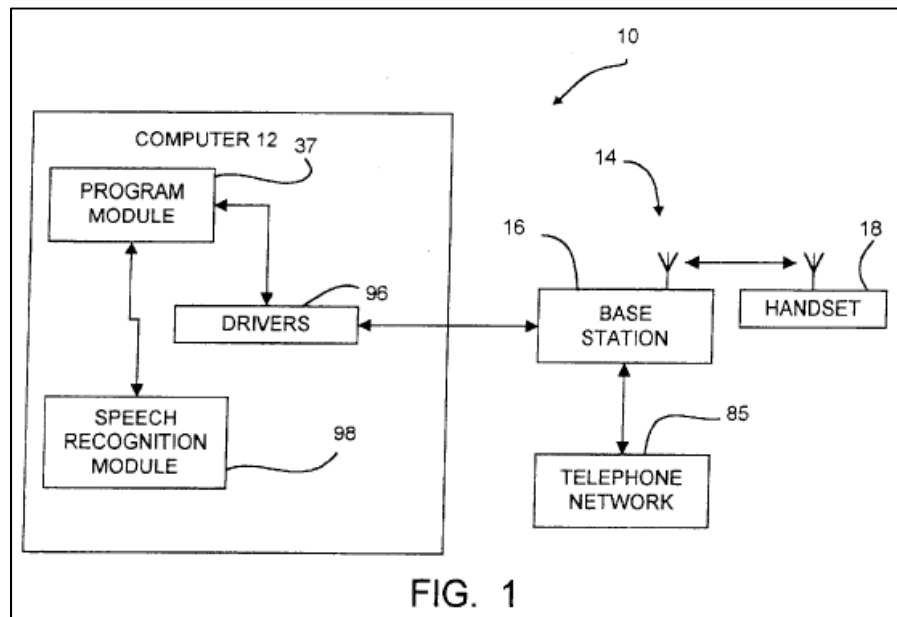
As demonstrated below, this and other information in Theodore and Shahoian renders each of the challenged claims obvious. Ex. 1102, ¶¶ 93-117.

3. Detailed Analysis

13.a “A computer-implemented method comprising the steps of:”

The preamble is not a claim limitation because the body of the claim defines a complete and operative system, and nothing in the body of the claim relies on the preamble for antecedent basis. Nevertheless, Theodore discloses the preamble.

Specifically, Theodore discloses “[a]n apparatus and a method for providing speech input into a computer having a speech recognition system and an input device remote from the computer.” Ex. 1104, 1:53-54. Further, Fig. 1 of Theodore depicts an embodiment of the invention using a computer:

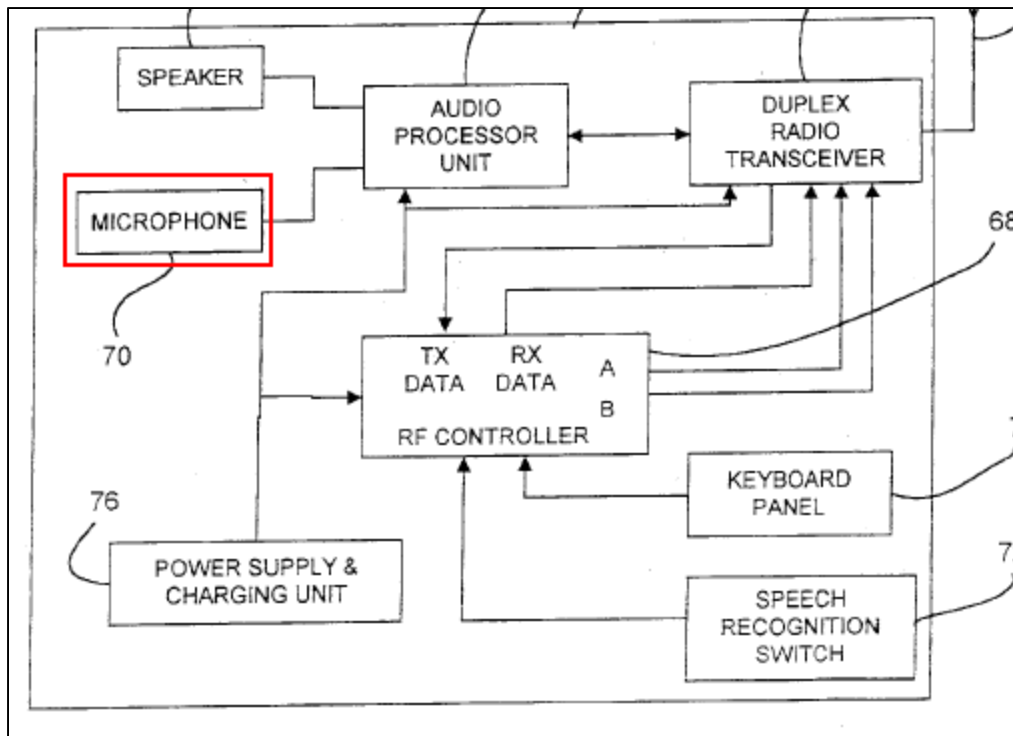


Ex. 1104, Fig. 1. Thus, one skilled in the art would understand that the methods disclosed by Theodore are “computer-implemented.” Ex. 1102, ¶ 94.

13.b “receiving, from a sensor, a sensor signal associated with a user input”

Theodore discloses a sensor in the form of a microphone. For example, Theodore discloses that “[a] user may enter commands and information into the personal computer 12 through devices such as a keyboard 40, a pointing device 42 and a microphone 43 located at the site of the personal computer 12, as well as through the input device 14 (FIG. 2B), discussed in detail below, which allows the user to input speech from a location remote from the computer 12.” Ex. 1104, 3:40-46 (emphasis added); Ex. 1102, ¶ 96.

A microphone in input device 14 is depicted in Figure 2B, reproduced below.



Ex. 1104, Fig. 2b (annotated); *see also* 1:55-59 (“[t]he input device includes a microphone, an indicator and a user operated switch.”). Theodore does not expressly disclose that the microphone generates signals. However, a POSITA would understand or at least have found obvious that a microphone is a transducer that converts sound into electrical signals. *See, e.g.*, Ex. 1103 (Microsoft Computer Dictionary) (“microphone n. 1. A device that converts sound waves into analog electrical signals.”); Ex. 1102, ¶ 98.

Theodore further discloses receiving inputs from the microphone associated with user input, in the form of voice commands. For example, Theodore discloses that computer 12 is “programmed to carry out voice recognition based on voice

data produced from sound spoken by a user through an input device 14.” Ex. 1104, 2:20-23.

Accordingly, Theodore discloses receiving from the sensor (microphone) sensor signals associated with the user input (voice command). Ex. 1102, ¶ 100.

13.c “recognizing the user input and determining a command associated with the speech information”

Theodore discloses recognizing the user input and determining a command associated with the speech information. For example, Theodore “[a] user may enter commands and information into the personal computer 12 through devices such as a keyboard 40, a pointing device 42 and a microphone...” and that when a microphone is used “the speech recognition module 98 evaluates the input voice instruction against the set of valid instructions.” Ex. 1104, 3:40-46; 6:62-64.

Theodore further discloses that “[i]f the voice instruction received from the user does not correspond with any of the expected instructions in the set of valid instructions, program flow continues to step 122 whereat a ‘Not Recognized Signal’ is transmitted to the user indicating that the voice instruction received was not recognized.” *Id.*, 6:64-7:2. However, if the voice command matches a set of valid voice instructions, then “the system generates a ‘Recognized Signal’ that is transmitted to the user...” *Id.*, 7:9-15.

After determining that a valid voice command was received, “[s]ystem operation is then transferred to the program module 37 at step 126 where

instructions are provided to components of the computer 12 necessary to complete the task in accordance with the voice instructions received.” Ex. 1104, 7:18-22. In response to the valid speech input, the system can carry out various commands associated with the input: “For example, the computer 12 may open, close or transfer files requested by the user. In another application, the program module 37 may begin recording a message from the user, or play a selected message to the user. At the completion of the task, the system awaits reactivation of the speech recognition switch 72 at step 102 indicating that another voice instruction is to be provided by the user.” Ex. 1104, 7:18-29.

Accordingly, Theodore discloses recognizing the user input (voice command) using the speech recognition module and determining a command (valid instruction) associated with the speech information. Ex. 1102, ¶ 104.

13.d “if the user input is recognized and the command is determined: generating a first actuator signal configured to cause an actuator to output a first haptic effect; and”

As discussed above in connection with the preceding claim limitation, Theodore discloses that if the user input is recognized and the command is determined, then “the system generates a ‘Recognized Signal’ that is transmitted to the user...” *Id.*, 7:9-15. Theodore teaches that this “Recognized Signal” is sent to the user in the form of “an audible tone provided to the user.” *Id.*, 7:15-18. However, Theodore does not limit its disclosure to audible tones. Rather,

Theodore discloses that “it is worth noting, that other types of indications can be used in addition or in place of the audible tones described above for the Activation Signal, the Speech Recognition Ready Signal, the Computer Error Signal, the Recognized Signal and the Not Recognized Signal. For example, each of these signals can initiate visual indicators such as lights, or tactile indicators such as buzzers.” *Id.*, 7:30-36.

A POSITA would understand or at least find obvious that a “buzzer” which provides a “tactile indication” inherently comprises or includes an actuator. Ex. 1102 ¶ 106; *see also* Ex. 1105, ¶ 106 (describing a buzzer for generating tactile sensations as an actuator). Indeed, a POSITA would appreciate that while there are many types of actuators that may be used to generate vibration feedback (*e.g.* an LRA, ERM or piezo-electric actuator), some type of actuator is required to convert electrical energy into mechanical energy in order to generate tactile feedback in an electronic device, such as the device disclosed by Theodore. Ex. 1102 ¶ 106. At a minimum, it would have been obvious to a POSITA that the buzzer could be implemented using an actuator. Indeed, it was well known in the art that actuators were components capable of, and typically used when generating haptic effects. *See, e.g.*, Ex. 1115 (U.S. Patent No. 5,999,168 to Rosenberg, et al.) at 9:41-52 (describing various types of actuators for generating force feedback); 3:3

(describing “force feedback ‘effects,’ such as jolts, vibrations, etc.”); 4:7-11 (same); 8:13-41 (same); Ex. 1102 ¶ 106.

Theodore does not expressly disclose generating an actuator signal configured to activate the tactile buzzer and output a haptic effect. However, Shahoian discloses this. For example, Shahoian discloses that: “To provide the desired haptic sensations, a large piezo buzzer should provide large sustainable displacements (accelerations) of the mass and the carrier frequency (the frequency at which it oscillates) should be modulated with the haptic signal.” Ex. 1105, ¶ 106. Shahoian further discloses circuitry for driving the actuator, such as a self-exciting oscillation circuit for driving the actuator and a gating feature “to start and stop the oscillation as well as a proportional control to allow modulation of the amplitude of the output.” *Id.* A POSITA would readily appreciate that this circuitry generates and transmits signals to drive the tactile buzzer (actuator). Ex. 1102, ¶ 107. Accordingly, it would have been obvious to a POSITA at the time of the alleged invention to incorporate circuitry such as the oscillation circuit described in Shaohian to generate actuator signals to activate the buzzer in Theodore’s input device 14 to provide tactile feedback to the user. Ex. 1102, ¶ 107.

Motivation to combine the teachings of Shahoian and Theodore arises from at least the fact that both references disclose the use of tactile buzzers to provide

tactile feedback. A POSITA would have been further motivated to combine the teachings of Shahoian and Theodore, because applying a known technique (*i.e.*, Shahoian's haptic feedback circuitry) to a known device (*i.e.*, the one disclosed by Theodore) would yield predictable results (*i.e.*, to implement a tactile buzzer). Ex. 1102, ¶ 108. In addition, combining Shahoian with Theodore in this manner would have been obvious to try because it amounts to merely choosing from a finite number of identified, predictable solutions for implementing a tactile buzzer, with a reasonable expectation of success. Ex. 1102, ¶ 108. 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. Ex. 1102, ¶ 108.

13.e “if the user input is recognized and the command is determined: ... transmitting the first actuator signal to the actuator.”

Theodore does not expressly disclose transmitting the actuator signal to activate the tactile buzzer. However, Shahoian discloses this. As discussed above in connection with the preceding limitation, Shahoian discloses a circuitry for driving a tactile buzzer, including a self-exciting oscillation circuit and a gating feature “to start and stop the oscillation as well as a proportional control to allow modulation of the amplitude of the output.” Ex. 1105, ¶ 106. A POSITA would readily appreciate that this circuitry generates and transmits signals to drive the tactile buzzer (actuator). Ex. 1102, ¶ 109. And, it would have been obvious to

combine the teachings of Shahoian with Theodore for the reasons discussed above.

Ex. 1102, ¶ 109.

13.f “otherwise: generating a second actuator signal configured to cause the actuator to output a second haptic effect;”

As discussed above in Section V.D.3, the PTAB determined in IPR2016-01603 that under the broadest reasonable interpretation of the conditional limitations of claim 1, a prior art reference does not need to teach the steps recited in the “otherwise” portion of the claim in order to render the claim obvious. IPR2016-01603, Paper 7 at 19 (citing *Ex Parte Schulhauser*, No. 2013-0007847, 2016 WL 6277792 (PTAB April 28, 2016)). For the same reasons, Theodore does not need to teach the steps following the otherwise limitation of claim 13 in order to render the claim obvious. *Id.*

Regardless, this limitation is obvious in view of Theodore and Shahoian. For example, Theodore discloses that “[i]f the voice instruction received from the user does not correspond with any of the expected instructions in the set of valid instructions, program flow continues to step 122 whereat a ‘Not Recognized Signal’ is transmitted to the user indicating that the voice instruction received was not recognized.” Ex. 1104, 6:64-7:2. As discussed for claim element 13.d, Theodore contemplates that the Not Recognized Signal can initiate a “tactile indicator such as buzzers.” *Id.*, 7:30-36.

Theodore does not expressly disclose generating an actuator signal to configured to activate the tactile buzzer and output a haptic effect. However, as discussed above in connection with element 13.d, Shahoian discloses this. Ex. 1102 ¶ 112; *see also* Ex. 1105, ¶ 106. And it would have been obvious to combine Shahoian's teachings of circuitry for generating and transmitting an actuator signal to drive the tactile buzzer for the reasons discussed above in connection with element 13.d

13.g “otherwise: ... transmitting the second actuator signal to the actuator.”

Theodore does not expressly disclose transmitting the actuator signal to activate the tactile buzzer. However, Shahoian discloses this. As discussed above in connection with the claim element 13.d, Shahoian discloses a circuitry for driving a tactile buzzer, including a self-exciting oscillation circuit and a gating feature “to start and stop the oscillation as well as a proportional control to allow modulation of the amplitude of the output.” *Id.* A POSITA would readily appreciate that this circuitry generates and transmits signals to drive the tactile buzzer (actuator). Ex. 1102, ¶ 113. And, it would have been obvious to combine the teachings of Shahoian with Theodore for the reasons discussed above. Ex. 1102, ¶ 113.

Claim 18: “The computer-implemented method of claim 13, further comprising: generating an audio signal configured to cause a speaker to output a sound; and transmitting the audio signal to the speaker.”

Theodore discloses the additional limitation of claim 18. For example, Theodore discloses that “[i]f the voice instruction received from the user does not correspond with any of the expected instructions in the set of valid instructions, program flow continues to step 122 whereat a ‘Not Recognized Signal’ is transmitted to the user indicating that the voice instruction received was not recognized. In the embodiment illustrated, the Not Recognized Signal is generated as a tone and transmitted through the speaker 66 of the handset 18 to the user.” Ex. 1104, 6:64-7:4 (emphasis added). Similarly, if the signal is recognized, then “the Recognition Signal is used to initiate an audible tone provided to the user.” *Id.*, 7:15-18 (emphasis added); Ex. 1102, ¶ 114.

To the extent this limitation is found not to be disclosed in Theodore, a POSITA would have found it obvious. A POSITA would understand, or at least would have found obvious, that to generate an audio tone as taught by Theodore, requires generating an audio signal corresponding to audible tone and transmitting the audio signal to the speaker for the user to hear. Ex. 1102, ¶ 115.

Claim 19: “The computer-implemented method of claim 13, further comprising: generating a display signal configured to cause a display to display an image; and transmitting the display signal to the display.

Theodore discloses the additional limitation of claim 19. For example, Theodore discloses that the signals generated via the “Recognized Signal,” “Not Recognized Signal,” etc., are not limited to audible tones, rather “other types of indications can be used in addition or in place of the audible tones described above for the Activation Signal, the Speech Recognition Ready Signal, the Computer Error Signal, the Recognized Signal and the Not Recognized Signal. For example, each of these signals can initiate visual indicators such as lights, or tactile indicators such as buzzers. *Likewise, a display, such as a liquid crystal display (LCD) can be provided on the input device 14 to display icons or text corresponding to each of the signals.*” Ex. 1104, 7:30-39 (emphasis added).

To the extent this limitation is found not to be disclosed in Theodore, a POSITA would have found it obvious. A POSITA would understand, or at least would have found obvious, that to display icons or text corresponding to each of the signals as disclosed by Theodore, requires generating a display signal corresponding to the icon or text and then transmitting the display signal to the display for the user to see. Ex. 1102, ¶ 117.

F. This Petition Is Proper Under 35 U.S.C. §§ 315 and 325(d)

The Board should reject any argument by Patent Owner that the Board should deny institution of this petition under 35 U.S.C. §§ 315(d) and/or 325(d). First, the arguments in this Petition address different claims and different prior art than IPR2016-01603. *See, e.g., Microsoft Corporation v. Bradium Technologies*, IPR2016-00448, Paper 9 at 10 (instituting trial on second petition because it raised substantively different arguments). Second, Petitioner has not “overwhelmed Patent Owner with an unreasonable number of challenges of patentability” because this is only the second petition that Petitioner has filed regarding the ’710 patent. *Id.* Third, in order to conserve the resources of the Board and the private parties, Petitioner limited the petition in IPR2016-01603 to the claims asserted in the ITC investigation. However, the ITC Investigation has not settled and the statutory bar provided under 35 U.S.C. § 315(b) is not limited to asserted claims. Accordingly, Petitioner files the instant Petition to challenge additional claims in order to avoid the (currently stayed) costly District Court action, which aligns with the statutory goal of the America Invents Act (AIA) to provide lower-cost alternatives. The Board has permitted second petitions under similar circumstances. *See e.g., Silicon Laboratories, Inc. v. Cresta Technology Corporation*, IPR2015-00615, Paper 9 at 24-25; *Silicon Laboratories, Inc. v. Cresta Technology Corporation*, IPR2015-00626, Paper 9 at 15-16.

V. CONCLUSION

For the foregoing reasons, Petitioner requests that the Board institute trial and cancel claims 13, 18, 19, and 20 of the '710 patent.

Dated: May 4, 2017

Respectfully Submitted,

/James M. Heintz/

James M. Heintz

Reg. No. 41,828

DLA Piper LLP (US)

11911 Freedom Drive, Suite 300

Reston, VA 20190

Apple-Immersion-IPRs@dlapiper.com

Phone: 703-773-4148

Fax: 703-773-5200

Brian Erickson

Reg. No. 48,895

DLA Piper LLP (US)

401 Congress Avenue, Suite 2500

Austin, TX 78701

Brian.erickson@dlapiper.com

Phone: 512-457-7059

Fax: 512-721-2263

Attorneys for Petitioner Apple Inc.

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 9,815 as calculated by Microsoft Word, which is less than the 14,000 allowed under 37 CFR §42.24(a)(i).

Dated: May 4, 2017

Respectfully Submitted,

/James M. Heintz/

James M. Heintz

Reg. No. 41,828

DLA Piper LLP (US)

11911 Freedom Drive, Suite 300

Reston, VA 20190

Jim.heintz@dlapiper.com

Phone: 703-773-4148

Fax: 703-773-5200

Brian Erickson

Reg. No. 48,895

DLA Piper LLP (US)

401 Congress Avenue, Suite 2500

Austin, TX 78701

brian.erickson@dlapiper.com

Phone: 512-457-7059

Fax: 512-457-7001

Attorneys for Petitioner Apple Inc.

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 May 4, 2017, via United Parcel Service, directed to the attorneys of record for the patent at the following address:

MILES & STOCKBRIDGE P.C.
Immersion Corporation
1751 Pinnacle Drive, Suite 1500
Tysons Corner, VA 22102-3833

Dated: May 4, 2017

Respectfully Submitted,

/James M. Heintz/

James M. Heintz
Reg. No. 41,828
DLA Piper LLP (US)
11911 Freedom Drive, Suite 300
Reston, VA 20190
Apple-Aylus-IPR@dlapiper.com
Phone: 703-773-4148
Fax: 703-773-5200

Brian Erickson
Reg. No. 48,895
DLA Piper LLP (US)
401 Congress Avenue, Suite 2500
Austin, TX 78701
Brian.erickson@dlapiper.com
Phone: 512-457-7059
Fax: 512-721-2263
Attorneys for Petitioner Apple Inc.