

UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.	IMM328.C1 (51851/849050)
First Inventor	Robert W. Heubel
Title	Systems and Methods For Haptic. . .
Express Mail Label No.	

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

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- ☐ Fee Transmittal Form (e.g., PTO/SB/17)
- ☐ Applicant claims small entity status.
See 37 CFR 1.27.
- ☒ Specification [Total Pages 30]
Both the claims and abstract must start on a new page
(For information on the preferred arrangement, see MPEP 608.01(a))
- ☒ Drawing(s) (35 U.S.C. 113) [Total Sheets 7]
- Oath or Declaration [Total Sheets 4]
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 - ☒ A copy from a prior application (37 CFR 1.63(d))
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name in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b).
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ACCOMPANYING APPLICATION PARTS

- ☐ Assignment Papers (cover sheet & document(s))
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- ☐ English Translation Document (if applicable)
- ☐ Information Disclosure Statement (PTO/SB/08 or PTO-1449)
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☒ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.: 12/612,230

Prior application information: Examiner Pham, Toan Hgoc Art Unit: 2612

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57,203

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Immersion Ex 2008-1
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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	IMM328.C1 (51851/849050)
		Application Number	
Title of Invention	Systems And Methods For Haptic Confirmation Of Commands		
<p>The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.</p> <p>This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.</p>			

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Applicant Authority <input checked="" type="radio"/> Inventor		<input type="radio"/> Legal Representative under 35 U.S.C. 117		<input type="radio"/> Party of Interest under 35 U.S.C. 118
Prefix	Given Name	Middle Name	Family Name	Suffix
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Residence Information (Select One) <input checked="" type="radio"/> US Residency <input type="radio"/> Non US Residency <input type="radio"/> Active US Military Service				
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Citizenship under 37 CFR 1.41(b)		US		
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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	IMM328.C1 (51851/849050)
		Application Number	
Title of Invention	Systems And Methods For Haptic Confirmation Of Commands		
Customer Number	34300		
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Application Information:

Title of the Invention	Systems And Methods For Haptic Confirmation Of Commands		
Attorney Docket Number	IMM328.C1 (51851/849050)	Small Entity Status Claimed	<input type="checkbox"/>
Application Type	Nonprovisional		
Subject Matter	Utility		
Suggested Class (if any)		Sub Class (if any)	
Suggested Technology Center (if any)			
Total Number of Drawing Sheets (if any)	7	Suggested Figure for Publication (if any)	

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Prior Application Status		<input type="button" value="Remove"/>	
Application Number	Continuity Type	Prior Application Number	Filing Date (YYYY-MM-DD)
	Continuation of	12612230	2009-11-04
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Application Data Sheet 37 CFR 1.76		Attorney Docket Number	IMM328.C1 (51851/849050)
		Application Number	
Title of Invention	Systems And Methods For Haptic Confirmation Of Commands		

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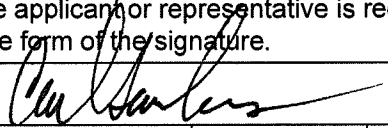
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If the Assignee is an Organization check here. <input checked="" type="checkbox"/>			
Organization Name	Immersion Corporation		
Mailing Address Information:			
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Address 2			
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Country	US	Postal Code	95134
Phone Number		Fax Number	
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A signature of the applicant or representative is required in accordance with 37 CFR 1.33 and 10.18. Please see 37 CFR 1.4(d) for the form of the signature.			
Signature			Date (YYYY-MM-DD)
First Name	Carl	Last Name	Sanders
Registration Number	57203		

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SYSTEMS AND METHODS FOR HAPTIC CONFIRMATION OF COMMANDS

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation of co-pending U.S. Patent Application No. 12/612,230, entitled “System and Methods for Haptic Confirmation of Commands,” filed November 4, 2009, which is hereby incorporated by reference in its entirety.

FIELD OF THE INVENTION

[0002] The present invention generally relates to haptic feedback and more particularly to haptic confirmation of commands.

BACKGROUND

[0003] Commands 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 the voice-commanded dialing of cell phones. In such systems, a user may speak a command into a microphone to dial a friend’s phone number, and the user may hear a beep or see a light flash to indicate that the phone is dialing the number. But if the cell phone’s speaker is already being used, such as because the phone is playing a song, the cell phone may interrupt the music to play the beep, or, if sounds have been muted, it may not provide an acknowledgement to the user at all. Thus, it may be desirable to provide other mechanisms for providing responses to the user.

SUMMARY

[0004] Embodiments of the present invention provide systems and methods for haptic confirmation of voice commands. For example, in one embodiment, a method for haptic confirmation of commands comprises receiving speech information from a microphone,

recognizing the speech information and determining a command associated with the speech information, and 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 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. Another embodiment comprises a computer-readable medium comprising program code for executing such a method.

[0005] These illustrative embodiments are mentioned not to limit or define the invention, but to provide examples to aid understanding thereof. Illustrative embodiments are discussed in the Detailed Description, and further description of the invention is provided therein. Advantages offered by various embodiments of this invention may be further understood by examining this specification.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] These and other features, aspects, and advantages of the present invention are better understood when the following Detailed Description is read with reference to the accompanying figures, wherein:

[0007] Figures 1-4 show block diagrams of systems for haptic confirmation of commands according to embodiments of the present invention;

[0008] Figure 5 shows a flow diagram of a computer-implemented method for haptic confirmation of commands according to one embodiment of the present invention;

[0009] Figure 6 shows a block diagram of a system for haptic confirmation of commands according to embodiments of the present invention; and

[0010] Figure 7 shows a flow diagram of a computer-implemented method for haptic confirmation of commands according to one embodiment of the present invention.

DETAILED DESCRIPTION

[0011] Embodiments of the present invention provide systems and methods for haptic confirmation of commands. For example, in one embodiment, a user may speak a command into a microphone on a cellular telephone, such as “call home.” The phone attempts to recognize the spoken command, and if it is successful, it generates a haptic effect to provide a tactile indication to the user that the spoken command was recognized and that the phone will perform the requested function. The phone may then attempt to make a phone call to a telephone number corresponding to “home.” However, if the phone does not recognize the command, it generates a second haptic effect to provide a tactile indication to the user that the spoken command was not recognized and that no function would be executed.

[0012] In another embodiment, a first user and a second user may be in communication with each other using wireless communication devices, such as radios. Each user has a headset with a microphone and a radio in communication with the microphone. The headset also includes an actuator for outputting haptic effects. The first user may issue a verbal command to the second user over the radio. The second user may be unable to provide a verbal response to the first user. For example, the second user may be located in a combat zone near enemy combatants. The second user may respond to the verbal command by pressing a button or series of buttons on his head set or on the radio to cause a haptic message to be transmitted to the first user. The first user’s radio may receive the haptic message, and transmit a signal to the actuator in the first user’s headset to cause the actuator to output a haptic effect to the first user.

Illustrative System for Haptic Confirmation of Commands

[0013] Referring now to the figures in which like numbers refer to like elements throughout the several drawings, Figure 1 shows a block diagram of a system for haptic confirmation of commands according to one embodiment of the present invention. In the embodiment shown in Figure 1, the system comprises a device 100 having a housing 105. The device further comprises a processor 110, a memory 115, an actuator 130, and a microphone 135, each of which is disposed in, or coupled to, the housing 105. In the embodiment shown in Figure 1, the device 100 is a cell phone and the housing 105 is configured to be grasped by a user, who can speak into the microphone 135. In some embodiments, the device 100 may be a headset comprising a housing 105, a processor 110, a memory 115, an actuator 130, and a microphone 135. In some embodiments, the device 100 may comprise a system having a plurality of devices. For example, Figure 2, which will be discussed in greater detail below, comprises two devices 110, 150 in communication with each other.

[0014] Referring again to the embodiment shown in Figure 1, the processor 110 is in communication with the memory 115, actuator 130, and microphone 135. The microphone 135 encodes speech information received from the user into one or more microphone signals that are transmitted to the processor 110. The processor 110 receives the microphone signals and executes voice recognition software stored in memory 115 to attempt to recognize the speech information encoded within the received microphone signals. If the processor 110 is able to recognize the speech information, it executes software stored in memory 115 that attempts to identify a command associated with the recognized speech information. If the processor 110 identifies a command associated with the recognized speech information, it generates a first actuator signal configured to cause the actuator to output a first haptic effect. The first haptic

effect is configured to indicate to the user that the voice command was recognized. The processor 110 then transmits the first actuator signal to the actuator 130, which outputs the first haptic effect based on the first actuator signal.

[0015] However, if the speech information is not recognized, or if a command corresponding to the speech information is not found, the processor 110 generates a second actuator signal configured to cause the actuator 130 to output a second haptic effect. The processor 110 then transmits the second actuator signal to the actuator 130, which outputs the second haptic effect based on the second actuator signal. The second haptic effect is configured to indicate that the speech information was not recognized, or that a corresponding command was not found. In one embodiment, however, different haptic effects may be output for a failure to recognize the speech information or failure to find a command corresponding to the recognized speech information. Note that the identifiers “first” and “second” are used here to differentiate between different signals and effects, rather than a sequence of particular signals or effects. For example, if the voice command is not recognized, only the second actuator signal is generated and transmitted to the actuator; the first signal, indicating that the voice command was recognized, is not generated or transmitted to the actuator.

[0016] The embodiment in Figure 1 can comprise any of a number of devices, such as a handheld device, a wearable device, a vehicle (e.g. a car, a wheelchair, etc.), a non-portable device (e.g. a desktop computer), or other devices capable of receiving voice commands, processing them, and generating haptic effects.

[0017] For example, in one embodiment, the device 100 comprises a personal digital assistant (PDA). In such an embodiment, a user may speak a voice command into the microphone 135 to cause the PDA to perform a function. For example, the user may instruct the

PDA to add an appointment to the calendar for Tuesday at 3pm. The processor 110 attempts to recognize the voice command and if the processor 110 recognizes the voice command, the processor 110 then generates an actuator signal and transmits the actuator signal to the actuator to cause the actuator to output a haptic effect to indicate that the voice command was recognized. Alternatively, if the voice command was not recognized, the processor 110 may generate a second actuator signal and transmit the second actuator signal to the actuator to cause the actuator to output a haptic effect to indicate that the voice command was not recognized.

[0018] In a similar embodiment, the processor 110 may partially recognize the command. For example, the processor 110 may recognize that the speech command was to add an appointment to the calendar, but may not have recognized the time of the appointment. In such an embodiment, the processor 110 may generate a third actuator signal and transmit the third actuator signal to the actuator to cause the actuator to output a haptic effect to indicate that the voice command was partially recognized. In such an embodiment, the haptic effect may indicate not only that the command was partially recognized, but which part of the command was not recognized. For example, if the date was not recognized, the device may output a fourth haptic effect, while if the time was not recognized, the device may output a fifth haptic effect. Using haptic signaling, a user may be apprised of difficulties understanding the spoken command without needing to resort to viewing a display to determine the source of the problem.

[0019] In a similar embodiment, the processor 110 may generate actuator signals as parts of a speech command are received and recognized or not recognized. For example, in one embodiment, a user may say “add appointment to calendar for Tuesday, September 2 at 3pm.” The processor may recognize “add appointment to calendar” and generate a first actuator signal to cause the actuator to output a first haptic effect to indicate that a portion of the command was

recognized. The first haptic effect is then output very shortly after the user has said “add appointment to calendar” to indicate to the user that this portion of the speech command was recognized. Another haptic effect may then be output after the date is recognized or not recognized, and a third haptic effect may then be output after the time is recognized or not recognized. The user may then re-state the unrecognized portion of the command. Haptic effects that are output corresponding to parts of a speech command may indicate to the user which portion of the command needs to be repeated rather than requiring the user to restate the entire command.

[0020] Still further haptic effects may be output to a user in response to a voice command. For example, in the embodiments described above in which a user attempts to add an appointment to a calendar on a PDA, additional haptic effects may be used. For example, if the processor 110 recognizes the command, but determines that the commanded date and time would present a conflict with an appointment already stored in the calendar, the processor 110 may generate an actuator signal to cause the actuator to output a haptic effect to indicate that the command was recognized, but that a potential conflict exists. In a similar embodiment, if the processor 110 recognizes the command, but determines that the commanded date and time are adjacent to an existing appointment, the processor 110 may generate an actuator signal to cause the actuator to output a haptic effect to indicate that the command was recognized, but that the desired date and time is adjacent to an existing appointment. In such an embodiment, the haptic effect indicating a potential conflict is different than the haptic effect indicating that the appointment time is adjacent to another appointment.

[0021] As described above, some embodiments of the present invention may attempt to recognize speech information as it is received, such as in real-time. However, even in some

embodiments that do not attempt to recognize speech information as it is received, it may be advantageous to perform other functions when speech information is received. For example, in one embodiment, a device 100 receives speech information from the microphone and attempts to recognize the speech information as it is received. As the device 100 begins to recognize the speech information, it may recognize a word or phrase that corresponds to a command. For example, if the user says “call home,” the device 100 may recognize the word “call” and determine that it corresponds to a command to start a phone call. This may indicate to the device that the user is issuing a voice command, and the device may prepare to output a haptic effect before receiving the entire command. For example, the device 100 may warm up an amplifier (not shown) that supplies current to the actuator 130 in anticipation of generating haptic effect. The device 100 may select one or more potential haptic effects that may be output, depending on what additional speech information may be received. In one embodiment in which the device 100 does not attempt to recognize speech information as it is received, the device 100 may begin to warm-up an amplifier when it detects that it is receiving speech information. Such an embodiment may determine that speech information is being received and the speech information may comprise a voice command. Thus, it may be advantageous for the device 100 to warm-up the amplifier while it is receiving the speech information to ensure a haptic effect may be output shortly after a voice command has been recognized or not recognized.

[0022] In addition to handheld embodiments, other devices may provide haptic confirmation of voice commands. For example, in one embodiment, the device 100 comprises a desktop computer. A user may issue a command to cause the computer 100 to perform a function that takes an extended period of time to complete, such as to execute a software build. If the processor 110 recognizes the command, it may generate a first actuator signal configured

to cause the actuator 130 to output a haptic effect to the user, such as through an actuator 130 embedded within a keyboard or mouse (not shown) coupled to the computer 100. Then, as the processor 110 executes the function, it may periodically transmit a second actuator signal to the actuator 130 within the keyboard or mouse to indicate that the function is still executing. Such a haptic effect may be a low magnitude vibration designed to provide unobtrusive status information to the user. In another embodiment, the vibration may initially be unobtrusive, but may get stronger as the function gets nearer to completion. For example, the magnitude of the vibration may increase, or the frequency may increase or decrease. When the processor 110 completes the function, it may generate and transmit a third actuator signal to the actuator 130 within the keyboard or mouse to indicate that the function has completed. Alternatively, if an error occurs during execution of the function, such as a build error, a haptic effect may be output to indicate that the function terminated unsuccessfully. Such an embodiment may be useful in contexts where a user begins a function on a device 100 and allows the function to execute in the background, but the device 100 is able to keep the user apprised of the status of the function. For example, a user may issue a voice command to his cell phone to initiate a download of an application from a remote server over a cellular network. The user may then put the cell phone back in his pocket, initiate a phone call, or perform some other task. However, the cell phone may still be able to provide haptic status of the download to the user, such as percentage of the download completed, a problem with the download, or a haptic indication when the download has completed.

[0023] Referring now to Figure 2, Figure 2 shows a block diagram of a system 200 for haptic confirmation of commands according to one embodiment of the present invention. The system 200 shown in Figure 2 comprises a first device 100 and a second device 150 where each

device 100, 150 is in communication with the other device using connection 170. The first device 100 comprises the components described with respect to Figure 1. The second device comprises a processor 160 in communication with a memory 165. The processor 110 in the first device 140 is in communication with the processor 160 in the second device 150. For example, in one embodiment, the two processors 110, 160 communicate over a wireless connection, such as via Bluetooth. In some embodiments, the wireless connection may comprise an infrared link, an RF link, a Wifi link, or other wireless connection. In another embodiment, the two processors 110, 160 are in communication over a wired connection, such as a serial or parallel connection or Ethernet connection. Using the connection 170, processor 110 is able to transmit signals to and receive signals from processor 160, though in some embodiments the connection 170 may be a one-way connection.

[0024] For example, in one embodiment, device 100 comprises a Bluetooth headset and device 150 comprises a cell phone. In such an embodiment, The microphone 135 encodes speech information received from the user into one or more microphone signals that are transmitted to the processor 110. The processor 110 in the headset then causes the microphone signals to be transmitted to the processor 160 in the cell phone. Processor 160 then executes voice recognition software stored in memory 165 to attempt to recognize the speech information encoded within the received microphone signals. If the processor 160 is able to recognize the speech information, it executes software stored in memory 165 that attempts to identify a command associated with the recognized speech information. If the processor 160 identifies a command associated with the recognized speech information, it generates a first actuator signal configured to cause the actuator to output a first haptic effect. The processor 160 transmits the first actuator signal to processor 110, which then transmits the first actuator signal to the actuator

130. In some embodiments, the processor 110 transmits a signal to the actuator to cause the actuator to power-up in preparation for outputting a haptic effect. In another embodiment, processor 160 transmits the first actuator signal to the actuator 130.

[0025] However, if the speech information or a corresponding command is not recognized, the processor 160 generates a second actuator signal configured to cause the actuator 130 to output a second haptic effect. The processor 160 transmits the second actuator signal to processor 110, which then transmits the second actuator signal to the actuator 130. In another embodiment, processor 160 transmits the second actuator signal to the actuator 130. After receiving the second actuator signal, the actuator 130 outputs a second haptic effect based on the second actuator signal.

[0026] In some embodiments, processor 160 may transmit high level actuator signals to processor 110. Processor 110 may then generate a low-level actuator signal based on the high-level actuator signal. Processor 110 may then transmit the low-level actuator signal to the actuator 130 to cause the actuator 130 to output a haptic effect. More detailed descriptions of high-level and low-level actuator signals may be found in U.S. Patent No. 5,734,373, entitled "Method and Apparatus for Controlling Force Feedback Interface Systems Utilizing a Host Computer," filed December 1, 1995 and issued March 31, 1998, the entirety of which is incorporated herein by reference.

[0027] Referring again to Figure 2, one embodiment of the present invention may provide haptic effects that emulate the command determined by the processor 110, 160 or the function performed by the processor 110, 160. For example, in one embodiment, the first device 100 comprises an earbud and the second device 150 comprises a cell phone. In such an embodiment, a user may issue a voice command, such as "call home." The processor 110

transmits the speech information received from the microphone 135 to the processor 160 in the second device 150. The processor 160 recognizes the voice command and generates a series of haptic effects corresponding to each number dialed and each ring of the phone being called. Actuator signals corresponding to the haptic effects are transmitted to the processor 110 in the first device 100, which outputs the haptic effects, such as at a time corresponding to each button press and each ring.

[0028] In other embodiments, a haptic command may be received from a processor associated with a remote device. For example, Figure 3 shows a block diagram of a system 300 for haptic confirmation of commands according to one embodiment of the present invention. In the embodiment shown in Figure 3, a system 300 for haptic confirmation of commands comprises a haptically-enabled medical alert device 100 in communication with a communications device 150. The communications device is in communication with a remote system 170. In this embodiment, the medical alert device 100 is in communication with the communication device 150 using an RF link, such as an RF link using standard cordless phone frequencies. The medical alert device 100 is configured to be worn by a user, such as around the user's neck or wrist. The medical alert device 100 can be used by the user to indicate a medical emergency, such as a fall or heart attack. For example, the user may speak into a microphone on the device, such as by saying "help" or by pressing a button and speaking a command, such as "help" or "emergency." In the embodiment shown in Figure 3, the processor 110 in the medical alert device 100 then transmits one or more signals to the processor 160 in the communications device 150. The communications device 150 then initiates a connection to the remote system 170 and transmits one or more signals to the remote system 170 indicating that the user has

signaled a medical emergency. In such an embodiment, the remote system 170 may be monitored by a dispatcher who can dispatch an ambulance or other services to aid the user.

[0029] During the transmission of messages between the medical alert device 100, the communication device 150, and the remote system 170, additional haptic effects may be generated and output. For example, in the embodiment shown, the communication device 150 may send a message to the medical alert device 100 that causes the medical alert device 100 to output a haptic effect to indicate that an emergency call has been initiated. After the call has been answered, the communication device 150 may cause a second haptic effect to be output to indicate that the call was answered. Alternatively, or in addition, the dispatcher may cause a signal to be transmitted across the network 380 to the processor 160 in the communications device 150. For example, the dispatcher can provide haptic signals to the user to indicate that their request was received and that help is on the way. The processor 160 may then transmit a high-level actuator signal to the processor 110 in the medical alert device to cause a haptic effect to be output. The processor 110 in the medical alert device may then generate a low-level actuator signal based on the received signal from the processor 160 and transmit the actuator signal to the actuator to cause a haptic effect to be output. For example, the dispatcher may transmit a long vibration to indicate that the request was received, followed later by additional vibrations to indicate that an ambulance has been dispatched. The dispatcher may periodically transmit such haptic signals to indicate that he is still paying attention to the user and their request is being responded to. Such an embodiment may be advantageous for a person who has difficulty hearing or seeing. It may also provide assurance to the user that their request for help has been received and that the dispatcher is still handling their needs.

[0030] Referring now to Figure 4, Figure 4 shows a block diagram of a system 400 for haptic confirmation of commands according to one embodiment of the present invention. The system 400 shown in Figure 4 comprises two devices 410, 412 in communication with each other via network 480. Device 410 comprises a device 100 as shown in Figure 1. Device 425 also comprises a processor 430, a memory 115, a microphone 435, and an actuator 440 as described with respect to Figure 1. However, each device 410, 412 also comprises a network interface 315. Each network interface 315 is in communication with its respective processor 110, 430 and is configured to communicate with network 480, thus enabling the devices 410, 412 to communicate with each other over network 480. In such an embodiment, device 410 is capable of receiving a voice command from its microphone 435 and transmitting the voice command to device 412. For example, in one embodiment, the speech information received from the microphone 135 may be transmitted over the network 480 so that a user of device 412 can hear the voice command, such as via a speaker (not shown). The user may confirm that the command was recognized by pressing a button on device 425 to send a signal indicating an acknowledgment that the voice command was received. Device 410 may receive the signal, and processor 110 may generate an actuator signal and transmit the actuator signal to the actuator to cause the actuator to output a haptic effect to the user. In some embodiments, the user may respond by providing a haptic indication that the command was not received, or that the command was garbled or unintelligible. In one such embodiment, the user may also provide a haptic indication to request a re-transmission of the message.

[0031] In another embodiment, a user may respond to a received voice command by providing haptic inputs, such as by pressing a button or tapping on a touch-sensitive device. Each of the haptic inputs may be correlated to a response, which may be converted to a spoken

command and transmitted to a recipient. For example, a soldier may tap a response to a command into a touch-sensitive input device coupled to a communication device, such as device 412, in a sequence to indicate that the command was received and that the soldier will comply. The device 412 may then transmit the tactile response to another device, such as device 410, which then converts the tactile response into an audible signal, such as a spoken message. In such an embodiment, the tactile response may correspond to a pre-recorded message or to pre-determined text that may be converted to speech by the device 412. Such an embodiment, would allow for a silent acknowledgement by a user that results in a spoken reply to the recipient.

[0032] The system shown in Figure 4 may also be advantageously used by multiple users to perform coordinated tasks or procedures. For example, in one embodiment, devices 410 and 412 may comprise computers in different locations within a bank. Each computer 410, 412 is in communication with a security system that controls access to a bank vault. Users at the two computers may need to perform functions, or provide authentication to open the bank vault. For example, a user at the first computer 410 may be required to speak a command, such as a word or phrase, to verify authorization to open the vault. After the command is recognized, a haptic confirmation may be sent to a second user at the second computer 412 to indicate that they need to speak a command, such as another word or phrase, to complete authentication to open the vault. If the second user's command is recognized, a haptic confirmation may be output at each of the two devices 410, 412 to indicate to the users that the command was successful. At such a time, the lock on the bank vault may be disengaged.

[0033] However, if one of the commands was not recognized, one or both users may receive a haptic indication that the authentication failed. In one embodiment, the user whose command failed may be given a second opportunity to provide authentication. In such an

embodiment, a haptic effect indicating that the authentication failed but that the command may be retried may be output to one or both users. However, if the authentication has finally failed such that no retries are available, a different haptic effect may be output to one or both users to indicate that authentication failed.

[0034] Still further embodiments including different or more complicated sequences of events may be used. In such embodiments, haptic effects may be output to one or more users to indicate that action on their part is necessary to complete the sequence. For example, in one embodiment, multiple mechanics may be repairing a large machine. In such a scenario, each user may wear a device, such as device 410 or 412. As users complete portions of the repair or need assistance, they may transmit commands to trigger haptic effects on other users' devices 410, 412. By doing so, the next user may be notified that a task is complete or that they need to perform some action to continue the repair process. The recipient of the haptic effect may provide a haptic confirmation back to the sender of the command to indicate that the recipient will take the necessary action or some other indication.

[0035] Referring now to Figure 5, Figure 5 shows a flow diagram of a computer-implemented method 500 for haptic confirmation of voice commands according to one embodiment of the present invention. The method 500 shown in Figure 5 will be discussed with reference to the device 100 shown in Figure 1.

[0036] The method 500 begins in block 510 when a processor 100 receives speech information. For example, the processor 110 may receive speech information encoded in a microphone signal from a microphone 135 or it may receive the speech information from another processor, such as over a Bluetooth connection. After receiving speech information, the method proceeds to block 520.

[0037] At block 520, after receiving the speech information, the processor 100 then executes speech recognition software to recognize the speech information. If the processor recognizes the speech information, it attempts to determine a command associated with the speech information. If the processor 110 determines a command associated with the speech information, the method proceeds to step 530. However, if the processor is unable to recognize the speech information, or is unable to determine a command associated with the speech information, the method proceeds to block 522.

[0038] In block 522, the processor 110 generates a second actuator signal configured to cause an actuator to output a second haptic effect. The second haptic effect is configured to indicate to the user that the speech information was not recognized, or that no command corresponding to the speech information was found. The processor 110 then transmits the actuator signal to the actuator 130 as shown in block 524.

[0039] In block 530, the processor 110 generates a first actuator signal configured to cause an actuator to output a first haptic effect. The first haptic effect is configured to indicate to the user that the speech information was recognized and that a command corresponding to the speech information was found. The processor 110 then transmits the actuator signal to the actuator 130 as shown in block 532. After transmitting the first actuator signal to the actuator 130, the method proceeds to block 534.

[0040] In block 534, the processor 110 determines whether additional speech information is available. For example, as described above, the processor 110 may attempt to recognize parts of the speech information as it is received and then provide haptic effects to indicate that parts of the speech information were recognized. For example, a user may attempt to add an event to calendar, and the processor may perform steps 510-532 or steps 510-524 for each component of

the event, such as the date, time, and location of the event. If additional speech information is available to be received, the method returns to step 510 to receive the additional speech information. However, if no additional speech information is received, the method 500 proceeds to step 536.

[0041] At block 536, the processor 110 executes a function associated with the recognized speech information and the command. For example, if the speech information comprised “call home” and the determined command to dial a phone number associated with a contact called “home,” the processor would then execute a dialing function to dial the number associated with “home.” After the function has begun, the method proceeds to block 540 which is a test condition for a loop based on whether the function has completed or not.

[0042] In block 540, the processor 110 determines whether the function has completed or not. If the function has not completed, the method proceeds to step 542 to output a haptic effect to indicate that the function is still executing. However, if the function has completed, the method proceeds to step 550, where another haptic effect is output to indicate that the function has completed.

[0043] Blocks 542 through 546 are steps to output a haptic effect to indicate that a function is still executing. In block 542, the processor 110 generates an actuator signal corresponding to a haptic effect that indicates that the function is still executing. In one embodiment, the processor 110 may generate the same actuator signal regardless of how many times the haptic effect has been output. For example, if the function requires ten minutes to complete and a haptic effect is output every 30 seconds, the processor may generate the same actuator signal each time the haptic effect is output. Thus, a user would feel the same haptic effect about every 30 seconds. However, in some embodiments, different haptic effects may be

output depending on the status of the function. For example, in one embodiment, the processor 110 may generate different actuator signals each time the method returns to block 542. In such an embodiment, the processor 110 may generate actuator signals to generate increasingly stronger haptic effects for each iteration through blocks 542-546. In one embodiment, the processor 110 may generate a different actuator signal if the function is still executing, but encounters an error. In such an embodiment, the processor 110 may generate an actuator signal associated with a haptic effect that indicates that the function encountered an error.

[0044] After generating an actuator signal in block 542, in block 544 the processor 110 transmits the actuator signal to the actuator 130 to cause the actuator to output a haptic effect. In some embodiments, the processor may transmit the actuator signal to another device comprising an actuator. For example, in the system shown in Figure 2, processor 160 may transmit the actuator signal to processor 110. Processor 110 may then transmit the actuator signal to the actuator 130. As described above, processor 160 may transmit a high-level actuator signal to processor 110, which may then generate a low-level actuator signal that the processor 110 then transmits to the actuator 130. After the actuator signal has been transmitted, the method proceeds to block 546.

[0045] In block 546, the method delays for a period of time before returning to block 540. A delay may be advantageous to allow time to pass between haptic effects. For example, a delay may allow haptic effects to be output once every 30 seconds so that the user is not feeling haptic effects repeatedly over very short periods of time, which may be distracting to the user. However, in some embodiments, the delay time may be set to 0, which may allow haptic effects to be output as needed. After the delay has elapsed, the method returns to block 540.

[0046] After the function has completed, the method proceeds to block 550 at which time the processor 110 generates an actuator signal corresponding to a haptic effect that indicates that the function has completed. For example, in one embodiment, the processor 110 may generate an actuator signal corresponding to a haptic effect that indicates the function completed successfully. Alternatively, the processor 110 may generate an actuator signal corresponding to a haptic effect that indicates the function encountered an error and terminated before running to completion. After the actuator signal has been generated, the method proceeds to block 552 where the processor 110 transmits the actuator signal to the actuator 130 to cause the actuator 130 to output a haptic effect. After which, the method returns to block 510 and the processor 110 attempts to receive more speech information.

[0047] Referring now to Figure 6, Figure 6 shows a block diagram of a system 600 for haptic confirmation of commands according to one embodiment of the present invention. The system 600 comprises a device 610 having a housing 605. The device 610 further comprises a processor 620, a memory 625, an actuator 630, and a sensor 640. The processor 620, the memory, 625, the actuator 630, and the sensor are each disposed within or coupled to the housing 605. The processor 620 is in communication with each of the memory 625, the actuator 630, and the sensor 640. The processor is further in communication with a display 650, which may coupled to the housing, disposed within the housing, or a separate device. The device 610 is configured to receive commands based on sensor signals received from the sensor and to output haptic effects based on the received sensor signals.

[0048] In one embodiment the device 610 may be carried or worn by a user and the sensor 640 may comprise an optical sensor configured to detect a location a user's eye is viewing. For example, display 650 may comprise a display worn by a user, such as goggles with

an integrated display. The processor 620 may cause the display 650 to display images or text corresponding to commands, such as commands to control a vehicle (e.g. a wheelchair) or commands to send to another person, such as an order to a soldier. To issue a command, a user may look at the desired command. The sensor 640 detects the orientation of the user's eye is looking and transmits a sensor signal to the processor 620. The processor 620 determines a command associated with the orientation and generates an actuator signal to cause the actuator to output a haptic effect. The processor 620 then transmits the actuator signal to the actuator 630. In another embodiment, the device 610 further comprises a network interface, such as network interface 315 shown in Figure 4. In such an embodiment, the processor 620 may receive the command from a second device, such as device 412 shown in Figure 4, across a network 480. The device 610 may output a haptic effect to the user to indicate a command has been received and may display possible responses to the command on the display 650. The user of the device 610 may select a response from the available responses to send to the second device 412 across the network. Such an embodiment may be useful in a covert military operation where spoken commands or responses may not be desirable.

[0049] In a related embodiment, the selected response may be sent to a plurality of recipients. For example, a military unit, such as a squad of soldiers, may be in communication with a command center and provide haptic responses to received voice commands. In such an embodiment, the command center may transmit voice or haptic commands to each of the soldiers in the squad and may receive responses or acknowledgements from each soldier. A further embodiment may include multiple command centers to receive responses from each of the soldiers. For example, a commander of the squad may be in a base camp near the squad's operations or may be with the squad but separated due to the nature of the operation. In addition,

other locations may monitor the squad's activities from another location, such as on a ship or at another military installation. In such an embodiment, each of the other locations may receive communications to and from the squad, including haptic commands and confirmations from the squad.

[0050] Referring again to Figure 6, one embodiment of the present invention may output haptic effects that emulate the command issued or the function executed. For example, in one embodiment, a device 610 may be configured to control a vehicle, such as a wheelchair. In such an embodiment, it may be advantageous to provide haptic effects that emulate commands issued to the vehicle. For example, if a user selects a command to turn the vehicle to the right, the processor 620 may generate an actuator signal to cause the actuator to output a haptic effect the emulates a right turn. For example, in a wheelchair embodiment, the actuator may comprise a plurality of actuators. The actuators may then output a vibration that begins in the middle of the back of the wheelchair and moves to the right. For example, the actuators may be placed along a horizontal line in the back of the wheelchair, such that the actuators are activated in succession. The user may thus perceive the vibration moving to the right across their back and therefore receive feedback indicating that the command was recognized.

[0051] Referring now to Figure 7, Figure 7 shows a flow diagram of a computer-implemented method for haptic confirmation of commands according to one embodiment of the present invention. Figure 7 will be described with respect to the system 600 shown in Figure 6.

[0052] In the embodiment shown in Figure 7, the method 700 begins in block 710 when the processor 620 receives a sensor signal from the sensor 640. For example, in one embodiment the sensor signal may correspond to a user touching a location on a touch-sensitive display, such

as display 650. In another embodiment, the sensor signal may correspond to an orientation of a user's eye. After receiving the sensor signal, the method 700 proceeds to block 720.

[0053] In block 720, the processor 620 attempts to identify a command corresponding to the received sensor signal. For example, the processor 620 may identify a button or user interface element at a location corresponding to a sensed position on the touch-sensitive display screen. If the processor 620 determines a command corresponding to information received in the sensor signal, the method 700 proceeds to block 730. Otherwise, the method 700 proceeds to block 722.

[0054] If the method proceeds to block 722, the processor 620 generates an actuator signal corresponding to a haptic effect configured to indicate that a command was not recognized based on the input received from the sensor. After generating the actuator signal, the method proceeds to step 724 when the processor transmits the actuator signal to the actuator 630 to cause the actuator to output a haptic effect.

[0055] If the method proceeds to block 730, the processor 620 generates an actuator signal corresponding to a haptic effect configured to indicate that a command was recognized based on the input received from the sensor. After generating the actuator signal, the method proceeds to step 750 when the processor transmits the actuator signal to the actuator 630 to cause the actuator to output a haptic effect. After outputting the haptic effect, the method proceeds to block 750 the processor 610 executes a function associated with the command, though in some embodiments, the processor 610 may begin executing the function before generating the actuator signal or transmitting the actuator signal to the actuator.

[0056] While the methods and systems herein are described in terms of software executing on various machines, the methods and systems may also be implemented as

specifically-configured hardware, such a field-programmable gate array (FPGA) specifically to execute the various methods. For example, referring again to Figures 1-4 and 6, embodiments can be implemented in digital electronic circuitry, or in computer hardware, firmware, software, or in combination of them. In one embodiment, a computer may comprise a processor or processors. The processor comprises a computer-readable medium, such as a random access memory (RAM) coupled to the processor. The processor executes computer-executable program instructions stored in memory, such as executing one or more computer programs for editing an image. Such processors may comprise a microprocessor, a digital signal processor (DSP), an application-specific integrated circuit (ASIC), field programmable gate arrays (FPGAs), and state machines. Such processors may further comprise programmable electronic devices such as PLCs, programmable interrupt controllers (PICs), programmable logic devices (PLDs), programmable read-only memories (PROMs), electronically programmable read-only memories (EPROMs or EEPROMs), or other similar devices.

[0057] Such processors may comprise, or may be in communication with, media, for example computer-readable media, that may store instructions that, when executed by the processor, can cause the processor to perform the steps described herein as carried out, or assisted, by a processor. Embodiments of computer-readable media may comprise, but are not limited to, an electronic, optical, magnetic, or other storage device capable of providing a processor, such as the processor in a web server, with computer-readable instructions. Other examples of media comprise, but are not limited to, a floppy disk, CD-ROM, magnetic disk, memory chip, ROM, RAM, ASIC, configured processor, all optical media, all magnetic tape or other magnetic media, or any other medium from which a computer processor can read. The processor, and the processing, described may be in one or more structures, and may be dispersed

through one or more structures. The processor may comprise code for carrying out one or more of the methods (or parts of methods) described herein.

General

[0058] The foregoing description of some embodiments of the invention has been presented only for the purpose of illustration and description and is not intended to be exhaustive or to limit the invention to the precise forms disclosed. Numerous modifications and adaptations thereof will be apparent to those skilled in the art without departing from the spirit and scope of the invention.

[0059] Reference herein to "one embodiment" or "an embodiment" means that a particular feature, structure, operation, or other characteristic described in connection with the embodiment may be included in at least one implementation of the invention. The invention is not restricted to the particular embodiments described as such. The appearance of the phrase "in one embodiment" or "in an embodiment" in various places in the specification does not necessarily refer to the same embodiment. Any particular feature, structure, operation, or other characteristic described in this specification in relation to "one embodiment" may be combined with other features, structures, operations, or other characteristics described in respect of any other embodiment.

CLAIMS

That which is claimed is:

1. A system for generating haptic effects to confirm receipt of a voice command, the system comprising:
 - a microphone;
 - a housing configured to be contacted by a user;
 - an actuator in communication with the housing, the actuator configured to output a haptic effect to the housing; and
 - a processor in communication with the microphone and the actuator, the processor configured to:
 - receive speech information from the microphone;
 - recognize the speech information and determine a command associated with the speech information;
 - if the speech information is recognized and the command is determined:
 - generate a first actuator signal configured to cause the 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.
2. The system of claim 1, wherein the processor is further configured to, if the speech information is recognized and the command is determined:

execute a function associated with the speech information;

generate a third actuator signal configured to cause the actuator to output a third haptic effect; and

transmit the third actuator signal to the actuator upon completion of execution of the function.

3. The system of claim 2, wherein the third haptic effect is configured to emulate the function.

4. The system of claim 3, wherein the function comprises activating a turn signal indicator and the third haptic effect comprises a vibration that travels in the direction of the impending turn.

5. The system of claim 1, further comprising a speaker in communication with the processor, and wherein the processor is further configured to:

generate an audio signal configured to cause the speaker to output a sound; and

transmit the audio signal to the speaker.

6. The system of claim 1, further comprising a display in communication with the processor, and wherein the processor is further configured to:

generate a display signal configured to cause the display to display an image; and

transmit the display signal to the display.

7. The system of claim 1, wherein the first haptic effect is configured to emulate the command.

8. The system of claim 1, wherein the microphone, actuator, and processor are disposed within the housing.

9. The system of claim 1, wherein the housing comprises one of a Bluetooth headset, a Bluetooth earbud, a cell phone, a personal digital assistant, a touch-sensitive surface, a mouse, or a keyboard.

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 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.

11. The computer-implemented method of claim 10, wherein if the speech information is recognized and the command is determined:

executing a function associated with the command;

generating a third actuator signal configured to cause the actuator to output a third haptic effect; and

transmitting the third actuator signal to the actuator upon completion of execution of the function.

12. The computer-implemented method of claim 11, wherein the third haptic effect is configured to emulate the function.

13. The computer-implemented method of claim 12, wherein the function comprises activating a turn signal indicator and the third haptic effect comprises a vibration that travels in the direction of the impending turn.

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.

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.

16. The computer-implemented method of claim 10, wherein the first haptic effect is configured to emulate the command.

ABSTRACT

Systems and methods for haptic confirmation of commands are disclosed. For example a system for generating haptic effects to confirm receipt of a voice command includes a microphone; a housing configured to be contacted by a user, and an actuator in communication with the housing, the actuator configured to output a haptic effect to the housing. The system also includes a processor in communication with the microphone and the actuator, the processor configured to receive speech information from the microphone; recognize the speech information and determine a command associated with the speech information. If the speech information is recognized and the command is determined, the processor is configured to generate a first actuator signal configured to cause the actuator to output a first haptic effect, and transmit the first actuator signal to the actuator. Otherwise, the processor is configured 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.

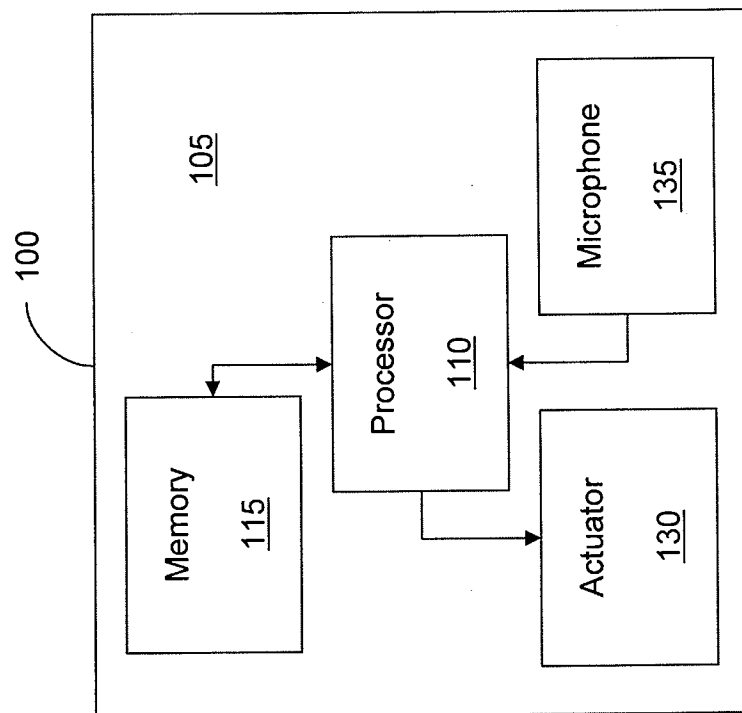


Figure 1

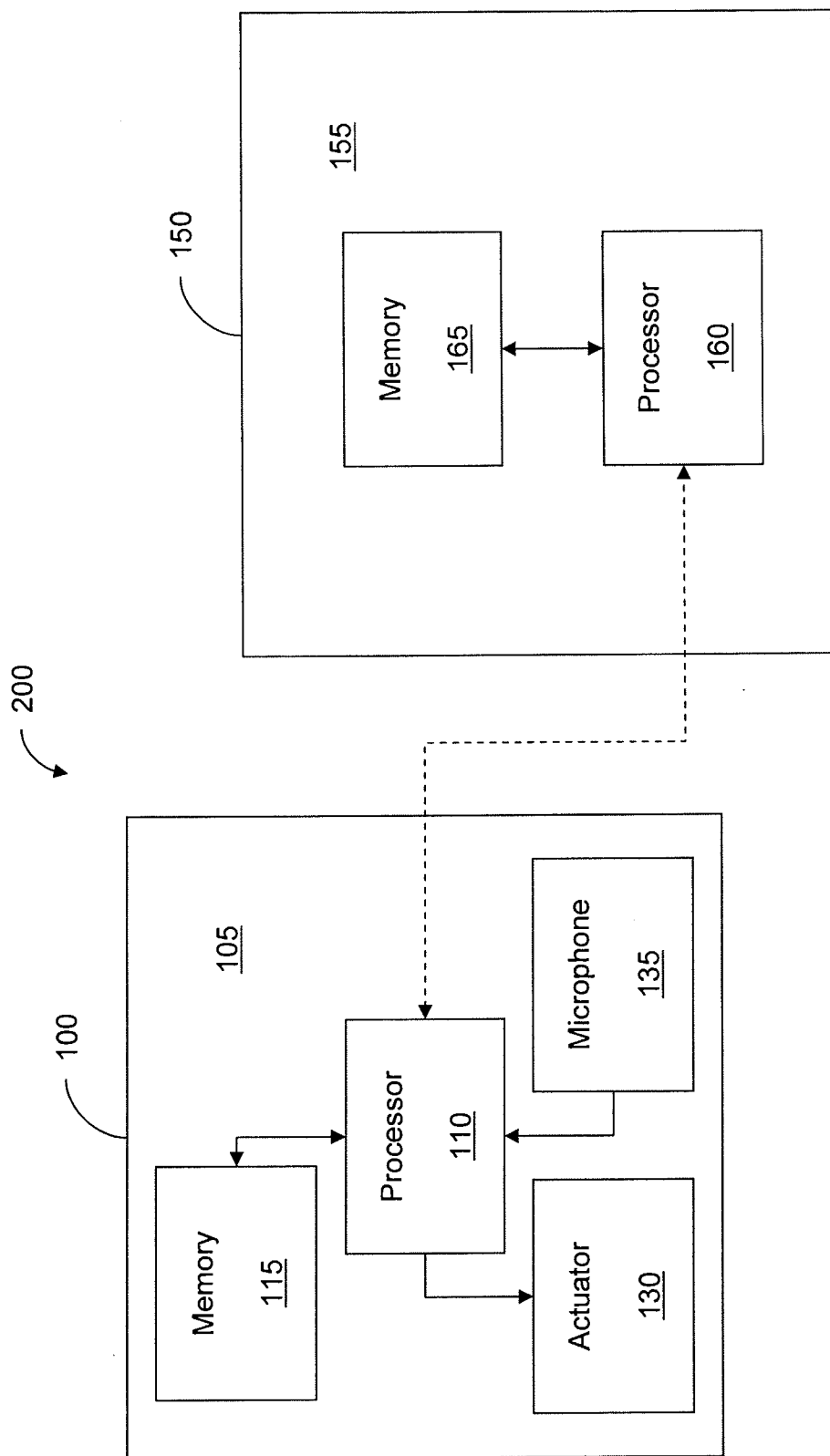


Figure 2

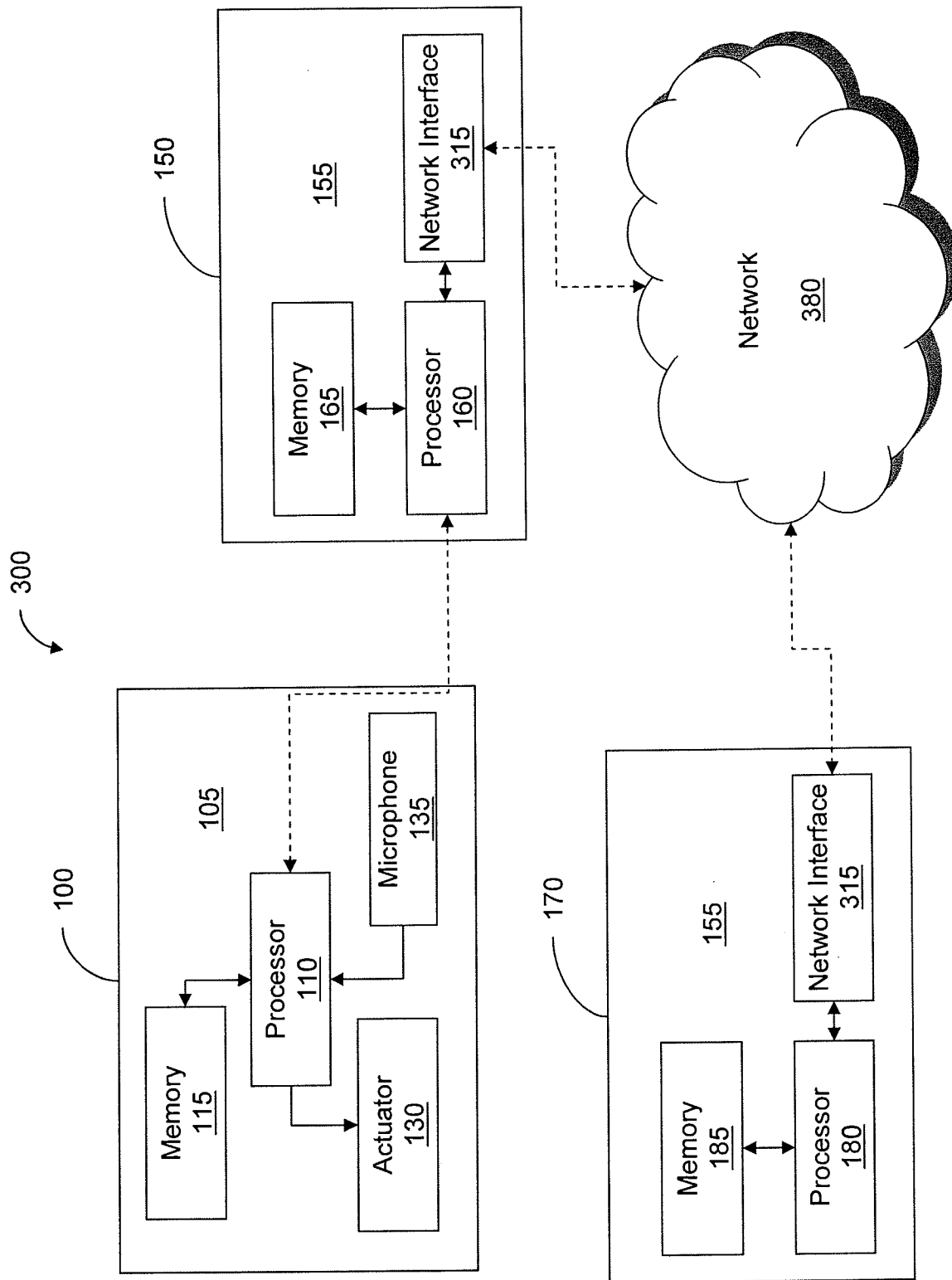


Figure 3

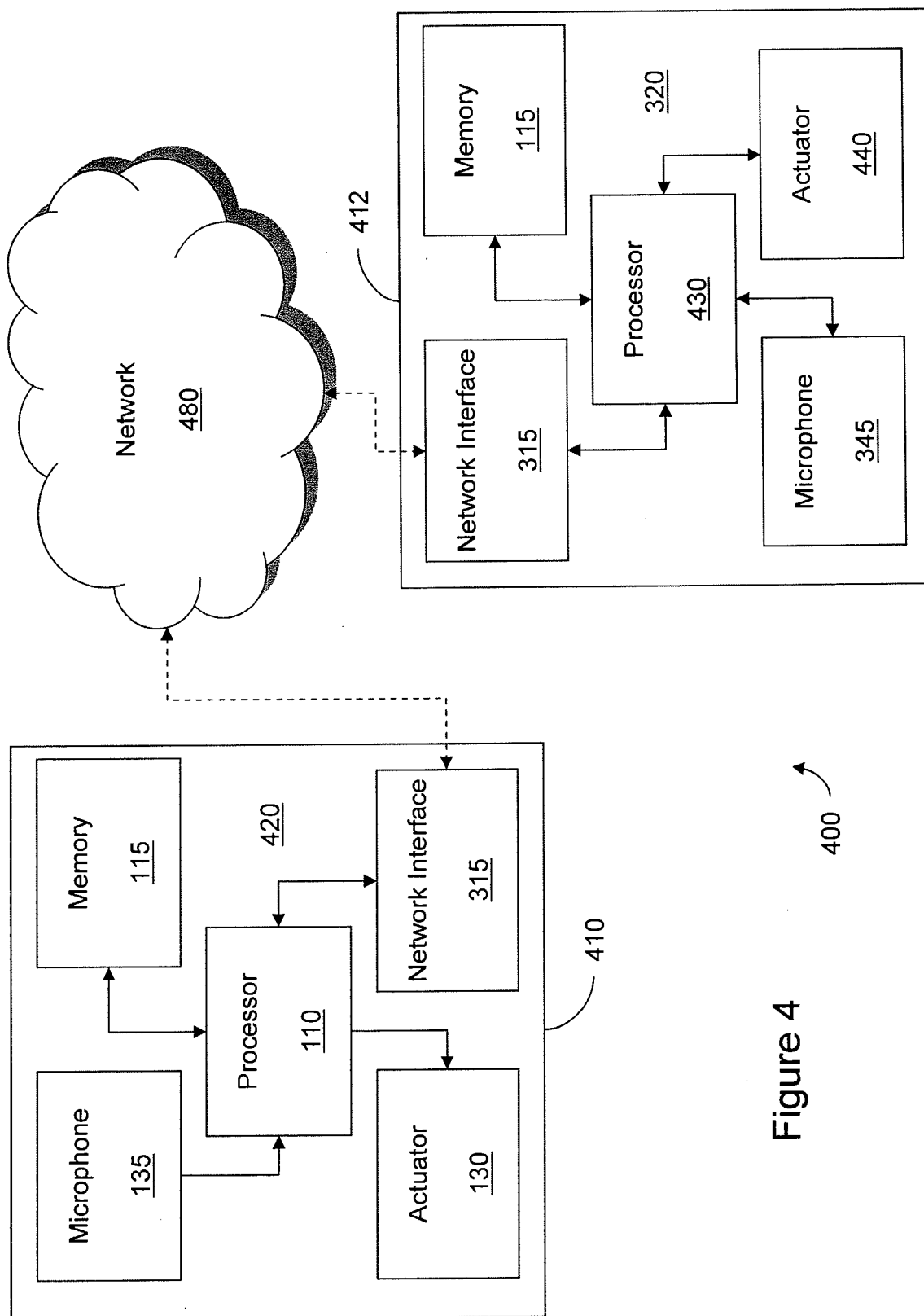


Figure 4

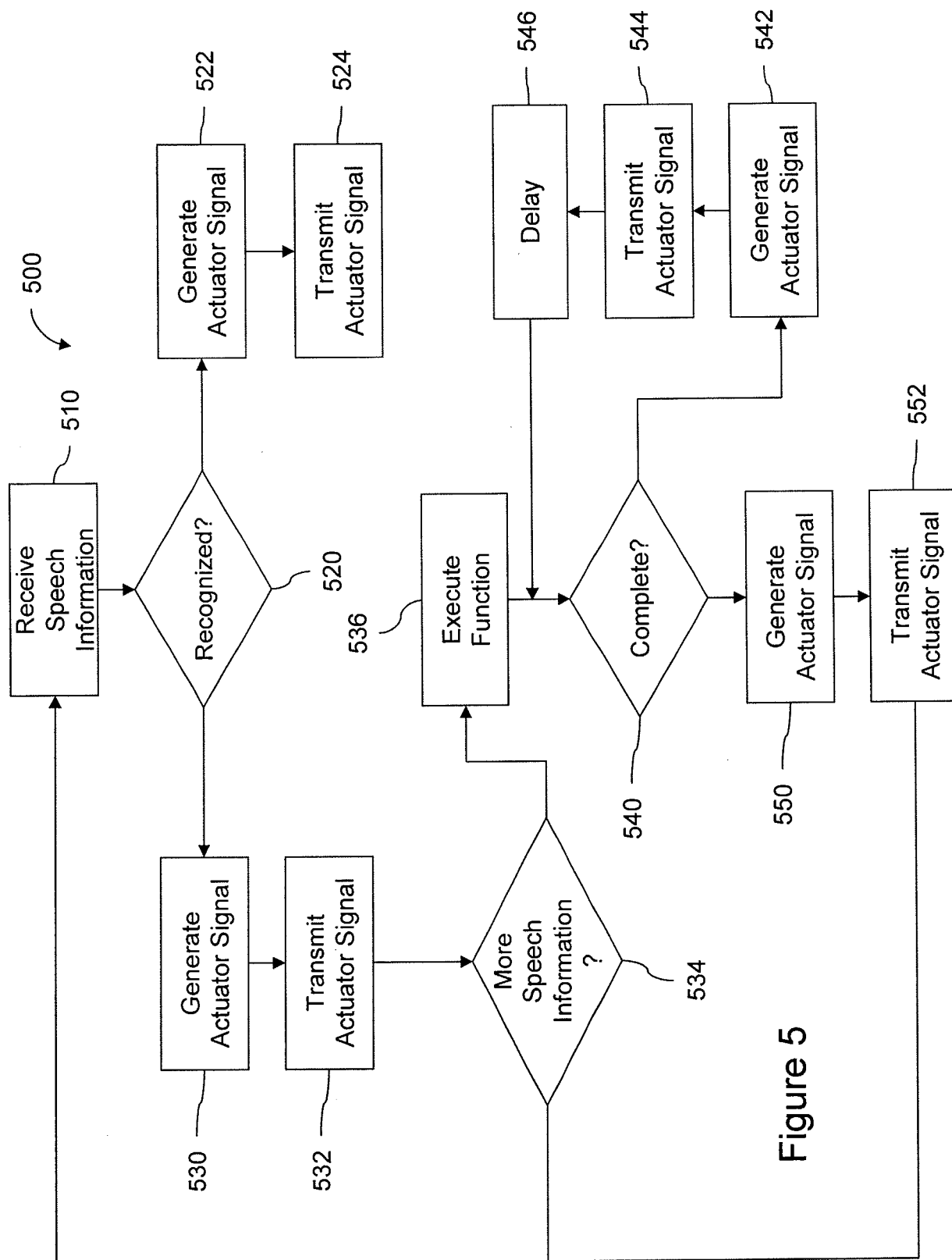


Figure 5

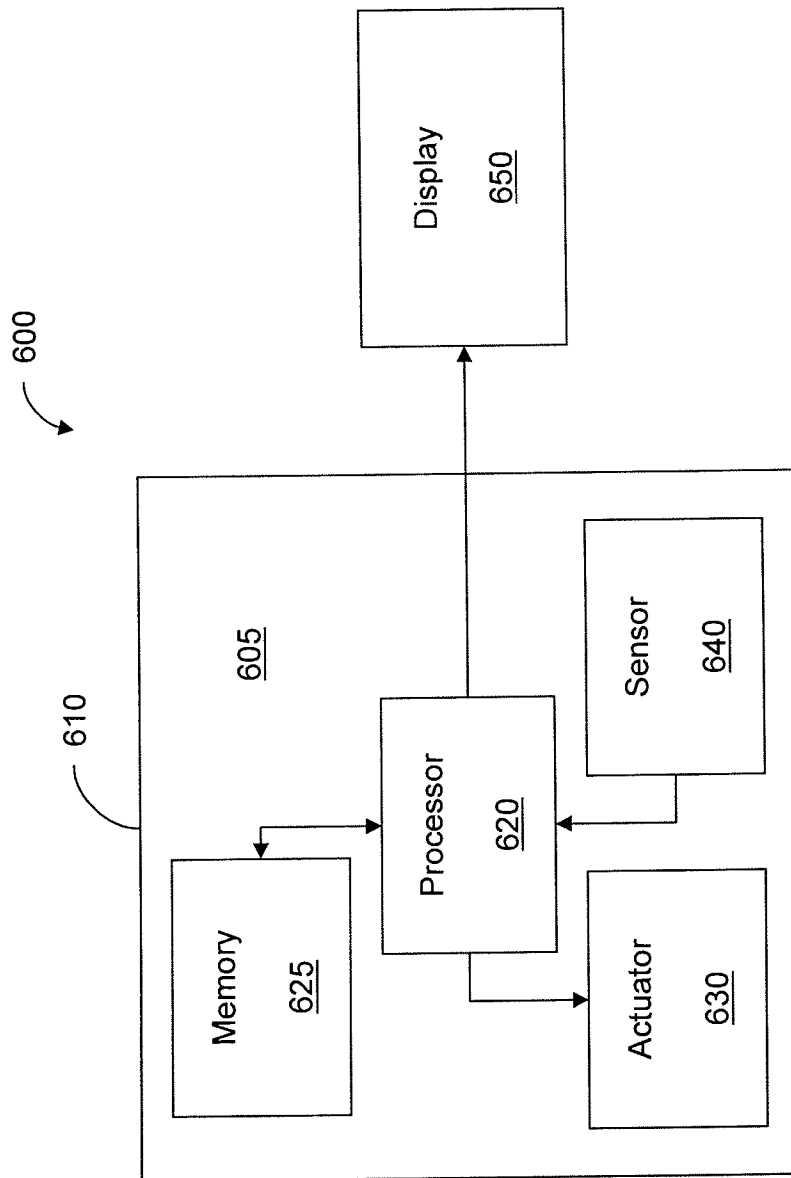


Figure 6

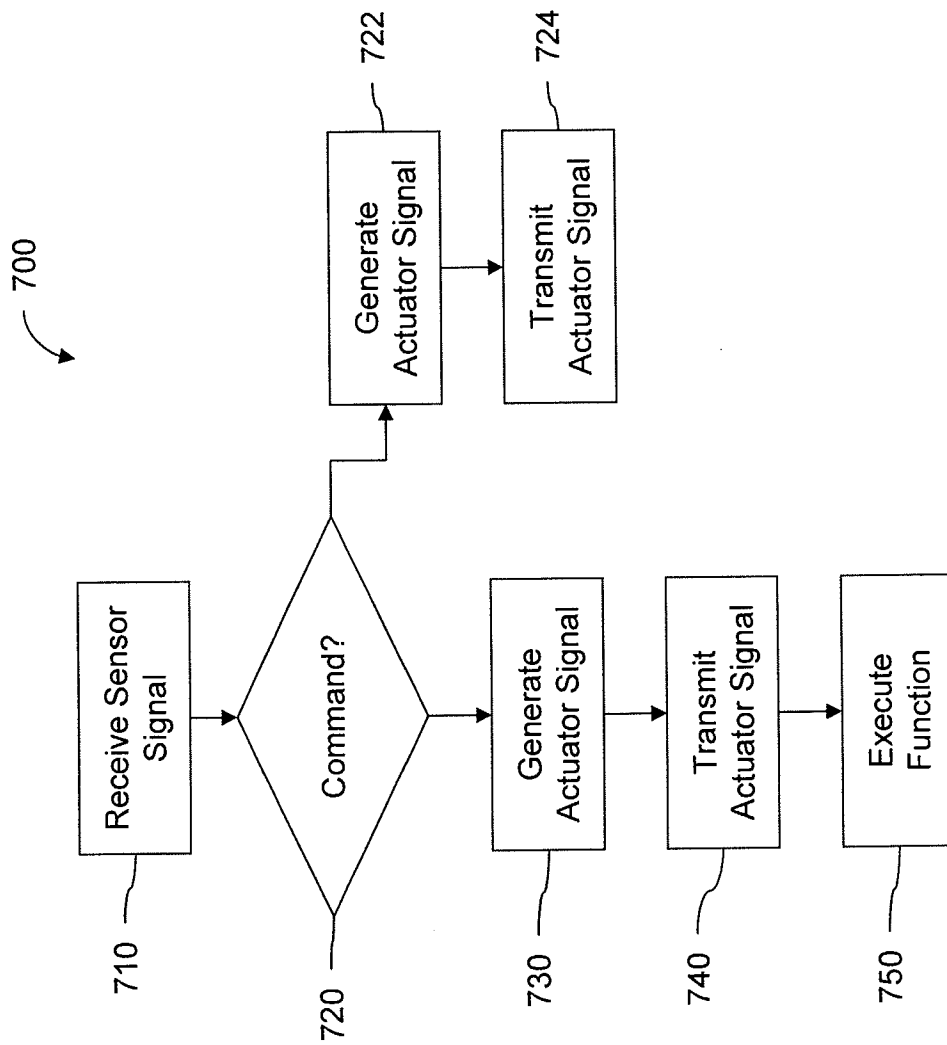


Figure 7

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**DECLARATION FOR UTILITY OR
DESIGN
PATENT APPLICATION
(37 CFR 1.63)**

☒ Declaration Submitted With Initial Filing OR ☐ Declaration Submitted After Initial Filing (surcharge (37 CFR 1.16(f)) required)

Attorney Docket Number	IMM328 (51851/369768)
First Named Inventor	Robert W. Heubel et al
<i>COMPLETE IF KNOWN</i>	
Application Number	To Be Assigned
Filing Date	Herewith
Art Unit	To Be Assigned
Examiner Name	To Be Assigned

I hereby declare that: (1) Each inventor's residence, mailing address, and citizenship are as stated below next to their name; and (2) I believe the inventor(s) named below to be the original and first inventor(s) of the subject matter which is claimed and for which a patent is sought on the invention titled:

SYSTEMS AND METHODS FOR HAPTIC CONFIRMATION OF COMMANDS

(Title of the Invention)

the application of which

☒ is attached hereto

OR

☐ was filed on (MM/DD/YYYY) _____ as United States Application Number or PCT International Application Number _____ and was amended on (MM/DD/YYYY) _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified application, including the claims, as amended by any amendment specifically referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application.

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[Page 1 of 3]

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 21 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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DECLARATION — Utility or Design Patent Application

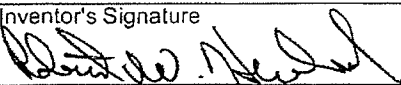
Claim of Foreign Priority Benefits

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or (f), or 365(b) of any foreign application(s) for patent, inventor's or plant breeder's rights certificate(s), or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent, inventor's or plant breeder's rights certificate(s), or any PCT international application having a filing date before that of the application on which priority is claimed.

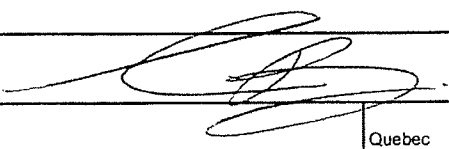
Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached?	
				YES	NO
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

☐ Additional foreign application number(s) are listed on a supplemental priority data sheet PTO/SB/02B attached hereto.

DECLARATION — Utility or Design Patent Application

Direct all correspondence to:	<input checked="" type="checkbox"/> The address associated with Customer Number:	<input type="checkbox"/> OR	<input type="checkbox"/> Correspondence address below
		34300	
Name			
Address			
City		State	Zip
Country	Telephone		Email
<p align="center">WARNING:</p> <p>Petitioner/applicant is cautioned to avoid submitting personal information in documents filed in a patent application that may contribute to identity theft. Personal information such as social security numbers, bank account numbers, or credit card numbers (other than a check or credit card authorization form PTO-2038 submitted for payment purposes) is never required by the USPTO to support a petition or an application. If this type of personal information is included in documents submitted to the USPTO, petitioners/applicants should consider redacting such personal information from the documents before submitting them to the USPTO. Petitioner/applicant is advised that the record of a patent application is available to the public after publication of the application (unless a non-publication request in compliance with 37 CFR 1.213(a) is made in the application) or issuance of a patent. Furthermore, the record from an abandoned application may also be available to the public if the application is referenced in a published application or an issued patent (see 37 CFR 1.14). Checks and credit card authorization forms PTO-2038 submitted for payment purposes are not retained in the application file and therefore are not publicly available. Petitioner/applicant is advised that documents which form the record of a patent application (such as the PTO/SB/01) are placed into the Privacy Act system of records DEPARTMENT OF COMMERCE, COMMERCE-PAT-7, System name: <i>Patent Application Files</i>. Documents not retained in an application file (such as the PTO-2038) are placed into the Privacy Act system of COMMERCE/PAT-TM-10, System name: <i>Deposit Accounts and Electronic Funds Transfer Profiles</i>.</p> <p>I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.</p>			
NAME OF SOLE OR FIRST INVENTOR:		<input type="checkbox"/> A petition has been filed for this unsigned inventor	
Given Name (first and middle [if any])		Family Name or Surname	
Robert W.		Heubel	
Inventor's Signature		Date	
		2-NOV-2009	
Residence: City	State	Country	Citizenship
San Leandro	CA	US	US
Mailing Address			
652 Begier Avenue			
City	State	Zip	Country
San Leandro	CA	94577	US
<input checked="" type="checkbox"/> Additional inventors or a legal representative are being named on the <u>1</u> supplemental sheet(s) PTO/SB/02A or 02LR attached hereto			

DECLARATION**ADDITIONAL INVENTOR(S)**
Supplemental SheetPage 1 of 1

Name of Additional Joint Inventor, if any:		<input type="checkbox"/> A petition has been filed for this unsigned inventor	
Given Name (first and middle (if any))		Family Name or Surname	
Erin		Ramsay	
Inventor's Signature 		Date	
Montreal Residence: City	Quebec State	CA Country	CA Citizenship
2012 Harvard Avenue, Apartment #104			
Mailing Address			
Montreal City	Quebec State	H4A 2V9 Zip	CA Country
Name of Additional Joint Inventor, if any:		<input type="checkbox"/> A petition has been filed for this unsigned inventor	
Given Name (first and middle (if any))		Family Name or Surname	
Inventor's Signature		Date	
Residence: City	State	Country	Citizenship
Mailing Address			
City	State	Zip	Country
Name of Additional Joint Inventor, if any:		<input type="checkbox"/> A petition has been filed for this unsigned inventor	
Given Name (first and middle (if any))		Family Name or Surname	
Inventor's Signature		Date	
Residence: City	State	Country	Citizenship
Mailing Address			
City	State	Zip	Country

This collection of information is required by 35 U.S.C. 115 and 37 CFR 1.63. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 21 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

POWER OF ATTORNEY TO PROSECUTE APPLICATIONS BEFORE THE USPTO

I hereby revoke all previous powers of attorney given in the application identified in the attached statement under 37 CFR 3.73(b).

I hereby appoint:

☒ Practitioners associated with the Customer Number:

34300

OR

☐ Practitioner(s) named below (if more than ten patent practitioners are to be named, then a customer number must be used):

Name	Registration Number	Name	Registration Number

as attorney(s) or agent(s) to represent the undersigned before the United States Patent and Trademark Office (USPTO) in connection with any and all patent applications assigned only to the undersigned according to the USPTO assignment records or assignment documents attached to this form in accordance with 37 CFR 3.73(b).

Please change the correspondence address for the application identified in the attached statement under 37 CFR 3.73(b) to:

☐ The address associated with Customer Number:

OR

<input type="checkbox"/> Firm or Individual Name			
Address			
City	State	Zip	
Country			
Telephone	Email		

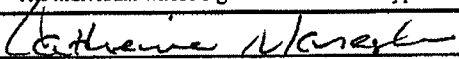
Assignee Name and Address:

Immersion Corporation
801 Fox Lane
San Jose, California 95131

A copy of this form, together with a statement under 37 CFR 3.73(b) (Form PTO/SB/96 or equivalent) is required to be filed in each application in which this form is used. The statement under 37 CFR 3.73(b) may be completed by one of the practitioners appointed in this form if the appointed practitioner is authorized to act on behalf of the assignee, and must identify the application in which this Power of Attorney is to be filed.

SIGNATURE of Assignee of Record

The individual whose signature and title is supplied below is authorized to act on behalf of the assignee

Signature		Date	March 27, 2009
Name	Catherine Maresh	Telephone	408-350-8819
Title	Senior IP Counsel		

This collection of information is required by 37 CFR 1.31, 1.32 and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

STATEMENT UNDER 37 CFR 3.73(b)Applicant/Patent Owner: Immersion CorporationApplication No./Patent No.: To Be AssignedFiled/Issue Date: HerewithTitled: Systems And Methods For Haptic Confirmation Of CommandsImmersion Corporation, a corporation

(Name of Assignee)

(Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

1. ☒ the assignee of the entire right, title, and interest in;
2. ☐ an assignee of less than the entire right, title, and interest in
(The extent (by percentage) of its ownership interest is _____ %); or
3. ☐ the assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made)

the patent application/patent identified above, by virtue of either:

- A. ☒ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 023522, Frame 0080, or for which a copy therefore is attached.

OR

- B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

2. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

3. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at

Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

- ☐ As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

Signature

Date

Carl SandersSeptember 5, 2012

Printed or Typed Name

Title

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Electronic Patent Application Fee Transmittal

Application Number:

Filing Date:

Title of Invention:

Systems And Methods For Haptic Confirmation Of Commands

First Named Inventor/Applicant Name:

Robert W. Heubel

Filer:

Carl E. Sanders/Laura Smith

Attorney Docket Number:

IMM328.C1(51851/849050)

Filed as Large Entity

Utility under 35 USC 111(a) Filing Fees

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Utility application filing	1011	1	380	380
Utility Search Fee	1111	1	620	620
Utility Examination Fee	1311	1	250	250

Pages:

Claims:

Miscellaneous-Filing:

Petition:

Patent-Appeals-and-Interference:

Immersion Ex 2008-48

Apple v Immersion
IPR2017-01368

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				1250

Electronic Acknowledgement Receipt

EFS ID:	13658529
Application Number:	13603578
International Application Number:	
Confirmation Number:	1043
Title of Invention:	Systems And Methods For Haptic Confirmation Of Commands
First Named Inventor/Applicant Name:	Robert W. Heubel
Customer Number:	34300
Filer:	Carl E. Sanders/Laura Smith
Filer Authorized By:	Carl E. Sanders
Attorney Docket Number:	IMM328.C1(51851/849050)
Receipt Date:	05-SEP-2012
Filing Date:	
Time Stamp:	11:29:02
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$1250
RAM confirmation Number	10551
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part / .zip (if appl.)	Pages (if appl.)
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Immersion Ex 2008-59
Apple v Immersion

IPR2017-01368

1	Transmittal of New Application	UtilityTransmittal849050.pdf	100180	no	1
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Warnings:					
Information:					
2	Application Data Sheet	ApplicationDataSheet849050.pdf	280230	no	3
			05f72b13d9c23185e3630b465f55a7b92085f756		
Warnings:					
Information:					
This is not an USPTO supplied ADS fillable form					
3	Specification	Specification849050.pdf	1508129	no	30
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Warnings:					
Information:					
4	Drawings-only black and white line drawings	Figures849050.pdf	113317	no	7
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Warnings:					
Information:					
5	Oath or Declaration filed	Declaration849050.pdf	261182	no	4
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Warnings:					
Information:					
6	Power of Attorney	PowerofAttorney840050.pdf	88894	no	1
			18e8a5790cca51b5dd458a870abbdd20390b45f1		
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Information:					
7	Miscellaneous Incoming Letter	StatementUnder37CFR849050.pdf	86548	no	1
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Warnings:					
Information:					
8	Fee Worksheet (SB06)	fee-info.pdf	32872	no	2
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Warnings:					
Information:					
Total Files Size (in bytes):			2471352		

This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875						Application or Docket Number 13/603,578			
APPLICATION AS FILED - PART I									
(Column 1)		(Column 2)		SMALL ENTITY		OTHER THAN SMALL ENTITY			
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)		RATE(\$)	FEE(\$)		
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	380		
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A			N/A	620		
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	250		
TOTAL CLAIMS (37 CFR 1.16(j))	16	minus 20 = *			OR	x 60 =	0.00		
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2	minus 3 = *				x 250 =	0.00		
APPLICATION SIZE FEE (37 CFR 1.16(s))			If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))						0.00			
						0.00			
			TOTAL			TOTAL	1250		
* If the difference in column 1 is less than zero, enter "0" in column 2.									
APPLICATION AS AMENDED - PART II									
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OTHER THAN SMALL ENTITY	
AMENDMENT A		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)	RATE(\$)	ADDITIONAL FEE(\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x	=	OR	x
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x	=	OR	x
	Application Size Fee (37 CFR 1.16(s))							OR	
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR	
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE
AMENDMENT B		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)	RATE(\$)	ADDITIONAL FEE(\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x	=	OR	x
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x	=	OR	x
	Application Size Fee (37 CFR 1.16(s))							OR	
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR	
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.									



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/603,578	09/05/2012	Robert W. Heubel	IMM328.C1 (51851/849050)

CONFIRMATION NO. 1043

FORMALITIES LETTER



34300
PATENT DEPARTMENT (51851)
KILPATRICK TOWNSEND & STOCKTON LLP
1001 WEST FOURTH STREET
WINSTON-SALEM, NC 27101

Date Mailed: 09/18/2012

NOTICE TO FILE CORRECTED APPLICATION PAPERS

Filing Date Granted

An application number and filing date have been accorded to this application. The application is informal since it does not comply with the regulations for the reason(s) indicated below. Applicant is given TWO MONTHS from the date of this Notice within which to correct the informalities indicated below. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a).

The required item(s) identified below must be timely submitted to avoid abandonment:

- A replacement abstract not exceeding 150 words in length and commencing on a separate sheet in compliance with 37 CFR 1.72(b) and 37 CFR 1.121 is required.

Applicant is cautioned that correction of the above items may cause the specification and drawings page count to exceed 100 pages. If the specification and drawings exceed 100 pages, applicant will need to submit the required application size fee.

Replies should be mailed to:

Mail Stop Missing Parts
Commissioner for Patents
P.O. Box 1450
Alexandria VA 22313-1450

Registered users of EFS-Web may alternatively submit their reply to this notice via EFS-Web.
<https://sportal.uspto.gov/authenticate/AuthenticateUserLocalEPF.html>

For more information about EFS-Web please call the USPTO Electronic Business Center at **1-866-217-9197** or visit our website at <http://www.uspto.gov/ebc>.

If you are not using EFS-Web to submit your reply, you must include a copy of this notice.

/mbelay/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
13/603,578	09/05/2012	2629	1250	IMM328.C1 (51851/849050)	16	2

CONFIRMATION NO. 1043

34300

PATENT DEPARTMENT (51851)
KILPATRICK TOWNSEND & STOCKTON LLP
1001 WEST FOURTH STREET
WINSTON-SALEM, NC 27101

FILING RECEIPT



Date Mailed: 09/18/2012

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Robert W. Heubel, San Leandro, CA;
Erin Ramsay, Montreal, CANADA;

Applicant(s)

Robert W. Heubel, San Leandro, CA;
Erin Ramsay, Montreal, CANADA;

Assignment For Published Patent Application

Immersion Corporation, San Jose, CA

Power of Attorney: The patent practitioners associated with Customer Number 34300

Domestic Priority data as claimed by applicant

This application is a CON of 12/612,230 11/04/2009 PAT 8279052

Foreign Applications (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.)

If Required, Foreign Filing License Granted: 09/14/2012

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/603,578**

Projected Publication Date: To Be Determined - pending completion of Corrected Papers

Non-Publication Request: No

Early Publication Request: No

Title

Systems And Methods For Haptic Confirmation Of Commands

Preliminary Class

345

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

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set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/603,578	09/05/2012	Robert W. Heubel	IMM328.C1 (51851/849050)

CONFIRMATION NO. 1043

POA ACCEPTANCE LETTER

34300
PATENT DEPARTMENT (51851)
KILPATRICK TOWNSEND & STOCKTON LLP
1001 WEST FOURTH STREET
WINSTON-SALEM, NC 27101



Date Mailed: 09/18/2012

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 09/05/2012.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

/ttruong/

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of : Robert W. Heubel
Application No. : 13/603,578
For : **Systems and Methods for Haptic
Confirmation of Commands**
Filed : September 5, 2012
Examiner : To Be Assigned
Art Unit : 2629
Confirmation No. : 1043

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE TO NOTICE TO FILE CORRECTED APPLICATION PAPERS

Sir:

The following Amendment and Remarks are submitted in response to the Notice to File Missing Application Papers mailed September 18, 2012.

Amendments to the Specification begin on page 2 of this paper.

Remarks begin on page 3 of this paper.

ABSTRACT OF THE DISCLOSURE

Please replace the current Abstract with the Abstract found on the following page.

ABSTRACT OF THE DISCLOSURE

Systems and methods for haptic confirmation of commands are disclosed. For example, ~~a one system for generating haptic effects to confirm receipt of a voice command~~ includes a microphone; a housing configured to be contacted by a user, and an actuator in communication with the housing, the actuator configured to output a haptic effect to the housing. The system also includes a processor in communication with the microphone and the actuator, the processor configured to receive speech information from the microphone; recognize the speech information and determine a command associated with the speech information. If the speech information is recognized and the command is determined, the processor is configured to generate an first actuator signal configured to cause the actuator to output a ~~first~~ haptic effect, and transmit the ~~first~~ actuator signal to the actuator. Otherwise, the processor is configured 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.

REMARKS

In response to the Notice to File Corrected Application Papers mailed September 18, 2012, Applicant submits herewith a replacement Abstract having no more than 150 words and otherwise in compliance with 37 C.F.R. § 1.72(b).

CONCLUSION

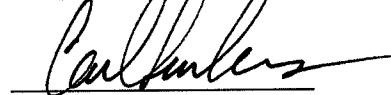
Applicant respectfully asserts that in view of the amendments and remarks above, all pending claims are allowable and Applicant respectfully requests the allowance of all claims.

Should the Examiner have any comments, questions, or suggestions of a nature necessary to expedite the prosecution of the application, or to place the case in condition for allowance, the Examiner is courteously requested to telephone the undersigned at the number listed below.

Date:

December 18, 2012

Respectfully submitted,



Carl Sanders
Reg. No. 57,203

KILPATRICK TOWNSEND & STOCKTON LLP
1001 West Fourth Street
Winston-Salem, NC 27101
(336) 607-7474 (voice)
(336) 734-2629 (fax)

Electronic Patent Application Fee Transmittal

Application Number:	13603578			
Filing Date:	05-Sep-2012			
Title of Invention:	Systems And Methods For Haptic Confirmation Of Commands			
First Named Inventor/Applicant Name:	Robert W. Heubel			
Filer:	Carl E. Sanders/Laura Smith			
Attorney Docket Number:	IMM328.C1 (51851/849050)			
Filed as Large Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Extension - 1 month with \$0 paid	1251	1	150	150

Immersion Ex 2008.63

Apple v Immersion

IPR2017-01368

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Total in USD (\$)				150

Electronic Acknowledgement Receipt

EFS ID:	14495934
Application Number:	13603578
International Application Number:	
Confirmation Number:	1043
Title of Invention:	Systems And Methods For Haptic Confirmation Of Commands
First Named Inventor/Applicant Name:	Robert W. Heubel
Customer Number:	34300
Filer:	Carl E. Sanders/Laura Smith
Filer Authorized By:	Carl E. Sanders
Attorney Docket Number:	IMM328.C1 (51851/849050)
Receipt Date:	18-DEC-2012
Filing Date:	05-SEP-2012
Time Stamp:	10:31:36
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$ 150
RAM confirmation Number	10669
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part / .zip (if appl.)	Pages (if appl.)
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Immersion Ex 2008-63
Apple v Immersion

IPR2017-01368

1	Transmittal Letter	Transmittal849050.pdf	39975	no	1
			80b74e6c74c9405ff774a4f931d4da59cc10124c		
Warnings:					
Information:					
2	Extension of Time	ExtensionofTime849050.pdf	77957	no	1
			9b56771c3822d69d26aceabf84913ebae2b7b25c		
Warnings:					
Information:					
3	Miscellaneous Incoming Letter	Response849050.pdf	96846	no	4
			f6783034c575fc775fda79b3fd5954310558c376		
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	30318	no	2
			b3b4f3a088a013acb0a0a4288d149fa25b5fead5		
Warnings:					
Information:					
Total Files Size (in bytes):			245096		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of : Robert W. Heubel
Application No. : 13/603,578
Filed : September 5, 2012
For : Systems And Methods For Haptic
Confirmation Of Commands
Examiner : To Be Assigned
Art Unit : 2629
Confirmation No. : 1043

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL

Sir:

Transmitted herewith are copies of the following documents for filing in the above-identified application:

1. Transmittal;
2. Petition for Extension of Time (1 month);
3. Response to Notice to File Corrected Application Papers; and
4. EFS-Web Payment in the amount of \$150.00
(Extension of Time Fee)

The Commissioner is hereby authorized to charge any additional fees required by this action, or credit any overpayment, to Deposit Account Number 20-1430.

Respectfully submitted,

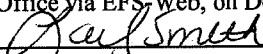
Date: December 18, 2012
KILPATRICK TOWNSEND &
STOCKTON LLP
1001 West Fourth Street
Winston-Salem, NC 27101-2400
(336) 747-7541

By: 

Carl Sanders (Reg. No. 57,203)

Certificate of Electronic Filing

I hereby certify that this correspondence is being electronically filed with the United States Patent Office via EFS-Web, on December 18, 2012.


Laura J. Smith

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)		Docket Number (Optional) IMM328.C1 (51851/849050)
Application Number 13/603,578	Filed September 5, 2012	
For Systems And Methods For Haptic Confirmation Of Commands		
Art Unit 2629	Examiner To Be Assigned	

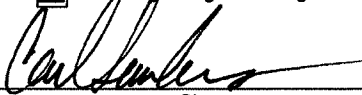
This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above-identified application.

The requested extension and fee are as follows (check time period desired and enter the appropriate fee below):

	<u>Fee</u>	<u>Small Entity Fee</u>	
<input checked="" type="checkbox"/> One month (37 CFR 1.17(a)(1))	\$150	\$75	\$ <u>150.00</u>
<input type="checkbox"/> Two months (37 CFR 1.17(a)(2))	\$570	\$285	\$ _____
<input type="checkbox"/> Three months (37 CFR 1.17(a)(3))	\$1,290	\$645	\$ _____
<input type="checkbox"/> Four months (37 CFR 1.17(a)(4))	\$2,010	\$1,005	\$ _____
<input type="checkbox"/> Five months (37 CFR 1.17(a)(5))	\$2,730	\$1,365	\$ _____

☐ Applicant claims small entity status. See 37 CFR 1.27.☐ A check in the amount of the fee is enclosed.☐ Payment by credit card. Form PTO-2038 is attached.☐ The Director has already been authorized to charge fees in this application to a Deposit Account.☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to
Deposit Account Number 20-1430.☒ Payment made via EFS-Web.**WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**

I am the

☐ applicant/inventor.☐ assignee of record of the entire interest. See 37 CFR 3.71. 37 CFR 3.73(b) statement is enclosed (Form PTO/SB/96).☐ attorney or agent of record. Registration number _____.☒ attorney or agent acting under 37 CFR 1.34. Registration number 57,203.

Signature

December 18, 2012

Date

Carl Sanders

Typed or printed name

336/607-7300

Telephone Number

NOTE: This form must be signed in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. Submit multiple forms if more than one signature is required, see below*.☐ * Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.136(a). The information is required to obtain or retain a benefit by the public, which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 6 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop PCT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875						Application or Docket Number 13/603,578				
APPLICATION AS FILED - PART I										
(Column 1)		(Column 2)		SMALL ENTITY		OR OTHER THAN SMALL ENTITY				
FOR	NUMBER FILED	NUMBER EXTRA	RATE(\$)	FEE(\$)		RATE(\$)	FEE(\$)			
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A	390			
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A			N/A	620			
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A	250			
TOTAL CLAIMS (37 CFR 1.16(j))	16	minus 20 = *			OR	x 62 =	0.00			
INDEPENDENT CLAIMS (37 CFR 1.16(h))	2	minus 3 = *				x 250 =	0.00			
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).						0.00			
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))							0.00			
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL			TOTAL	1260			
APPLICATION AS AMENDED - PART II										
(Column 1)		(Column 2)		(Column 3)		SMALL ENTITY		OR OTHER THAN SMALL ENTITY		
AMENDMENT A		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x	=	OR	x	=
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x	=	OR	x	=
	Application Size Fee (37 CFR 1.16(s))							OR		
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	
AMENDMENT B		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE(\$)	ADDITIONAL FEE(\$)		RATE(\$)	ADDITIONAL FEE(\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	x	=	OR	x	=
	Independent (37 CFR 1.16(h))	*	Minus	***	=	x	=	OR	x	=
	Application Size Fee (37 CFR 1.16(s))							OR		
	FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1.										



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APPLICATION NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
13/603,578	09/05/2012	2629	1250	IMM328.C1 (51851/849050)	16	2

CONFIRMATION NO. 1043

UPDATED FILING RECEIPT

34300
PATENT DEPARTMENT (51851)
KILPATRICK TOWNSEND & STOCKTON LLP
1001 WEST FOURTH STREET
WINSTON-SALEM, NC 27101



Date Mailed: 12/28/2012

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

Robert W. Heubel, San Leandro, CA;
Erin Ramsay, Montreal, CANADA;

Applicant(s)

Robert W. Heubel, San Leandro, CA;
Erin Ramsay, Montreal, CANADA;

Assignment For Published Patent Application

Immersion Corporation, San Jose, CA

Power of Attorney: The patent practitioners associated with Customer Number 34300

Domestic Priority data as claimed by applicant

This application is a CON of 12/612,230 11/04/2009 PAT 8279052

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.) - None.

Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

If Required, Foreign Filing License Granted: 09/14/2012

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 13/603,578**

Projected Publication Date: 04/11/2013

Non-Publication Request: No

Early Publication Request: No

Title

Systems And Methods For Haptic Confirmation Of Commands

Preliminary Class

345

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

Applicants also are advised that in the case of inventions made in the United States, the Director of the USPTO must issue a license before applicants can apply for a patent in a foreign country. The filing of a U.S. patent application serves as a request for a foreign filing license. The application's filing receipt contains further information and guidance as to the status of applicant's license for foreign filing.

Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

For information on preventing theft of your intellectual property (patents, trademarks and copyrights), you may wish to consult the U.S. Government website, <http://www.stopfakes.gov>. Part of a Department of Commerce initiative, this website includes self-help "toolkits" giving innovators guidance on how to protect intellectual property in specific countries such as China, Korea and Mexico. For questions regarding patent enforcement issues, applicants may call the U.S. Government hotline at 1-866-999-HALT (1-866-999-4158).

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set forth in 37 CFR 5.15. The scope and limitations of this license are set forth in 37 CFR 5.15(a) unless an earlier license has been issued under 37 CFR 5.15(b). The license is subject to revocation upon written notification. The date indicated is the effective date of the license, unless an earlier license of similar scope has been granted under 37 CFR 5.13 or 5.14.

This license is to be retained by the licensee and may be used at any time on or after the effective date thereof unless it is revoked. This license is automatically transferred to any related applications(s) filed under 37 CFR 1.53(d). This license is not retroactive.

The grant of a license does not in any way lessen the responsibility of a licensee for the security of the subject matter as imposed by any Government contract or the provisions of existing laws relating to espionage and the national security or the export of technical data. Licensees should apprise themselves of current regulations especially with respect to certain countries, of other agencies, particularly the Office of Defense Trade Controls, Department of State (with respect to Arms, Munitions and Implements of War (22 CFR 121-128)); the Bureau of Industry and Security, Department of Commerce (15 CFR parts 730-774); the Office of Foreign Assets Control, Department of Treasury (31 CFR Parts 500+) and the Department of Energy.

NOT GRANTED

No license under 35 U.S.C. 184 has been granted at this time, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" DOES NOT appear on this form. Applicant may still petition for a license under 37 CFR 5.12, if a license is desired before the expiration of 6 months from the filing date of the application. If 6 months has lapsed from the filing date of this application and the licensee has not received any indication of a secrecy order under 35 U.S.C. 181, the licensee may foreign file the application pursuant to 37 CFR 5.15(b).

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The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage, facilitate, and accelerate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of : Robert W. Heubel
Application No. : 13/603,578
For : **SYSTEMS AND METHODS FOR HAPTIC
CONFIRMATION OF COMMANDS**
Filed : September 5, 2012
Examiner : Unassigned
Art Unit : 2681
Confirmation No. : 1043

Mail Stop **Amendment**
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Preliminary Amendment

Sir:

Please amend the application as follows.

Listing of the Claims begins on page 2 of this paper.

Remarks begin on page 7 of this paper.

LISTING OF THE CLAIMS

1-16 (Cancelled)

17. (New) A system for generating haptic effects to confirm receipt of a command, the system comprising:

- a sensor;
- a housing configured to be contacted by a user;
- an actuator configured to output a haptic effect to the housing; and
- a processor in communication with the sensor and the actuator, the processor configured to:
 - receive, from the sensor, a sensor signal associated with a user input;
 - recognize the user input and determine a command associated with the user input;
 - 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
 - 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.

18. (New) The system of claim 17, wherein the sensor comprises an optical sensor.

19. (New) The system of claim 18, wherein the user input comprises a focal point of a user's eyes.

20. (New) The system of claim 17, wherein the processor is further configured to, if the user input is recognized and the command is determined:

execute a function associated with the user input;
generate a third actuator signal configured to cause the actuator to output a third haptic effect; and
transmit the third actuator signal to the actuator upon completion of execution of the function.

21. (New) The system of claim 18, wherein the third haptic effect is configured to emulate the function.

22. (New) The system of claim 17, further comprising a speaker in communication with the processor, and wherein the processor is further configured to:

generate an audio signal configured to cause the speaker to output a sound; and
transmit the audio signal to the speaker.

23. (New) The system of claim 17, further comprising a display in communication with the processor, and wherein the processor is further configured to:

generate a display signal configured to cause the display to display an image; and
transmit the display signal to the display.

24. (New) The system of claim 17, wherein the first haptic effect is configured to emulate the command.

25. (New) The system of claim 17, wherein the sensor, actuator, and processor are disposed within the housing.

26. (New) The system of claim 17, wherein the housing comprises one of: a device configured to be worn by the user, a mobile phone, a personal digital assistant, a touch-sensitive surface, a medical alert device, a mouse, or a keyboard.

27. (New) The system of claim 17, wherein the user input comprises an indication of a medical emergency.

28. (New) The system of claim 17, wherein command is a request associated with an operation, and the first haptic effect is configured to provide information associated with the status of the operation.

29. (New) 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.

30. (New) The computer-implemented method of claim 29, wherein the sensor comprises an optical sensor.

31. (New) The computer-implemented method of claim 30, wherein the user input comprises a focal point of a user's eyes.

32. (New) The computer-implemented method of claim 29, wherein if the user input is recognized and the command is determined:

executing a function associated with the command;
generating a third actuator signal configured to cause the actuator to output a third haptic effect; and
transmitting the third actuator signal to the actuator upon completion of execution of the function.

33. (New) The computer-implemented method of claim 30, wherein the third haptic effect is configured to emulate the function.

34. (New) The computer-implemented method of claim 29, further comprising:

generating an audio signal configured to cause a speaker to output a sound; and
transmitting the audio signal to the speaker.

35. (New) The computer-implemented method of claim 29, further comprising:

generating a display signal configured to cause a display to display an image; and
transmitting the display signal to the display.

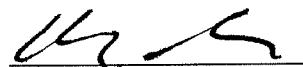
36. (New) The computer-implemented method of claim 29, wherein the first haptic effect
is configured to emulate the command.

REMARKS

Should the Examiner have any comments, questions, or suggestions of a nature necessary to expedite the prosecution of the application, or to place the case in condition for allowance, the Examiner is courteously requested to telephone the undersigned at the number listed below.

Respectfully submitted,

Date: 2/7/2013



Michael Morlock
Reg. No. 62,245

KILPATRICK TOWNSEND & STOCKTON LLP
1001 West Fourth Street
Winston-Salem, NC 27101
(336) 607-7391 (voice)
(336) 734-2756 (fax)

Electronic Acknowledgement Receipt

EFS ID:	14905358
Application Number:	13603578
International Application Number:	
Confirmation Number:	1043
Title of Invention:	Systems And Methods For Haptic Confirmation Of Commands
First Named Inventor/Applicant Name:	Robert W. Heubel
Customer Number:	34300
Filer:	Michael T. Morlock/Laura Smith
Filer Authorized By:	Michael T. Morlock
Attorney Docket Number:	IMM328.C1 (51851/849050)
Receipt Date:	07-FEB-2013
Filing Date:	05-SEP-2012
Time Stamp:	16:24:23
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	Transmittal849050.pdf	42294 dbb9ec159fa97b2be6eeabd821436b789f62bdde	no	1

Warnings:

Information:

Immersion Ex 2008-80

Apple v Immersion
IPR2017-01368

2	Preliminary Amendment	PreliminaryAmendment849050.pdf	178784 d4a14880e06b7ca9bcb8d038769e1f8e6016d7ef	no	7
Warnings:					
Information:					
Total Files Size (in bytes):				221078	
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of : Robert W. Heubel
Application No. : 13/603,578
Filed : September 5, 2012
For : Systems And Methods For Haptic
Confirmation Of Commands
Examiner : To Be Assigned
Art Unit : 2681
Confirmation No. : 1043

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL

Sir:

Transmitted herewith are copies of the following documents for filing in the above-identified application:

1. Transmittal; and
2. Preliminary Amendment

Shown below are the fees for the presentation of the amended claims:

	Claims Remaining	Highest # Previously Paid For	Extra	Rate	Fee
TOTAL	20	20	0	\$ 62	\$ 0
Ind. Cls.	2	3	0	\$250	\$ 0
Multiple Dependent Claim Added.....					NO
TOTAL					\$ 0

The Commissioner is hereby authorized to charge any additional fees required by this action, or credit any overpayment, to Deposit Account Number 20-1430.

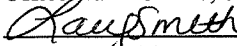
Respectfully submitted,

By: 
Michael Morlock (Reg. No. 62,245)

Date: 2/7/2013
KILPATRICK TOWNSEND &
STOCKTON LLP
1001 West Fourth Street
Winston-Salem, NC 27101-2400
(336) 747-7541

Certificate of Electronic Filing

I hereby certify that this correspondence is being electronically filed with the United States Patent Office via EFS-Web, on February 17, 2013.


Laura J. Smith

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875					Application or Docket Number 13/603,578		Filing Date 09/05/2012		<input type="checkbox"/> To be Mailed	
APPLICATION AS FILED – PART I										
(Column 1)			(Column 2)			SMALL ENTITY <input type="checkbox"/> OR		OTHER THAN SMALL ENTITY		
FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)	OR	RATE (\$)	FEE (\$)			
<input type="checkbox"/> BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A				
<input type="checkbox"/> SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A			N/A				
<input type="checkbox"/> EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A			N/A				
TOTAL CLAIMS (37 CFR 1.16(j))	minus 20 =	*	X \$	=		X \$	=			
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X \$	=		X \$	=			
<input type="checkbox"/> APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).									
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))										
* If the difference in column 1 is less than zero, enter "0" in column 2.										
APPLICATION AS AMENDED – PART II										
(Column 1)			(Column 2)			SMALL ENTITY OR		OTHER THAN SMALL ENTITY		
AMENDMENT	02/07/2013	CLAIMS REMAINING AFTER AMENDMENT	MINUS	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0	X \$	=		X \$62=	0
	Independent (37 CFR 1.16(h))	* 2	Minus	***3	= 0	X \$	=		X \$250=	0
<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))										
<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))										
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0
(Column 1)			(Column 2)			SMALL ENTITY OR		OTHER THAN SMALL ENTITY		
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT	MINUS	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	*	Minus	**	=	X \$	=		X \$	=
	Independent (37 CFR 1.16(h))	*	Minus	***	=	X \$	=		X \$	=
<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))										
<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))										
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	
* If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.										

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/603,578	09/05/2012	Robert W. Heubel	IMM328.C1 (51851/849050)	1043
34300 7590 03/12/2013 PATENT DEPARTMENT (51851) KILPATRICK TOWNSEND & STOCKTON LLP 1001 WEST FOURTH STREET WINSTON-SALEM, NC 27101			EXAMINER PHAM, TOAN NGOC	
			ART UNIT 2684	PAPER NUMBER
			MAIL DATE 03/12/2013	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 13/603,578	Applicant(s) HEUBEL ET AL.	
	Examiner TOAN N. PHAM	Art Unit 2684	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on ____; the restriction requirement and election have been incorporated into this action.
- 4) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 5) ☒ Claim(s) 17-36 is/are pending in the application.
 5a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 6) ☐ Claim(s) ____ is/are allowed.
- 7) ☒ Claim(s) 17-36 is/are rejected.
- 8) ☐ Claim(s) ____ is/are objected to.
- 9) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

* If any claims have been determined allowable, you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.

Application Papers

- 10) ☐ The specification is objected to by the Examiner.
- 11) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 3) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date ____. | 4) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Specification

Please update the "CROSS-REFERENCE TO RELATED APPLICATIONS" to include the U.S. Patent Number 8,279,052.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to

Art Unit: 2684

be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 17-36 are rejected on the ground of nonstatutory double patenting over claims 1-16 of U. S. Patent No. 8,279,052 since the claims, if allowed, would improperly extend the "right to exclude" already granted in the patent.

The subject matter claimed in the instant application is fully disclosed in the patent and is covered by the patent since the patent and the application are claiming common subject matter, as follows: The actuator configured to output a haptic effect to the housing; and a processor in communication with the sensor (microphone) and the actuator, the processor configured to: receive, from the sensor (microphone), a sensor signal (speech) associated with a user input; recognize the user input (speech) and determine a command associated with the user input (speech); if the user input (speech) is recognized and the command is determined: generate a first actuator signal configured to cause the 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.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TOAN N. PHAM whose telephone number is (571)272-2967. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin C. Lee can be reached on (571) 272-2963. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/TOAN N PHAM/
Primary Examiner, Art Unit 2684
3/7/2013

Notice of References Cited	Application/Control No. 13/603,578	Applicant(s)/Patent Under Reexamination HEUBEL ET AL.	
	Examiner TOAN N. PHAM	Art Unit 2684	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-8,279,052	10-2012	Heubel et al.	340/407.2
	B	US-			
	C	US-			
	D	US-			
	E	US-			
	F	US-			
	G	US-			
	H	US-			
	I	US-			
	J	US-			
	K	US-			
	L	US-			
	M	US-			


FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Country	Name	Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in MM-YYYY format are publication dates. Classifications may be US or foreign.

Search Notes 	Application/Control No. 13603578	Applicant(s)/Patent Under Reexamination HEUBEL ET AL.
	Examiner TOAN N PHAM	Art Unit 2684

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
340	407.1, 407.2	5/29/12	TNP
704	275, 246	5/29/12	TNP
715	780, 702, 816	5/29/12	TNP

SEARCH NOTES		
Search Notes	Date	Examiner
EAST	5/25/12, 5/29/12, 5/31/12, 3/7/13	TNP

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
340	407.2, 407.1	3/7/13	TNP
715	702	3/7/13	TNP

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BIB DATA SHEET

CONFIRMATION NO. 1043

SERIAL NUMBER 13/603,578	FILING or 371(c) DATE 09/05/2012 RULE	CLASS 340	GROUP ART UNIT 2684	ATTORNEY DOCKET NO. IMM328.C1 (51851/849050)		
APPLICANTS Robert W. Heubel, San Leandro, CA; Erin Ramsay, Montreal, CANADA; ** CONTINUING DATA ***** This application is a CON of 12/612,230 11/04/2009 PAT 8,279,052 ** FOREIGN APPLICATIONS ***** ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** 09/14/2012						
Foreign Priority claimed <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No 35 USC 119(a-d) conditions met <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Verified and Acknowledged <u>/TOAN NGOC PHAM/</u> Examiner's Signature		<input type="checkbox"/> Met after Allowance Initials	STATE OR COUNTRY CA	SHEETS DRAWINGS 7	TOTAL CLAIMS 16	INDEPENDENT CLAIMS 2
ADDRESS PATENT DEPARTMENT (51851) KILPATRICK TOWNSEND & STOCKTON LLP 1001 WEST FOURTH STREET WINSTON-SALEM, NC 27101 UNITED STATES						
TITLE Systems And Methods For Haptic Confirmation Of Commands						
FILING FEE RECEIVED 1250	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:		<input type="checkbox"/> All Fees <input type="checkbox"/> 1.16 Fees (Filing) <input type="checkbox"/> 1.17 Fees (Processing Ext. of time) <input type="checkbox"/> 1.18 Fees (Issue) <input type="checkbox"/> Other _____ <input type="checkbox"/> Credit			

EAST Search History

EAST Search History (Prior Art)

Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
L1	251	HAPTIC WITH EFFECTS WITH GENERATING	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2013/03/07 12:55
L2	131	1 and voice and command	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2013/03/07 12:55
L3	28	2 and recognized and (speech voice)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2013/03/07 12:56
L4	9	3 and first and second and actuator	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2013/03/07 12:56
S1	430	generating with haptic with feedback	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2012/05/25 07:44
S2	13	S1 and effects and (voice adj2 command)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2012/05/25 07:44
S3	8	("20020098874" "20020107695" "3736551" "5767796").PN.	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2012/05/25 07:46
S4	2	(voice same command) with haptic with (receipt confirmation)	US-PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2012/05/25 11:38
S5	0	voice with activated with haptic with (receipt confirmation)	US-PGPUB;	OR	OFF	2012/05/25 11:39

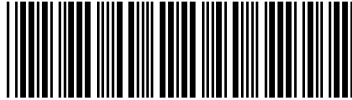
			USPAT; FPRS; EPO; JPO; DERWENT			
S6	1	voice with recognition with haptic with (receipt confirmation)	US- PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2012/05/25 11:39
S7	667	voice and command and haptic and (receipt confirmation) and microphone	US- PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2012/05/25 11:42
S8	98	S7 and recognition and speech and actuator	US- PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2012/05/25 11:42
S9	5	340/407.2.ccls. and voice and command and haptic and (receipt confirmation) and microphone	US- PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2012/05/25 12:06
S10	4	340/407.1.ccls. and voice and command and haptic and (receipt confirmation) and microphone	US- PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2012/05/25 12:08
S11	0	704/246.ccls. and voice and command and haptic and (receipt confirmation) and microphone	US- PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2012/05/25 12:12
S12	7	704/275.ccls. and voice and command and haptic and (receipt confirmation) and microphone	US- PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2012/05/25 12:12
S13	15	715/702.ccls. and voice and command and haptic and (receipt confirmation) and microphone	US- PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2012/05/25 12:14
S14	2	715/780.ccls. and voice and command and haptic and (receipt confirmation) and microphone	US- PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2012/05/25 12:18
S15	1	715/816.ccls. and voice and command and haptic and (receipt confirmation) and	US- PGPUB;	OR	OFF	2012/05/25 12:18

		microphone	USPAT; FPRS; EPO; JPO; DERWENT			
S16	503	voice and recognition and command and haptic and (receipt confirmation) and microphone	US- PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2012/05/25 14:43
S17	155	S16 and actuator\$2 and speech	US- PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2012/05/25 14:43
S18	146	S17 and recognize\$2	US- PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2012/05/25 14:43
S19	20	S18 and (haptic adj2 effect)	US- PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2012/05/25 14:44
S20	96	("20110102161" "20050122317" "20070097091" "20080024457" "20120019463" "20060061553" "20070057927" "20110133910" "20100055651" "5691898" "5734373" "5739811" "5907487" "5929607" "5999168" "6020876" "6050718" "6057828" "6088019" "6147674" "6211861" "6219033" "6211861" "6219033" "6271833" "6300937" "6342880" "6348911" "6580417" "6641480" "6824468" "6982700" "7038657" "7061467" "7236157" "7348968" "7439951" "7503852" "7507158" "7605800" "7607087" "7656388" "7834857" "7920126" "7991491" "8077145" "7920126" "7991491" "8077145" "20010030658") .pn.	US- PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2012/05/25 15:07
S21	1	S20 and voice and recognition and command and haptic and (receipt confirmation) and microphone	US- PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2012/05/25 15:09
S22	1	S20 and voice and recognition and microphone	US- PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2012/05/25 15:10
S23	2	S20 and voice and microphone	US- PGPUB;	OR	OFF	2012/05/25 15:10

			USPAT; FPRS; EPO; JPO; DERWENT			
S24	1375	haptic with effects	US- PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2012/05/29 09:14
S25	793	S24 and voice and (recognition command)	US- PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2012/05/29 09:15
S26	39	S25 and microphone and actuator and speech	US- PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2012/05/29 09:15
S27	0	speech with unrecogniz\$4 with haptic with effect	US- PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2012/05/31 13:16
S28	3	speech with unrecogniz\$4 with indication	US- PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2012/05/31 13:17
S29	0	S28 and haptic	US- PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2012/05/31 13:17
S30	282	speech and haptic and effect\$2 and actuators and recognize\$2	US- PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2012/05/31 13:18
S31	5	S30 and unrecognized	US- PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2012/05/31 13:18
S32	4	haptic with confirmation with command\$2	US- PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2012/05/31 13:20
S33	342	haptic and confirmation and command\$2 and (speech voice) and recognition	US- PGPUB;	OR	OFF	2012/05/31 13:21

			USPAT; FPRS; EPO; JPO; DERWENT			
S34	141	S33 and actuators	US- PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2012/05/31 13:21
S35	0	S34 and unrecognized and actuation	US- PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2012/05/31 13:22
S36	3	S34 and unrecognized	US- PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2012/05/31 13:22
S37	11	S34 and (second adj2 haptic)	US- PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2012/05/31 13:24
S38	2	"8279052".pn.	US- PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2013/02/25 15:12
S39	2	"8279052".PN.	US- PGPUB; USPAT; FPRS; EPO; JPO; DERWENT	OR	OFF	2013/03/06 16:52

3/ 7/ 2013 1:27:36 PM
C:\ Users\ tpham2\ Documents\ EAST\ Workspaces\ generating haptic effects.wsp

<i>Index of Claims</i> 	Application/Control No. 13603578	Applicant(s)/Patent Under Reexamination HEUBEL ET AL.
	Examiner TOAN N PHAM	Art Unit 2684

✓	Rejected	-	Cancelled	N	Non-Elected	A	Appeal
=	Allowed	÷	Restricted	I	Interference	O	Objected

<input type="checkbox"/> Claims renumbered in the same order as presented by applicant		<input type="checkbox"/> CPA		<input type="checkbox"/> T.D.		<input type="checkbox"/> R.1.47			
CLAIM		DATE							
Final	Original	03/07/2013							
	1	-							
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	17	✓							
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	29	✓							
	30	✓							
	31	✓							
	32	✓							
	33	✓							
	34	✓							
	35	✓							
	36	✓							

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)

Sheet 1 of 1

Complete if Known

Application Number	13/603,578
Filing Date	September 5, 2012
First Named Inventor	Robert W. Heubel
Art Unit	2684
Examiner Name	Pham, Toan Ngoc
Attorney Docket Number	IMM328.C1(51851/849050)

U.S. PATENT DOCUMENTS

Examiner Initials *	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number - Kind Code ² (if known)			
	1.	US- 3,736,551	05-29-1973	Hirsch	
	2.	US- 5,767,796	06-16-1998	Van Roekel et al.	
	3.	US- 2002/098874	07-25-2002	Zirul et al.	
	4.	US- 2002/107695	08-08-2002	Roth et al.	
	5.	US- 2011/0061017	03-10-2011	Ullrich et al.	
	6.	US- 2011/0102160	05-05-2011	Heubel et al.	
		US-			
		US-			
		US-			
		US-			

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Cite No. ¹	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T ⁶
		Country Code ³ - Number ⁴ - Kind Code ⁵ (if known)				
	7.	WO 99/045531	09-10-1999	Microsoft Corp		
	8.	WO 04/053830	06-24-2004	Immersion Corp		
	9.	WO 04/102527	11-25-2004	Voice Signal Technologies Inc.		

NON PATENT LITERATURE DOCUMENTS

Examiner Initials *	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
	10.	Patent Cooperation Treaty, International Search Report, Application No. PCT/US2010/054967, mailed February 24, 2011.	
	11.	Patent Cooperation Treaty, Preliminary report on Patentability, Application No. PCT/US2010/054967, mailed May 18, 2012.	

Examiner
SignatureDate
Considered

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹ Applicant's unique citation designation number (optional). ² See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

PCT

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT AND
THE WRITTEN OPINION OF THE INTERNATIONAL
SEARCHING AUTHORITY, OR THE DECLARATION

To:
Alemanni, John C.
KILPATRICK STOCKTON LLP
1001 West Fourth Street
Winston-Salem, NC 27101
ETATS-UNIS D'AMERIQUE

(PCT Rule 44.1)

Date of mailing (day/month/year)	24 February 2011 (24-02-2011)
-------------------------------------	-------------------------------

Applicant's or agent's file reference 51851-395421	FOR FURTHER ACTION See paragraphs 1 and 4 below
International application No. PCT/US2010/054967	International filing date (day/month/year) 1 November 2010 (01-11-2010)
Applicant IMMERSION CORPORATION	

1. ☒ The applicant is hereby notified that the international search report and the written opinion of the International Searching Authority have been established and are transmitted herewith.

Filing of amendments and statement under Article 19:
The applicant is entitled, if he so wishes, to amend the claims of the international Application (see Rule 46):

When? The time limit for filing such amendments is normally two months from the date of transmittal of the International Search Report

Where? Directly to the International Bureau of WIPO, 34 chemin des Colombettes
1211 Geneva 20, Switzerland, Facsimile No.: (41-22) 338.82.70

For more detailed instructions, see PCT Applicant's Guide, International Phase, paragraphs 9.004 - 9.011.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect and the written opinion of the International Searching Authority are transmitted herewith.

3. ☐ **With regard to any protest** against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Reminders**


The applicant may submit comments on an informal basis on the written opinion of the International Searching Authority to the International Bureau. The International Bureau will send a copy of such comments to all designated Offices unless an international preliminary examination report has been or is to be established. Following the expiration of 30 months from the priority date, these comments will also be made available to the public.

Shortly after the expiration of **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau before completion of the technical preparations for international publication (Rules 90bis.1 and 90bis.3).

Within **19 months** from the priority date, but only in respect of some designated Offices, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase **until 30 months** from the priority date (in some Offices even later); otherwise, the applicant must, **within 20 months** from the priority date, perform the prescribed acts for entry into the national phase before those designated Offices.

In respect of other designated Offices, the time limit of **30 months** (or later) will apply even if no demand is filed within 19 months.

For details about the applicable time limits, Office by Office, see www.wipo.int/pct/en/texts/time_limits.html and the *PCT Applicant's Guide, National Chapters*.

Name and mailing address of the International Searching Authority  European Patent Office, P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk Tel: (+31-70) 340-2040 Fax: (+31-70) 340-3016	Authorized officer JAMES, Stephanie Tel: +49 (0)89 2399-8736
--	--

Form PCT/ISA/220 (July 2010)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 51851-395421	FOR FURTHER ACTION <small>see Form PCT/ISA/220 as well as, where applicable, item 5 below.</small>	
International application No. PCT/US2010/054967	International filing date (day/month/year) 01/11/2010	(Earliest) Priority Date (day/month/year) 04/11/2009
Applicant IMMERSION CORPORATION		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 4 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of:

- ☒ the international application in the language in which it was filed
☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b))

b. ☐ This international search report has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43.6bis(a)).

c. ☐ With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, see Box No. I.

2. ☐ **Certain claims were found unsearchable** (See Box No. II)

3. ☐ **Unity of invention is lacking** (see Box No. III)

4. With regard to the **title**,

- ☒ the text is approved as submitted by the applicant
☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

- ☒ the text is approved as submitted by the applicant
☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box No. IV. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority

6. With regard to the **drawings**,

- a. the figure of the **drawings** to be published with the abstract is Figure No. 5
☒ as suggested by the applicant
☐ as selected by this Authority, because the applicant failed to suggest a figure
☐ as selected by this Authority, because this figure better characterizes the invention
b. ☐ none of the figures is to be published with the abstract

Form PCT/ISA/210 (first sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2010/054967

A. CLASSIFICATION OF SUBJECT MATTER

INV. G06F3/01 G10L15/22 G10L21/06
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
G06F G10L H04M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 99/45531 A1 (MICROSOFT CORP [US]) 10 September 1999 (1999-09-10) page 4, line 12 - line 16 page 8, line 16 - line 20 page 13, line 18 - page 15, line 31 figures 1,2A,3,4	1-16
Y	US 2002/107695 A1 (ROTH DANIEL L [US] ET AL) 8 August 2002 (2002-08-08) paragraph [0001] paragraph [0023] - paragraph [0029] paragraph [0043] paragraph [0052] - paragraph [0053] figures 1,4	1-16

-/--

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

A document defining the general state of the art which is not considered to be of particular relevance

E earlier document but published on or after the international filing date

L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

O document referring to an oral disclosure, use, exhibition or other means

P document published prior to the international filing date but later than the priority date claimed

T later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

X document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

Y document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

S document member of the same patent family

Date of the actual completion of the international search

16 February 2011

Date of mailing of the international search report

24/02/2011

Name and mailing address of the ISA*

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040,
Fax: (+31-70) 340-3016

Authorized officer

Hauber, Jörg

6

Form PCT/ISA/210 (second sheet) (April 2006)

page 1 of 2

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2010/054967

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WO 2004/053830 A1 (IMMERSION CORP [US]; GRANT DANNY [CA]; EID JEFFREY [US]; ENDO SHOICHI) 24 June 2004 (2004-06-24) page 1, line 10 - line 12 page 3, line 13 - line 19 page 5, line 14 - page 6, line 11 page 7, line 13 - line 23 page 10, line 23 - page 11, line 2 page 12, line 6 - line 20 -----	1-16
A	WO 2004/102527 A2 (VOICE SIGNAL TECHNOLOGIES INC [US]; COHEN JORDAN [US]; ROTH DANIEL L [] 25 November 2004 (2004-11-25) paragraph [0014] - paragraph [0022] -----	1,5,6, 8-10,14, 15
A	US 2002/098874 A1 (ZIRUL JOCELYN [US] ET AL) 25 July 2002 (2002-07-25) paragraph [0056] -----	2,11
A	US 5 767 796 A (VAN ROEKEL JAUKE [DE] ET AL) 16 June 1998 (1998-06-16) claim 2 -----	4,13
A	US 3 736 551 A (HIRSCH J) 29 May 1973 (1973-05-29) * abstract column 4, line 5 - line 31 figures 8,9 -----	4,13

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2010/054967

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9945531	A1	10-09-1999	AU 2797199 A US 6505159 B1	20-09-1999 07-01-2003
US 2002107695	A1	08-08-2002	NONE	
WO 2004053830	A1	24-06-2004	AU 2003293449 A1 AU 2003296334 A1 AU 2003297716 A1 AU 2003297717 A1 AU 2003298038 A1 GB 2413416 A GB 2414319 A GB 2414836 A GB 2412989 A GB 2413417 A GB 2428118 A WO 2004053829 A1 WO 2004053644 A2 WO 2004052193 A1 WO 2004053671 A1 US 2008133648 A1 US 2006288137 A1 US 2009021473 A1	30-06-2004 30-06-2004 30-06-2004 30-06-2004 30-06-2004 26-10-2005 23-11-2005 07-12-2005 12-10-2005 26-10-2005 17-01-2007 24-06-2004 24-06-2004 24-06-2004 24-06-2004 05-06-2008 21-12-2006 22-01-2009
WO 2004102527	A2	25-11-2004	CN 1802694 A DE 112004000782 T5 GB 2417812 A JP 2007501444 T	12-07-2006 06-03-2008 08-03-2006 25-01-2007
US 2002098874	A1	25-07-2002	NONE	
US 5767796	A	16-06-1998	DE 19538894 A1 EP 0769678 A1 ES 2169205 T3 JP 9133545 A SG 64951 A1	24-04-1997 23-04-1997 01-07-2002 20-05-1997 17-04-2001
US 3736551	A	29-05-1973	NONE	

Form PCT/ISA/210 (patent family annex) (April 2006)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/US2010/054967

International filing date (day/month/year)
01.11.2010

Priority date (day/month/year)
04.11.2009

International Patent Classification (IPC) or both national classification and IPC
INV. G06F3/01 G10L15/22 G10L21/06

Applicant
IMMERSION CORPORATION

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step and industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☒ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



European Patent Office
D-80298 Munich
Tel. +49 89 2399 - 0
Fax: +49 89 2399 - 4465

Date of completion of
this opinion

see form
PCT/ISA/210

Authorized Officer

Hauber, Jörg
Telephone No. +49 89 2399-7751



Form PCT/ISA/237 (Cover Sheet) (July 2009)

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2010/054967

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:
 - ☒ the international application in the language in which it was filed
 - ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).
2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43bis.1(a))
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:
 - a. (means)
 - ☐ on paper
 - ☐ in electronic form
 - b. (time)
 - ☐ in the international application as filed
 - ☐ together with the international application in electronic form
 - ☐ subsequently to this Authority for the purposes of search
4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	<u>2-4, 7-9, 11-13, 16</u>
	No: Claims	<u>1, 5, 6, 10, 14, 15</u>
Inventive step (IS)	Yes: Claims	
	No: Claims	<u>1-16</u>
Industrial applicability (IA)	Yes: Claims	<u>1-16</u>
	No: Claims	

2. Citations and explanations

see separate sheet

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2010/054967

Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1 Reference is made to the following documents:

- D1** WO 99/45531 A1 (MICROSOFT CORP [US]) 10 September 1999 (1999-09-10)
- D2** US 2002/107695 A1 (ROTH DANIEL L [US] ET AL) 8 August 2002 (2002-08-08)
- D3** WO 2004/053830 A1 (IMMERSION CORP [US]; GRANT DANNY [CA]; EID JEFFREY [US]; ENDO SHOICHI) 24 June 2004 (2004-06-24)
- D4** WO 2004/102527 A2 (VOICE SIGNAL TECHNOLOGIES INC [US]; COHEN JORDAN [US]; ROTH DANIEL L) 25 November 2004 (2004-11-25)
- D5** US 2002/098874 A1 (ZIRUL JOCELYN [US] ET AL) 25 July 2002 (2002-07-25)
- D6** US 5 767 796 A (VAN ROEKEL JAUKE [DE] ET AL) 16 June 1998 (1998-06-16)
- D7** US 3 736 551 A (HIRSCH J) 29 May 1973 (1973-05-29)

2 INDEPENDENT CLAIM 1

2.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of **claim 1** is not new in the sense of Article 33(2) PCT.

2.1.1 Document **D1** discloses (the references in parentheses applying to this document):

A system (see Fig. 2A) for generating haptic effects to confirm receipt of a voice command, the system comprising:
a microphone (see Fig. 2A, microphone 43);

a housing configured to be contacted by a user (see Fig. 3, housing 81);

an actuator in communication with the housing, the actuator configured to output a haptic effect to the housing (see Fig. 1 with p. 4, l. 12-16, "The input device 14 includes an indicator, such as a speaker, light or buzzer. [...]", emphasis added); and

a processor in communication with the microphone and the actuator (see Fig. 2A, computer 12), the processor configured to:
receive speech information from the microphone (see Fig. 1 with p. 8, l. 16-20, "In the transmitter mode, the transceiver unit 62 receives audio signals, picked-up (i. e., detected) by a microphone 70 and amplified by the audio processor unit 64, for transmission to the base station 16."; Note: from Fig. 1 it is furthermore clear that computer 12 is linked with base station 16, and is hence configured to receive audio signals from the base station);

recognize the speech information and determine a command associated with the speech information (see Fig. 4, step 120, with p. 14, l. 6-8, "At step 120, the speech recognition module 98 evaluates the input voice instruction against the set of valid instructions.");

if the speech information is recognized and the command is determined (see Fig. 4, step 120 = YES):

generate a first actuator signal (see Fig. 4, step 124, "recognized signal") configured to cause the actuator to output a first haptic effect; and transmit the first actuator signal to the actuator (see Fig. 4, step 124, with p. 15, l. 12-19, "At this point, 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 [...] 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);

otherwise (see Fig. 4, step 120 = NO):

generate a second actuator signal (see Fig. 4, step 122, "not recognized signal") configured to cause the actuator to output a second haptic effect; and transmit the second actuator signal to the actuator (see Fig. 4, step 122, with p. 15, l. 12-19).

2.2 Alternatively, the subject-matter of **claim 1** also does not involve an inventive step in the sense of Article 33 (3) PCT with regard to a combination of documents **D2** and **D3** for the reasons that follow.

2.2.1 Document **D2** discloses (the references in parentheses applying to this document):

A system for generating ~~haptic effects~~ signals to confirm receipt of a voice command (see [0001], "This invention relates to voice recognition systems, and more particularly to voice recognition systems which provide feedback for unrecognized speech."), the system comprising:

a microphone (see Fig. 1, microphone 30);

a housing configured to be contacted by a user (see Fig. 4, the embodiments shown, i.e. wireless communication device 210, cellular telephone 212, personal digital assistant 214, child's toy 216 or palmtop computer 218 all comprise a housing to be contacted by a user);

~~an actuator in communication with the housing, the actuator configured to output a haptic effect to the housing~~
an audible signal (see Fig. 1 with [0029], "As stated above, feedback process 10 may be incorporated in cellular telephone 50, personal digital assistant 52, or computer 54, and if generic response 12 is an audible response, a beep or some other form of sound can be generated by the internal speakers (not shown) incorporated into these devices (50, 52 and 54)."); and

a processor in communication with the microphone and the actuator (see Fig. 4, processor 200), the processor configured to:

receive speech information from the microphone (see Fig. 4, step 204, "receive 204 a speech command as spoken by a user"; Note: it is implicitly clear that the speech command originates in a speech input process utilising microphone 30);

recognize the speech information and determine a command associated with the speech information (see Fig. 4, step 206, "compare the user's speech command to a plurality of recognized speech commands available in a speech library [...]);

if the speech information is recognized and the command is determined (see [0043], "Accordingly, if a comparison between user's speech command 18 and one of the recognized commands 40 results in an acoustical score over this threshold, voice recognition system 16 and feedback process 10 will consider user's speech

command 18 to be identical to the recognized command being analyzed. This command will then be considered recognized speech 22 for which the device into which voice recognition system 16 and feedback process 10 is incorporated into will take the appropriate action.[...]):

generate a first output configured to cause the actuator to output a first ~~haptic-effect~~ audible signal; and transmit the first actuator signal to the actuator (see [0043], "[...] As stated above, if the device is a child's toy 56 and the recognized speech 22 asked by child user 20 is the question "What is your name?", toy 56 would respond by saying "Yogi" through an internal speaker (not shown). ");

otherwise:

generate a second actuator signal configured to cause the actuator to output a second audible effect ~~haptic-effect~~; and transmit the second actuator signal to the actuator (see Fig. 4, step 208, "[...] and generate 208 a generic response and provide it to the user if it is determined that the user's speech command is unrecognized speech"; also see [0029], "As stated above, feedback process 10 may be incorporated in cellular telephone 50, personal digital assistant 52, or computer 54, and if generic response 12 is an audible response, a beep or some other form of sound can be generated by the internal speakers (not shown) incorporated into these devices (50, 52 and 54).").

- 2.2.2 The subject-matter of claim 1 therefore differs from this known system in that tactile feedback is provided to the user by means of haptic effects output by a haptic actuator, whereas in **D2**, audible signals, or alternatively, visual signals are provided to the user indicating whether input speech has been recognized or not. It is further noted that **D2** also discloses that feedback can be in many forms depending on the type of device on which feedback process is operating (see **D2**, [0028]).
- 2.2.3 The underlying technical problem may thus be regarded as how to adapt the system of **D2** such that it is less obtrusive, thus allowing it to be usable also in an environment where audible and visual signals are not desirable (e.g. in a cinema).
- 2.2.4 Document **D3** (see the passages cited in the search report) discloses how customized haptic effects, provided by haptic actuators, can be used in a variety of applications to convey information to users of handheld communication devices. **D3** teaches that "in contrast with conventional auditory ring tones, the aforementioned haptic effects (e. g. , haptic ringers) are more desirable in an environment where extraneous auditory signals are prohibited (e. g. , during a meeting or a concert), and/or where it is difficult to distinguish auditory signals

(e. g. , in a loud environment such as an airport). The haptic ringers are also more suitable in distracting situations such as driving, so that the user of a handheld communication device can keep eyes on the road without having to look at the device." (see **D3**, p. 6, l. 3-11).

- 2.2.5 The skilled person in the field of interaction design is perfectly aware of tactile feedback schemes and knows that the tactile communication channel is less obtrusive and distracting than the visual and auditory channel, not least from the teachings of document **D3**. She would therefore consider it a straightforward measure to replace the auditory signals of **D2** which implicitly or explicitly indicate to the user whether or not a speech command was correctly recognized by corresponding tactile effects. She would hence arrive at the subject-matter of claim 1 based on a combination of documents **D2** and **D3**, but without the need of exercising inventive skill. The requirements of Article 33(3) PCT is therefore not met.

2.3 INDEPENDENT CLAIM 10

The subject-matter of independent **claim 10**, directed towards a computer-implemented method substantially corresponds to the subject-matter of independent system claim 1. Hence, for the same reasons that have been given with regard to claim 1 (see items 2.1 and 2.2 supra), claim 10 does also not meet the requirements of novelty and/or inventive step (Articles 33(2) and 33(3) PCT)).

2.4 DEPENDENT CLAIMS

Dependent **claims 2-9** and **11-16** do not appear to contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step, the reasons being as follows:

- 2.4.1 Dependent **claim 2** and **claim 11**, respectively, define a function to be executed that corresponds to recognized speech information, and, a third haptic effect to be played upon completion of the function.

While **D1** also discloses that a task is performed upon recognition of a voice instruction (see **D1**, Fig. 4, step 126), it remains silent about playing a haptic effect upon completion of the task.

The underlying technical problem may thus be regarded as how to provide status feedback about the progress of the performed function to the user.

However, providing tactile feedback to indicate completion of a function such as a downloading or uploading operation is known (see document **D5**, [0056]).

The skilled person in the field of interaction design would thus see it a straightforward measure to provide a similar tactile indication of completion of the performed task also to the system of **D1**, whenever the nature of the task renders such indication desirable. The features defined in claims 2 and 11, hence do not meet the requirements for inventive step (Article 33(3) PCT).

- 2.4.2 Dependent **claims 3, 4, 7, 12, 13 and 16** relate to the nature of the individual haptic effects. In particular, claims 3, 7, 12, and 16 suggest that the first or third haptic effects "emulate" the function that is performed in response to recognizing a speech command. Claim 4, as far as it can be understood (see item VIII-1 below), and claim 13 further specify the function to comprise activating a turn signal indicator and the third haptic effect to comprise a vibration that travels in the direction of the impending turn.

Haptic effects that emulate expressions or behaviours are known from document **D3** (see **D3**, p. 7, l. 17-23); indicating directional information to a user by means of a vibration that travels in the respective direction is disclosed in document **D7** (see **D7**, Figs. 8 and 9 with col. 4, l. 5-31).

The specified haptic effects therefore merely constitute straightforward known possibilities from which the skilled person would select, in accordance with circumstances, without the exercise of inventive skill, in order to solve the problem posed.

- 2.4.3 Any combination of tactile, visual, and auditory indicators, such as suggested by the features defined in **claims 5, 6, 14 and 15** is also anticipated by document **D1** (see **D1**, p. 15, l. 12-31, "[...], other types of indications can be used in addition or in place of the audible tones described above [...]"). Claims 5, 6, 14 and 15 are therefore also not new.
- 2.4.4 **Claim 8** defines a system according to claim 1, wherein the microphone, actuator, and processor are disposed within the housing. In the system of **D1**, on the contrary, the processor does not reside in the same housing as the microphone and the actuator. Such minor variations of the system of **D1**, however, lie within the scope of normal adaptations and optimisations the skilled person is able to implement as part of her routine work, without the need for inventive skill. She would routinely implement such adaptations where circumstances make them desirable.

Re Item VII

Certain defects in the international application

- 1 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents **D1-D7** is not mentioned in the description, nor are these documents identified therein.
- 2 Independent **claims 1 and 10** are not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art (see document **D1**) being placed in the preamble (Rule 6.3(b)(i) PCT) and with the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).
- 3 The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

Re Item VIII

Certain observations on the international application

- 1 The application does not meet the requirements of Article 6 PCT, because **claim 4** is not clear for the following reasons.

Claim 4 defines "the system of claim 3, wherein the function comprises activating a turn signal indicator and the third haptic effect comprises a vibration that travels in the direction of the impending turn."

The only embodiment disclosed in the description that describes a function to comprise a "turn signal indicator" appears to relate to a device which may be configured to control a vehicle, such as a wheelchair. In such an embodiment, the description discloses that a plurality of actuators may output a vibration that begins in the middle of the back of the wheelchair and moves to the right. "For example, the actuators may be placed along a horizontal line in the back of the wheelchair, such that the actuators are activated in succession. The user may thus perceive the vibration moving to the right across their back and therefore receive feedback indicating that the command was recognized" (see description, p. 15, l. 29 - p. 16, l. 3).

Accordingly, in view of the disclosed actuator placement along a horizontal line in the back of the wheelchair, it seems that this embodiment does not comprise an actuator in communication with a housing, the actuator being configured to output a haptic effect to the housing, as it is defined in independent claim 1. Therefore, the combination of features defined by claim 4 in

combination with claim 1, on which claim 4 depends, is not supported by the description, rendering the subject-matter defined by claim 4 unclear (Article 6 PCT).

Possible steps after receipt of the international search report (ISR) and written opinion of the International Searching Authority (WO-ISA)

General information	For all international applications filed on or after 01/01/2004 the competent ISA will establish an ISR. It is accompanied by the WO-ISA. Unlike the former written opinion of the IPEA (Rule 66.2 PCT), the WO-ISA is not meant to be responded to, but to be taken into consideration for further procedural steps. This document explains about the possibilities.
Amending claims under Art. 19 PCT	Within 2 months after the date of mailing of the ISR and the WO-ISA the applicant may file amended claims under Art. 19 PCT directly with the International Bureau of WIPO. The PCT reform of 2004 did not change this procedure. For further information please see Rule 46 PCT as well as form PCT/ISA/220 and the corresponding Notes to form PCT/ISA/220.
Filing a demand for international preliminary examination	<p>In principle, the WO-ISA will be considered as the written opinion of the IPEA. This should, in many cases, make it unnecessary to file a demand for international preliminary examination. If the applicant nevertheless wishes to file a demand this must be done before expiry of 3 months after the date of mailing of the ISR/WO-ISA or 22 months after priority date, whichever expires later (Rule 54bis PCT). Amendments under Art. 34 PCT can be filed with the IPEA as before, normally at the same time as filing the demand (Rule 66.1 (b) PCT).</p> <p>If a demand for international preliminary examination is filed and no comments/amendments have been received the WO-ISA will be transformed by the IPEA into an IPRP (International Preliminary Report on Patentability) which would merely reflect the content of the WO-ISA. The demand can still be withdrawn (Art. 37 PCT).</p>
Filing informal comments	After receipt of the ISR/WO-ISA the applicant may file informal comments on the WO-ISA directly with the International Bureau of WIPO. These will be communicated to the designated Offices together with the IPRP (International Preliminary Report on Patentability) at 30 months from the priority date. Please also refer to the next box.
End of the international phase	At the end of the international phase the International Bureau of WIPO will transform the WO-ISA or, if a demand was filed, the written opinion of the IPEA into the IPRP, which will then be transmitted together with possible informal comments to the designated Offices. The IPRP replaces the former IPEA (international preliminary examination report).
Relevant PCT Rules and more information	Rule 43 PCT, Rule 43bis PCT, Rule 44 PCT, Rule 44bis PCT, PCT Newsletter 12/2003, OJ 11/2003, OJ 12/2003

From the INTERNATIONAL BUREAU

PCTNOTIFICATION CONCERNING
TRANSMITTAL OF COPY OF INTERNATIONAL
PRELIMINARY REPORT ON PATENTABILITY
(CHAPTER I OF THE PATENT COOPERATION
TREATY)

(PCT Rule 44bis.1(c))

To:

ALEMANNI, John, C.
Kilpatrick Stockton LLP
1001 West Fourth Street
Winston-Salem, North Carolina 27101
ETATS-UNIS D'AMERIQUEDate of mailing (day/month/year)
18 May 2012 (18.05.2012)Applicant's or agent's file reference
51851-395421

IMPORTANT NOTICE

International application No.
PCT/US2010/054967International filing date (day/month/year)
01 November 2010 (01.11.2010)Priority date (day/month/year)
04 November 2009 (04.11.2009)Applicant
IMMERSION CORPORATION et al

The International Bureau transmits herewith a copy of the international preliminary report on patentability (Chapter I of the Patent Cooperation Treaty)

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No. +41 22 338 82 70

Authorized officer

Simin Baharlou

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Form PCT/IB/326 (January 2004)

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44bis)

Applicant's or agent's file reference 51851-395421	FOR FURTHER ACTION		See item 4 below
International application No. PCT/US2010/054967	International filing date (day/month/year) 01 November 2010 (01.11.2010)	Priority date (day/month/year) 04 November 2009 (04.11.2009)	
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237			
Applicant IMMERSION CORPORATION			

<p>1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 bis.1(a).</p> <p>2. This REPORT consists of a total of 12 sheets, including this cover sheet.</p> <p>In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.</p>																									
<p>3. This report contains indications relating to the following items:</p> <table border="0"> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. I</td> <td>Basis of the report</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. II</td> <td>Priority</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. III</td> <td>Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. IV</td> <td>Lack of unity of invention</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. V</td> <td>Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</td> </tr> <tr> <td><input type="checkbox"/></td> <td>Box No. VI</td> <td>Certain documents cited</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. VII</td> <td>Certain defects in the international application</td> </tr> <tr> <td><input checked="" type="checkbox"/></td> <td>Box No. VIII</td> <td>Certain observations on the international application</td> </tr> </table> <p>4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44bis.3(c) and 93bis.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44bis.2).</p>		<input checked="" type="checkbox"/>	Box No. I	Basis of the report	<input type="checkbox"/>	Box No. II	Priority	<input type="checkbox"/>	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability	<input type="checkbox"/>	Box No. IV	Lack of unity of invention	<input checked="" type="checkbox"/>	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	<input type="checkbox"/>	Box No. VI	Certain documents cited	<input checked="" type="checkbox"/>	Box No. VII	Certain defects in the international application	<input checked="" type="checkbox"/>	Box No. VIII	Certain observations on the international application
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The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 338 82 70	Date of issuance of this report 08 May 2012 (08.05.2012)
	Authorized officer Simin Baharlou e-mail: pt08.pct@wipo.int

Form PCT/IB/373 (January 2004)

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2010/054967

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:
 - ☒ the international application in the language in which it was filed
 - ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).
2. ☐ This opinion has been established taking into account the **rectification of an obvious mistake** authorized by or notified to this Authority under Rule 91 (Rule 43bis.1 (a))
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, this opinion has been established on the basis of a sequence listing filed or furnished:
 - a. (means)
 - ☐ on paper
 - ☐ in electronic form
 - b. (time)
 - ☐ in the international application as filed
 - ☐ together with the international application in electronic form
 - ☐ subsequently to this Authority for the purposes of search
4. ☐ In addition, in the case that more than one version or copy of a sequence listing has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
5. Additional comments:

Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	<u>2-4, 7-9, 11-13, 16</u>
	No: Claims	<u>1, 5, 6, 10, 14, 15</u>
Inventive step (IS)	Yes: Claims	
	No: Claims	<u>1-16</u>
Industrial applicability (IA)	Yes: Claims	<u>1-16</u>
	No: Claims	

2. Citations and explanations

see separate sheet

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
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The following defects in the form or contents of the international application have been noted:

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Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

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1 Reference is made to the following documents:

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- D4 WO 2004/102527 A2 (VOICE SIGNAL TECHNOLOGIES INC [US]; COHEN JORDAN [US]; ROTH DANIEL L) 25 November 2004 (2004-11-25)
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- D6 US 5 767 796 A (VAN ROEKEL JAUKE [DE] ET AL) 16 June 1998 (1998-06-16)
- D7 US 3 736 551 A (HIRSCH J) 29 May 1973 (1973-05-29)

2 INDEPENDENT CLAIM 1

2.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of **claim 1** is not new in the sense of Article 33(2) PCT.

2.1.1 Document **D1** discloses (the references in parentheses applying to this document):

A system (see Fig. 2A) for generating haptic effects to confirm receipt of a voice command, the system comprising:
a microphone (see Fig. 2A, microphone 43);

a housing configured to be contacted by a user (see Fig. 3, housing 61);

an actuator in communication with the housing, the actuator configured to output a haptic effect to the housing (see Fig. 1 with p. 4, l. 12-16, "The input device 14 includes an indicator, such as a speaker, light or buzzer. [...]", emphasis added); and

a processor in communication with the microphone and the actuator (see Fig. 2A, computer 12), the processor configured to:

receive speech information from the microphone (see Fig. 1 with p. 8, l. 16-20, "In the transmitter mode, the transceiver unit 62 receives audio signals, picked-up (i. e., detected) by a microphone 70 and amplified by the audio processor unit 64, for transmission to the base station 16."; Note: from Fig. 1 it is furthermore clear that computer 12 is linked with base station 16, and is hence configured to receive audio signals from the base station);

recognize the speech information and determine a command associated with the speech information (see Fig. 4, step 120, with p. 14, l. 6-8, "At step 120, the speech recognition module 98 evaluates the input voice instruction against the set of valid instructions.");

if the speech information is recognized and the command is determined (see Fig. 4, step 120 = YES):

generate a first actuator signal (see Fig. 4, step 124, "recognized signal") configured to cause the actuator to output a first haptic effect; and transmit the first actuator signal to the actuator (see Fig. 4, step 124, with p. 15, l. 12-19, "At this point, 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 [...] 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);

otherwise (see Fig. 4, step 120 = NO):

generate a second actuator signal (see Fig. 4, step 122, "not recognized signal") configured to cause the actuator to output a second haptic effect; and transmit the second actuator signal to the actuator (see Fig. 4, step 122, with p. 15, l. 12-19).

2.2 Alternatively, the subject-matter of **claim 1** also does not involve an inventive step in the sense of Article 33 (3) PCT with regard to a combination of documents **D2** and **D3** for the reasons that follow.

2.2.1 Document **D2** discloses (the references in parentheses applying to this document):

A system for generating ~~haptic effects~~ signals to confirm receipt of a voice command (see [0001], "This invention relates to voice recognition systems, and more particularly to voice recognition systems which provide feedback for unrecognized speech."), the system comprising:

a microphone (see Fig. 1, microphone 30);

a housing configured to be contacted by a user (see Fig. 4, the embodiments shown, i.e. wireless communication device 210, cellular telephone 212, personal digital assistant 214, child's toy 216 or palmtop computer 218 all comprise a housing to be contacted by a user);

~~an actuator in communication with the housing, the actuator configured to output a haptic effect to the housing~~
an audible signal (see Fig. 1 with [0029], "As stated above, feedback process 10 may be incorporated in cellular telephone 50, personal digital assistant 52, or computer 54, and if generic response 12 is an audible response, a beep or some other form of sound can be generated by the internal speakers (not shown) incorporated into these devices (50, 52 and 54)."); and

a processor in communication with the microphone and the actuator (see Fig. 4, processor 200), the processor configured to:

receive speech information from the microphone (see Fig. 4, step 204, "receive 204 a speech command as spoken by a user"; Note: It is implicitly clear that the speech command originates in a speech input process utilising microphone 30);

recognize the speech information and determine a command associated with the speech information (see Fig. 4, step 206, "compare the user's speech command to a plurality of recognized speech commands available in a speech library [...]);

if the speech information is recognized and the command is determined (see [0043], "Accordingly, if a comparison between user's speech command 18 and one of the recognized commands 40 results in an acoustical score over this threshold, voice recognition system 16 and feedback process 10 will consider user's speech

command 18 to be identical to the recognized command being analyzed. This command will then be considered recognized speech 22 for which the device into which voice recognition system 16 and feedback process 10 is incorporated into will take the appropriate action.[...]" :

generate a first output configured to cause the actuator to output a first ~~haptic-effect~~ audible signal; and transmit the first actuator signal to the actuator (see [0043], "[...] As stated above, if the device is a child's toy 56 and the recognized speech 22 asked by child user 20 is the question "What is your name?", toy 56 would respond by saying "Yogi" through an internal speaker (not shown).");

otherwise:

generate a second actuator signal configured to cause the actuator to output a second audible effect ~~haptic-effect~~; and transmit the second actuator signal to the actuator (see Fig. 4, step 208, "[...] and generate 208 a generic response and provide it to the user if it is determined that the user's speech command is unrecognized speech"; also see [0029], "As stated above, feedback process 10 may be incorporated in cellular telephone 50, personal digital assistant 52, or computer 54, and if generic response 12 is an audible response, a beep or some other form of sound can be generated by the internal speakers (not shown) incorporated into these devices (50, 52 and 54).").

- 2.2.2 The subject-matter of claim 1 therefore differs from this known system in that tactile feedback is provided to the user by means of haptic effects output by a haptic actuator, whereas in **D2**, audible signals, or alternatively, visual signals are provided to the user indicating whether input speech has been recognized or not. It is further noted that **D2** also discloses that feedback can be in many forms depending on the type of device on which feedback process is operating (see **D2**, [0028]).
- 2.2.3 The underlying technical problem may thus be regarded as how to adapt the system of **D2** such that it is less obtrusive, thus allowing it to be usable also in an environment where audible and visual signals are not desirable (e.g. in a cinema).
- 2.2.4 Document **D3** (see the passages cited in the search report) discloses how customized haptic effects, provided by haptic actuators, can be used in a variety of applications to convey information to users of handheld communication devices. **D3** teaches that "in contrast with conventional auditory ring tones, the aforementioned haptic effects (e. g. , haptic ringers) are more desirable in an environment where extraneous auditory signals are prohibited (e. g. , during a meeting or a concert), and/or where it is difficult to distinguish auditory signals

(e. g. , in a loud environment such as an airport). The haptic ringers are also more suitable in distracting situations such as driving, so that the user of a handheld communication device can keep eyes on the road without having to look at the device." (see D3, p. 6, i. 3-11).

- 2.2.5 The skilled person in the field of interaction design is perfectly aware of tactile feedback schemes and knows that the tactile communication channel is less obtrusive and distracting than the visual and auditory channel, not least from the teachings of document D3. She would therefore consider it a straightforward measure to replace the auditory signals of D2 which implicitly or explicitly indicate to the user whether or not a speech command was correctly recognized by corresponding tactile effects. She would hence arrive at the subject-matter of claim 1 based on a combination of documents D2 and D3, but without the need of exercising inventive skill. The requirements of Article 33(3) PCT is therefore not met.

2.3 INDEPENDENT CLAIM 10

The subject-matter of independent **claim 10**, directed towards a computer-implemented method substantially corresponds to the subject-matter of independent system claim 1. Hence, for the same reasons that have been given with regard to claim 1 (see items 2.1 and 2.2 supra), claim 10 does also not meet the requirements of novelty and/or inventive step (Articles 33(2) and 33(3) PCT)).

2.4 DEPENDENT CLAIMS

Dependent **claims 2-9** and **11-16** do not appear to contain any additional features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step, the reasons being as follows:

- 2.4.1 Dependent **claim 2** and **claim 11**, respectively, define a function to be executed that corresponds to recognized speech information, and, a third haptic effect to be played upon completion of the function.

While D1 also discloses that a task is performed upon recognition of a voice instruction (see D1, Fig. 4, step 126), it remains silent about playing a haptic effect upon completion of the task.

The underlying technical problem may thus be regarded as how to provide status feedback about the progress of the performed function to the user.

However, providing tactile feedback to indicate completion of a function such as a downloading or uploading operation is known (see document **D5**, [0056]).

The skilled person in the field of interaction design would thus see it a straightforward measure to provide a similar tactile indication of completion of the performed task also to the system of **D1**, whenever the nature of the task renders such indication desirable. The features defined in claims 2 and 11, hence do not meet the requirements for inventive step (Article 33(3) PCT).

- 2.4.2 Dependent **claims 3, 4, 7, 12, 13** and **16** relate to the nature of the individual haptic effects. In particular, claims 3, 7, 12, and 16 suggest that the first or third haptic effects "emulate" the function that is performed in response to recognizing a speech command. Claim 4, as far as it can be understood (see Item VIII-1 below), and claim 13 further specify the function to comprise activating a turn signal indicator and the third haptic effect to comprise a vibration that travels in the direction of the impending turn.

Haptic effects that emulate expressions or behaviours are known from document **D3** (see **D3**, p. 7, l. 17-23); indicating directional information to a user by means of a vibration that travels in the respective direction is disclosed in document **D7** (see **D7**, Figs. 8 and 9 with col. 4, l. 5-31).

The specified haptic effects therefore merely constitute straightforward known possibilities from which the skilled person would select, in accordance with circumstances, without the exercise of inventive skill, in order to solve the problem posed.

- 2.4.3 Any combination of tactile, visual, and auditory indicators, such as suggested by the features defined in **claims 5, 6, 14** and **15** is also anticipated by document **D1** (see **D1**, p. 15, l. 12-31, "[...], other types of indications can be used in addition or in place of the audible tones described above [...]"). Claims 5, 6, 14 and 15 are therefore also not new.
- 2.4.4 **Claim 8** defines a system according to claim 1, wherein the microphone, actuator, and processor are disposed within the housing. In the system of **D1**, on the contrary, the processor does not reside in the same housing as the microphone and the actuator. Such minor variations of the system of **D1**, however, lie within the scope of normal adaptations and optimisations the skilled person is able to implement as part of her routine work, without the need for inventive skill. She would routinely implement such adaptations where circumstances make them desirable.

Re Item VII

Certain defects in the international application

- 1 Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the documents **D1-D7** is not mentioned in the description, nor are these documents identified therein.
- 2 Independent **claims 1 and 10** are not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known in combination from the prior art (see document **D1**) being placed in the preamble (Rule 6.3(b)(i) PCT) and with the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).
- 3 The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

Re Item VIII

Certain observations on the international application

- 1 The application does not meet the requirements of Article 6 PCT, because **claim 4** is not clear for the following reasons.

Claim 4 defines "the system of claim 3, wherein the function comprises activating a turn signal indicator and the third haptic effect comprises a vibration that travels in the direction of the impending turn."

The only embodiment disclosed in the description that describes a function to comprise a "turn signal indicator" appears to relate to a device which may be configured to control a vehicle, such as a wheelchair. In such an embodiment, the description discloses that a plurality of actuators may output a vibration that begins in the middle of the back of the wheelchair and moves to the right. "For example, the actuators may be placed along a horizontal line in the back of the wheelchair, such that the actuators are activated in succession. The user may thus perceive the vibration moving to the right across their back and therefore receive feedback indicating that the command was recognized" (see description, p. 15, l. 29 - p. 16, l. 3).

Accordingly, in view of the disclosed actuator placement along a horizontal line in the back of the wheelchair, it seems that this embodiment does not comprise an actuator in communication with a housing, the actuator being configured to output a haptic effect to the housing, as it is defined in independent claim 1. Therefore, the combination of features defined by claim 4 in

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combination with claim 1, on which claim 4 depends, is not supported by the description, rendering the subject-matter defined by claim 4 unclear (Article 6 PCT).

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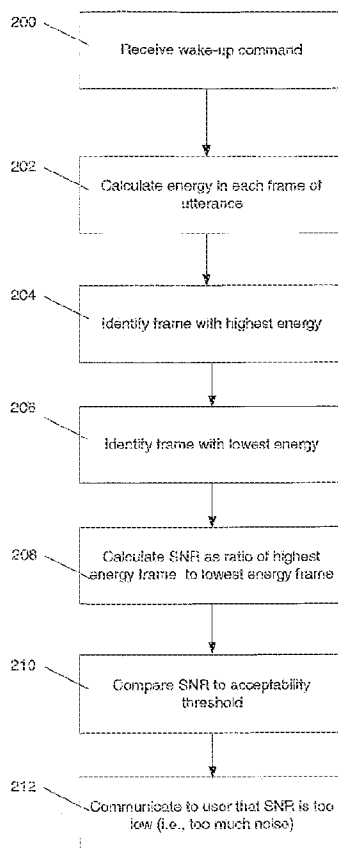
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(54) Title: A SIGNAL TO-NOISE MEDIATED SPEECH RECOGNITION ALGORITHM



(57) Abstract: A method of processing speech in a noisy environment includes determining, upon a wake-up command, when the environment is too noisy to yield reliable recognition of a user's spoken words, and alerting the user that the environment is too noisy. Determining when the environment is too noisy includes calculating a ratio of signal to noise. The signal corresponds to of an amount of energy in the spoken utterance, and the noise corresponds to an amount of energy in the background noise. The method further includes comparing the signal to noise to a threshold.

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A SIGNAL-TO-NOISE MEDIATED SPEECH RECOGNITION ALGORITHM

5

TECHNICAL FIELD

[0001] This invention relates generally to wireless communication devices with speech recognition capabilities.

BACKGROUND

10 [0002] Wireless communications devices, such as cellular telephones (cell phones), commonly employ speech recognition algorithms that enable a user to operate the device in a hands-free and eyes-free manner. For example, many cell phones that are currently on the market can recognize and execute spoken commands to initiate an outgoing phone call, to answer an incoming phone call, and to perform other functions. Many of those cell phones
15 can also recognize a spoken name, locate the recognized name in an electronic phone book, and then automatically call the telephone number associated with the recognized name.

[0003] Speech recognition algorithms tend to perform better when the environment in which the user is operating the device has low background noise, i.e., when the signal-to-noise (SNR) of the speech signal is high. As the background noise level increases, the SNR
20 of the speech signal decreases, and the error rate of a speech recognition algorithm typically goes up. That is, the spoken word is either not recognized at all or is recognized incorrectly. This tends to especially be a problem in the case of cell phones and other mobile communication devices in which the available computational power and memory is severely limited due to the small size of the smaller platform. Moreover, cell phones and those other
25 mobile communication devices tend to be used in noisy environments. For example, two locations in which cell phones are commonly used are in the car and on busy city streets. In the car, especially if it is being driven on the highway, the speech signal will be mixed with a significant amount of car noise (e.g. the noise made by the tires against the pavement, the noise made by the air passing over the car, music from the radio, etc.). And on the busy city
30 street, the speech signal will be mixed with traffic noises, car horns, the voices of other nearby people talking, etc.

SUMMARY OF THE INVENTION

[0004] The described embodiment informs a cell phone user when the speech environment is too noisy for reliable operation of the embedded voice recognizer. The cell
5 phone user can then take steps to increase the SNR, e.g., by either speaking more loudly or by reducing the noise level.

[0005] In one aspect, a method of performing speech recognition on a mobile device includes receiving a spoken utterance from a user of the mobile device, and processing a signal derived from the received spoken utterance with a speech recognition algorithm. The
10 processing of the derived signal also involves determining whether the environment in which the utterance was spoken is too noisy to yield reliable recognition of the spoken utterance. The method further includes performing an action to improve recognition of the content of the spoken utterance by the speech recognition algorithm, if processing of the derived signal determines that the environment is too noisy to yield reliable recognition of the spoken
15 utterance.

[0006] The action to improve recognition of the content of the spoken utterance may involve alerting the user that there was too much noise to permit reliable recognition of the spoken utterance. The action may involve asking the user to repeat the utterance, or generating an audio signal, or generating a visual signal. The action may involve a
20 mechanical vibration of the mobile device.

[0007] The action to improve recognition of the content of the spoken utterance may include modifying the speech recognition algorithm to improve recognition performance in the environment in which the utterance was spoken. The speech recognition algorithm may include an acoustic model, where modifying the speech recognition algorithm involves
25 changing the acoustic model. The speech recognition algorithm may include an acoustic model that is parameterized to handle different levels of background noise, where modifying the speech recognition algorithm involves changing parameters in the acoustic model to adjust for the level of background noise.

[0008] The step of determining whether the environment in which the utterance was spoken is too noisy to yield reliable recognition may include computing a signal-to-noise ratio for the received utterance, and comparing the computed signal-to-noise ratio to a threshold.

5 [0009] In another aspect, an embodiment includes a computer readable medium storing instructions which, when executed on a processor system, causes the processor system to employ a speech recognition algorithm to process a signal derived from an utterance spoken by a user. The instructions executed on the processor system further determine whether the environment in which the utterance was spoken is too noisy to yield reliable recognition of
10 the spoken utterance. If it is determined that the environment is too noisy to yield reliable recognition of the spoken utterance, the instructions executed on the processor system perform an action to improve recognition of the content of the spoken utterance by the speech recognition algorithm.

[0010] The stored instructions executed on the processor system cause the processor
15 system to perform the action by alerting the user that there was too much noise to permit reliable recognition of the spoken utterance, or the instructions cause the processor system to determine whether the environment in which the utterance was spoken is too noisy to yield reliable recognition by computing a signal-to-noise ratio for the spoken utterance. The stored instructions executed on the processor system may cause the processor system to determine
20 whether the environment in which the utterance was spoken is too noisy to yield reliable recognition by also comparing the computed signal-to-noise ratio to a threshold.

[0011] The instructions executed on the processor system may cause the processor system to perform the action by modifying the speech recognition algorithm to improve recognition performance in the environment in which the utterance was spoken. In one
25 embodiment, the speech recognition algorithm includes an acoustic model and wherein the stored instructions cause the processor system to modify the speech recognition algorithm by changing the acoustic model. In another embodiment, the speech algorithm includes an acoustic model that is parameterized to handle different levels of background noise. The stored instructions cause the processor system to modify the speech recognition algorithm by
30 changing parameters in the acoustic model to adjust for the level of background noise.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] FIG. 1 is a flow diagram of the operation of an embodiment of the invention;
and,

5 [0013] FIG. 2 is a high-level block diagram of a smartphone on which the functionality described herein can be implemented.

DETAILED DESCRIPTION

[0014] The described embodiment is a cellular telephone with software that provides
10 speech recognition functionality such as is commonly found on many cell phones that are commercially available today. In general, the speech recognition functionality allows a user to bypass the manual keypad and enter commands and data via spoken words. In this case, the software also determines when the environment in which the cell phone is being used is too noisy to yield reliable recognition of the user's spoken words. In the embodiment that
15 will be described in greater detail below, the software measures a SNR and compares that to a predetermined threshold to determine whether there is too much noise. Upon determining that the environment is too noisy, the cell phone then takes some action to deal with that problem. For example, it either alerts the user of the fact that the environment is too noisy to permit reliable recognition or it modifies the internal speech recognition algorithm to improve
20 the recognition performance in that particular environment.

[0015] With the help of the flow chart shown in FIG. 1, we will describe the operation of one particular embodiment of the invention. Following that we will describe alternative approaches to detecting when the environment is too noisy and alternative approaches to responding to noisy environments. Finally, we will describe a typical cell phone in which the
25 functionality can be implemented.

[0016] The cell phone first receives a wake-up command (block 200), which may be a button-push, a key-stroke, a particular spoken keyword, or simply the beginning of speech from the user. The wake-up command initiates the process that determines whether the speech environment is too noisy. If the wake-up command is a spoken command, the
30 software can be configured to use wake-up command to measure SNR. Alternatively, it can

be configured to wait for the next utterance received from the user and use that next utterance (or some portion of that utterance) to measure SNR.

[0017] To determine the SNR, voice recognition software calculates the energy as a function of time for the utterance (block 202). It then identifies the portion of the utterance
5 having the highest energy (block 204) and it identifies the portion having the lowest energy (block 206). The software uses those two values to compute an SNR for the utterance (block 208). In this case, the SNR is simply the ratio of the highest value to the lowest value.

[0018] In the described embodiment, the recognition software processes the received utterance on a frame-by-frame basis where each frame represents of a sequence of samples of
10 the utterance. For each frame, the software computes an energy value. It does this by integrating the sampled energy over the entire frame so that the computed energy value represents the total energy for the associated frame. At the end of the utterance (or after some period has elapsed after the beginning of the utterance) the software identifies the frame with the highest energy value and the frame with the lowest energy value. It then calculates the
15 SNR by dividing the energy of the frame with the highest energy value by the energy of the frame with the lowest energy value.

[0019] The voice recognition software compares the calculated signal to noise ratio to an acceptability threshold (block 210). The threshold represents that level the SNR must exceed for the speech recognition to produce an acceptably low error rate. The threshold can
20 be determined empirically, analytically, or by some combination of the two. The software also enables the user to adjust this threshold to tune the performance or sensitivity of the cell phone.

[0020] If the signal to noise ratio does not exceed the acceptability threshold, the voice recognition software communicates to the user that the signal to noise ratio is too low 212.

25 [0021] If the signal to noise ratio does not exceed the acceptability threshold, the voice recognition software takes steps to address the problem (block 212). In the described embodiment, it does this by discontinuing recognition and simply alerting the user that there is too much noise for reliable recognition to take place. The user can then try to reduce the background noise level (e.g., by changing his location, turning down the radio, waiting for
30 some particularly noisy event to end, etc.). The voice recognition software alerts the user by any one or more of a number of different ways that can be configured by the user including

an audio signal (i.e., a beep or a tone), a visual signal (i.e., a message or a flashing symbol on the cell phone display), a tactile signal (e.g., a vibration pulse, if the cell phone is so equipped), or some combination thereof.

5 [0022] If the signal to noise ratio exceeds the acceptability threshold, the voice recognition software continues with normal processing.

[0023] The speech recognition algorithms may use other techniques (or combinations of those techniques) for calculating a signal-to-noise ratio for a speech signal. In general, these techniques determine the amount of energy in the incoming speech relative to energy in the non-speech. One alternative technique is to generate an energy histogram over an
10 utterance or a period of time and calculate a ratio of lower energy percentiles versus higher energy percentiles (e.g., 5 percent energy regions versus 95 percent energy regions). Another technique is to use a two-state HMM (Hidden Markov Model) and compute means and variances for the two states, where one of the states represents speech and the other state represents noise.

15 [0024] The speech recognition algorithm can also calculate a statistic that is related to signal-to-noise. This statistic is referred to as an "intelligibility index." According to this approach, the speech recognition software separates the acoustic frames (or samples within the frames) into discrete frequency ranges, and calculates a high-energy to low-energy ratio for only a subset of those frequency ranges. For example, in a particular environment noise
20 may be predominant in frequencies from 300 Hz to 600 Hz. So, the speech recognition software would calculate the high-energy to low-energy ratio only for energy that falls within that frequency range. Alternatively, the speech recognition software may apply a weighting coefficient to each of the distinct frequency ranges, and calculate a weighted composite high-energy to low energy ratio.

25 [0025] In the embodiment described above, the speech recognition software responds to detecting a low SNR by alerting the user. There are other ways in which it could respond as an alternative to or in addition to sending a simple alert. For example, the speech recognition software can instruct the user either visually or audibly to repeat the utterance. Instead of alerting the user, the speech recognition software could modify the acoustic model
30 to account for the noisy environment to produce a speech recognizer that performs better in that environment.

[0026] For example, the speech recognition software could include an acoustic model that has been trained from noisy speech. Such an acoustic model might be parameterized to handle different levels of noise. In that event, the speech recognition software would select the appropriate one of those levels depending upon the calculated signal-to-noise ratio.

5 Alternatively, the acoustic model could be scalable to handle a range of noise levels, in which case the speech recognition software would scale the model that is used according to the calculated signal-to-noise ratio. Still another approach is to employ an acoustic model that is parameterized to handle categories of noise (e.g., car noise, street noise, auditorium noise, etc.), in which case the speech recognition software would select a particular category for the
10 model depending upon user input and/or the calculated signal-to-noise ratio.

[0027] Still another approach is to use an acoustic model with a different phonetic inventory to account for a high-noise environment. For example, a high-noise environment may obscure certain consonants (e.g., "p's" and "b's"), so an acoustic model with a phonetic inventory specifically designed to decode with those obscured consonants will perform better
15 in a noisy environment, relative to the default acoustic model.

[0028] Yet another approach would be to use an acoustic model with a different classifier geometry to compensate for a low signal-to-noise environment. Such classifiers include HMMs, neural networks, or other speech classifiers known in the art. The speech recognition software may alternatively use an acoustic model with different front-end
20 parameterization to provide better performance in a noisy environment. For example, an acoustic model processing a spectral representation of the acoustic signal may perform better than an acoustic model processing a cepstral representation of the signal, if noise is limited to a particular narrow frequency range. This is because the spectral model can excise the noisy frequency range, whereas the cepstral model cannot.

25 [0029] A smartphone 100, as shown in FIG. 2, is an example of platform that can implement the above-described speech recognition functionality. One example of a smartphone 100 is a Microsoft PocketPC-powered phone which includes at its core a baseband DSP 102 (digital signal processor) for handling the cellular communication functions (including for example voiceband and channel coding functions) and an
30 applications processor 104 (e.g. Intel StrongArm SA-1110) on which the PocketPC operating system runs. The phone supports GSM voice calls, SMS (Short Messaging Service) text

messaging, wireless email, and desktop-like web browsing along with more traditional PDA features.

[0030] An RF synthesizer 106 and an RF radio transceiver 108, followed by a power amplifier module 110 implement the transmit and receive functions. The power amplifier module handles the final-stage RF transmit duties through an antenna 112. An interface ASIC 114 and an audio CODEC 116 provide interfaces to a speaker, a microphone, and other input/output devices provided in the phone such as a numeric or alphanumeric keypad (not shown) for entering commands and information.

[0031] DSP 102 uses a flash memory 118 for code store. A Li-Ion (lithium-ion) battery 120 powers the phone and a power management module 122 coupled to DSP 102 manages power consumption within the phone. SDRAM 124 and flash memory 126 provide volatile and non-volatile memory, respectively, for applications processor 114. This arrangement of memory holds the code for the operating system, the code for customizable features such as the phone directory, and the code for any other applications software in the smartphone, including the voice recognition software described above. The visual display device for the smartphone includes an LCD driver chip 128 that drives an LCD display 130. There is also a clock module 132 that provides the clock signals for the other devices within the phone and provides an indicator of real time. All of the above-described components are packages within an appropriately designed housing 134.

[0032] Smartphone 100 described above represents the general internal structure of a number of different commercially available smartphones, and the internal circuit design of those phones is generally known in the art.

[0033] Other aspects, modifications, and embodiments are within the scope of the following claims.

CLAIMS

What is claimed is:

1. A method of performing speech recognition on a mobile device, the
5 method comprising:
 - receiving a spoken utterance from a user of the mobile device;
 - processing a signal derived from the received spoken utterance with a speech
recognition algorithm, wherein said processing of the derived signal also involves
determining whether the environment in which the utterance was spoken is too noisy to yield
10 reliable recognition of the spoken utterance;
 - if processing of the derived signal determines that the environment is too noisy
to yield reliable recognition of the spoken utterance, performing an action to improve
recognition of the content of the spoken utterance by the speech recognition algorithm.
2. The method of claim 1, wherein performing the action involves alerting the
15 user that there was too much noise to permit reliable recognition of the spoken utterance.
3. The method of claim 2, wherein alerting also involves asking the user to
repeat the utterance.
4. The method of claim 2, wherein alerting involves generating an audio
signal.
- 20 5. The method of claim 2, wherein alerting involves generating a visual signal
6. The method of claim 2, wherein alerting involves generating a tactile signal
7. The method of claim 6, wherein the tactile signal is a mechanical vibration
of the mobile device
8. The method of claim 1, wherein determining whether the environment in
25 which the utterance was spoken is too noisy to yield reliable recognition comprises
computing a signal-to-noise ratio for the received utterance.

9. The method of claim 8, wherein determining whether the environment in which the utterance was spoken is too noisy to yield reliable recognition further comprises comparing the computed signal-to-noise ratio to a threshold.

10. The method of claim 1, wherein performing the action involves modifying
5 the speech recognition algorithm to improve recognition performance in the environment in which the utterance was spoken.

11. The method of claim 10, wherein the speech recognition algorithm includes an acoustic model and wherein modifying the speech recognition algorithm involves changing the acoustic model.

10 12. The method of claim 10, wherein the speech recognition algorithm includes an acoustic model that is parameterized to handle different levels of background noise and wherein modifying the speech recognition algorithm involves changing parameters in the acoustic model to adjust for the level of background noise.

13. A computer readable medium storing instructions which when executed
15 on a processor system causes the processor system to:
employ a speech recognition algorithm to process a signal derived from an utterance spoken by a user;
determine whether the environment in which the utterance was spoken is too
noisy to yield reliable recognition of the spoken utterance; and
20 if it is determined that the environment is too noisy to yield reliable
recognition of the spoken utterance, perform an action to improve recognition of the content
of the spoken utterance by the speech recognition algorithm.

14. The computer readable medium of claim 13, wherein the stored
instructions cause said processor system to perform said action by alerting the user that there
25 was too much noise to permit reliable recognition of the spoken utterance.

15. The computer readable medium of claim 13, wherein the stored
instructions cause said processor system to determine whether the environment in which the

utterance was spoken is too noisy to yield reliable recognition by computing a signal-to-noise ratio for the spoken utterance.

16. The computer readable medium of claim 13, wherein the stored instructions cause said processor system to determine whether the environment in which the
5 utterance was spoken is too noisy to yield reliable recognition by also comparing the computed signal-to-noise ratio to a threshold.

17. The computer readable medium of claim 13, wherein the stored instructions cause said processor system to perform the action by modifying the speech recognition algorithm to improve recognition performance in the environment in which the
10 utterance was spoken.

18. The computer readable medium of claim 17, wherein the speech recognition algorithm includes an acoustic model and wherein the stored instructions cause said processor system to modify the speech recognition algorithm by changing the acoustic model.

15 19. The computer readable medium of claim 17, wherein the speech algorithm includes an acoustic model that is parameterized to handle different levels of background noise and wherein the stored instructions cause said processor system to modify the speech recognition algorithm by changing parameters in the acoustic model to adjust for the level of background noise.

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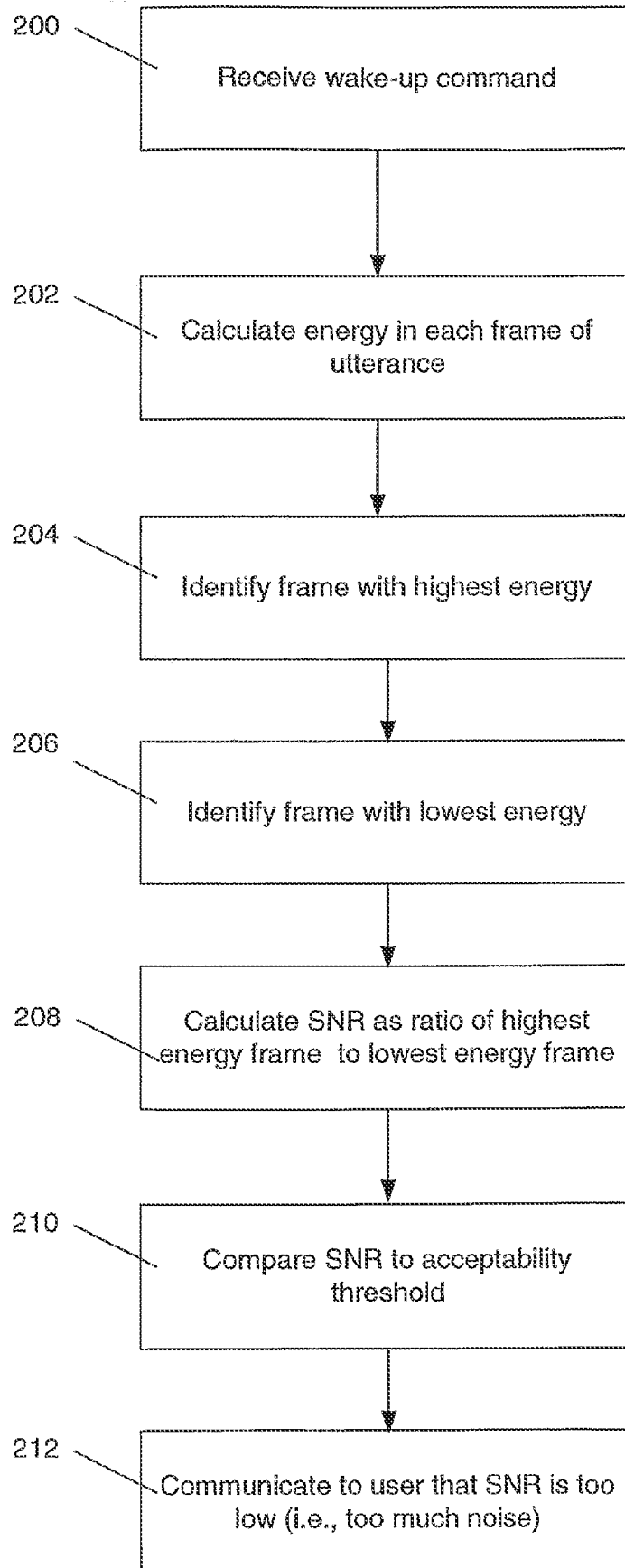


FIG. 1

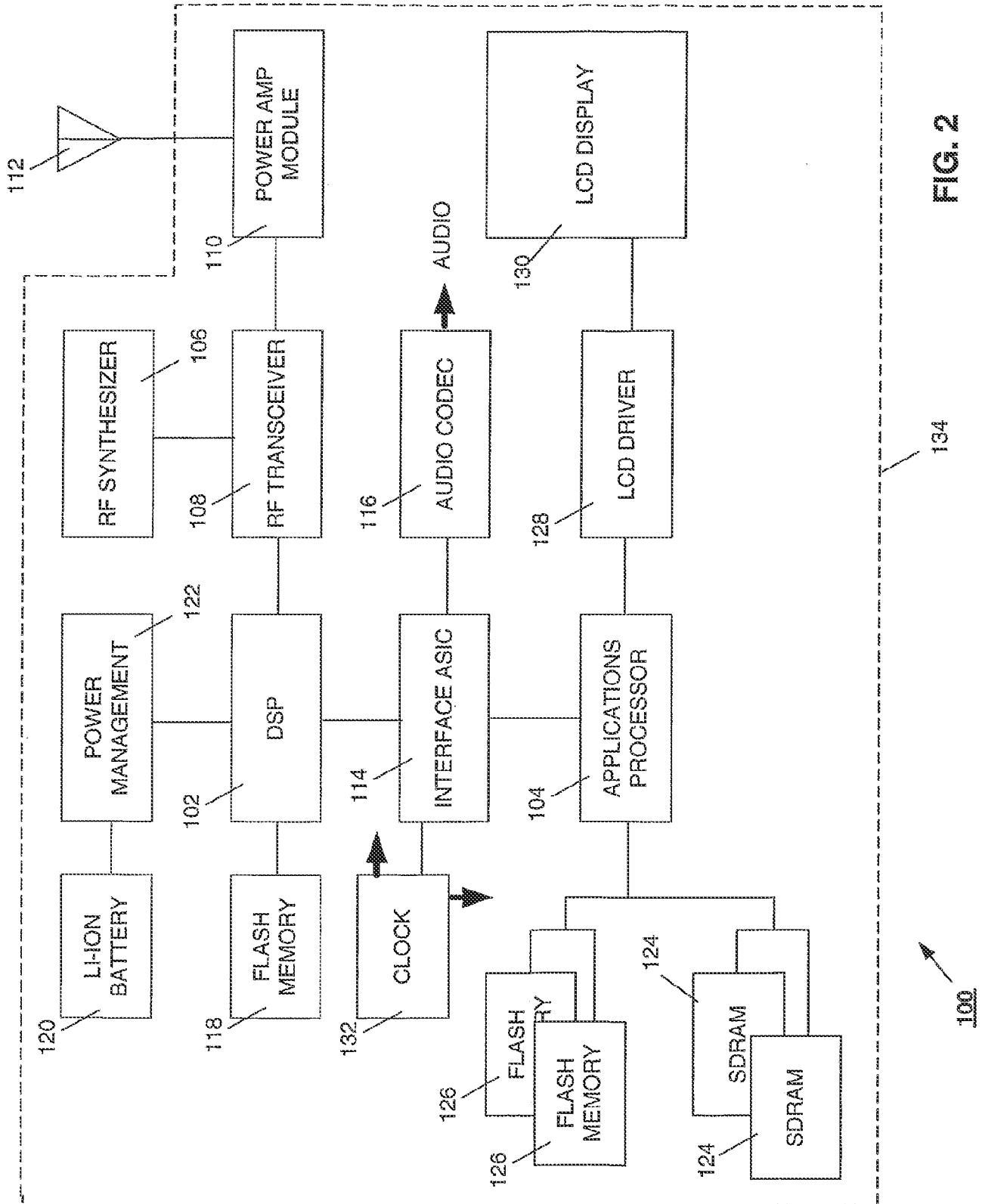


FIG. 2

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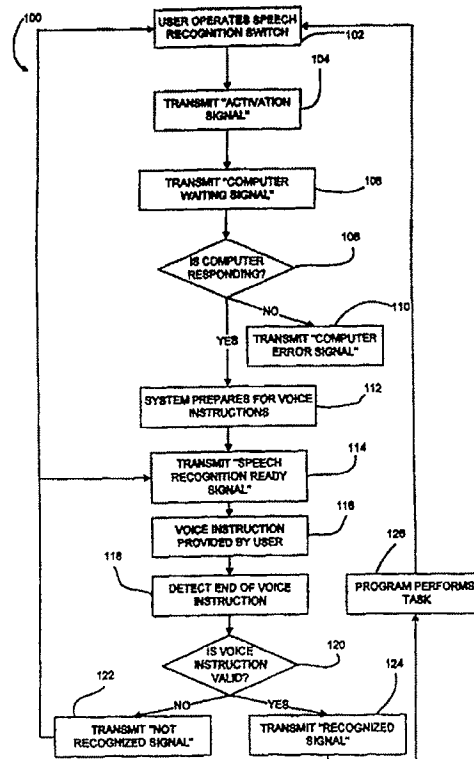
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(54) Title: APPARATUS AND METHOD FOR PROVIDING SPEECH INPUT TO A SPEECH RECOGNITION SYSTEM

(57) Abstract

An apparatus and a method for providing input speech into a computer having a speech recognition system and an input device remote from the computer. The input device includes a microphone, an indicator and a user operated switch. To provide input speech, the user operates the user operated switch wherein an activation signal is transmitted from the input device to the computer. A speech recognition ready signal is then transmitted from the computer to the input device when the speech recognition system is operable to receive input speech. The indicator is actuated upon receipt of the speech recognition ready signal.



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APPARATUS AND METHOD FOR PROVIDING SPEECH INPUT TO A SPEECH RECOGNITION SYSTEM

BACKGROUND OF THE INVENTION

The present invention relates to speech
5 recognition systems. More particularly, the present
invention is an apparatus and method for providing
speech input into a speech recognition system.

Various input devices have been used in the
past for interacting with a computer system. These
10 devices include a keyboard, a mouse, a joystick, all of
which require the user to manipulate a physical device
in order to perform functions on a computer.

Recently, computers have been designed to
recognize and respond to a user's spoken words. In such
15 a system, the computer is equipped with a microphone to
which the user speaks. Input speech from the user is
analyzed to detect various commands upon which the
computer takes subsequent action. This type of
interface, in theory, allows hands-free communication
20 with the computer, which can be more efficient and/or
user-friendly for some applications.

However, problems are associated with
providing spoken instructions to a computer that are not
present with other interactive devices, such as a mouse
25 or a keyboard. One of the more significant problems is
that the computer should respond only to the user
operating the system and not attempt to interpret other
spoken words in a surrounding environment. For
instance, it is not desirable for the computer to try to
30 interpret other conversations, music, etc., which may be

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present when the user is not giving instructions to the computer.

Prior art systems and techniques have addressed this problem by requiring the user to use one of the above-mentioned physical interactive devices in cooperation with prompts provided on a visual display screen when voice instructions are given. For instance, the user may be required to depress keys or buttons on the keyboard or mouse to signify to the computer that instructions will be provided. Alternatively, the mouse can be used to position a cursor in a selected area of the screen to signify to the system that voice commands will be provided. However, each of the foregoing techniques requires the user to be present at the computer in order to operate the keyboard or mouse when voice commands are given. This requirement limits the user's mobility, and thus inhibits wide spread use of speech recognition systems.

SUMMARY OF THE INVENTION

An apparatus and a method for providing input speech into a computer having a speech recognition system and an input device remote from the computer. The input device includes a microphone, an indicator and a user operated switch. To provide input speech, the user operates the user operated switch wherein an activation signal is transmitted from the input device to the computer. A speech recognition ready signal is then transmitted from the computer to the input device when the speech recognition system is operable to receive input speech. The indicator is actuated upon receipt of the speech recognition ready signal.

In one embodiment, the input device is a

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telephone such as a cordless telephone, conventional telephone or a cellular telephone. The user operated switch can be a keyboard of the telephone or a separate switch remote from the keyboard. A light, a speaker or
5 a buzzer can be used to transmit the speech recognition ready signal to the user.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic representation of a first embodiment of the present invention.

10 FIGS. 2A and 2B are a block diagram of an exemplary environment for implementing the present invention.

FIG. 3 is a front elevational view of a handset.

15 FIG. 4 is a flow diagram illustrating operation of the present invention.

FIG. 5 is a schematic representation of a second embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

20 FIG. 1 schematically illustrates an apparatus 10 in accordance with a first embodiment of the present invention. Generally, the apparatus 10 includes a computer 12 programmed to carry out voice recognition based on voice data produced from sound spoken by a user
25 through an input device 14. In the embodiment illustrated, the input device 14 comprises a cordless telephone having a base station 16 and a portable handset 18 that is operable with the base station 16 in a limited distance or area therefrom. In other words,
30 the handset 18 allows the user to be remote from the computer 12, yet allows the user to remain in contact with the computer 12 through the base station 16 and a

suitable communication link, such as a RF link, established between the base station 16 and the handset 18. As used herein, "remote" from the computer shall mean that the user can maintain communication with computer 12 at a position away from the actual site of the computer 12 where typical interactive devices such as a keyboard, a monitor and a speaker are provided and are directly (electrically) connected to the computer 12. In general, the input device 14 allows the user to signal to the computer 12 when input speech is going to be provided while the user is located at a position remote from the computer 12. The input device 14 includes an indicator, such as a speaker, light or buzzer, which, when operated by the computer 12, provides feedback to the user that the computer 12 is now ready to receive input speech.

FIGS. 2A and 2B and the related discussion are intended to provide a brief, general description of a suitable computing environment in which the invention may be implemented. Although not required, the invention will be described, at least in part, in the general context of computer-executable instructions, such as program modules, being executed by a personal computer. Generally, program modules include routine programs, objects, components, data structures, etc. that perform particular tasks or implement particular abstract data types. Moreover, those skilled in the art will appreciate that the invention can be practiced with other computer system configurations, including handheld devices, multiprocessor systems, microprocessor-based or programmable consumer electronics, network PCs, minicomputers, mainframe computers, and the like. The

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invention can also be practiced in distributed computing environments where tasks are performed by remote processing devices that are linked through a communications network. In a distributed computing environment, program modules can be located in both local and remote memory storage devices.

With reference to FIG. 2A, an exemplary system for implementing the invention includes a general purpose computing device in the form of a conventional personal computer 12, including a processing unit 21, a system memory 22, and a system bus 23 that couples various system components including the system memory 22 to the processing unit 21. The system bus 23 can be any of several types of bus structures including a memory bus or memory controller, a peripheral bus, and a local bus using any of a variety of bus architectures. The system memory 22 includes read only memory (ROM) 24 and random access memory (RAM) 25. A basic input/output (BIOS) 26, containing the basic routine that helps to transfer information between elements within the personal computer 12, such as during start-up, is stored in the ROM 24. The personal computer 12 further includes a hard disk drive 27 for reading from and writing to a hard disk (not shown), a magnetic disk drive 28 for reading from or writing to a removable magnetic disk 29, and an optical disk drive 30 for reading from or writing to a removable optical disk 31 such as a CD ROM or other optical media. The hard disk drive 27, the magnetic disk drive 28, and the optical disk drive 30 are connected to the system bus 23 by a hard disk drive interface 32, a magnetic disk drive interface 33, and an optical disk drive interface 34,

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respectively. The drives and the associated computer-readable media provide nonvolatile storage of computer readable instructions, data structures, program modules and other data for the personal computer 12.

5 Although the exemplary environment described herein employs the hard disk, the removable magnetic disk 29 and the removable optical disk 31, it should be appreciated by those skilled in the art that other types of computer readable media which can store data that is
10 accessible by a computer, such as magnetic cassettes, flash memory cards, digital video disks, Bernoulli cartridges, random access memories (RAMs), read only memory (ROM), and the like, can also be used in the exemplary operating environment.

15 A number of program modules may be stored on the hard disk, magnetic disk 29, optical disk 31, ROM 24 or RAM 25, including an operating system 35, one or more application programs 36, other program modules 37, and program data 38. A user may enter commands and
20 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
25 user to input speech from a location remote from the computer 12. Other input devices (not shown) can include a joystick, game pad, satellite dish, scanner, or the like. These and other input devices are often connected to the processing unit 21 through a serial
30 port interface 46 that is coupled to the system bus 23, but can be connected by other interfaces, such as a sound card, a parallel port, a game port or a universal

serial bus (USB). A monitor 47 or other type of display device is also connected to the system bus 23 via an interface, such as a video adapter 48. In addition to the monitor 47, personal computers can typically include
5 other peripheral output devices, such as a speaker 45 and printers (not shown).

The personal computer 12 can operate in a networked environment using logic connections to one or more remote computers, such as a remote computer 49.
10 The remote computer 49 may be another personal computer, a server, a router, a network PC, a peer device or other network node, and typically includes many or all of the elements described above relative to the personal computer 12, although only a memory storage device 50
15 has been illustrated in FIG. 1. The logic connections depicted in FIG. 1 include a local area network (LAN) 51 and a wide area network (WAN) 52. Such networking environments are commonplace in offices, enterprise-wide computer network intranets and the Internet.

20 When used in a LAN networking environment, the personal computer 12 is connected to the LAN 51 through a network interface or adapter 53. When used in a WAN networking environment, the personal computer 12 typically includes a modem 54 or other means for
25 establishing communications over the WAN 52, such as the Internet. The modem 54, which can be internal or external, is connected to the system bus 23 via the serial port interface 46. In a network environment, program modules depicted relative to the personal
30 computer 12, or portions thereof, may be stored in the remote memory storage devices. It will be appreciated that the network connections shown are exemplary and

other means of establishing a communications link between the computers may be used.

FIG. 2B is a simplified illustration of the cordless telephone 14 comprising the base station 16 and the handset 18. The handset 18 receives and transmits RF signals via an antenna 60. The antenna 60 is coupled to a duplex radio transceiver unit 62 which is capable of operation in a receiver mode and in a transmitter mode. In the receiver mode, the transceiver unit 62 applies received and demodulated audio signals to an audio processor unit 64 for amplification and ultimate reproduction in a speaker 66. Also in the receiver mode, the transceiver unit 62 also provides digital data to the "receive data" (i.e., RXdata) terminal of a controller 68, for instance, a HC05 microcontroller sold by Motorola, Inc. of Schaumburg, Illinois. In the transmitter mode, the transceiver unit 62 receives audio signals, picked-up (i.e., detected) by a microphone 70 and amplified by the audio processor unit 64, for transmission to the base station 16. Also in the transmitter mode, the transceiver unit 62 receives "transmit data" (i.e., TXdata) from the controller 68, for transmission to the base station 16. The controller 68 is coupled to a keyboard panel 74 for receiving keystroke commands from the user through a plurality of buttons or keys. In the embodiment illustrated, a separate speech recognition switch 72 is also connected to the controller 68. The speech recognition switch 72 is operated when voice instructions are going to be provided as discussed below. The controller 68 also has two output lines A and B for controlling the transceiver unit 62 to operate on a RF communications channel A or

on a RF communications channel B. A power supply and charging unit 76 supplies operating power to the circuitry of the handset 18.

FIG. 3 is a front elevational view of an exemplary embodiment of the handset 18. In the embodiment illustrated, the speech recognition switch 72 is located on a side of a housing 81, which allows operation of the switch 72 with the index finger or thumb of the user.

Referring back to FIG. 2B, the base station 16 receives and transmits RF signals via an antenna 82. The antenna 82 is coupled to a duplex radio transceiver unit 84 which is capable of operation in a receiver mode and in a transmitter mode. In the receiver mode, the transceiver unit 84 applies received and demodulated audio signals to an audio processor unit 86 for amplification and coupling to a telephone network 85, or to the personal computer 12 via a telephone/computer interface unit and controller 87. The telephone/computer interface unit and controller 87 is connected to the telephone network via two terminals traditionally known as tip (T) and ring (R). The telephone/computer interface unit and controller 87 is connected to the system bus 23 (FIG. 2A) with a suitable interface unit, not shown, communicating with suitable protocols. In one embodiment, the interface unit and protocol are in accordance with the USB standard. The USB standard has particular attributes such as increased bandwidth over prior serial communication links, which allows more voice data to be provided to the computer 12 from the input device 14. In addition, the USB standard can allow simultaneous connection of the base station 16

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with the telephone network 85 and the personal computer 12, if desired.

In the receiver mode, transceiver unit 84 also provides digital data to the "receive data" (i.e., RXdata) terminal of a controller 89. The controller 89 has a control terminal C by which the telephone/computer interface unit and controller 87 can be controlled to establish communication over the telephone network 85 or the personal computer 12. Suitable microcontrollers for blocks 87 and 89 include the Z8 integrated digital signal processor microcontroller sold by Zilog Inc. of Campbell California and the HC05 microcontroller sold by Motorola, Inc., respectively. In the transmitter mode, the transceiver unit 84 receives signals, conveyed by the telephone network 85, or the personal computer 12 via the telephone/computer interface unit and controller 87 and amplified by the audio processor unit 86, for transmission to the handset 18. Also in transmitter mode, the transceiver unit 84 receives "transmit data" (i.e., TXdata) from the controller 89, for transmission to handset 18. The transceiver unit 84 is coupled to a switch 90 via two input lines A and B, which control the transceiver unit 84 to operate on RF communications channel A or on RF communications channel B. A power supply 94 provides operating power to the circuitry of the base station 16.

Referring back to FIG. 1, the computer 12 generally includes (or can be equipped with) the program module 37, a speech recognition module 98 and suitable drivers (hardware and software) 96 for the input device 14 to communicate with the program module 37 and the speech recognition module 98. The program module 37 can

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be any number of applications which are to be performed using voice instructions. For example, the program module 37 can be an answering machine residing in the computer 12 wherein operation such as playback of messages, record new messages and transferring messages can be accomplished through voice instructions. In another application, the program module 37 could be a dictation system where commands as well as dictation are provided through speech input. It should be noted that the present invention is not limited to applications performed with a general purpose computer such as the computer 12, but can also be used with other consumer and office electronic devices such as remote machine controllers, TVs, etc. Likewise, the input device 14 need not be a telephone having an associated keyboard panel, but can simply be a handheld voice input device without the capability of operating as telephone.

FIG. 4 is a flow diagram illustrating operation of the apparatus 10. Operation begins at step 102 whereat the user operates the speech recognition switch 72 to indicate to the computer 12 that voice instructions are going to be provided. Generally, an "Activation Signal" is then transmitted from the input device 14 to the computer 12 at step 104. The Activation Signal can be an analog or digital signal that is audible or inaudible. In the embodiment illustrated, the Activation Signal originates at the handset 18 and is transmitted to the base station 16. The base station 16 then transmits the Activation Signal to the program module 37 through the drivers 96 to indicate that the user wants to input voice instructions. In one embodiment, the base station 16

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also generates and transmits a "Computer Waiting Signal" to the handset 18 at step 106 which is communicated to the user. In the embodiment described, the Computer Waiting Signal initiates an audible tone indicating to the user that the input device 14 is attempting to establish a connection to the computer 12. For example, the computer 12 may be in a "sleep" mode where selected components such as the hard disk drive 27 have been turned off in order to conserve power. In such a case, the Computer Waiting Signal can be transmitted to the user until the computer 12 has become fully operational.

If at step 108, the input device 14 is unable to communicate with the computer 12 and, in particular, the program module 37 and speech recognition module 98, a "Computer Error Signal" is generated at step 110. For instance, the Computer Error Signal can be generated after a preselected time interval if the computer 12 does not respond. In the embodiment illustrated, the base station 16 generates the Computer Error Signal and transmits it to the handset 18. The Computer Error Signal initiates an audible tone to indicate to the user that the computer 12 is not responding.

If the computer 12 is on and the program module 37 is running a program such as an answering machine where voice messages are being played to the user, upon receipt of the Activation Signal provided by the input device 14, the program module 37 suspends current operations, such as playing a recorded message, and prepares the speech recognition module 98 for receipt of subsequent voice instructions at step 112. Preparation of the speech recognition module 98 can include providing a set of allowable voice instructions

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based upon the current status of the program. The set of allowable voice instructions can be one valid instruction that the program module 37 expects to receive from the user, or one of a number of valid
5 instructions that the program module 37 expects to receive from the user.

After preparation of the speech recognition module 98 at step 112, the program module 37 provides a "Speech Recognition Ready Signal" at step 114 through
10 the input device 14 to the user indicating that the system and, in particular, the speech recognition module 98, are ready to accept voice instructions from the user. In the embodiment illustrated, the Speech Recognition Ready Signal is transmitted from the base
15 station 16 to the handset 18 whereat the Speech Recognition Ready Signal is used to initiate an audible tone recognizable by the user.

The user then enters a voice instruction at step 116. Program flow then continues to step 118 where
20 end event detection is provided. End event detection, or detection of the end of the voice instruction provided at step 116, can be performed using any one of a number of techniques. For instance, release or deactivation of the speech recognition switch 72 is
25 monitored by deactivation of the Activation Signal. Likewise, transmission of another signal corresponding to release of the speech recognition switch 72 can be used to indicate that the voice instructions have been completed. Alternatively, silence can be used as a
30 signal that voice instructions are completed. In one embodiment, silence is presumed when the power level of the signal from the input device 14 has decreased below

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a selected level. In yet another embodiment, reactivation of the speech recognition switch 72, and subsequent retransmission of the Activation Signal can be used to signify that voice instructions have been
5 completed.

At step 120, the speech recognition module 98 evaluates the input voice instruction against the set of valid instructions. If the voice instruction received from the user does not correspond with any of the
10 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
15 Signal is generated as a tone and transmitted through the speaker 66 of the handset 18 to the user. System operation can then return to control of the program module 37, where, for example, if prior to step 102 the program was playing a message, the message can be
20 continued to be played. If desired, system operation could alternatively return to step 114 so that another voice instruction can be provided by the user.

If at step 120, the speech recognition module 98 does determine that the received voice instruction
25 corresponds to one of the set of valid voice instructions, the system generates a "Recognized Signal" that is transmitted to the user through the input device 14 at step 124. In the embodiment illustrated, the base station 16 transmits the Recognized Signal to the
30 handset 18 whereat the Recognition Signal is used to initiate an audible tone provided to the user. System operation is then transferred to the program module 37

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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. For example, the computer 12 may open, close or transfer
5 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
10 102 indicating that another voice instruction is to be provided by the user.

At this point, 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
15 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
20 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. Furthermore, audio message signals, such as "please wait" for the Computer Waiting Signal, "the computer is not
25 responding" for the Computer Error Signal, "speech recognition ready" for the Speech Recognition Ready Signal, "speech input not recognized" for the Not Recognized Signal, or repeating the recognized instruction for the Recognized Signal, can be used in
30 place of or in addition to the indicators described above.

It is to be understood that other telephones

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can be used in addition, or in place of, the cordless telephone 14 illustrated in FIGS. 1, 2A and 2B. FIG. 5 illustrates a second embodiment where a cellular telephone or a conventional phone 130, such as a pay phone, comprises the input device 14. In this embodiment, the telephone 130 communicates with the computer 12 remotely through the telephone network 85.

In one embodiment, the telephone 130 includes the speech recognition switch 72 separate from the associated keyboard in a manner similar to the handset 18 of the first embodiment. Alternatively, one or a number of keys can be depressed on the keyboard associated with the telephone 130 in place of the separate speech recognition switch 72. Operation of the embodiment of FIG. 5 is in accordance with the flow diagram illustrated in FIG. 4. Transmission of the Activation Signal from the telephone 130 to the computer 12 can be an analog or digital signal that is audible or inaudible. Likewise, transmission of the Speech Recognition Ready Signal, the Computer Error Signal, the Recognized Signal and the Not Recognized Signal, although originating from the computer 12 can be an analog or digital signal that is audible or inaudible.

If the signals are inaudible, suitable circuitry is provided in the telephone 130 to generate audible tones, or activate other indicating devices such as lights, buzzers, etc. on the telephone 130.

Although the present invention has been described with reference to preferred embodiments, workers skilled in the art will recognize that changes may be made in form and detail without departing from the spirit and scope of the invention.

WHAT IS CLAIMED IS:

1. An apparatus for providing speech input into a computer having a speech recognition system, the apparatus comprising:

an input device positionable remote from the computer, the input device including:

a microphone;

an indicator;

a user operated switch; and

a transceiver operably coupled to the microphone, the indicator and the user operated switch, the transceiver transmitting an activation signal from the input device to the computer upon operation of the user operated switch, and receiving a speech recognition ready signal from the speech recognition system to the input device when the speech recognition system is operable to receive input speech, wherein the indicator is actuated upon receipt of the speech recognition ready signal.

2. The apparatus of claim 1 wherein the transceiver receives a recognized signal from the computer to the input device if input speech is recognized, and receives a not recognized signal from the computer to the input device if the input speech is not recognized, the indicator being actuated as a

function of receipt of the recognized signal and the not recognized signal.

3. The apparatus of claim 1 wherein the input device checks the operational status of the speech recognition system and actuates the indicator if the speech recognition system is not operational.

4. The apparatus of claim 1 wherein the input device comprises a telephone having a keyboard for initiating a call to a second telephone through a telephone network.

5. The apparatus of claim 4 wherein the keyboard includes the user operated switch.

6. The apparatus of claim 4 wherein the keyboard is remote from the user operated switch.

7. The apparatus of claim 4 wherein the telephone comprises a cellular phone.

8. The apparatus of claim 4 wherein the telephone comprises a base station connectable to the computer and a handset operable with the base station within a limited distance of the base station, the handset including the microphone and the indicator.

9. The apparatus of claim 1 wherein the indicator comprises a speaker.

10. The apparatus of claim 1 wherein the indicator

comprises a light.

11. A method for providing input into a speech recognition system, the method comprising the steps of:
providing an input device remote from the speech recognition system, the input device including a microphone, an indicator and a user operated switch;
transmitting an activation signal from the input device to the speech recognition system upon operation of the user operated switch;
transmitting a speech recognition ready signal from the speech recognition system to the input device when the speech recognition system is operable to receive input speech; and
operating the indicator upon receipt of the speech recognition ready signal to indicate to a user that the speech recognition system is operable to receive input speech.

12. The method of claim 11 and further comprising the steps of:
transmitting input speech from the input device to the speech recognition system after activation of the indicator;
analyzing the input speech;
transmitting a recognized signal from the speech recognition system to the input device if the input speech was

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recognized, or transmitting a not recognized signal from the speech recognition system to the input device if the input speech was not recognized; and

operating the indicator as a function of receipt of the recognized signal or the not recognized signal.

13. The method of claim 12 and further comprising the step of preparing the speech recognition system for input prior to the step of transmitting the speech recognition ready signal.

14. The method of claim 13 wherein the step of preparing includes providing a set of valid input speech to the speech recognition system.

15. The method of claim 11 and further comprising the steps of:

checking the operational status of the speech recognition system; and
transmitting an error signal to a user via the input device if the speech recognition system is not operational.

16. The method of claim 15 wherein the step of operating the indicator comprises operating the indicator as a function of receipt of the speech recognition ready signal or the error signal.

17. The method of claim 11 wherein the input

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device comprises a telephone having input means for inputting a sequence of symbols to initiate connection of the telephone to a second telephone through a telephone network.

18. The method of claim 17 wherein the input means includes the user operated switch.

19. The method of claim 17 wherein the input means is remote from the user operated switch.

20. The method of claim 17 wherein the telephone is remote from the speech recognition system, and the method includes connecting the telephone to the speech recognition system through a telephone network.

21. The method of claim 20 wherein the telephone comprises a cellular phone.

22. The method of claim 17 wherein the telephone comprises a base station connected to the speech recognition system and a handset operable with the base station within a limited distance of the base station, the handset including the microphone and the indicator.

23 The method of claim 17 wherein the indicator comprises a speaker and the step of operating includes generating an audible tone as a function of receipt of the speech recognition ready signal.

24. An apparatus for providing speech input into a computer having a speech recognition system, the apparatus comprising:

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an input device positionable remote from the computer, the input device including a microphone, an indicator and a user operated switch; and

means for transmitting an activation signal from the input device to the computer upon operation of the user operated switch, and transmitting a speech recognition ready signal from the speech recognition system to the input device when the speech recognition system is operable to receive input speech, wherein the indicator is actuated upon receipt of the speech recognition ready signal.

25. The apparatus of claim 24 wherein the means for transmitting transmits a recognized signal from the computer to the input device if input speech is recognized, and transmits a not recognized signal from the computer to the input device if the input speech is not recognized, the indicator being actuated as a function of receipt of the recognized signal and the not recognized signal.

26. The apparatus of claim 25 and wherein the computer provides a set of valid input speech to the speech recognition system.

27. The apparatus of claim 24 wherein the input device checks the operational status of the speech recognition system and transmits an error signal to a

23

user if the speech recognition system is not operational.

28. The apparatus of claim 27 wherein transmission of the error signal comprises operating the indicator as a function of receipt of the speech recognition ready signal and the error signal.

29. The apparatus of claim 24 wherein the input device comprises a telephone having a keyboard for initiating a call to a second telephone through a telephone network.

30. The apparatus of claim 29 wherein the keyboard includes the user operated switch.

31. The apparatus of claim 29 wherein the keyboard is remote from the user operated switch.

32. The apparatus of claim 29 wherein the telephone comprises a cellular phone.

33. The apparatus of claim 29 wherein the telephone comprises a base station connected to the computer and a handset operable with the base station within a limited distance of the base station, the handset including the microphone and the indicator.

34. The apparatus of claim 24 wherein the indicator comprises a speaker.

35. The apparatus of claim 24 wherein the indicator comprises a light.

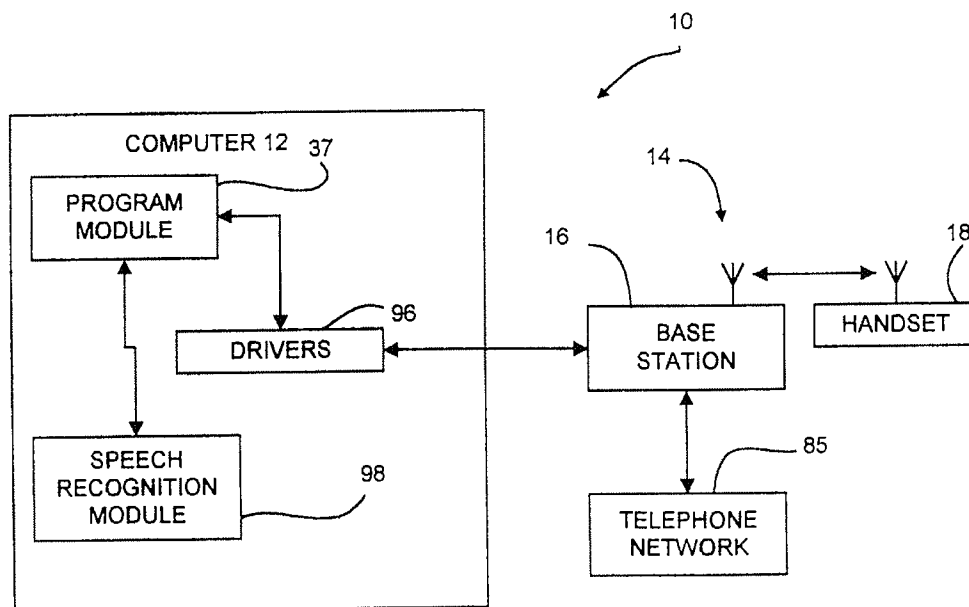


FIG. 1

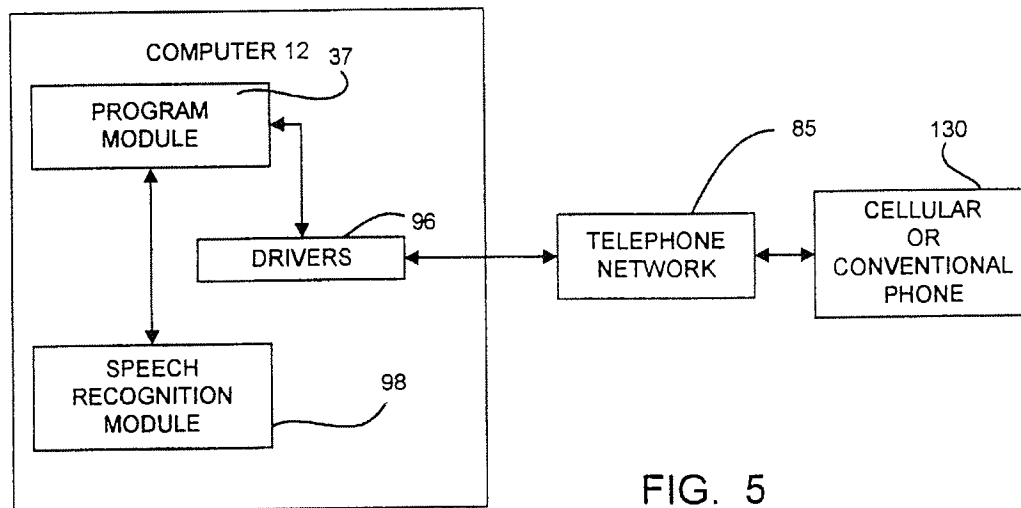
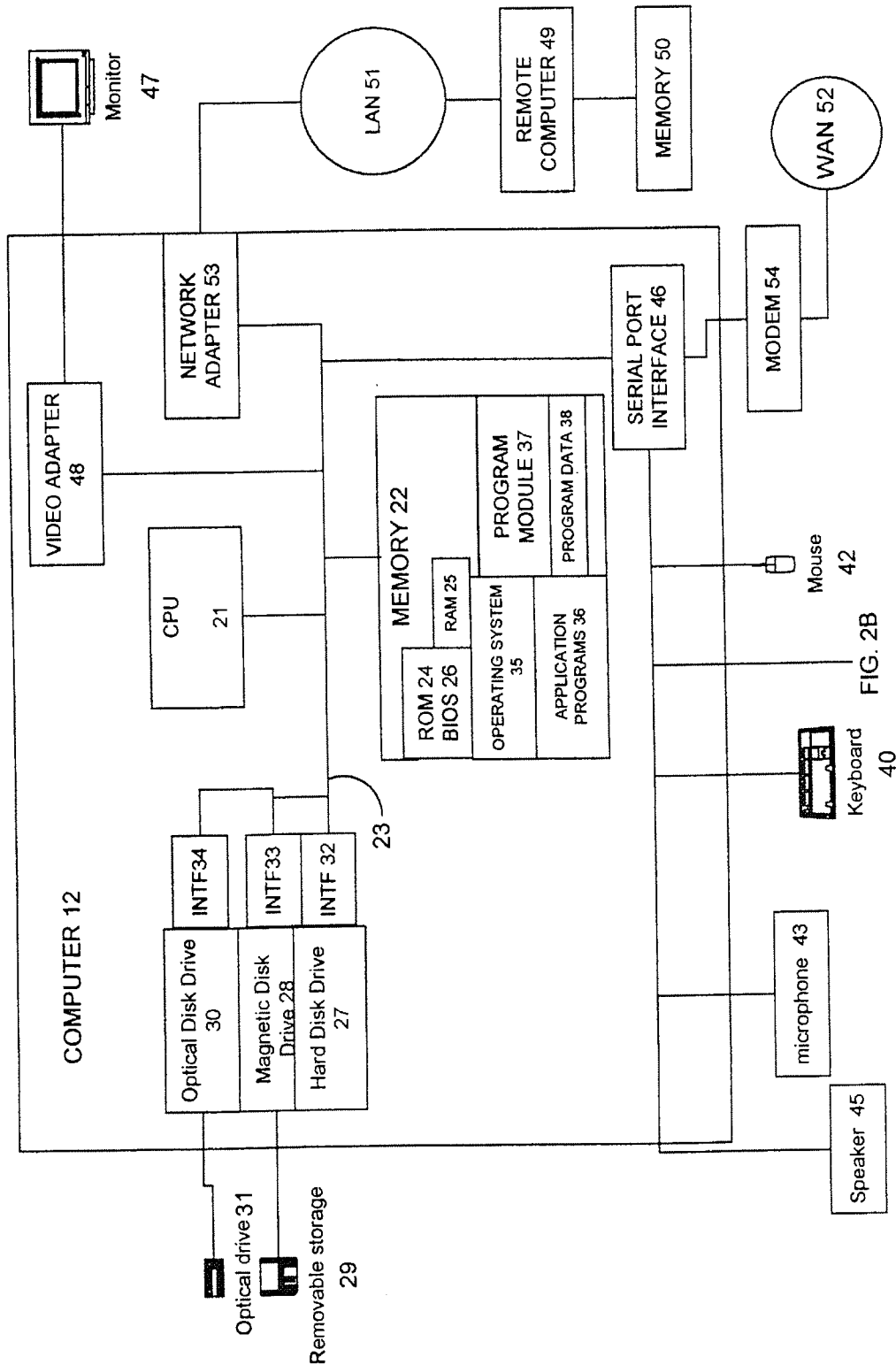


FIG. 5

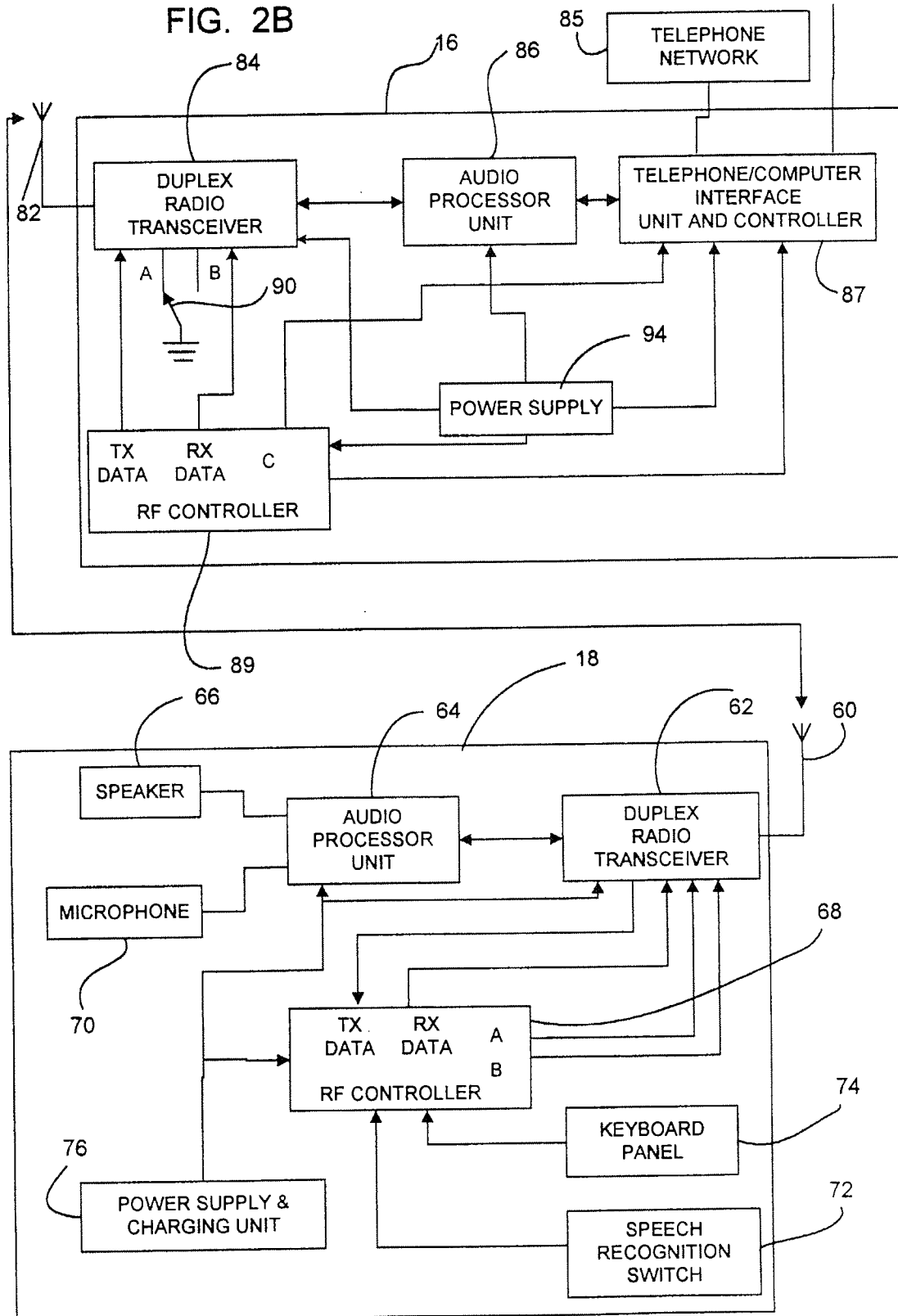


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FIG. 2B

FIG. 2A



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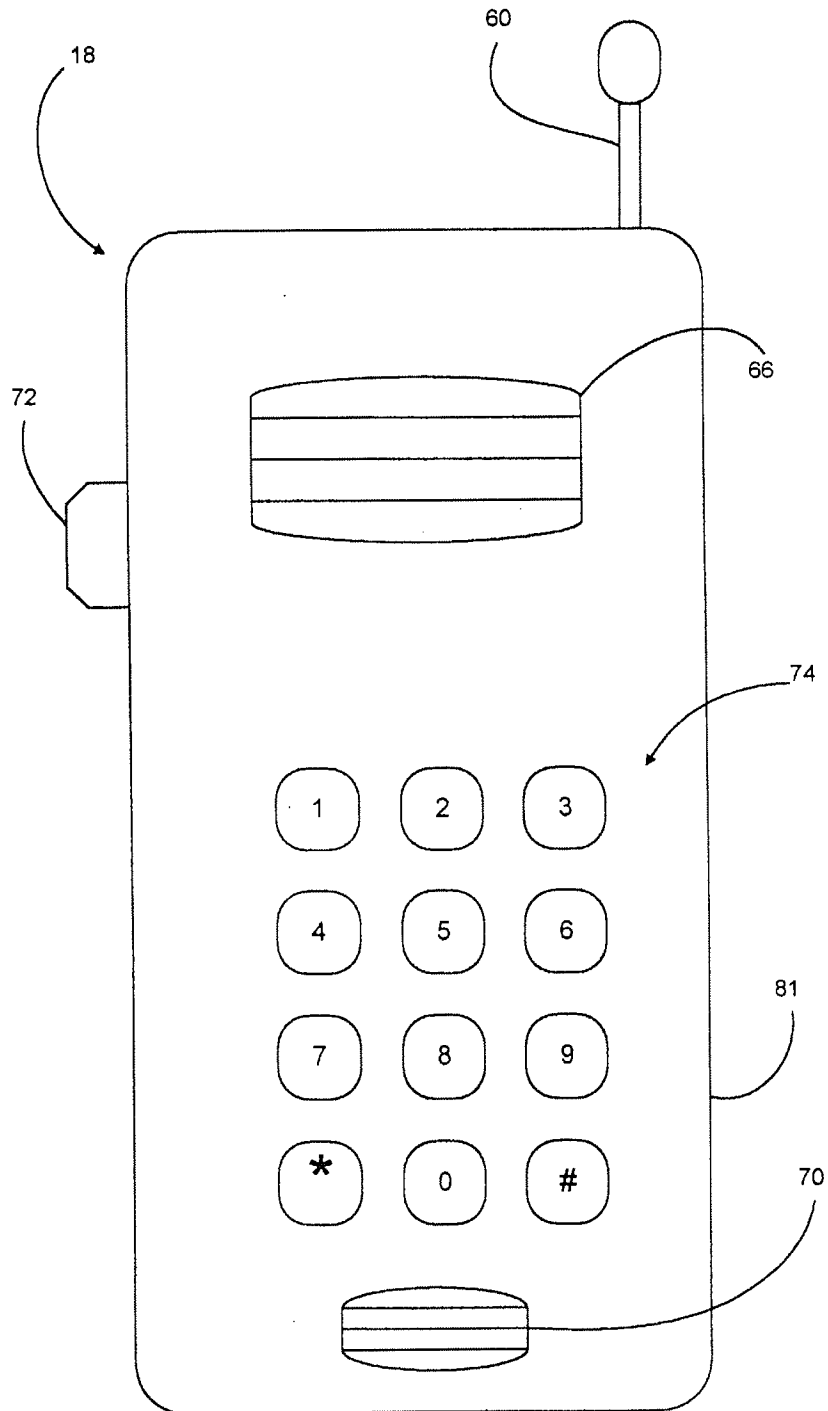


FIG. 3

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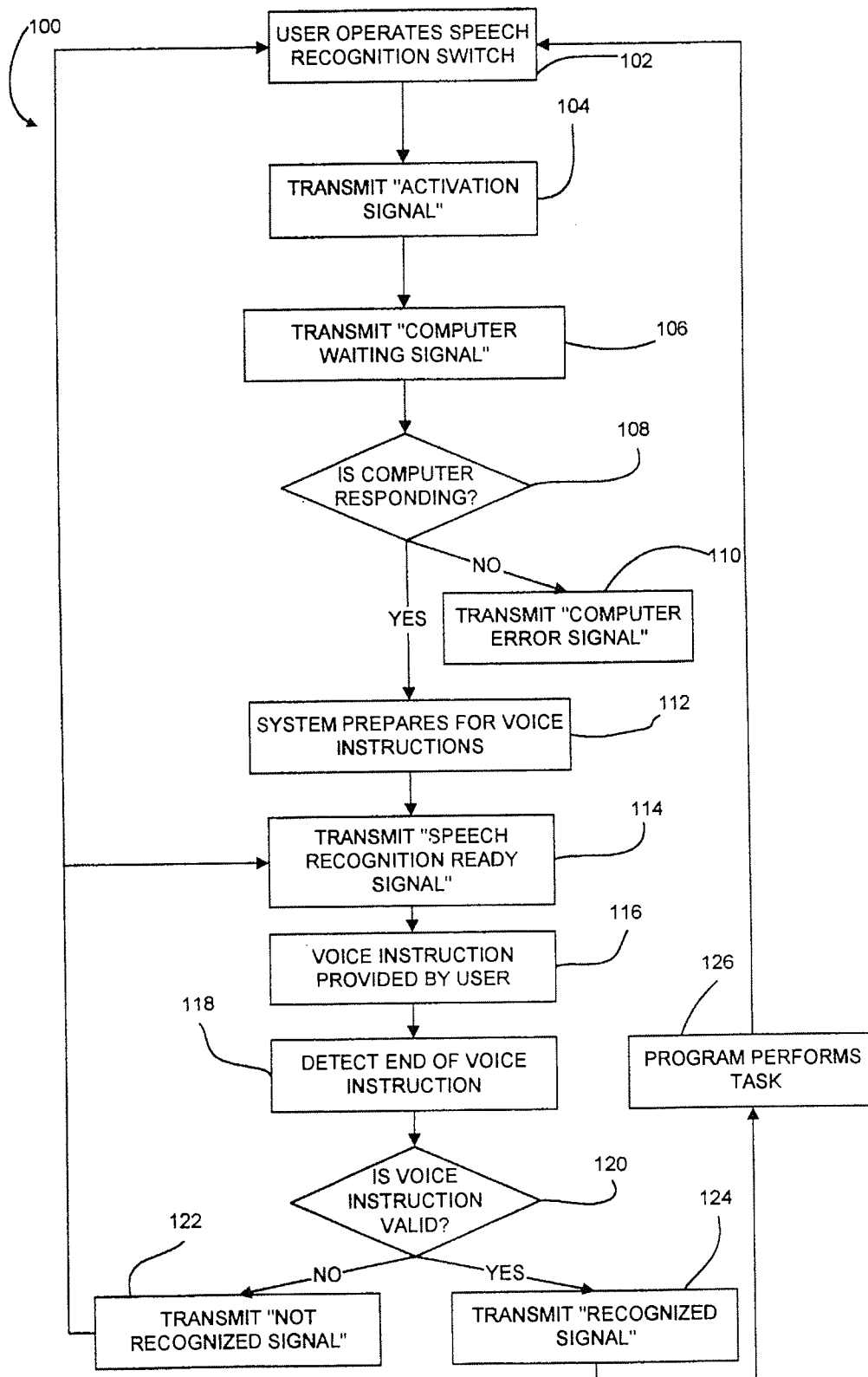


FIG. 4

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INTERNATIONAL SEARCH REPORT

INTERNATIONAL SEARCH REPORT		Interr al Application No PCT/US 99/04410
A. CLASSIFICATION OF SUBJECT MATTER IPC 6 G10L5/06		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols) IPC 6 G10L H04M		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practical, search terms used)		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	"METHOD TO PACE USER INPUT FOR SPEECH RECOGNITION SYSTEMS" IBM TECHNICAL DISCLOSURE BULLETIN, vol. 37, no. 10, 1 October 1994, pages 575-577, XP000475783	1,3,11, 15,16, 24,27,28
Y	idem	2,4,5,7, 9,10, 12-14, 17,18, 20,21, 23,25, 29,30, 32,34,35
<div><input checked="" type="checkbox"/> Further documents are listed in the continuation of box C.</div> <div><input checked="" type="checkbox"/> Patent family members are listed in annex.</div>		
<div>* Special categories of cited documents :</div> <div>"A" document defining the general state of the art which is not considered to be of particular relevance</div> <div>"E" earlier document but published on or after the international filing date</div> <div>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</div> <div>"O" document referring to an oral disclosure, use, exhibition or other means</div> <div>"P" document published prior to the international filing date but later than the priority date claimed</div> <div>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</div> <div>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</div> <div>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</div> <div>"&" document member of the same patent family</div>		
Date of the actual completion of the international search 1 June 1999		Date of mailing of the international search report 09/06/1999
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016		Authorized officer Krembel, L

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 99/04410

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Information on patent family members

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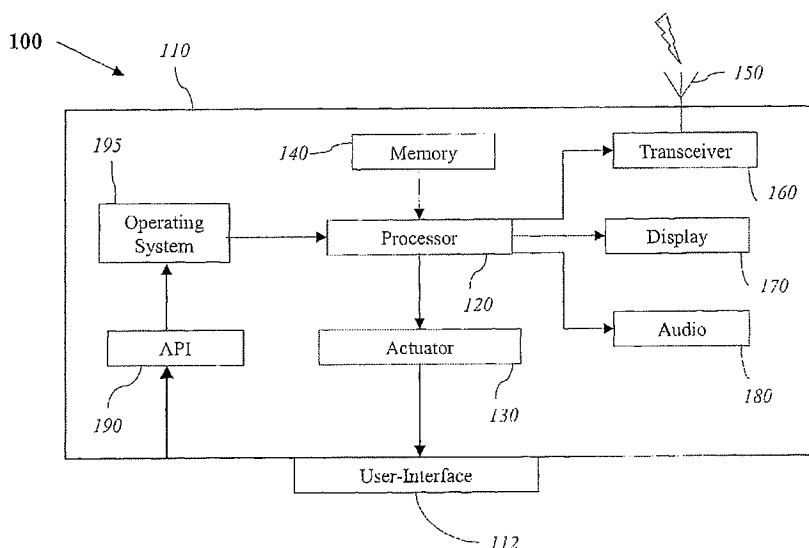
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For two-letter codes and other abbreviations, refer to the "Guid-
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(54) Title: **HAPTIC COMMUNICATION DEVICES**



(57) Abstract: Embodiments of the invention relate to methods and systems for providing customized "haptic messaging" to users of handheld communication devices in a variety of applications. In one embodiment, a method of using haptic effects to relate location information includes: receiving an input signal associated with a position of a handheld communication device (100); determining the position of the handheld communication device (100) relative to a predetermined location; and providing a haptic effect associated with a distance between the position of the handheld communication device (100) and the predetermined location. In another embodiment, a handheld communication device (100) can be used as a two-way haptic remote control.

WO 2004/053830 A1

HAPTIC COMMUNICATION DEVICES**INVENTORS****Danny Grant, Jeffrey Eid, and Shoichi Endo**

5

CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims priority to U.S. Provisional Patent Application No. 60/431,662, filed on December 8, 2002, the entire disclosure of which is incorporated herein by reference.

FIELD OF THE INVENTION

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This invention relates generally to haptic-feedback systems. More specifically, embodiments of the present invention relate to using customized haptic effects in a variety of applications to convey information to users of handheld communication devices.

BACKGROUND

15

As handheld communication devices become part of everyday life, device manufactures and service providers strive to enhance the versatility and performance of such devices.

20

Handheld communication devices in the art (e.g., mobile phones, pagers, personal digital assistants (PDAs), etc.) typically use auditory and visual cues to alert a user when incoming messages, such as voice calls and emails, are received. Such auditory and visual alerts, however, have the disadvantages of being distracting in some situations (e.g., during driving), or annoying in others (e.g., during a meeting or a concert). Although vibratory alerts are made available in some communication devices such as cellular phones, such vibratory effects cannot be customized or personalized according to applications, thus conveying little information to the user. A need, therefore, exists in the art for a new sensory modality that delivers information to users of handheld communication devices in a personalized fashion.

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SUMMARY

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Embodiments of the invention relate to methods and systems for providing customized "haptic messaging" to users of handheld communication devices in a variety of applications.

In one embodiment, a method of using haptic effects to relate location information includes: receiving an input signal associated with a position of a handheld communication device; determining the position of the handheld communication device relative to a

predetermined location; and providing a haptic effect associated with a distance between the position of the handheld communication device and the predetermined location.

In another embodiment, a method of using a handheld communication device as a two-way haptic remote control includes: sending a command signal to a remote device;
5 determining if a feedback signal is received from the remote device; and providing a haptic effect associated with the determination.

Further details and advantages of embodiments of the invention are set forth below.

BRIEF DESCRIPTION OF THE FIGURES

These and other features, aspects, and advantages of the present invention are better
10 understood when the following Detailed Description is read with reference to the accompanying drawings, wherein:

FIG. 1 depicts a block diagram of a haptic handheld communication device according to an embodiment of the present invention;

FIG. 2 shows a flowchart depicting a method of using customized haptic effects to
15 convey information to users of handheld communication devices, according to an embodiment of the invention;

FIG. 3 shows a flowchart depicting a method of using haptic logos to relate information to users of handheld communication devices, according to an embodiment of the invention;

FIG. 4 shows a flowchart depicting a method of haptically encoding communication
20 signals, according to an embodiment of the invention;

FIG. 5 shows a flowchart depicting a method of providing haptic messaging to users of handheld communication devices, according to a further embodiment of the invention;

FIG. 6 shows a flowchart illustrating a method of providing an interactive virtual
25 touch in one embodiment of the present invention;

FIG. 7 depicts a flowchart illustrating a method of carrying out a chat session using handheld communication devices, according to an embodiment of the invention;

FIG. 8 shows a flowchart depicting a method of using haptic effects to relate navigation information, according to an embodiment of the invention; and

FIG. 9 shows a flowchart illustrating a method for providing haptic effects to a remote
30 control in one embodiment of the present invention.

DETAILED DESCRIPTION

Embodiments described in the following description are provided by way of example to illustrate some general principles of the invention, and should not be construed as limiting the scope of the invention in any manner. One skilled in the art would also recognize that various changes and modifications can be made herein, without departing from the principles and scope of the invention.

FIG. 1 depicts a block diagram of a handheld communication device 100 according to an embodiment of the invention. It will be appreciated that various elements are shown in schematic form for illustrative purposes and are not drawn to scale. It will also be appreciated that many alternative ways of practicing the present invention exist. Accordingly, various changes and modifications may be made herein, without departing from the principles and scope of the invention.

Device 100 includes a device body including a housing 110 and a user-interface 112; a processor 120; at least one actuator 130 in communication with processor 120; and a memory 140 in communication with processor 120. Device 100 also includes an antenna 150 and a transceiver 160, in communication with processor 120. Device 100 additionally includes a display module 170 and an audio module 180, in communication with processor 120. Display module 170 may include, for example, a liquid crystal device. Audio means 180 may include, for example, a speaker, a microphone, and the like.

For purpose of illustration in the embodiment of FIG. 1, processor 120, actuator 130, and memory 140 are shown to be enclosed within and coupled to the device body. Such an illustration, however, should not be construed as limiting the scope of the invention in any manner. In alternative embodiments, actuator 130 may, for example, be coupled to the outside of housing 110, or embedded in housing 110 via a suitable mechanism. Further, user-interface 112 may include one or more user-interface members. As used herein, a user-interface member includes, without limitation, a key pad having one or more keys, one or more buttons, a touch screen or touch pad, a scroll wheel, a direction pad, a trackball, a knob, a miniature joystick, or other user-interface means known in the art.

Device 100 further includes an API (Application Program Interface) 190, working in conjunction with an operating system 195. A device driver (not shown) may optionally provide an interface between operating system 195 and processor 120.

Memory 140 of device 100 stores a program code that includes instructions to cause processor 120 to perform various tasks. The following description provides some examples.

FIG. 2 shows a flowchart 200 depicting a method of using customized haptic effects to convey information to users of handheld communication devices, according to an embodiment of the invention. At step 210, an input signal associated with an event is received. At step 220, a source of the event is determined and a control signal is selected
5 based on the determination. At step 230, a control signal is output to an actuator coupled to a handheld communication device (see FIG. 1 for an embodiment of such device). The control signal is configured to cause the actuator to output a haptic effect associated with the event.

Furthermore at step 240, a collection of haptic effects is provided, each haptic effect being associated with a control signal. For example, memory 140 of FIG. 1 can store a
10 program code that includes instructions to generate the control signals (e.g., each characterized by a distinct waveform) for rendering the corresponding haptic effects. Haptic effects (along with associated control signals) may also be downloaded or transmitted from a remote source, such as a service provider, a network resource, a Web server, a remote handheld communication device or computer. Such downloaded or transmitted haptic effects
15 can be further edited or modified. At step 250, a mapping between an event of interest and one of the stored haptic effects is received. By way of example, memory 140 of FIG. 1 may also store a program code that enables a user to map an event of interest to one of the haptic effects as provided, e.g., via user-interface 112 through API 190, where the event may be identified by its source. At step 260, the one-to-one mappings made between various events
20 of interest and the corresponding haptic effects are compiled into a haptic lookup table, which can, for example, be stored in memory 140 of FIG. 1.

In the embodiment of FIG. 2, the term "selecting" includes, without limitation, looking up a predetermined mapping between the event of interest and a corresponding haptic effect based on the source determination, and selecting/generating a control signal that is
25 configured to render the desired haptic effect associated with the event (e.g., upon being applied to an actuator). Selection can be made based upon the aforementioned haptic lookup table, for example.

In one embodiment, the input signal may include a communication signal associated with a call event, such as a voice call, an e-mail, or a message in text or multimedia form,
30 which may be received via antenna 150 and transceiver 160 of FIG. 1, for example. The "source" of a call event may be related to a characteristic that distinctly identifies or characterizes the call event, such as the caller's phone number, the sender's e-mail address, a graphical feature or an icon associated with the incoming message, etc.

In another embodiment, the input signal may be associated with a reminder event, which may be a self-generated message on the handheld communication device serving as a reminder for a pre-scheduled activity (e.g., an appointment or a meeting). The source in this scenario may be associated with the type of a pre-scheduled activity (e.g., a business meeting
5 vs. a restaurant reservation), or the time at which the pre-scheduled activity takes place.

In yet another embodiment, the input signal may include a communication signal associated with a status event, for example, received via antenna 150 and transceiver 160 of FIG. 1. Examples of a status event include, but are not limited to: an advertisement (e.g., sale) event, a one-to-one marketing event, a business-transaction event, a stock-trading event,
10 a weather-forecast event, a sports (or game) event, an entertainment event, and an emergency (e.g., 911) event. In this scenario, the source may be associated with a characteristic that distinctly identifies the sender and/or the nature of a status event, such as the phone number of the handheld user's stock broker, the e-mail address of the user's favorite store, the logo associated with the user's favorite TV or radio station, and so on.

In one embodiment, an event of interest can be accompanied by a distinct haptic effect, or overlapping haptic effects, conveying to the user customized information such as "who is calling," "what is happening," and so on. The user can also be allowed to update the haptic lookup table, e.g., to include new events, and/or to modify the mappings between the existing events of interest and the corresponding haptic effects.
15

Moreover, a specific haptic effect can be assigned to any incoming signal event whose source is unknown, so as to alert the user that the incoming message is from an un-identifiable or sender.
20

As used herein, the term "handheld communication device" includes, without limitation, a mobile phone such as a cellular phone or a satellite phone, a personal digital assistant (PDA), a cordless telephone, a pager, a two-way radio, a handheld or portable
25 computer, a game console controller, a personal gaming device, an MP3 player, or other personal electronic devices known in the art that are equipped with communication or networking capabilities.

In one embodiment, the aforementioned haptic effects can be used as haptic ringers (e.g., counterparts to auditory ring tones) that are customized or personalized to convey information to the user about various events of interest. By way of example, a haptic ringer associated with a call from a loved one (e.g., the user's spouse) may comprise low-amplitude and high frequency vibrations that impart gentle sensations to the user. In contrast, a haptic
30

ringer associated with an emergency event (such as a 911-call) may comprise jolt-like pulses that impart pounding sensations to the user.

In contrast with conventional auditory ring tones, the aforementioned haptic effects (e.g., haptic ringers) are more desirable in an environment where extraneous auditory signals are prohibited (e.g., during a meeting or a concert), and/or where it is difficult to distinguish auditory signals (e.g., in a loud environment such as an airport). The haptic ringers are also more suitable in distracting situations such as driving, so that the user of a handheld communication device can keep eyes on the road without having to look at the device. Moreover, such haptic ringers convey customized information to the user, so that the user is aware of "who is calling," "what is happening," and so on, as the following examples further illustrate.

A handheld communication device such as a mobile phone may be configured to allow a user to include haptic information or a haptic code in an outgoing communication signal, e.g., carrying a voice call, an e-mail, or a message. The encoding of a communication signal with haptic information may be based on an established scheme or protocol, and/or on a per-system basis. The haptic code is configured to cause a haptic effect to be output when the communication signal is delivered to another handheld communication device. In one embodiment, businesses and organizations may each be associated with a distinct haptic logo (e.g., a particular vibration pattern) and include their haptic logos in various messages sent to the handheld communication devices of their customers. Such haptic logos can serve as counterparts to conventional logos known in the art, for example. Various status events mentioned above may also be transmitted in this manner. By way of example, a merchant may include its haptic logo in various advertisement events and business transaction events to be transmitted to the handheld communication devices of its customers. Stock brokers (or brokerage firms), TV or radio stations, and marketing/advertising agencies may likewise include their haptic logos in various stock-trading events, weather-forecast events, sports events, entertainment events, and one-to-one marketing events to be transmitted to the handheld users.

FIG. 3 shows a flowchart 300 depicting a method of using haptic logos to relate information to users of handheld communication devices, according to an embodiment of the invention. A handheld communication device receives an input signal at step 310, the input signal being associated with a status event. The handheld communication device extracts a haptic code from the input signal at step 320, where the haptic code is associated with a haptic logo. At step 330, the handheld communication device provides a haptic effect

associated with the haptic logo. Step 330 may include providing a control signal to an actuator coupled to the handheld communication device, where the control signal is based at least in part on the haptic code and configured to cause the actuator to output the haptic effect.

5 In one embodiment, the extracted haptic code may be directly applied to the actuator for rendering the desired haptic effect. In another embodiment, the haptic code may be configured according to a predetermined scheme or protocol that includes, for example, a table of haptic codes (some of which may be associated with one or more haptic logos) versus control signals for rendering the corresponding haptic effects. In this way, a processor in the
10 handheld communication device can look up the corresponding control signal from the table based on the extracted haptic code, and output the selected control signal to the actuator for rendering the desired haptic effect.

In the embodiments of FIG. 2 or 3, the handheld communication device (or the haptic code) may be programmed such that the haptic effect is output immediately, or at a
15 prescribed time after receiving the input signal, as desired in applications. The haptic effects can also be triggered by, or synchronized with, other occurrences.

A handheld communication device may be further configured such that some of its user-interface members (such as those described above) are each associated with a haptic code, e.g., according to a predetermined scheme or protocol. In one embodiment, some of
20 these haptic codes may be associated with haptic effects that emulate expressions or behaviors, such as "laugh," "giggle," "hug," "high-five," "heartbeat," "pet purring," etc. This allows haptic effects to be transmitted and experienced, e.g., in an interactive conversation or a chat session, by pressing or manipulating such members.

By way of example, suppose that user A (termed "Alice" herein) is engaged in a chat
25 session with user B (termed "Bob" herein) via their respective mobile phones. In one embodiment, when Bob tells Alice a joke, Alice can respond by sending a "laugh" sensation to Bob, e.g., by pressing a key on her mobile phone that is assigned with a haptic code corresponding to a laugh sensation. This causes a signal to be transmitted from Alice's phone to Bob's phone, and a corresponding haptic effect to be output to Bob's phone (and thereby
30 experienced by Bob). In alternative embodiments, Alice can include a haptic code in an outgoing message (which may also contain a video image such as a picture taken by her mobile phone, and/or a graphical feature such as an emoticon emulating a smiley face) to be transmitted to Bob, e.g., by pressing the corresponding user-interface member. The haptic code causes a haptic effect to be output when the message is delivered to a remote device

such as Bob's mobile phone. In one embodiment, the haptic effect may be correlated or synchronized with the displaying of a video image contained in the message. In another embodiment, the generation of the haptic effect based on the haptic code may be carried out in a manner similar to that described above with respect to the embodiment of FIG. 3.

5 FIG. 4 depicts a flowchart 400 illustrating a method of a method of haptically encoding communication signals, according to an embodiment of the invention. At step 410, an input signal associated with an actuation of a user-interface member is received. By way of example, the input signal may be associated with Alice's pressing or manipulating a particular user-interface member. At step 420, a haptic code associated with the actuation is
10 determined. At step 430, the haptic code is included in an output signal, and the output signal is sent to a remote handheld communication device. As described above, the output signal may also include a message, a video image, and/or a graphical feature.

 A handheld communication device may also be configured such that a haptic effect, along with a message, is output upon a contact with a user-interface member being made
15 (e.g., by a user or an input device). FIG. 5 depicts a flowchart 500 illustrating a method of haptic message that can be associated with this situation, according to an embodiment of the invention. At step 510 of the flowchart 500, a handheld communication device receives an input signal. At step 520, the handheld communication device outputs a request for a contact with a user-interface member coupled to the handheld communication device. At step 530,
20 the handheld communication device provides a control signal associated with the contact to an actuator coupled to the handheld communication device. The control signal is configured to cause the actuator to output a haptic effect associated with the input signal. Step 520 may include having a visual effect displayed, an auditory effect played, and/or a distinctive haptic ringer output, which requests a contact with the user-interface member being made.

25 In one embodiment, the input signal in FIG. 5 may include a haptic code, along with a message, a video image, and/or a graphical feature, etc. For example, the haptic code may be configured to cause a "hug" sensation to be output when the video image contained in the input signal is displayed. The input signal may also contain a provision or protocol that specifies that the incoming message along with the corresponding haptic effect is output upon
30 a contact with a particular user-interface member (e.g., the #5 key) being made. Alternatively, the handheld communication device may determine the user-interface member to be contacted, before outputting incoming message along with the corresponding haptic effect.

In another embodiment, the input signal of FIG. 5 may be associated with a "virtual touch," e.g., to mimic a handshake, a "high-five," a pat on the back, a pulse or heartbeat sensation, a pet purring sensation, or other touch sensations associated with human (and/or human-animal) interactions. In one scenario, the input signal at step 510 may include a
5 "virtual touch indicator," based on which the request for a contact with a particular user-interface member is made. The virtual touch indicator may be in the form of a haptic code, a message, or other informative means. The control signal at step 530 may be generated, e.g., based on the virtual touch indicator, a haptic code associated with the user-interface member at play, or other predetermined scheme. The input signal at step 510 may also include a
10 virtual touch indicator along with a virtual touch signal for rendering the desired haptic effect. In this case, the control signal at step 530 may be based on the virtual touch signal.

Referring back to the chat session between Alice and Bob, by way of example at the end of their chat session, Alice may wish to send Bob a "high-five." She sends to Bob's mobile phone a signal including a virtual touch indicator, which in turn prompts a request that
15 Bob be in contact with a user-interface member coupled to his phone, such as a direction pad (e.g., by putting his fingers on the individual keys of the direction pad), a key pad, a touch screen, a trackball, a joystick, or the like. The control signal for rendering a haptic effect that emulates a "high-five" may be based on the haptic code associated with the user-interface member, transmitted with the input signal from Alice, and/or other predetermined scheme.

20 Interactive virtual touch can also be engaged between users of handheld communication devices, where the manipulation of a user-interface member on one handheld communication device is transmitted possibly in substantially real-time to another handheld device and experienced by its user, and vice versa. FIG. 6 depicts a flowchart 600 illustrating a method of providing interactive virtual touch in one embodiment of the present invention.
25 In the embodiment shown, a handheld communication device first receives an input signal including a virtual touch indicator at step 610. A distinctive haptic ringer may, for example, accompany the arrival of the virtual touch indicator, identifying the sender and the nature of the input signal. The handheld communication device may then perform any necessary initialization to enable the communication at step 620, which may also include requesting a
30 contact with a particular user-interface member coupled to the handheld communication device at step 625. The handheld communication device subsequently receives a virtual touch signal in the communication associated with the desired haptic effect at step 630. The handheld communication device provides the haptic effect at step 640, e.g., by applying the virtual touch signal to an actuator coupled to the user-interface member.

In one embodiment, the virtual touch signal may be associated with the manipulation of a user-interface member on a remote handheld device and transmitted in substantially real-time. And the user on the receiving end may respond by acting in a similar fashion, so as to emulate an interactive touch. Any schemes for delivering virtual touch to users of handheld communication devices may be used.

Haptic effects can also be used to enhance and complement the information content communicated between handheld communication devices. In one embodiment, a plurality of handheld communication users may be engaged in a chat session via their handheld communication devices. The users may each have a graphical representation or avatar displayed on other handheld communication devices. Such avatars can also be haptically enabled, for example, whereby their expressions and/or behaviors are accompanied and enhanced by corresponding haptic effects. FIG. 7 is a flowchart 700 depicting a method of carrying out a chat session using handheld communication devices, according to an embodiment of the invention. In the embodiment shown, a handheld communication device receives an input signal associated with a chat message at step 710. The handheld communication device displays an avatar associated with the chat message at step 720. The avatar may be shown on display 170 of FIG. 1, in one embodiment. At step 730, the handheld communication device provides a haptic effect associated with the chat message. Step 730 may include outputting a control signal to an actuator coupled to the handheld communication device, where the control signal is configured to cause the actuator to output the haptic effect. In one embodiment, the haptic effect may be correlated with an expression or behavior of the avatar, such as a laugh or giggle, a cry, a pet purring, or the like.

Handheld communication devices are increasingly equipped with navigation capability, for example, in communication with the Global Position System (GPS) or other navigation systems. Haptic effects can also be used to convey navigation information, such as positional and/or directional information, to handheld users. By way of example, FIG. 8 shows a flowchart 800 depicting a method of haptic navigation, according to an embodiment of the present invention. The flowchart 800 discloses receiving an input signal associated with a position of a handheld communication device at step 810; determining the position of a handheld communication device relative to a predetermined location at step 820; and providing a haptic effect associated with the determination at step 830. Step 830 may include outputting a control signal associated with the determination to an actuator coupled to the handheld communication device, the control signal being configured to cause the actuator to

output the haptic effect. Further, the input signal at step 810 may be received from GPS, a digital compass, or other navigation systems known in the art.

In one embodiment, the haptic effect may be associated with a distance between the position of the handheld communication device and a predetermined location (termed “destination” herein). For example, the haptic effect may include a vibration having a magnitude and a frequency, where at least one of the magnitude and the frequency decreases as the distance from the destination diminishes. Additionally, the haptic effect may be configured to convey a quantitative measure of the distance. By way of example, the haptic effect may include one or more pulse or jolt sensations, where the number of pulses is proportional to the number of miles between the position of the handheld device and the destination.

Processors described above (including processor 120 of FIG. 1) can include, for example, one or more digital logical processors capable of processing input, execute algorithms, and generate output as necessary to perform various tasks, such as those described above. Such processors/controllers may include a microprocessor, an Application Specific Integrated Circuit (ASIC), and state machines. Such processors include, or may be in communication with, media (including memory 140 of FIG. 1). Such media include, for example, computer readable media, which stores program code that, when executed by a processor, cause the processor to perform the steps described herein. Embodiments of computer-readable media include, but are not limited to, an electronic, optical, magnetic, or other storage or transmission device capable of providing a processor, such as the processor in a web server, with computer-readable instructions. Other examples of suitable media include, but are not limited to, a floppy disk, CD-ROM, magnetic disk, memory chip, ROM, RAM, ASIC, configured processor, all optical media, all magnetic tape or other magnetic media, or any other medium from which a computer processor can read. Also, various other forms of computer-readable media may transmit or carry instructions to a computer, including a router, private or public network, or other transmission device or channel.

Program code and associated application programs related to various applications may also reside on a remote source, such as a network resource, a Web server, a remote handheld communication device or computer, which can be transmitted or downloaded to a handheld communication device on a regular or predetermined basis. Haptic effects (along with associated control signals) can also be downloaded or transmitted from a remote source, as described above.

Actuators described above (including actuator 130 shown in FIG. 1) can include, for example, a pager motor, an eccentric rotating motor, a harmonic eccentric rotating motor, a voice coil, a solenoid, a resistive actuator, a piezoelectric actuator, an electro-active polymer actuator, or other types of active/passive actuators suitable for generating haptic effects. U.S. Patent Nos. 6,429,846 and 6,424,333 disclose further details relating to some of these actuators, both of which are incorporated in full herein by reference. In some embodiments, one or more actuators may be implemented in a handheld communication device, configured to deliver appropriate haptic effects. It will be appreciated that various control schemes can be devised accordingly, for controlling the actuator(s) in a manner that best achieves the desired haptic effects.

Referring back to FIG. 1. In one embodiment, actuator 130 may be coupled to housing 110, thereby imparting haptic effects thus generated to the device body. Haptic ringers (or alerts) described above may be delivered in this manner, for instance. In another embodiment, actuator 130 may be coupled to user-interface 112 of the device body. For instance, an active and/or resistive actuator can be coupled to user-interface 112 to deliver a virtual touch described above. One or more actuators can also be coupled to user-interface 112, for example, to convey a virtual touch such to a user. In yet another embodiment, a plurality of actuators can be coupled to housing 110 as well as user-interface 112. In addition, one or more actuators may also be coupled to a headset, a wristband, or other accessory means associated with a handheld communication device.

Embodiments of the invention include the following.

In one embodiment, an individual (or "Bob") can have a mobile phone according to the invention. The mobile phone also has an e-mail capability, for example, including both "receive" and "send"). The mobile phone is configured to provide a plurality of haptic effects, e.g., by including appropriate hardware (such as actuators described above) and program code. Bob can program the mobile phone, for example, via user-interface 112 through API 150 shown in FIG. 1, by inputting various events of interest and associating each with a distinct haptic effect. Thus, when an event of interest is subsequently received, the mobile phone provides the corresponding haptic effect.

In one embodiment, Bob's phone includes programming that provides a first haptic effect when an input signal is received from the mobile phone of Bob's wife (or "Alice"). Bob's phone also includes programming that provides a second haptic effect that is different and distinct from the first haptic effect, when an input signal is received from the mobile phone of Bob's supervisor at work (termed "Carol" herein). Bob's phone is further be

configured to provide a third haptic effect that is different from the two mentioned above, e.g., when an e-mail is received from the e-mail address of Bob's stock broker (where the e-mail contains a "smiley-face" emoticon, for instance). The third haptic effect can be a vibration with high magnitude and short duration, e.g., to emulate a "high-five."

5 In another embodiment, Bob can be watching a movie in a theater with his mobile phone in his pocket. It is set to make no noise, because Bob is in a theater. While Bob is watching the movie, Bob's mobile phone vibrates with the second haptic effect mentioned above. Bob chooses to ignore the call, because he does not wish to speak with his supervisor at a movie theater. Later, Bob's mobile phone vibrates with the first haptic effect. Bob wants
10 to speak with Alice, for example, to make plans to meet later. So Bob answers the phone and quickly exits the theater to talk with Alice.

Bob's mobile phone can also include a personal schedule/calendar application. After speaking with Alice, Bob can enter an entry in the calendar at the 7:00PM time mark -- "Meet Alice". Bob can also choose a fourth haptic effect to associate with the calendar entry. The
15 mobile phone can be programmed to output the fourth haptic effect fifteen minutes before the time entry of the calendar (i.e., at 6:45PM).

Bob's mobile phone can be equipped with GPS capability, along with an associated application program for location determination. Bob can also store addresses of various locations of interest in the application program. In one embodiment, Bob can be on the road.
20 Bob's mobile phone vibrates with a distinct fifth haptic effect. Bob recognizes the fifth haptic effect being associated with the haptic logo of his favorite electronics store. He then checks with the application program, and receives a sixth haptic effect associated with the distance between his current position and the store location. Bob then decides to make a stop at the store.

25 A haptically-enabled handheld communication device of the invention may be further used as a two-way haptic remote control, for example, for controlling a remote system such as a Television set or a multimedia system. In one embodiment, the events as referred to above may be related to program channels shown on the remote system, each identified by a channel number (which may be used as the "source"), for instance. The corresponding haptic
30 effects may be customized on a per-channel basis. Such haptic effects can serve to inform a user as to which channel is on, as a user is channel-surfing by way of this haptic remote control, so that the user need not to look up the display screen.

FIG. 9 depicts a flowchart illustrating a method for providing haptic effects to a remote control in one embodiment of the present invention. In the embodiment shown, the

remote control sends a command signal to a remote system at step 910. As with a conventional remote control, the signal may or may not reach the television. The remote control then determines whether a feedback signal has been received at step 920. If the remote control receives a feedback signal, the remote control provides a first haptic effect at
5 step 930. If not, the remote control provides a second haptic effect at step 940.

The first haptic effect can be further customized according to the received feedback signal. In one embodiment, the remote system provides information (e.g., via the feedback signal) to the remote control regarding the state of the display, e.g., based on a predetermined scheme. The remote control may use the information to determine a corresponding haptic
10 effect to provide at step 930. In alternative embodiments, the remote system may determine the appropriate haptic effect to provide and include a corresponding haptic code in the feedback signal. The remote control provides the haptic effect at step 930 based on this haptic code.

The foregoing description of the preferred embodiments of the invention has been
15 presented only for the purpose of illustration and description and is not intended to be exhaustive or to limit the invention to the precise forms disclosed. Numerous modifications and adaptations thereof will be apparent to those skilled in the art without departing from the spirit and scope of the present invention.

That which is claimed is:

1. A method, comprising:
receiving an input signal associated with a position of a handheld communication device;
5 determining the position of the handheld communication device relative to a predetermined location; and
providing a haptic effect associated with a distance between the position of the handheld communication device and the predetermined location.
2. The method of claim 1 wherein the input signal is received from one of a Global
10 Position System and a digital compass.
3. The method of claim 1 wherein the haptic effect includes a vibration having a magnitude and a frequency, at least one of the magnitude and the frequency being associated with the distance between the position of the handheld communication device and the predetermined location.
- 15 4. The method of claim 3 wherein the at least one of the magnitude and the frequency decreases with the distance between the position of the handheld communication device and the predetermined location.
5. The method of claim 1 further comprising outputting a control signal associated with the determination to an actuator coupled to the handheld communication device, the control
20 signal configured to cause the actuator to output the haptic effect.
6. A method, comprising:
sending a command signal to a remote device;
determining if a feedback signal is received from the remote device; and
providing a haptic effect associated with the determination.
- 25 7. The method of claim 6 further comprising providing a first haptic effect if a feedback signal is received from the remote device.
8. The method of claim 7 further comprising providing a second haptic effect if no feedback signal is received from the remote device.
9. A computer-readable medium on which is encoded program code, comprising:
30 program code for receiving a signal associated with a position of a handheld communication device;
program code for determining the position of the handheld communication device relative to a predetermined location; and

program code for providing a haptic feedback associated with a distance between the position of the handheld communication device and the predetermined location.

10. The computer-readable medium of claim 9 wherein the haptic effect includes a vibration having a magnitude and a frequency, at least one of the magnitude and the frequency being associated with the distance between the position of the handheld communication device and the predetermined location.

11. The computer-readable medium of claim 10 wherein the at least one of the magnitude and the frequency decreases with the distance between the position of the handheld communication device and the predetermined location.

12. The computer-readable medium of claim 9 further comprising program code for outputting a control signal associated with the determination to an actuator coupled to the handheld communication device, the control signal configured to cause the actuator to output the haptic effect.

13. A computer-readable medium on which is encoded program code, comprising:
program code for sending a command signal to a remote device;
program code for determining if a feedback signal is received from the remote device;
and

program code for providing a haptic effect associated with the determination.

14. The computer-readable medium of claim 13 further comprising program code for providing a first haptic effect if a feedback signal is received from the remote device.

15. The computer-readable medium of claim 14 further comprising program code for providing a second haptic effect if no feedback signal is received from the remote device.

16. A data stream embodied in a carrier signal, carrying instructions to:
receive a signal associated with a position of a handheld communication device;
determine the position of the handheld communication device relative to a predetermined location; and

provide a haptic effect associated with a distance between the position of the handheld communication device and the predetermined location.

17. A data stream embodied in a carrier signal, carrying instructions to:
send a command signal to a remote device;
determine if a feedback signal is received from the remote device; and
provide a haptic effect associated with the determination.

18. The apparatus, comprising:

means for receiving an input signal associated with a position of a handheld communication device;

means for determining the position of the handheld communication device relative to a predetermined location; and

means for providing a haptic effect associated with a distance between the position of the handheld communication device and the predetermined location.

19. The apparatus of claim 18 wherein means for providing includes an actuator coupled to the handheld communication device, the actuator configured to receive a control signal associated with the determination and output the haptic effect.

20. The apparatus of claim 18 wherein the haptic effect includes a vibration having a magnitude and a frequency, at least one of the magnitude and the frequency being associated with the distance between the position of the handheld communication device and the predetermined location.

21. The apparatus of claim 20 wherein the at least one of the magnitude and the frequency decreases with the distance between the position of the handheld communication device and the predetermined location.

22. The apparatus, comprising:

means for sending a command signal to a remote device;

means for determining if a feedback signal is received from the remote device; and

means for providing a haptic effect associated with the determination.

23. The apparatus of claim 22 wherein a first haptic effect is provided if a feedback signal is received from the remote device.

24. The apparatus of claim 23 wherein a second haptic effect is provided if no feedback signal is received from the remote device.

25. The apparatus of claim 22 is included in a handheld communication device.

26. The apparatus of claim 25 wherein means for providing a haptic effect includes an actuator coupled to the handheld communication device, the actuator configured to receive a control signal associated with the determination and output the haptic effect.

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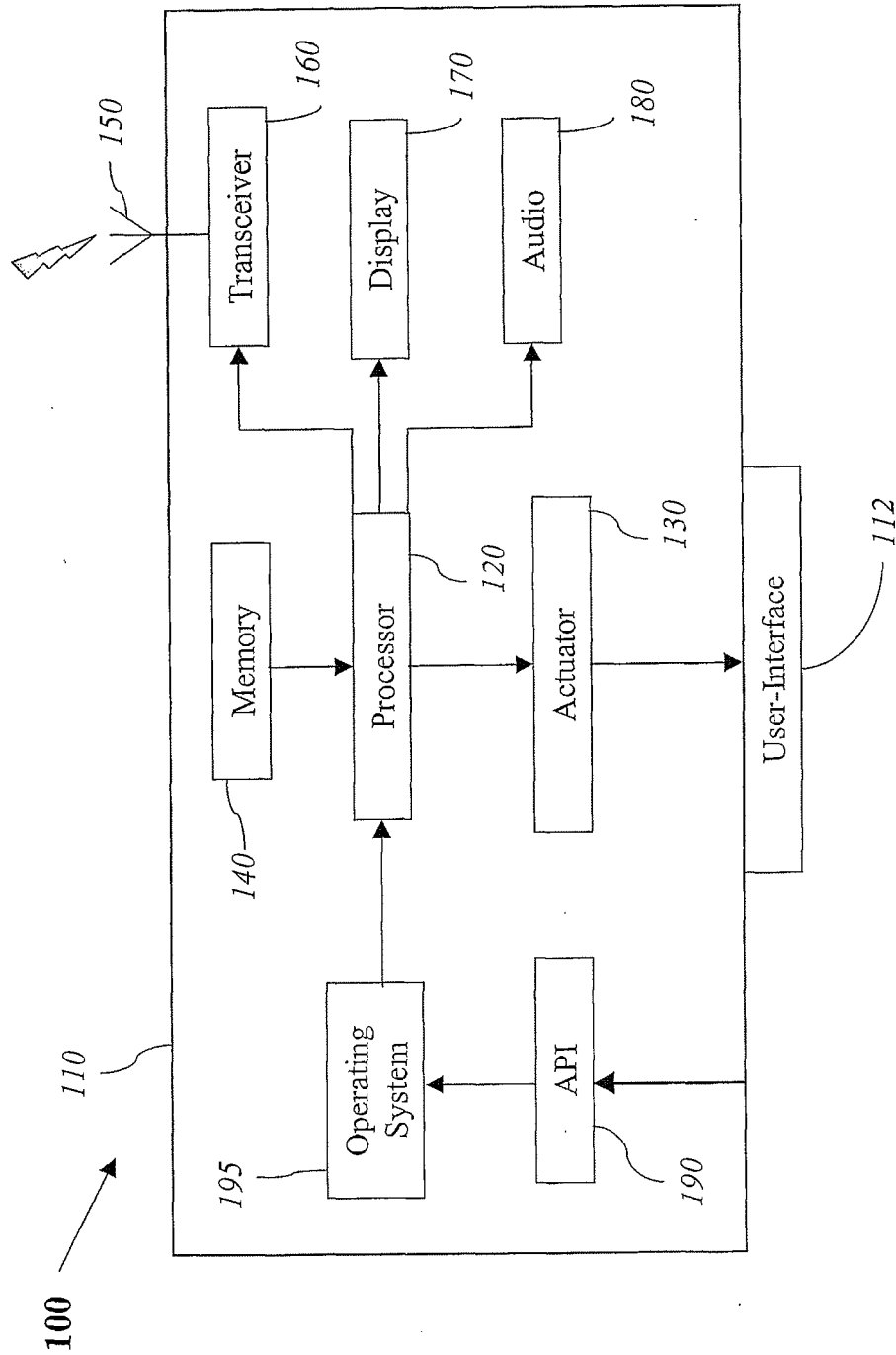


FIG. 1

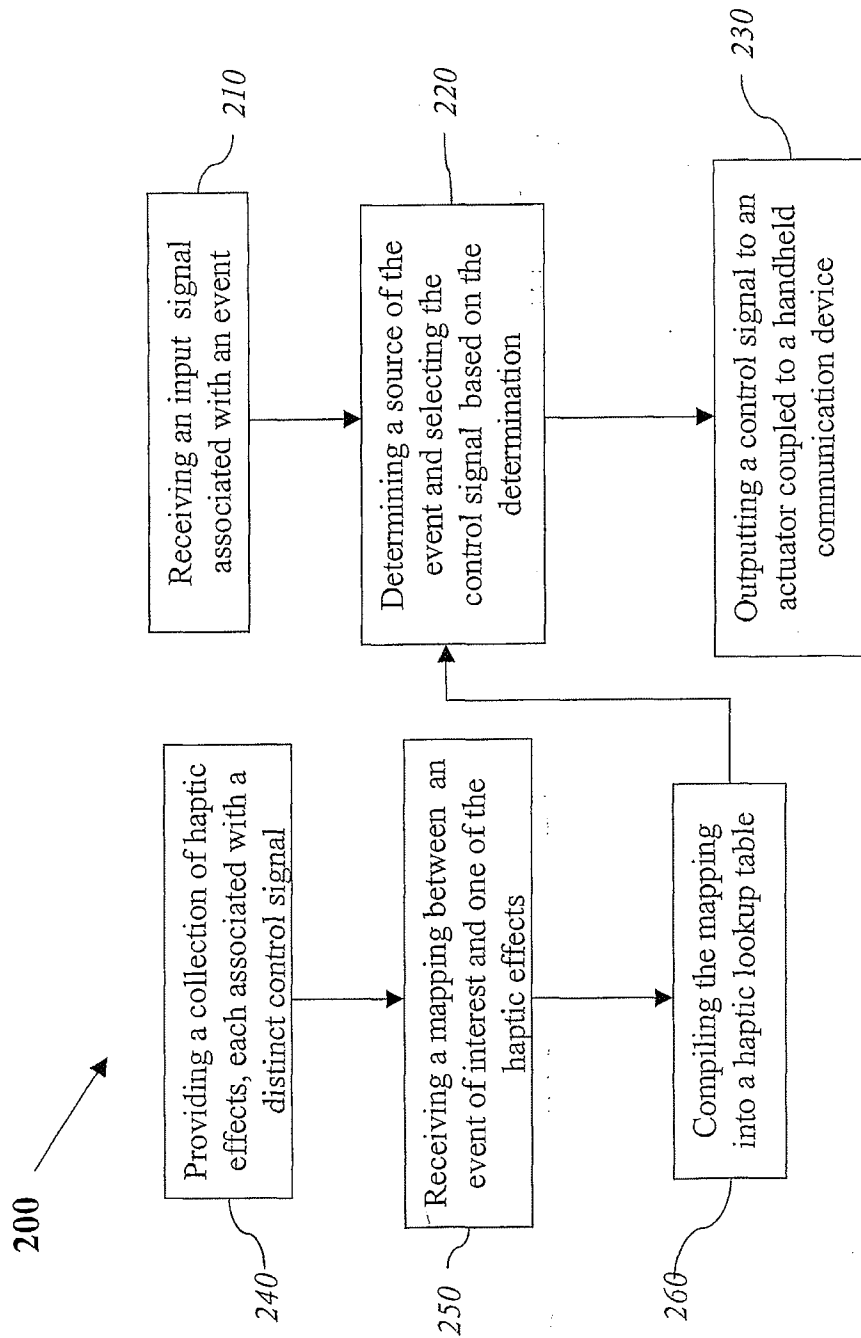


FIG.2

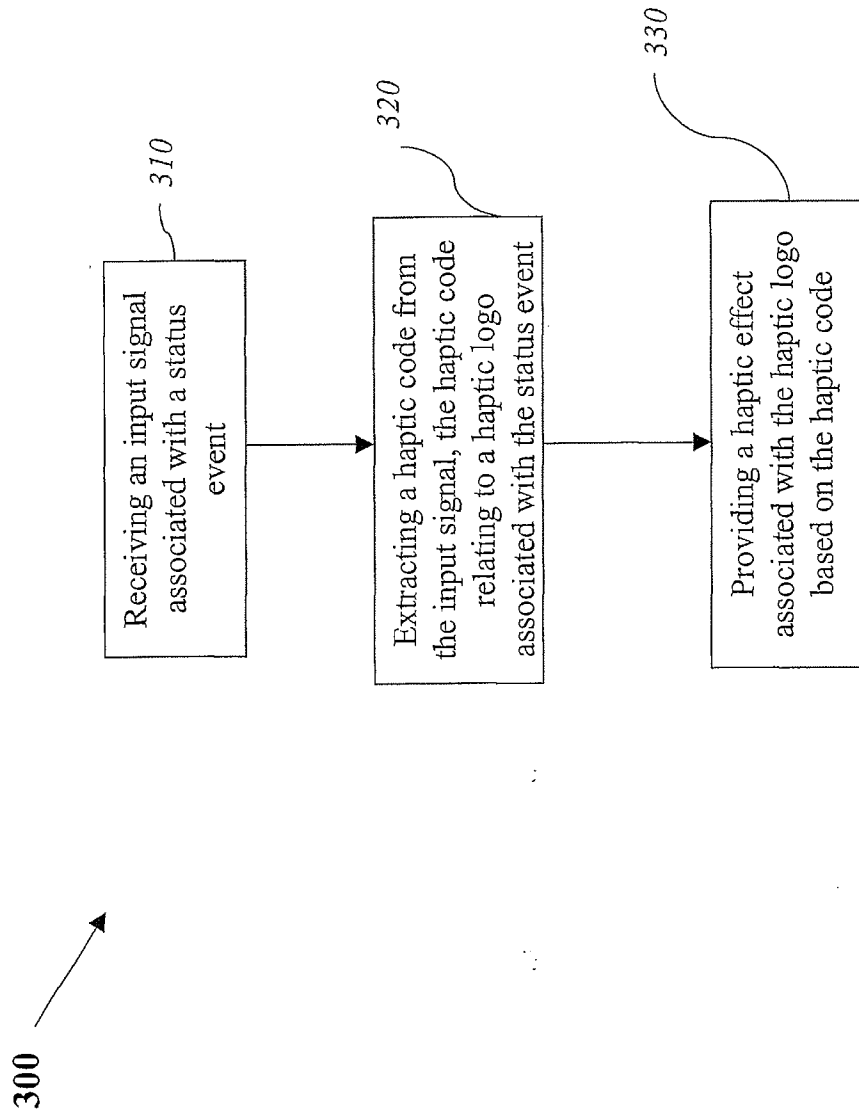


FIG. 3

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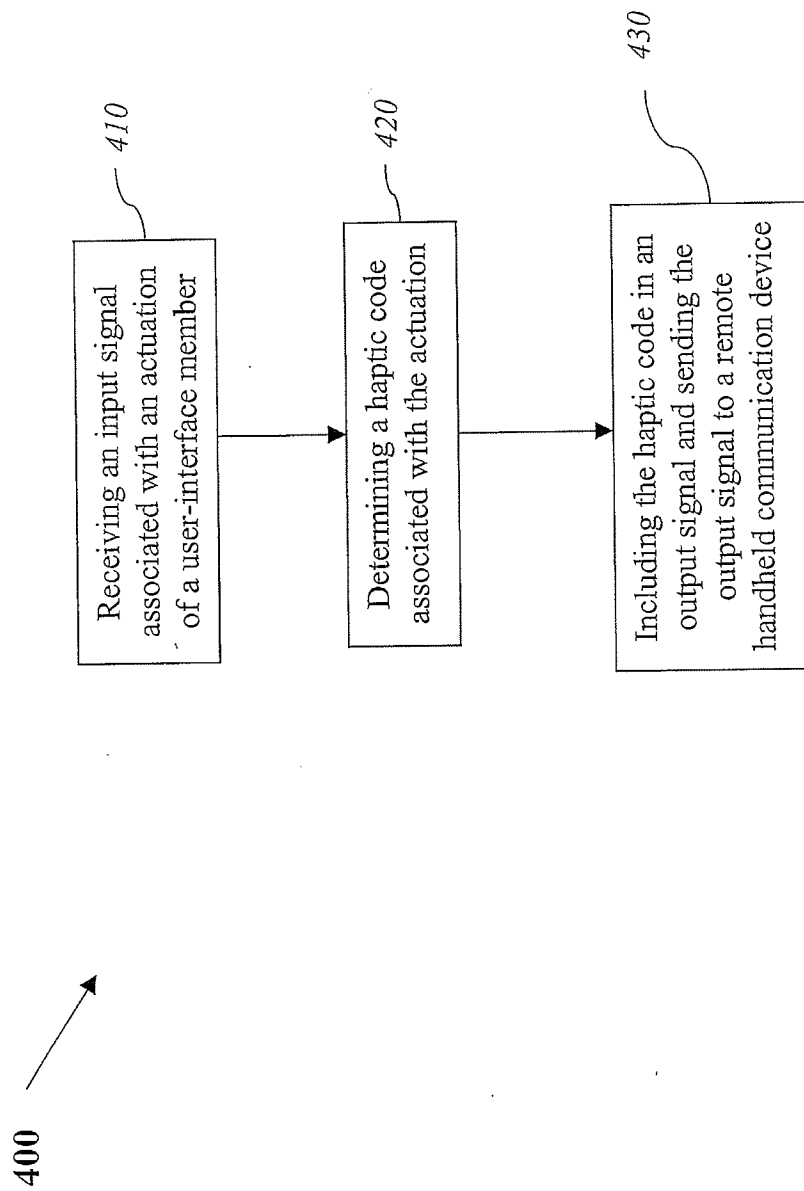


FIG. 4

5/9

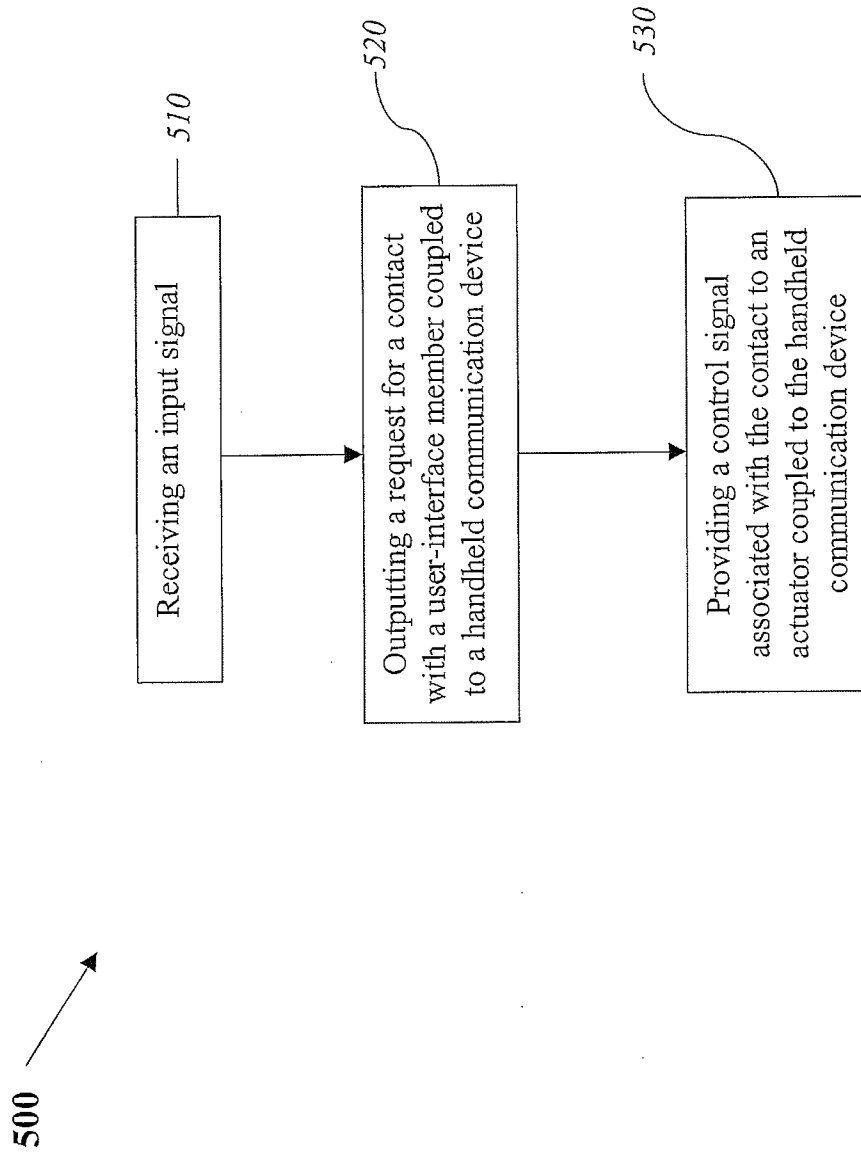


FIG. 5

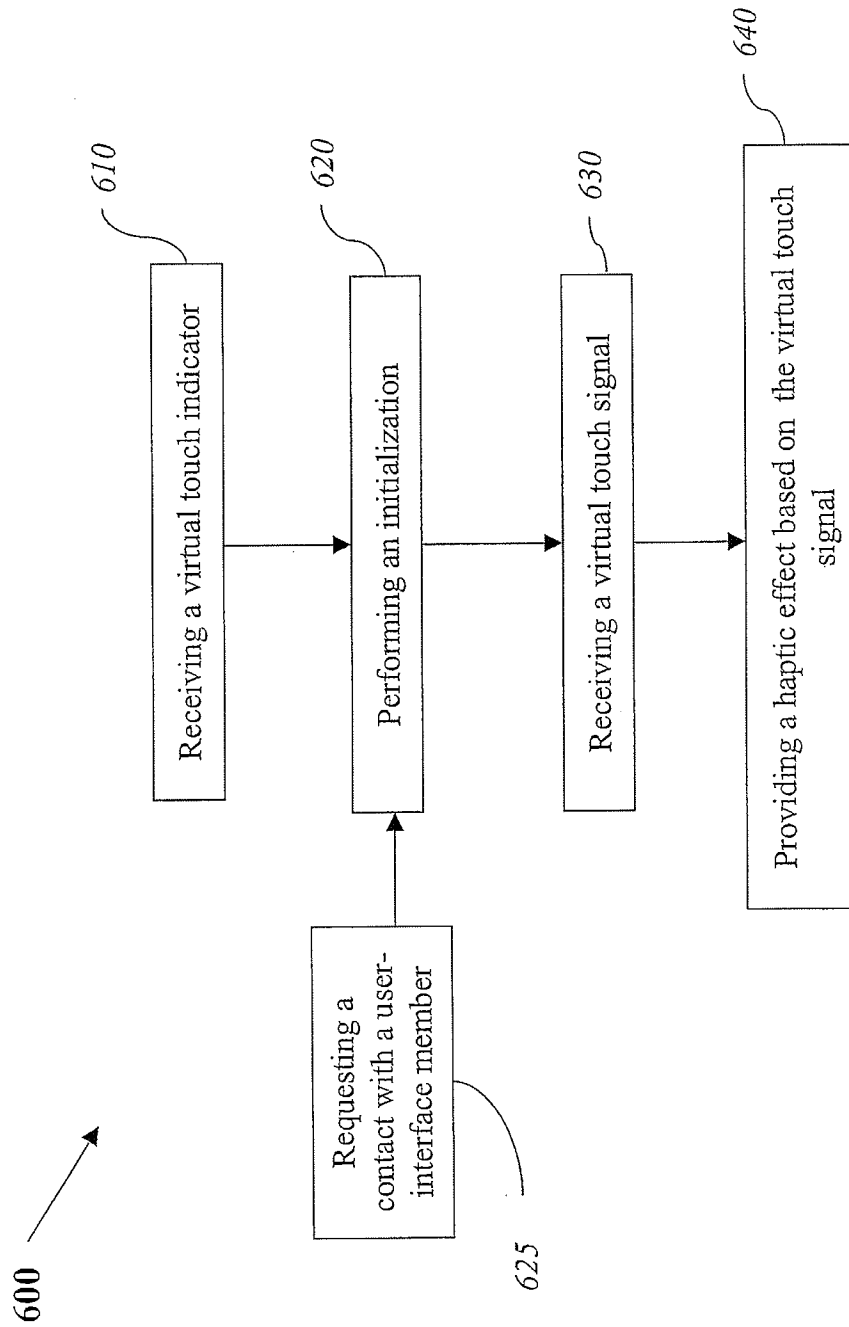


FIG. 6

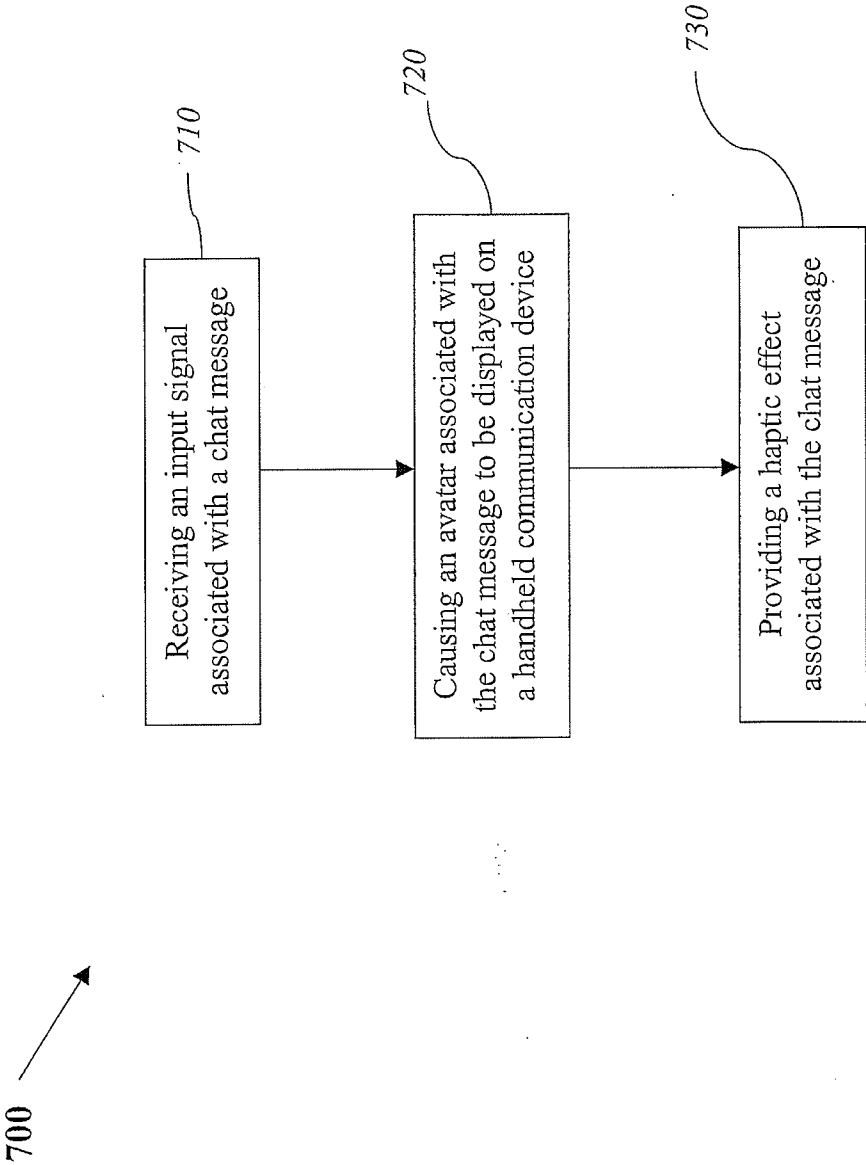


FIG. 7

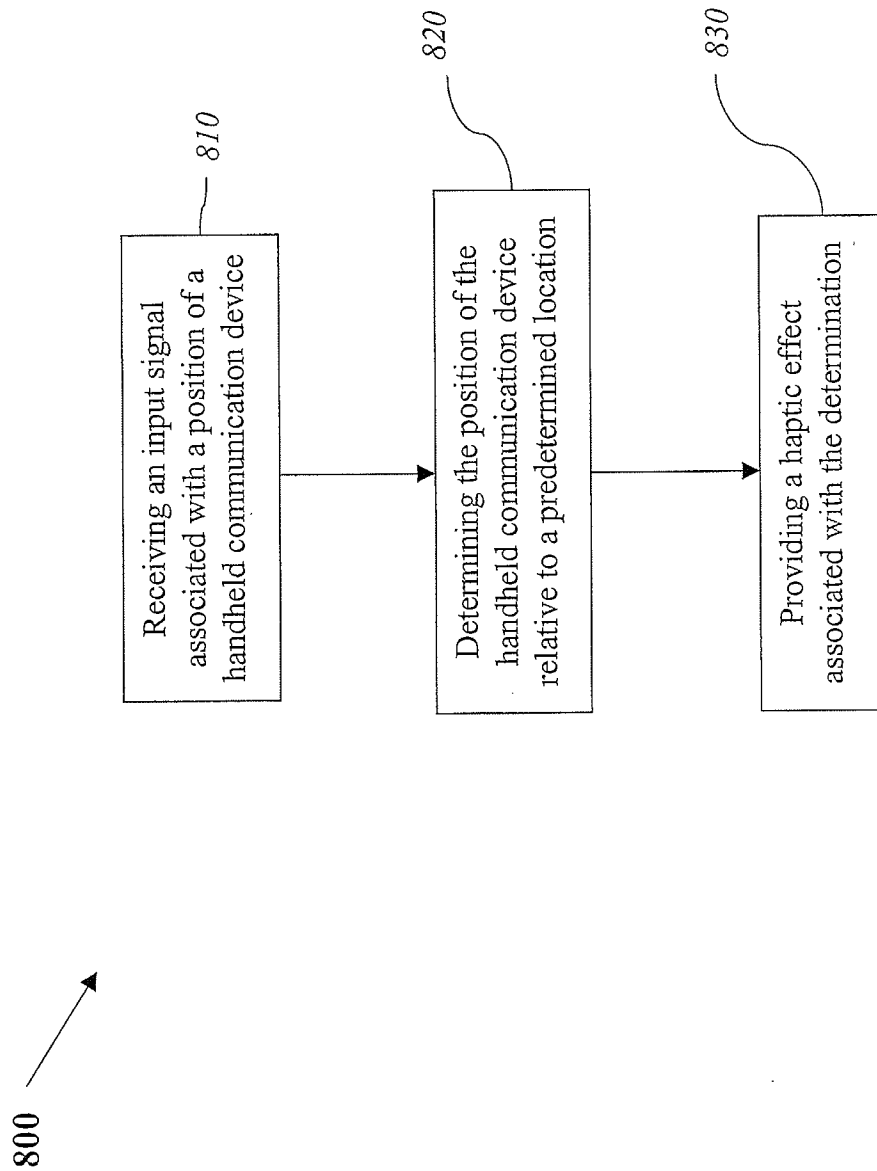


FIG. 8

900 ↗

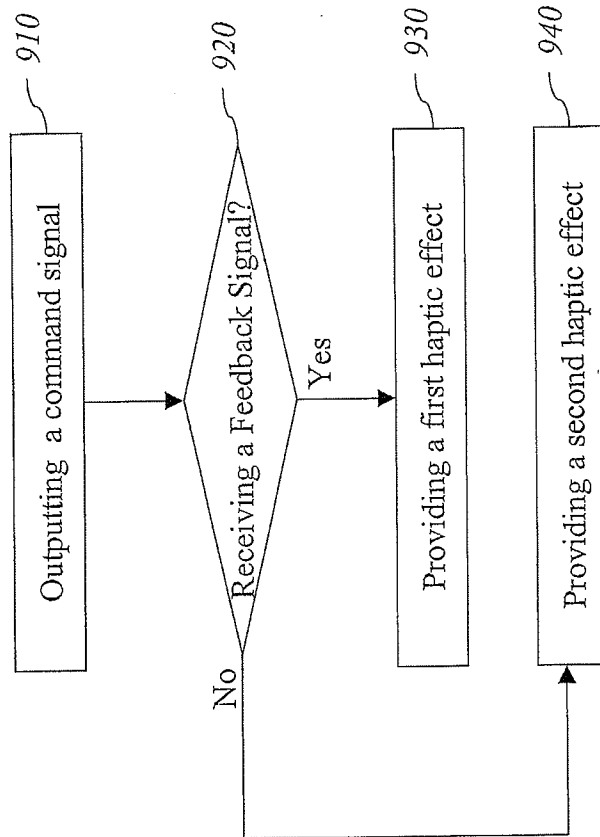


FIG. 9

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/38961

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : G09G 5/00

US CL : 345/156,157,169,701,702

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 345/156,157,169,701,702

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EAST: haptic messaging, handheld communication, portable communication, haptic effects, remote

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2002/0044155 A1 (BECKER) 18 April 2002 (18.04.2002), page 3, lines 16-29), fig. 1.	1-26
Y	US 2001/0036832 A1 (McKAY) 01 November 2001 (01.11.2001), page 2, lines 12-67, fig. 6.	1-26
Y	US 5,917,906 A (THORNTON) 29 June 1999 (29.06.1999), see abstract, fig. 1.	1-26
A	US 5,907,615 A (KASCHKE) 25 May 1999 (25.05.1999), see claim 20.	1-26

<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C.	<input type="checkbox"/> See patent family annex.
* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier application or patent published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search 15 March 2004 (15.03.2004)	Date of mailing of the international search report 05 APR 2004
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703)305-3230	Authorized officer Richard Hjerpe Telephone No. (703) 305-3973

Form PCT/ISA/210 (second sheet) (July 1998)

Electronic Patent Application Fee Transmittal

Application Number:	13603578			
Filing Date:	05-Sep-2012			
Title of Invention:	Systems And Methods For Haptic Confirmation Of Commands			
First Named Inventor/Applicant Name:	Robert W. Heubel			
Filer:	Michael T. Morlock/Renee Prevette			
Attorney Docket Number:	IMM328.C1 (51851/849050)			
Filed as Large Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Submission- Information Disclosure Stmt	1806	1	180	180
Total in USD (\$)				180

Electronic Acknowledgement Receipt

EFS ID:	15445604
Application Number:	13603578
International Application Number:	
Confirmation Number:	1043
Title of Invention:	Systems And Methods For Haptic Confirmation Of Commands
First Named Inventor/Applicant Name:	Robert W. Heubel
Customer Number:	34300
Filer:	Michael T. Morlock/Renee Prevette
Filer Authorized By:	Michael T. Morlock
Attorney Docket Number:	IMM328.C1 (51851/849050)
Receipt Date:	05-APR-2013
Filing Date:	05-SEP-2012
Time Stamp:	14:52:11
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$ 180
RAM confirmation Number	1277
Deposit Account	201430
Authorized User	KILPATRICK TOWNSEND & STOCKTON, LLP

The Director of the USPTO is hereby authorized to charge indicated fees and credit any overpayment as follows:

Charge any Additional Fees required under 37 C.F.R. Section 1.16 (National application filing, search, and examination fees)

Immersion Ex 2008-207
Apple v Immersion
IPR2017-01368

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal Letter	IDSLetter.pdf	212305	no	5
			7d20028c87d1ffc63a6f812d432363087e9e041f		
Warnings:					
Information:					
2	Information Disclosure Statement (IDS) Form (SB08)	PTOSB08.pdf	90356	no	1
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3	Non Patent Literature	IMM328PCT- SearchReportWrittenOpinion. pdf	1802066	no	17
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4	Non Patent Literature	IMM328PCT-IPER.pdf	786464	no	13
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5	Foreign Reference	SWO2004102527.pdf	15128490	no	15
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6	Foreign Reference	WO9945531S.pdf	1209787	no	33
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7	Foreign Reference	WO2004053830S.pdf	1295390	no	28
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8	Fee Worksheet (SB06)	fee-info.pdf	30457	no	2
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Warnings:					
Information:					
Immersion Ex 2008-208					

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New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Robert W. Heubel et al.)	
)	Conf No.: 1043
Serial No. 13/603,578)	
)	Art Unit: 2684
Filing Date: September 5, 2012)	
)	Examiner: Pham, Toan Ngoc

For: Systems and Methods for Haptic Confirmation of Commands

Attorney Ref. IMM328.C1 (51851/849050)

INFORMATION DISCLOSURE STATEMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Pursuant to 37 C.F.R. §§ 1.97 and 1.98, applicant(s) hereby submit(s) an Information Disclosure Statement for consideration by the Examiner.

I. LIST OF PATENTS, PUBLICATIONS OR OTHER INFORMATION

The patents, publications, or other information submitted for consideration by the Office are listed on the PTO/SB/08 forms attached hereto.

II. COPIES (check at least one box)

- a. ☐ This application was filed before June 30, 2003. Accordingly, submitted herewith is a legible copy of (i) each U.S. and foreign patent; (ii) each publication or that portion which caused it to be listed; and (iii) all other information or that portion which caused it to be listed.
- b. ☒ This application was filed on or after June 30, 2003. Accordingly, copies of cited U.S. patents and patent application publications therefore are not included. Copies of foreign patent documents and non-patent literature are included.

- c. ☒ No copies of the publications listed on the attached Form PTO/SB/08A are being provided pursuant to 37 C.F.R. § 1.98(d) because the publications were previously cited or submitted to the Office in prior Application Serial No. 12/612,230 (U.S. Patent No. 8,279,052) to which the above-identified application claims priority under 35 U.S.C. §120.

III. CONCISE EXPLANATION OF THE RELEVANCE
(check at least one box)

- a. ☒ **DOCUMENTS IN THE ENGLISH LANGUAGE**
The patents, publications, or other information listed on the attached PTO/SB/08 forms are in the English language and therefore, do not require a statement of relevancy.
- b. ☐ **DOCUMENTS NOT IN THE ENGLISH LANGUAGE**

A concise explanation of the relevance of all patents, publications, or other information listed that is not in the English language is as follows:
- c. ☐ **ENGLISH LANGUAGE SEARCH REPORT**
An English language version of the search report or action that indicates the degree of relevance found by the foreign office is attached, thereby satisfying the requirement for a concise explanation. See MPEP 609(III)(A)(3).
- d. ☐ **OTHER**
The following additional information is provided for the Examiner's consideration.

FEES

- IV. ☐ THIS IDS IS BEING FILED UNDER 37 C.F.R. § 1.97(b):
(check one box)

- a. ☐ within three months of the filing date of a national application (37 C.F.R. § 1.97(b)(1)). No fee or statement is required. *(This section is not to be used with RCE's.)*
- b. ☐ within three months of the date of entry of the national stage as set forth in § 1.491 in an international application (37 C.F.R. § 1.97(b)(2)). No fee or statement is required.
- c. ☐ before the mailing of a first Office action after the filing of or concurrently with a Request for Continued Examination under § 1.114 (37 C.F.R. § 1.97(b)(4)). No fee or statement is required.
- d. ☐ before the mailing date of a first Action on the merits (37 C.F.R. § 1.97(b)(3)). No fee or statement is required.

In the event that a first Office Action on the merits has been issued, please consider this IDS under 37 C.F.R. § 1.97(c) and see the statement under 37 C.F.R. § 1.97(e) below, or, if no statement has been made, charge our deposit account in the amount of \$180.00 as required by 37 C.F.R. § 1.17(p).

- V. ☒ THIS IDS IS BEING FILED UNDER 37 C.F.R. § 1.97(c):
(check one box)

before the mailing date of a Final Office Action under 37 C.F.R. § 1.113 (See 37 C.F.R. § 1.97(c)(1)) or before the mailing date of a Notice of Allowance under 37 C.F.R. § 1.311 (See 37 C.F.R. § 1.97(c)(2)).

- a. ☒ No statement; therefore, a fee in the amount of \$180.00 as required by 37 C.F.R. § 1.17(p).
- b. ☐ See the statement below. No fee is required.

- VI. ☐ THIS IDS IS BEING FILED UNDER 37 C.F.R. § 1.97(d)
after the period specified in 37 C.F.R. 1.97(c) but before payment of the issue fee; see statement and payment of fees below.

- VII. STATEMENT UNDER 37 C.F.R. § 1.97(e) (check only one box)
The undersigned hereby states that

- a. ☐ each item of information contained in the IDS was first cited in any communication from a foreign Patent Office in a counterpart foreign application not more than three months prior to the filing of this IDS;
- b. ☐ no item of information contained in the IDS was cited in a communication from a foreign Patent Office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of IDS was known to any individual designated in 37 C.F.R. § 1.56(c) more than three months prior to the filing of the IDS.
- c. ☐ Some of the items of information were cited in a communication from a foreign Patent Office. As to this information, the undersigned states that each item of information contained in the IDS was first cited in a communication from a foreign Patent Office in a counterpart foreign application not more than three months prior to the filing of this IDS. As to the remaining information, the undersigned hereby states that no item of this remaining information contained in the IDS was cited in a communication from a foreign Patent Office in a counterpart foreign application and, to the best of my knowledge after making reasonable inquiry, was known to any individual designated in 37 C.F.R. § 1.56(c) more than three months prior to the filing of this statement.

VIII. ☐ PATENT TERM ADJUSTMENT

Each item of information contained in this Information Disclosure Statement was first cited in a communication from a foreign patent office in a counterpart application and this communication was not received by any individual designated in § 1.56(c) more than thirty days prior to the filing of this Information Disclosure Statement. 37 C.F.R. § 1.704(d).

IX. PAYMENT OF FEES (check one box)

- ☒ Payment by credit card Form PTO-2038 in the amount of \$180 required by 37 C.F.R. § 1.17(p) is enclosed for the above-identified fee.
- ☐ Please charge Deposit Account No. 20-1430 in the amount required by 37 C.F.R. § 1.17(p) for the above-indicated fee. A triplicate copy of this paper is attached.
- ☐ No fee is required.

If the Examiner has any questions concerning this IDS, he/she is requested to contact the undersigned. If it is determined that this IDS has been filed under the wrong rule, the PTO is requested to consider this IDS under the proper rule and charge the appropriate fee to Deposit Account No. 20-1430.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 20-1430 for any additional fees required under 37 C.F.R. § 1.16 or under § 1.17.

Respectfully submitted,

Date: 4/5/2013

By: 
Michael Morlock (Reg. No. 62,245)

Attachment(s):

- ☒ PTO/SB/08
- ☒ Documents
- ☒ Fee
- ☐ Other



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/603,578	09/05/2012	Robert W. Heubel	IMM328.C1 (51851/849050)

CONFIRMATION NO. 1043

34300
PATENT DEPARTMENT (51851)
KILPATRICK TOWNSEND & STOCKTON LLP
1001 WEST FOURTH STREET
WINSTON-SALEM, NC 27101

PUBLICATION NOTICE



OC00000060379037

Title:Systems And Methods For Haptic Confirmation Of Commands

Publication No.US-2013-0088340-A1

Publication Date:04/11/2013

NOTICE OF PUBLICATION OF APPLICATION

The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

The publication may be accessed through the USPTO's publically available Searchable Databases via the Internet at www.uspto.gov. The direct link to access the publication is currently <http://www.uspto.gov/patft/>.

The publication process established by the Office does not provide for mailing a copy of the publication to applicant. A copy of the publication may be obtained from the Office upon payment of the appropriate fee set forth in 37 CFR 1.19(a)(1). Orders for copies of patent application publications are handled by the USPTO's Office of Public Records. The Office of Public Records can be reached by telephone at (703) 308-9726 or (800) 972-6382, by facsimile at (703) 305-8759, by mail addressed to the United States Patent and Trademark Office, Office of Public Records, Alexandria, VA 22313-1450 or via the Internet.

In addition, information on the status of the application, including the mailing date of Office actions and the dates of receipt of correspondence filed in the Office, may also be accessed via the Internet through the Patent Electronic Business Center at www.uspto.gov using the public side of the Patent Application Information and Retrieval (PAIR) system. The direct link to access this status information is currently <http://pair.uspto.gov/>. Prior to publication, such status information is confidential and may only be obtained by applicant using the private side of PAIR.

Further assistance in electronically accessing the publication, or about PAIR, is available by calling the Patent Electronic Business Center at 1-866-217-9197.

Office of Data Management, Application Assistance Unit (571) 272-4000, or (571) 272-4200, or 1-888-786-0101

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of : Robert W. Heubel
Application No. : 13/603,578
For : **Systems And Methods For Haptic Confirmation Of
Commands**
Filed : September 5, 2012
Examiner : Pham, Toan Ngoc
Art Unit : 2684
Confirmation No. : 1043

Mail Stop **Amendment**
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE TO NON-FINAL OFFICE ACTION

Sir:

The following Amendment and Remarks are submitted in response to the Office
Action mailed March 12, 2013.

Amendments to the Specification begin on page 2 of this paper.

Listing of the Claims begins on page 3 of this paper.

Remarks begin on page 8 of this paper.

AMENDMENTS TO THE SPECIFICATION

Please replace paragraph [0001] of the Specification with the following paragraph:

[0001] This application is a continuation of co-pending U.S. Patent Application No. 12/612,230, entitled “System and Methods for Haptic Confirmation of Commands,” filed November 4, 2009, now U.S. Patent No. 8,279,052, which is hereby incorporated by reference in its entirety.

LISTING OF THE CLAIMS

1-16 (Cancelled)

17. (Previously Presented) A system for generating haptic effects to confirm receipt of a command, the system comprising:

a sensor;

a housing configured to be contacted by a user;

an actuator configured to output a haptic effect to the housing; and

a processor in communication with the sensor and the actuator, the processor configured to:

receive, from the sensor, a sensor signal associated with a user input;

recognize the user input and determine a command associated with the user input;

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

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.

18. (Previously Presented) The system of claim 17, wherein the sensor comprises an optical sensor.

19. (Previously Presented) The system of claim 18, wherein the user input comprises a focal point of a user's eyes.

20. (Previously Presented) The system of claim 17, wherein the processor is further configured to, if the user input is recognized and the command is determined:

execute a function associated with the user input;

generate a third actuator signal configured to cause the actuator to output a third haptic effect; and

transmit the third actuator signal to the actuator upon completion of execution of the function.

21. (Previously Presented) The system of claim 18, wherein the third haptic effect is configured to emulate the function.

22. (Previously Presented) The system of claim 17, further comprising a speaker in communication with the processor, and wherein the processor is further configured to:

generate an audio signal configured to cause the speaker to output a sound; and

transmit the audio signal to the speaker.

23. (Previously Presented) The system of claim 17, further comprising a display in communication with the processor, and wherein the processor is further configured to:

generate a display signal configured to cause the display to display an image; and
transmit the display signal to the display.

24. (Previously Presented) The system of claim 17, wherein the first haptic effect is configured to emulate the command.

25. (Previously Presented) The system of claim 17, wherein the sensor, actuator, and processor are disposed within the housing.

26. (Previously Presented) The system of claim 17, wherein the housing comprises one of: a device configured to be worn by the user, a mobile phone, a personal digital assistant, a touch-sensitive surface, a medical alert device, a mouse, or a keyboard.

27. (Previously Presented) The system of claim 17, wherein the user input comprises an indication of a medical emergency.

28. (Previously Presented) The system of claim 17, wherein command is a request associated with an operation, and the first haptic effect is configured to provide information associated with the status of the operation.

29. (Previously Presented) 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.

30. (Previously Presented) The computer-implemented method of claim 29, wherein the
sensor comprises an optical sensor.

31. (Previously Presented) The computer-implemented method of claim 30, wherein the
user input comprises a focal point of a user's eyes.

32. (Previously Presented) The computer-implemented method of claim 29, wherein if
the user input is recognized and the command is determined:

executing a function associated with the command;

generating a third actuator signal configured to cause the actuator to output a third
haptic effect; and

transmitting the third actuator signal to the actuator upon completion of execution
of the function.

33. (Previously Presented) The computer-implemented method of claim 30, wherein the third haptic effect is configured to emulate the function.

34. (Previously Presented) The computer-implemented method of claim 29, further comprising:

generating an audio signal configured to cause a speaker to output a sound; and
transmitting the audio signal to the speaker.

35. (Previously Presented) The computer-implemented method of claim 29, further comprising:

generating a display signal configured to cause a display to display an image; and
transmitting the display signal to the display.

36. (Previously Presented) The computer-implemented method of claim 29, wherein the first haptic effect is configured to emulate the command.

REMARKS

This paper is filed in response to the Non-Final Office Action mailed March 12, 2013. Claims 17-36 are pending in the present application, and the Office Action rejects all pending claims. Specifically, the Office Action rejects claims 17-36 for non-statutory obviousness type double patenting. Applicants respectfully request reconsideration and allowance of all pending claims.

I. Double Patenting

The Office Action rejects claims 17-36 for non-statutory obviousness type double patenting in view of claims 1-16 of U.S. 8,279,052. In response, in order to advance prosecution, and not as an admission that claims 17-36 are not patentably distinct from claims 1-16 of U.S. 8,279,052, Applicants file herewith a Terminal Disclaimer.

CONCLUSION

Applicants respectfully assert that in view of the amendments and remarks above, all pending claims are allowable and Applicants respectfully request the allowance of all claims.

Should the Examiner have any comments, questions, or suggestions of a nature necessary to expedite the prosecution of the application, or to place the case in condition for allowance, the Examiner is courteously requested to telephone the undersigned at the number listed below.

Respectfully submitted,

Date: 6/7/2013



Michael Morlock
Reg. No. 62,245

KILPATRICK TOWNSEND & STOCKTON LLP
1001 West Fourth Street
Winston-Salem, NC 27101
(336) 607-7391 (voice)
(336) 734-2756 (fax)

**TERMINAL DISCLAIMER TO OBTAIN A DOUBLE PATENTING
REJECTION OVER A "PRIOR" PATENT**

Docket Number (Optional)

In re Application of: Robert W. Heubel

Application No.: 13/603,578

Filed: September 5, 2012

For: Systems And Methods For Haptic Confirmation Of Commands

The applicant, Immersion Corp., owner of 100 percent interest in the instant application hereby disclaims, except as provided below, the terminal part of the statutory term of any patent granted on the instant application which would extend beyond the expiration date of the full statutory term of **prior patent** No. 8,279,052 as the term of said **prior patent** is presently shortened by any terminal disclaimer. The applicant hereby agrees that any patent so granted on the instant application shall be enforceable only for any during such period that it and the **prior patent** are commonly owned. This agreement runs with any patent granted on the instant application and is binding upon the grantee, its successors or assigns.

In making the above disclaimer, the applicant does not disclaim the terminal part of the term of any patent granted on the instant application that would extend to the expiration date of the full statutory term of the **prior patent**, "as the term of said **prior patent** is presently shortened by any terminal disclaimer," in the event that said **prior patent** later:

- expires for failure to pay a maintenance fee;
- is held unenforceable;
- is found invalid by a court of competent jurisdiction;
- is statutorily disclaimed in whole or terminally disclaimed under 37 CFR 1.321;
- has all claims canceled by a reexamination certificate;
- is reissued; or
- is in any manner terminated prior to the expiration of its full statutory term as presently shortened by any terminal disclaimer.

Check either box 1 or 2 below, if appropriate.

1. ☐ The undersigned is the applicant. If the applicant is an assignee, the undersigned is authorized to act on behalf of the assignee.

I hereby acknowledge that any willful false statements made are punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both.

2. ☒ The undersigned is an attorney or agent of record. Reg. No. 62,245



Signature



Date

Michael T. Morlock

Typed or printed name

Attorney, Reg. No. 62,245

Title

336-607-7391

Telephone Number

- ☒ Terminal disclaimer fee under 37 CFR 1.20(d) included.

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

This collection of information is required by 37 CFR 1.321. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of : Robert W. Heubel
 Application No. : 13/603,578
 Filed : September 5, 2012
 For : Systems And Methods For Haptic
 Confirmation Of Commands
 Examiner : Pham, Toan Ngoc
 Art Unit : 2684
 Conf. No. : 1043

Mail Stop Amendment
 Commissioner for Patents
 P.O. Box 1450
 Alexandria, VA 22313-1450

TRANSMITTAL

Commissioner:

Transmitted herewith are the following document(s) for filing in the above-identified application:

1. Transmittal;
2. Terminal Disclaimer;
3. Response to Non-Final Office Action; and
4. EFS-Web Payment in the amount of \$160.00 (Disclaimer Fee)

Shown below are the fees for the presentation of the amended claims:

	Claims Remaining	Highest # Previously Paid For	Extra	Rate	Fee
TOTAL	20	20	0	\$ 80	\$ 0
Ind. Cls.	2	3	0	\$420	\$ 0
Multiple Dependent Claim Added..... NO					
TOTAL					\$ 0

The Commissioner is hereby authorized to charge any additional fees required by this action, or credit any overpayment, to Deposit Account Number 20-1430.

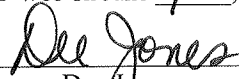
Respectfully submitted,

Date: 6/7/2013
KILPATRICK TOWNSEND &
STOCKTON LLP
1001 West Fourth Street
Winston-Salem, NC 27101
(336) 607-7300

By: 
Michael Morlock (Reg. No. 62245)

Certificate of Electronic Filing

I hereby certify that this correspondence is being electronically filed with the United States Patent Office via EFS-Web on June 7, 2013.


Dee Jones

Electronic Patent Application Fee Transmittal

Application Number:	13603578			
Filing Date:	05-Sep-2012			
Title of Invention:	Systems And Methods For Haptic Confirmation Of Commands			
First Named Inventor/Applicant Name:	Robert W. Heubel			
Filer:	Michael T. Morlock			
Attorney Docket Number:	IMM328.C1 (51851/849050)			
Filed as Large Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Miscellaneous:				
Statutory or Terminal Disclaimer	1814	1	160	160
Total in USD (\$)				160

Electronic Acknowledgement Receipt

EFS ID:	15981303
Application Number:	13603578
International Application Number:	
Confirmation Number:	1043
Title of Invention:	Systems And Methods For Haptic Confirmation Of Commands
First Named Inventor/Applicant Name:	Robert W. Heubel
Customer Number:	34300
Filer:	Michael T. Morlock/Dee Jones
Filer Authorized By:	Michael T. Morlock
Attorney Docket Number:	IMM328.C1 (51851/849050)
Receipt Date:	07-JUN-2013
Filing Date:	05-SEP-2012
Time Stamp:	15:59:20
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$ 160
RAM confirmation Number	2785
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi-Part / .zip (if appl.)	Pages
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1	Amendment/Req. Reconsideration-After Non-Final Reject	IMM328C1Response.pdf	224980	no	8
			010e5ab43fc36aad0c64382f56561c84bf46e049		
Warnings:					
Information:					
2	Terminal Disclaimer Filed	IMM328C1TerminalDisclaimer.pdf	73299	no	1
			9e0371bf504967ede5f44cd3c86a8599691e24b		
Warnings:					
Information:					
3	Transmittal Letter	IMM328C1Transmittal.pdf	50156	no	2
			b6db09923dc4c5fb063cd7ea7a51288758fe1c9		
Warnings:					
Information:					
4	Fee Worksheet (SB06)	fee-info.pdf	30292	no	2
			c85ad05c69b2870cadd185e784904b333a0fe655		
Warnings:					
Information:					
Total Files Size (in bytes):			378727		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

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PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875	Application or Docket Number 13/603,578	Filing Date 09/05/2012	<input type="checkbox"/> To be Mailed
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ENTITY: ☒ LARGE ☐ SMALL ☐ MICRO**APPLICATION AS FILED – PART I**

(Column 1)

(Column 2)

FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)
<input type="checkbox"/> BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A	
<input type="checkbox"/> SEARCH FEE (37 CFR 1.16(k), (i), or (m))	N/A	N/A	N/A	
<input type="checkbox"/> EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A	N/A	
TOTAL CLAIMS (37 CFR 1.16(i))	minus 20 =	*	X \$ =	
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X \$ =	
<input type="checkbox"/> APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).			
<input type="checkbox"/> MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))				
* If the difference in column 1 is less than zero, enter "0" in column 2.			TOTAL	

APPLICATION AS AMENDED – PART II

(Column 1)

(Column 2)

(Column 3)

AMENDMENT	06/07/2013	CLAIMS REMAINING AFTER AMENDMENT	MINUS	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	* 20	Minus	** 20	= 0	X \$80 =	0
	Independent (37 CFR 1.16(h))	* 2	Minus	*** 3	= 0	X \$420 =	0
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))						
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))						
						TOTAL ADD'L FEE	0

(Column 1)

(Column 2)

(Column 3)

AMENDMENT	CLAIMS REMAINING AFTER AMENDMENT	MINUS	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	*	Minus	**	X \$ =	
	Independent (37 CFR 1.16(h))	*	Minus	***	X \$ =	
	<input type="checkbox"/> Application Size Fee (37 CFR 1.16(s))					
	<input type="checkbox"/> FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))					
					TOTAL ADD'L FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20".

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3".

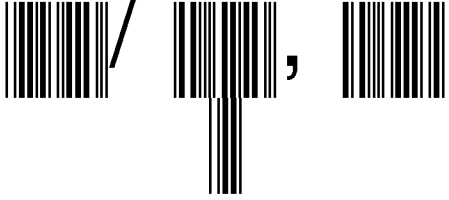
The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

LIE
/TRINA STEPTOE/

This collection of information is required by 37 CFR 1.16. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Immersion Ex 2008-231
Apple v Immersion
IPR2017-01368

Application Number 	Application/Control No. 13/603,578	Applicant(s)/Patent under Reexamination HEUBEL ET AL.	

Document Code - DISQ	Internal Document – DO NOT MAIL
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TERMINAL DISCLAIMER	<input checked="" type="checkbox"/> APPROVED	<input type="checkbox"/> DISAPPROVED
Date Filed : 6/07/13	This patent is subject to a Terminal Disclaimer	

Approved/Disapproved by:

jean proctor



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
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NOTICE OF ALLOWANCE AND FEE(S) DUE

34300 7590 07/05/2013
PATENT DEPARTMENT (51851)
KILPATRICK TOWNSEND & STOCKTON LLP
1001 WEST FOURTH STREET
WINSTON-SALEM, NC 27101

EXAMINER

PHAM, TOAN NGOC

ART UNIT

PAPER NUMBER

2684

DATE MAILED: 07/05/2013

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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13/603,578

09/05/2012

Robert W. Heubel

IMM328.C1
(51851/849050)

1043

TITLE OF INVENTION: Systems And Methods For Haptic Confirmation Of Commands

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$1780	\$300	\$0	\$2080	10/07/2013

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 1/2 the amount of undiscounted fees, and micro entity fees are 1/2 the amount of small entity fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed and an extra copy of the form should be submitted. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PART B - FEE(S) TRANSMITTAL

**Complete and send this form, together with applicable fee(s), to: Mail Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885**

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

34300 7590 07/05/2013
PATENT DEPARTMENT (51851)
KILPATRICK TOWNSEND & STOCKTON LLP
1001 WEST FOURTH STREET
WINSTON-SALEM, NC 27101

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/603,578	09/05/2012	Robert W. Heubel	IMM328.C1 (51851/849050)	1043

TITLE OF INVENTION: Systems And Methods For Haptic Confirmation Of Commands

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$1780	\$300	\$0	\$2080	10/07/2013

EXAMINER	ART UNIT	CLASS-SUBCLASS
PHAM, TOAN NGOC	2684	340-407100

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list

- (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, 1 _____
- (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 2 _____
- 3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ☐ Individual ☐ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

- ☐ Issue Fee
- ☐ Publication Fee (No small entity discount permitted)
- ☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (**Please first reapply any previously paid issue fee shown above**)

- ☐ A check is enclosed.
- ☐ Payment by credit card. Form PTO-2038 is attached.
- ☐ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number _____ (enclose an extra copy of this form).

5. **Change in Entity Status** (from status indicated above)

- ☐ Applicant certifying micro entity status. See 37 CFR 1.29
- ☐ Applicant asserting small entity status. See 37 CFR 1.27
- ☐ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see form PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature _____

Date _____

Typed or printed name _____

Registration No. _____

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/603,578	09/05/2012	Robert W. Heubel	IMM328.C1 (51851/849050)	1043
34300 7590 07/05/2013 PATENT DEPARTMENT (51851) KILPATRICK TOWNSEND & STOCKTON LLP 1001 WEST FOURTH STREET WINSTON-SALEM, NC 27101			EXAMINER PHAM, TOAN NGOC	
			ART UNIT 2684	PAPER NUMBER

DATE MAILED: 07/05/2013

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment to date is 0 day(s). If the issue fee is paid on the date that is three months after the mailing date of this notice and the patent issues on the Tuesday before the date that is 28 weeks (six and a half months) after the mailing date of this notice, the Patent Term Adjustment will be 0 day(s).

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Notice of Allowability	Application No. 13/603,578	Applicant(s) HEUBEL ET AL.	
	Examiner TOAN N. PHAM	Art Unit 2684	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the terminal disclaimer filed on 6/07/2013.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are 17-36. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

- a) ☐ All b) ☐ Some *c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has **THREE MONTHS FROM THE "MAILING DATE"** of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Examiner's Amendment/Comment |
| 2. <input checked="" type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____ | 6. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| 3. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 7. <input type="checkbox"/> Other _____. |
| 4. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. | |

Allowable Subject Matter

Claims 17-36 are allowed.

The following is an examiner's statement of reasons for allowance: The present invention is directed to haptic confirmation of speech commands. Each independent claim identifies the uniquely distinct features "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 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". The closest prior art, Heubel et al. (US 2011/0102160) and Ullrich et al. (US 2011/0061017) disclose the conventional haptic feedback devices, either singularly or in combination, fail to anticipate or render the above limitations obvious.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TOAN N. PHAM whose telephone number is (571)272-2967. The examiner can normally be reached on M-F.

Art Unit: 2684

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin C. Lee can be reached on (571) 272-2963. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/TOAN N PHAM/

Primary Examiner, Art Unit 2684

6/28/2013

Substitute for form 1449A/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)		Complete if Known	
		Application Number	13/603,578
		Filing Date	September 5, 2012
		First Named Inventor	Robert W. Heubel
		Art Unit	2684
		Examiner Name	Pham, Toan Ngoc
Sheet 1 of 1	Attorney Docket Number	IMM328.C1(51851/849050)	

U.S. PATENT DOCUMENTS					
Examiner Initials *	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number - Kind Code ² (if known)			
	1.	US- 3,736,551	05-29-1973	Hirsch	
	2.	US- 5,767,796	06-16-1998	Van Roekel et al.	
	3.	US- 2002/098874	07-25-2002	Zirul et al.	
	4.	US- 2002/107695	08-08-2002	Roth et al.	
	5.	US- 2011/0061017	03-10-2011	Ullrich et al.	
	6.	US- 2011/0102160	05-05-2011	Heubel et al.	
		US-			
		US-			
		US-			
		US-			

FOREIGN PATENT DOCUMENTS						
Examiner Initials *	Cite No. ¹	Foreign Patent Document	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T ⁶
		Country Code ³ - Number ⁴ - Kind Code ⁵ (if known)				
	7.	WO 99/045531	09-10-1999	Microsoft Corp		
	8.	WO 04/053830	06-24-2004	Immersion Corp		
	9.	WO 04/102527	11-25-2004	Voice Signal Technologies Inc.		

NON PATENT LITERATURE DOCUMENTS			
Examiner Initials *	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
	10.	Patent Cooperation Treaty, International Search Report, Application No. PCT/US2010/054967, mailed February 24, 2011.	
	11.	Patent Cooperation Treaty, Preliminary report on Patentability, Application No. PCT/US2010/054967, mailed May 18, 2012.	


Examiner Signature	/Toan Pham/	Date Considered	06/17/2013
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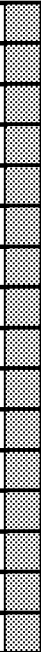
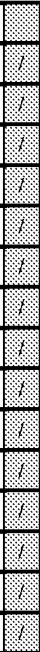
*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹ Applicant's unique citation designation number (optional). ² See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

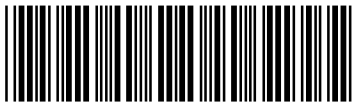
ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /TP/

Issue Classification 	Application/Control No. 13603578	Applicant(s)/Patent Under Reexamination HEUBEL ET AL.	
	Examiner TOAN N PHAM	Art Unit 2684	

CPC			
Symbol		Type	Version
			


CPC Combination Sets						
Symbol			Type	Set	Ranking	Version
						
						

NONE		Total Claims Allowed:	
		20	
(Assistant Examiner)	(Date)		
/TOAN N PHAM/ Primary Examiner.Art Unit 2684	06/28/2013	O.G. Print Claim(s)	O.G. Print Figure
(Primary Examiner)	(Date)	1	1

Issue Classification 	Application/Control No. 13603578	Applicant(s)/Patent Under Reexamination HEUBEL ET AL.
	Examiner TOAN N PHAM	Art Unit 2684

<input type="checkbox"/> Claims renumbered in the same order as presented by applicant															
<input type="checkbox"/> CPA															
<input type="checkbox"/> T.D.															
<input type="checkbox"/> R.1.47															
Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
	1	1	17	17	33										
	2	2	18	18	34										
	3	3	19	19	35										
	4	4	20	20	36										
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	13	13	29												
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	15	15	31												
	16	16	32												

NONE	Total Claims Allowed: 20	
(Assistant Examiner)	(Date)	
/TOAN N PHAM/ Primary Examiner.Art Unit 2684	06/28/2013	O.G. Print Claim(s) 1
(Primary Examiner)	(Date)	O.G. Print Figure 1

Search Notes 	Application/Control No. 13603578	Applicant(s)/Patent Under Reexamination HEUBEL ET AL.
	Examiner TOAN N PHAM	Art Unit 2684

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
340704715	407.1, 407.2275, 246780, 702, 816	5/29/125/29/125/ 29/12	TNPTNPTNP

SEARCH NOTES		
Search Notes	Date	Examiner
EAST	5/25/12, 5/29/12, 5/31/12, 3/7/13	TNP

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
340	407.2, 407.1	3/7/13	TNP
715	702	3/7/13	TNP

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/603,578	09/05/2012	Robert W. Heubel	IMM328.C1 (51851/849050)	1043
34300 7590 07/17/2013 PATENT DEPARTMENT (51851) KILPATRICK TOWNSEND & STOCKTON LLP 1001 WEST FOURTH STREET WINSTON-SALEM, NC 27101			EXAMINER PHAM, TOAN NGOC	
			ART UNIT 2684	PAPER NUMBER
			MAIL DATE 07/17/2013	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Supplemental Notice of Allowability	Application No. 13/603,578	Applicant(s) HEUBEL ET AL.	
	Examiner TOAN N. PHAM	Art Unit 2684	AIA (First Inventor to File) Status No

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☐ This communication is responsive to _____.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.
2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.
3. ☒ The allowed claim(s) is/are 17-36. As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see http://www.uspto.gov/patents/init_events/pph/index.jsp or send an inquiry to PPHfeedback@uspto.gov.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

Certified copies:

- a) ☐ All b) ☐ Some *c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has **THREE MONTHS FROM THE "MAILING DATE"** of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|--|--|
| 1. <input type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Examiner's Amendment/Comment |
| 2. <input type="checkbox"/> Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____ | 6. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| 3. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 7. <input type="checkbox"/> Other _____. |
| 4. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. | |

Allowable Subject Matter

Claims 17-36 are allowed.

The following is an examiner's statement of reasons for allowance: The present invention is directed to haptic confirmation of commands. Each independent claim identifies the uniquely distinct features "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 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". The closest prior art, Heubel et al. (US 2011/0102160) and Ullrich et al. (US 2011/0061017) disclose the conventional haptic feedback devices, either singularly or in combination, fail to anticipate or render the above limitations obvious.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TOAN N. PHAM whose telephone number is (571)272-2967. The examiner can normally be reached on M-F.

Art Unit: 2684

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Benjamin C. Lee can be reached on (571) 272-2963. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/TOAN N PHAM/

Primary Examiner, Art Unit 2684

7/12/2013

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), to: **Mail** Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
or Fax (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence including the Patent, advance orders and notification of maintenance fees will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications.

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

34300 7590 07/05/2013
PATENT DEPARTMENT (51851)
KILPATRICK TOWNSEND & STOCKTON LLP
1001 WEST FOURTH STREET
WINSTON-SALEM, NC 27101

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being facsimile transmitted to the USPTO (571) 273-2885, on the date indicated below.

(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/603,578	09/05/2012	Robert W. Heubel	IMM328.C1 (51851/849050)	1043

TITLE OF INVENTION: Systems And Methods For Haptic Confirmation Of Commands

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	UNDISCOUNTED	\$1780	\$300	\$0	\$2080	10/07/2013

EXAMINER	ART UNIT	CLASS-SUBCLASS
PHAM, TOAN NGOC	2684	340-407100

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).
☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
 (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, Kilpatrick Townsend & Stockton LLP
 (2) the name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed. 3

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document has been filed for recordation as set forth in 37 CFR 3.11. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE

(B) RESIDENCE: (CITY and STATE OR COUNTRY)

Immersion Corporation

San Jose, CA

Please check the appropriate assignee category or categories (will not be printed on the patent): ☐ Individual ☒ Corporation or other private group entity ☐ Government

4a. The following fee(s) are submitted:

☒ Issue Fee
☒ Publication Fee (No small entity discount permitted)
☐ Advance Order - # of Copies _____

4b. Payment of Fee(s): (Please first reapply any previously paid issue fee shown above)

☐ A check is enclosed.
☐ Payment by credit card. Form PTO-2038 is attached.
☒ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment, to Deposit Account Number 20-143 (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

☐ Applicant certifying micro entity status. See 37 CFR 1.29

☐ Applicant asserting small entity status. See 37 CFR 1.27

☐ Applicant changing to regular undiscounted fee status.


NOTE: Absent a valid certification of Micro Entity Status (see form PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: The Issue Fee and Publication Fee (if required) will not be accepted from anyone other than the applicant; a registered attorney or agent; or the assignee or other party in interest as shown by the records of the United States Patent and Trademark Office.

Authorized Signature



Date

10/3/2013

Typed or printed name

Michael Morlock

Registration No.

62,245

This collection of information is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Electronic Patent Application Fee Transmittal

Application Number:	13603578			
Filing Date:	05-Sep-2012			
Title of Invention:	Systems And Methods For Haptic Confirmation Of Commands			
First Named Inventor/Applicant Name:	Robert W. Heubel			
Filer:	Michael T. Morlock/Laura Smith			
Attorney Docket Number:	IMM328.C1 (51851/849050)			
Filed as Large Entity				
Utility under 35 USC 111(a) Filing Fees				
Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Basic Filing:				
Pages:				
Claims:				
Miscellaneous-Filing:				
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Utility Appl Issue Fee	1501	1	1780	1780
Publ. Fee- Early, Voluntary, or Normal	1504	1	300	300

Immersion Ex 2008-252

Apple v Immersion
IPR2017-01368

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				2080

Electronic Acknowledgement Receipt

EFS ID:	17026492
Application Number:	13603578
International Application Number:	
Confirmation Number:	1043
Title of Invention:	Systems And Methods For Haptic Confirmation Of Commands
First Named Inventor/Applicant Name:	Robert W. Heubel
Customer Number:	34300
Filer:	Michael T. Morlock/Laura Smith
Filer Authorized By:	Michael T. Morlock
Attorney Docket Number:	IMM328.C1 (51851/849050)
Receipt Date:	03-OCT-2013
Filing Date:	05-SEP-2012
Time Stamp:	09:18:03
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Credit Card
Payment was successfully received in RAM	\$2080
RAM confirmation Number	9631
Deposit Account	
Authorized User	

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi-Part / .zip (if appl.)	Pages
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1	Transmittal Letter	Transmittal849050.pdf	39400 652f5d4f5ffc8574bd09ca8df96c6e1f0b3de34	no	1
Warnings:					
Information:					
2	Amendment after Notice of Allowance (Rule 312)	AmendmentUnder37CFR849050.pdf	184034 d63fca6127326264a59e9dfa6fe579dc2ec025c8	no	7
Warnings:					
Information:					
3	Miscellaneous Incoming Letter	CommentsonStatement849050.pdf	45391 d3155e8f7116f38f71986c708aa252e7a5b84082	no	1
Warnings:					
Information:					
4	Issue Fee Payment (PTO-85B)	PartB849050.pdf	124555 fe1c42fa59fa8ea6949ffe90952480ae9c3bae1	no	2
Warnings:					
Information:					
5	Fee Worksheet (SB06)	fee-info.pdf	32070 fcadd09267cc14bfd8875608eba29067aaebc05	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			425450		
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>					

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of : Robert W. Heubel
Application No. : 13/603,578
Filed : September 5, 2012
For : Systems And Methods For Haptic
Confirmation Of Commands
Examiner : Pham, Toan Ngoc
Art Unit : 2684
Conf. No. : 1043

Mail Stop Issue Fee
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL

Commissioner:

Transmitted herewith are the following document(s) for filing in the above-identified application:

1. Transmittal;
2. Amendment Under 37 C.F.R. 1.312;
3. Comments on Statement Of Reasons For Allowance;
4. Part B – Fees Transmittal (PTOL-85B Form); and
5. EFS-Web Payment in the amount of \$2,080.00

The Commissioner is hereby authorized to charge any additional fees required by this action, or credit any overpayment, to Deposit Account Number 20-1430.

Respectfully submitted,

Date: 10/3/2013
KILPATRICK TOWNSEND &
STOCKTON LLP
1001 West Fourth Street
Winston-Salem, NC 27101
(336) 607-7300

By: 
Michael Morlock (Reg. No. 62245)

Certificate of Electronic Filing

I hereby certify that this correspondence is being electronically filed with the United States Patent Office via EFS-Web on October 3, 2013.


Laura J. Smith

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of : Robert W. Heubel
Application No. : 13/603,578
For : **Systems And Methods For Haptic Confirmation Of
Commands**
Filed : September 5, 2012
Examiner : Pham, Toan Ngoc
Art Unit : 2684
Confirmation No. : 1043

Mail Stop Issue Fee
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT UNDER 37 C.F.R. § 1.312

Sir:

The following Amendment and Remarks are submitted pursuant to 37 C.F.R. §
1.312.

Amendments to the Claims begin on page 2 of this paper.

Remarks begin on page 7 of this paper.

AMENDMENTS TO THE CLAIMS

1-16 (Cancelled)

17. (Previously Presented) A system for generating haptic effects to confirm receipt of a command, the system comprising:

a sensor;

a housing configured to be contacted by a user;

an actuator configured to output a haptic effect to the housing; and

a processor in communication with the sensor and the actuator, the processor

configured to:

receive, from the sensor, a sensor signal associated with a user input;

recognize the user input and determine a command associated with the

user input;

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

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.

18. (Previously Presented) The system of claim 17, wherein the sensor comprises an optical sensor.

19. (Previously Presented) The system of claim 18, wherein the user input comprises a focal point of a user's eyes.

20. (Previously Presented) The system of claim 17, wherein the processor is further configured to, if the user input is recognized and the command is determined:

execute a function associated with the user input;

generate a third actuator signal configured to cause the actuator to output a third haptic effect; and

transmit the third actuator signal to the actuator upon completion of execution of the function.

21. (Currently Amended) The system of claim ~~[[18]]~~ 20, wherein the third haptic effect is configured to emulate the function.

22. (Previously Presented) The system of claim 17, further comprising a speaker in communication with the processor, and wherein the processor is further configured to:

generate an audio signal configured to cause the speaker to output a sound; and

transmit the audio signal to the speaker.

23. (Previously Presented) The system of claim 17, further comprising a display in communication with the processor, and wherein the processor is further configured to:

generate a display signal configured to cause the display to display an image; and
transmit the display signal to the display.

24. (Previously Presented) The system of claim 17, wherein the first haptic effect is configured to emulate the command.

25. (Previously Presented) The system of claim 17, wherein the sensor, actuator, and processor are disposed within the housing.

26. (Previously Presented) The system of claim 17, wherein the housing comprises one of: a device configured to be worn by the user, a mobile phone, a personal digital assistant, a touch-sensitive surface, a medical alert device, a mouse, or a keyboard.

27. (Previously Presented) The system of claim 17, wherein the user input comprises an indication of a medical emergency.

28. (Previously Presented) The system of claim 17, wherein command is a request associated with an operation, and the first haptic effect is configured to provide information associated with the status of the operation.

29. (Previously Presented) 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.

30. (Previously Presented) The computer-implemented method of claim 29, wherein the
sensor comprises an optical sensor.

31. (Previously Presented) The computer-implemented method of claim 30, wherein the
user input comprises a focal point of a user's eyes.

32. (Previously Presented) The computer-implemented method of claim 29, wherein if
the user input is recognized and the command is determined:

executing a function associated with the command;

generating a third actuator signal configured to cause the actuator to output a third
haptic effect; and

transmitting the third actuator signal to the actuator upon completion of execution
of the function.

33. (Currently Amended) The computer-implemented method of claim [[30]] 32, wherein the third haptic effect is configured to emulate the function.

34. (Previously Presented) The computer-implemented method of claim 29, further comprising:

generating an audio signal configured to cause a speaker to output a sound; and
transmitting the audio signal to the speaker.

35. (Previously Presented) The computer-implemented method of claim 29, further comprising:

generating a display signal configured to cause a display to display an image; and
transmitting the display signal to the display.

36. (Previously Presented) The computer-implemented method of claim 29, wherein the first haptic effect is configured to emulate the command.

REMARKS

Applicant submits this amendment pursuant to 37 C.F.R. § 1.312. Applicant has amended claim 21 and 33 to correct minor typographical errors. These amendments do not add any new matter, and embody merely the correction of formal matters. Applicant respectfully requests the Examiner enter these amendments to the claims prior to their issuance.

Respectfully submitted,

Date: 10/3/2013



Michael Morlock
Reg. No. 62,245

KILPATRICK TOWNSEND & STOCKTON LLP
1001 West Fourth Street
Winston-Salem, NC 27101
(336) 607-7391 (voice)
(336) 734-2756 (fax)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of : Robert W. Heubel
Application No. : 13/603,578
For : **Systems And Methods For Haptic Confirmation Of Commands**
Filed : September 5, 2012
Examiner : Pham, Toan Ngoc
Art Unit : 2684
Confirmation No. : 1043


Mail Stop: Issue Fee
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

COMMENTS ON STATEMENT OF REASONS FOR ALLOWANCE

Under 37 C.F.R. §1.104(e), reasons for allowance are intended only as a supplement to the "record as a whole" when that record is not clear, and shall not be treated as a substitute for the record or in a manner inconsistent with the record. Thus, applicant accepts the examiner's reasons only to the extent that they are consistent with the record as a whole prior to the Examiner's statement of reasons for allowance, and does not accept any claim interpretation that is broader or narrower than that afforded by the record as a whole prior to the examiner's statement of reasons for allowance. No limitation or construction should be inferred from the examiner's statement under rule 104(e).

Respectfully submitted,

Date: 10/3/2013



Michael Morlock
Reg. No. 62,245

KILPATRICK TOWNSEND & STOCKTON LLP
1001 West Fourth Street
Winston-Salem, NC 27101
(336) 607-7474 (voice)
(336) 734-2629 (fax)



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/603,578	09/05/2012	Robert W. Heubel	IMM328.C1 (51851/849050)	1043
34300 7590 10/16/2013 PATENT DEPARTMENT (51851) KILPATRICK TOWNSEND & STOCKTON LLP 1001 WEST FOURTH STREET WINSTON-SALEM, NC 27101			EXAMINER PHAM, TOAN NGOC	
			ART UNIT 2684	PAPER NUMBER
			MAIL DATE 10/16/2013	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Response to Rule 312 Communication	Application No. 13/603,578	Applicant(s) HEUBEL ET AL.
	Examiner TOAN N. PHAM	Art Unit 2684

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

1. ☒ The amendment filed on 03 October 2013 under 37 CFR 1.312 has been considered, and has been:

a) ☒ entered.

b) ☐ entered as directed to matters of form not affecting the scope of the invention.

c) ☐ disapproved because the amendment was filed after the payment of the issue fee.

Any amendment filed after the date the issue fee is paid must be accompanied by a petition under 37 CFR 1.313(c)(1) and the required fee to withdraw the application from issue.

d) ☐ disapproved. See explanation below.

e) ☐ entered in part. See explanation below.

	/TOAN N PHAM/ Primary Examiner, Art Unit 2684
--	--

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of : Robert W. Heubel
Application No. : 13/603,578
For : **Systems And Methods For Haptic Confirmation Of
Commands**
Filed : September 5, 2012
Examiner : Pham, Toan Ngoc
Art Unit : 2684
Confirmation No. : 1043

OK TO ENTER: /TP/

Mail Stop Issue Fee
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDMENT UNDER 37 C.F.R. § 1.312

Sir:

The following Amendment and Remarks are submitted pursuant to 37 C.F.R. §
1.312.

Amendments to the Claims begin on page 2 of this paper.

Remarks begin on page 7 of this paper.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
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Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/603,578	11/12/2013	8581710	IMM328.C1 (51851/849050)	1043

34300 7590 10/23/2013
PATENT DEPARTMENT (51851)
KILPATRICK TOWNSEND & STOCKTON LLP
1001 WEST FOURTH STREET
WINSTON-SALEM, NC 27101

ISSUE NOTIFICATION

The projected patent number and issue date are specified above.

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b) (application filed on or after May 29, 2000)

The Patent Term Adjustment is 0 day(s). Any patent to issue from the above-identified application will include an indication of the adjustment on the front page.

If a Continued Prosecution Application (CPA) was filed in the above-identified application, the filing date that determines Patent Term Adjustment is the filing date of the most recent CPA.

Applicant will be able to obtain more detailed information by accessing the Patent Application Information Retrieval (PAIR) WEB site (<http://pair.uspto.gov>).

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Application Assistance Unit (AAU) of the Office of Data Management (ODM) at (571)-272-4200.

APPLICANT(s) (Please see PAIR WEB site <http://pair.uspto.gov> for additional applicants):

Robert W. Heubel, San Leandro, CA;
Erin Ramsay, Montreal, CANADA;

The United States represents the largest, most dynamic marketplace in the world and is an unparalleled location for business investment, innovation, and commercialization of new technologies. The USA offers tremendous resources and advantages for those who invest and manufacture goods here. Through SelectUSA, our nation works to encourage and facilitate business investment. To learn more about why the USA is the best country in the world to develop technology, manufacture products, and grow your business, visit SelectUSA.gov.

AO 120 (Rev. 08/10)

TO: Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
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In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court District of Delaware on the following

☐ Trademarks or ☒ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED 5/5/2016	U.S. DISTRICT COURT District of Delaware
PLAINTIFF Immersion Corporation		DEFENDANT Apple Inc., AT&T Inc., and AT&T Mobility LLC
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 US 8,749,507 B2	6/10/2014	Immersion Corporation
2 US 7,808,488 B2	10/5/2010	Immersion Corporation
3 US 8,581,710 B2	11/12/2013	Immersion Corporation
4 US 7,336,260 B2	2/26/2008	Immersion Corporation
5		

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY <input type="checkbox"/> Amendment <input type="checkbox"/> Answer <input type="checkbox"/> Cross Bill <input type="checkbox"/> Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1		
2		
3		
4		
5		

In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE
-------	-------------------	------

Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
 Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

Immersion Ex 2008-269
 Apple v Immersion
 IPR2017-01368

POWER OF ATTORNEY BY APPLICANT

I hereby revoke all previous powers of attorney given in the application identified in either the attached transmittal letter or the boxes below.

Application Number

Filing Date

(Note: The boxes above may be left blank if information is provided on form PTO/AIA/82A.)



I hereby appoint the Patent Practitioner(s) associated with the following Customer Number as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above:

95000

OR



I hereby appoint Practitioner(s) named in the attached list (form PTO/AIA/82C) as my/our attorney(s) or agent(s), and to transact all business in the United States Patent and Trademark Office connected therewith for the patent application referenced in the attached transmittal letter (form PTO/AIA/82A) or identified above. (Note: Complete form PTO/AIA/82C.)

Please recognize or change the correspondence address for the application identified in the attached transmittal letter or the boxes above to:



The address associated with the above-mentioned Customer Number

OR



The address associated with Customer Number:

95000

OR

Firm or
Individual Name

Address

City

State

Zip

Country

Telephone

Email

I am the Applicant (if the Applicant is a juristic entity, list the Applicant name in the box):

Immersion Corporation



Inventor or Joint Inventor (title not required below)



Legal Representative of a Deceased or Legally Incapacitated Inventor (title not required below)



Assignee or Person to Whom the Inventor is Under an Obligation to Assign (provide signer's title if applicant is a juristic entity)



Person Who Otherwise Shows Sufficient Proprietary Interest (e.g., a petition under 37 CFR 1.46(b)(2) was granted in the application or is concurrently being filed with this document) (provide signer's title if applicant is a juristic entity)

SIGNATURE of Applicant for Patent

The undersigned (whose title is supplied below) is authorized to act on behalf of the applicant (e.g., where the applicant is a juristic entity).

Signature

Date (Optional)

Name

Catherine Marsh

Title

Senior IP Patent Counsel, Immersion Corporation

NOTE: Signature - This form must be signed by the applicant in accordance with 37 CFR 1.33. See 37 CFR 1.4 for signature requirements and certifications. If more than one applicant, use multiple forms.

☐ Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.131, 1.32, and 1.33. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 3 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Electronic Acknowledgement Receipt

EFS ID:	26334083
Application Number:	13603578
International Application Number:	
Confirmation Number:	1043
Title of Invention:	Systems And Methods For Haptic Confirmation Of Commands
First Named Inventor/Applicant Name:	Robert W. Heubel
Customer Number:	34300
Filer:	Barry S. Goldsmith/Hilary Shannon
Filer Authorized By:	Barry S. Goldsmith
Attorney Docket Number:	IMM328.C1 (51851/849050)
Receipt Date:	13-JUL-2016
Filing Date:	05-SEP-2012
Time Stamp:	11:29:20
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		t9047-22259us02-poafire-.pdf	1010507	yes	3
			50e1c3be58257c671e064316b01646ct9d73770c		

	Multipart Description/PDF files in .zip description		
	Document Description	Start	End
	Assignee showing of ownership per 37 CFR 3.73	1	2
	Power of Attorney	3	3
Warnings:			
Information:			
Total Files Size (in bytes):		1010507	
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>			

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Robert W. HEUBEL et al.

Application No./Patent No.: 8,581,710

Filed/Issue Date: November 12, 2013

Titled: SYSTEMS AND METHODS FOR HAPTIC CONFIRMATION OF COMMANDS

Immersion Corporation, a corporation

(Name of Assignee)

(Type of Assignee, e.g., corporation, partnership, university, government agency, etc.)

states that it is:

1. ☒ the assignee of the entire right, title, and interest in;
2. ☐ an assignee of less than the entire right, title, and interest in
(The extent (by percentage) of its ownership interest is _____ %); or
3. ☐ the assignee of an undivided interest in the entirety of (a complete assignment from one of the joint inventors was made)

the patent application/patent identified above, by virtue of either:

A. ☒ An assignment from the inventor(s) of the patent application/patent identified above. The assignment was recorded in the United States Patent and Trademark Office at Reel 028906, Frame 0647, or for which a copy therefore is attached.

OR

B. ☐ A chain of title from the inventor(s), of the patent application/patent identified above, to the current assignee as follows:

1. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

2. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

3. From: _____ To: _____

The document was recorded in the United States Patent and Trademark Office at
Reel _____, Frame _____, or for which a copy thereof is attached.

☐ Additional documents in the chain of title are listed on a supplemental sheet(s).

☐ As required by 37 CFR 3.73(b)(1)(i), the documentary evidence of the chain of title from the original owner to the assignee was, or concurrently is being, submitted for recordation pursuant to 37 CFR 3.11.

[NOTE: A separate copy (i.e., a true copy of the original assignment document(s)) must be submitted to Assignment Division in accordance with 37 CFR Part 3, to record the assignment in the records of the USPTO. See MPEP 302.08]

The undersigned (whose title is supplied below) is authorized to act on behalf of the assignee.

/Barry S. Goldsmith/

07-13-2016

Signature

Date

Barry S. Goldsmith, Reg. No. 39,690

Attorney of Record

Printed or Typed Name

Title

This collection of information is required by 37 CFR 3.73(b). The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/603,578	09/05/2012	Robert W. Heubel	

95000
MILES & STOCKBRIDGE P.C.
Immersion Corporation
1751 Pinnacle Drive
Suite 1500
Tysons Corner, VA 22102-3833

CONFIRMATION NO. 1043
POA ACCEPTANCE LETTER



Date Mailed: 07/15/2016

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 07/13/2016.

The Power of Attorney in this application is accepted. Correspondence in this application will be mailed to the above address as provided by 37 CFR 1.33.

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/rmtturner myles/



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
13/603,578	09/05/2012	Robert W. Heubel	

34300
Kilpatrick Townsend and Stockton, LLP
1001 W Fourth Street
Winston-Salem, NC 27101

CONFIRMATION NO. 1043
POWER OF ATTORNEY NOTICE



OC000000084391290

Date Mailed: 07/15/2016

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 07/13/2016.

- The Power of Attorney to you in this application has been revoked by the assignee who has intervened as provided by 37 CFR 3.71. Future correspondence will be mailed to the new address of record(37 CFR 1.33).

Questions about the contents of this notice and the requirements it sets forth should be directed to the Office of Data Management, Application Assistance Unit, at (571) 272-4000 or (571) 272-4200 or 1-888-786-0101.

/rmtturner myles/

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

"FEE ADDRESS" INDICATION FORM

Address to:
Mail Stop M Correspondence
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Fax to:
571-273-6500

- OR -

INSTRUCTIONS: The issue fee must have been paid for application(s) listed on this form. In addition, only an address represented by a Customer Number can be established as the fee address for maintenance fee purposes (hereafter, fee address). A fee address should be established when correspondence related to maintenance fees should be mailed to a different address than the correspondence address for the application. **When to check the first box below:** If you have a Customer Number to represent the fee address. **When to check the second box below:** If you have no Customer Number representing the desired fee address, in which case a completed Request for Customer Number (PTO/SB/125) must be attached to this form. For more information on Customer Numbers, see the Manual of Patent Examining Procedure (MPEP) § 403.

For the following listed application(s), please recognize as the "Fee Address" under the provisions of 37 CFR 1.363 the address associated with:



Customer Number:

00204

OR



The attached Request for Customer Number (PTO/SB/125) form.

PATENT NUMBER (if known)	APPLICATION NUMBER
8,581,710	13/603,578

Completed by (check one):



Applicant/Inventor

/Barry S. Goldsmith/

Signature



Attorney or Agent of record 39690
 (Reg. No.)

Barry S. Goldsmith

Typed or printed name



Assignee of record of the entire interest. See 37 CFR 3.71.
 Statement under 37 CFR 3.73(b) is enclosed.
 (Form PTO/SB/96)

703-610-8680

Requester's telephone number



Assignee recorded at Reel _____ Frame _____

July 15, 2016

Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.



* Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.363. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 5 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND COMPLETE D FORMS TO THIS ADDRESS. **SEND TO: Mail Stop M Correspondence, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Immersion Ex 2008-277
 Apple v Immersion
 IPR2017-01368

Privacy Act Statement

The **Privacy Act of 1974 (P.L. 93-579)** requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. Accordingly, pursuant to the requirements of the Act, please be advised that: (1) the general authority for the collection of this information is 35 U.S.C. 2(b)(2); (2) furnishing of the information solicited is voluntary; and (3) the principal purpose for which the information is used by the U.S. Patent and Trademark Office is to process and/or examine your submission related to a patent application or patent. If you do not furnish the requested information, the U.S. Patent and Trademark Office may not be able to process and/or examine your submission, which may result in termination of proceedings or abandonment of the application or expiration of the patent.

The information provided by you in this form will be subject to the following routine uses:

1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether disclosure of these records is required by the Freedom of Information Act.
2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.
3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).
5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (*i.e.*, GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspection or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Electronic Acknowledgement Receipt

EFS ID:	26362296
Application Number:	13603578
International Application Number:	
Confirmation Number:	1043
Title of Invention:	Systems And Methods For Haptic Confirmation Of Commands
First Named Inventor/Applicant Name:	Robert W. Heubel
Customer Number:	95000
Filer:	Barry S. Goldsmith/Hilary Shannon
Filer Authorized By:	Barry S. Goldsmith
Attorney Docket Number:	T9047-22259US02; IMM328C1
Receipt Date:	15-JUL-2016
Filing Date:	05-SEP-2012
Time Stamp:	13:46:22
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Maintenance Fee Address Change	T9047-22259US02- FEEADDRESSINDICATIONFORM -immersion.pdf	203971 3054229f14494c05157966594f3c51636661cd5a	no	2

Warnings:

Immersion Ex 2008-279

Apple v Immersion
IPR2017-01368

Information:	
Total Files Size (in bytes):	203971
<p>This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.</p> <p><u>New Applications Under 35 U.S.C. 111</u> If a new application is being filed and the application includes the necessary components for a filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application.</p> <p><u>National Stage of an International Application under 35 U.S.C. 371</u> If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.</p> <p><u>New International Application Filed with the USPTO as a Receiving Office</u> If a new international application is being filed and the international application includes the necessary components for an international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.</p>	

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

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Alexandria, VA 22313-1450

Fax to:
571-273-6500

- OR -

INSTRUCTIONS: The issue fee must have been paid for application(s) listed on this form. In addition, only an address represented by a Customer Number can be established as the fee address for maintenance fee purposes (hereafter, fee address). A fee address should be established when correspondence related to maintenance fees should be mailed to a different address than the correspondence address for the application. **When to check the first box below:** If you have a Customer Number to represent the fee address. **When to check the second box below:** If you have no Customer Number representing the desired fee address, in which case a completed Request for Customer Number (PTO/SB/125) must be attached to this form. For more information on Customer Numbers, see the Manual of Patent Examining Procedure (MPEP) § 403.

For the following listed application(s), please recognize as the "Fee Address" under the provisions of 37 CFR 1.363 the address associated with:



Customer Number:

00204

OR



The attached Request for Customer Number (PTO/SB/125) form.

PATENT NUMBER (if known)	APPLICATION NUMBER
8,581,710	13/603,578

Completed by (check one):



Applicant/Inventor

/Barry S. Goldsmith/

Signature



Attorney or Agent of record 39690
 (Reg. No.)

Barry S. Goldsmith

Typed or printed name



Assignee of record of the entire interest. See 37 CFR 3.71.
 Statement under 37 CFR 3.73(b) is enclosed.
 (Form PTO/SB/96)

703-610-8680

Requester's telephone number



Assignee recorded at Reel _____ Frame _____

August 10, 2016

Date

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.



* Total of _____ forms are submitted.

This collection of information is required by 37 CFR 1.363. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 5 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND COMPLETE D FORMS TO THIS ADDRESS. **SEND TO: Mail Stop M Correspondence, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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EFS ID:	26598566
Application Number:	13603578
International Application Number:	
Confirmation Number:	1043
Title of Invention:	Systems And Methods For Haptic Confirmation Of Commands
First Named Inventor/Applicant Name:	Robert W. Heubel
Customer Number:	95000
Filer:	Barry S. Goldsmith/Hilary Shannon
Filer Authorized By:	Barry S. Goldsmith
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File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Maintenance Fee Address Change	T9047-22259US02feeaddress.pdf	203982	no	2
			e496320ef358f61ca0e6d3fc15bd66c939a74742		

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner,

v.

IMMERSION CORPORATION,
Patent Owner.

Case IPR2016-01603
Patent 8,581,710 B2

Before MICHAEL R. ZECHER, BRYAN F. MOORE, and MINN CHUNG,
Administrative Patent Judges.

CHUNG, *Administrative Patent Judge.*

DECISION

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

I. INTRODUCTION

Apple Inc. (“Petitioner”) filed a Petition (Paper 1, “Pet.”) requesting an *inter partes* review of claims 1, 7–10, and 12 (the “challenged claims”) of U.S. Patent No. 8,581,710 B2 (Ex. 1001, “the ’710 patent”). Immersion Corporation (“Patent Owner”) filed a Preliminary Response (Paper 6, “Prelim. Resp.”).

The standard for instituting an *inter partes* review is set forth in 35 U.S.C. § 314(a), which provides that an *inter partes* review may not be instituted unless the information presented in the Petition “shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” For the reasons described below, we determine that Petitioner has established a reasonable likelihood of prevailing in showing the unpatentability of claims 1, 7–10, and 12. Accordingly, we institute an *inter partes* review of claims 1, 7–10, and 12 of the ’710 patent.

II. BACKGROUND

A. Real Party In Interest

Apple Inc. identifies itself as the real-party-in-interest. Pet. 1.

B. Related Proceedings

According to the parties, the ’710 patent is the subject of the following proceedings: (1) *Immersion Corp. v. Apple Inc.*, Nos. 1:16-cv-00077 and 1:16-cv-00325 (D. Del.); and (2) *In the Matter of: Certain Mobile and Portable Electronic Devices Incorporating Haptics (Including Smartphones and Laptops) and Components Thereof*, ITC Investigation No. 337-TA-1004 (USITC). Pet. 1; Paper 4, 2.

III. THE '710 PATENT

A. Described Invention

The '710 patent describes a system and method for haptic confirmation of commands on electronic devices. Ex. 1001, Abstract. In one exemplary embodiment, the device recognizes a speech input, e.g., “call home,” and determines a command associated with the recognized speech, e.g., making a telephone call to the phone number designated as “home.” *Id.* at col. 2, ll. 17–25. If the spoken command is recognized successfully, the device generates a haptic effect to provide a tactile feedback to the user that the command has been recognized and that the device will perform the requested function. *Id.* at col. 2, ll. 19–23. If, on the other hand, the device does not recognize a command, it generates a different haptic effect to indicate that no command is recognized and that no function will be performed. *Id.* at col. 2, ll. 25–29.

In another embodiment, the device recognizes a touch input on a touch-sensitive display and determines a command corresponding to the touch input. *Id.* at col. 12, ll. 30–45. Figure 6 of the '710 patent is reproduced below.

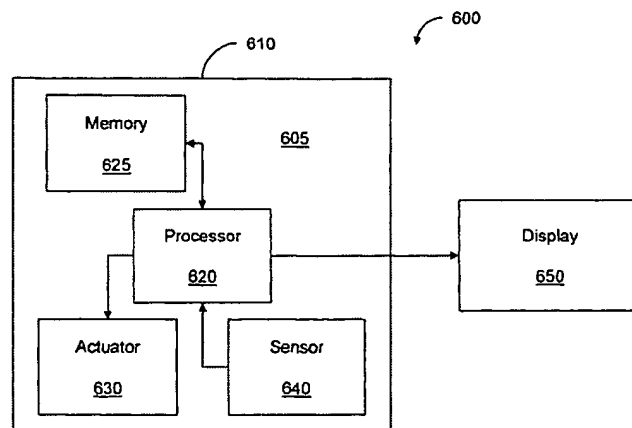


Figure 6

Figure 6 depicts a block diagram of a system for haptic confirmation of commands in an exemplary embodiment. *Id.* at col. 11, ll. 12–14. As shown in Figure 6 above, the system comprises device 610 having housing 605, and display 650, which may be coupled to the housing or disposed within the housing. *Id.* at col. 11, ll. 14–15, 21–22. Device 610, in turn, comprises processor 620, memory 625, actuator 630, and sensor 640. *Id.* at col. 11, ll. 15–17. In an embodiment, display 650 is a touch-sensitive display, which transmits sensor signals to the processor when a user touches a location on the touch-sensitive display. *Id.* at col. 12, ll. 32–34.

Upon receiving sensor signals from the touch-sensitive display, the processor attempts to identify a command corresponding to the signals, e.g., a button or other user interface element on the display corresponding to the location of the user touch on the touch-sensitive display. *Id.* at col. 12, ll. 38–42. If the processor determines a command corresponding to the user touch input, it generates an actuator signal to produce a haptic effect that indicates that a command was recognized successfully. *Id.* at col. 12, ll. 42–45, 53–56. Otherwise, the processor generates another actuator signal to

produce a haptic effect that indicates no command was recognized. *Id.* at col. 12, ll. 46–49. In either case, the processor then transmits the actuator signal to the actuator to output the appropriate haptic effect. *Id.* at col. 12, ll. 49–52, 56–59. If a command has been recognized, the processor executes the function associated with the command. *Id.* at col. 12, ll. 59–61.

B. Illustrative Claim

Claim 1 is the only independent claim at issue. Claims 7–10 and 12 depend directly from claim 1. Claim 1 is illustrative of the challenged claims and is reproduced below:

1. A system for generating haptic effects to confirm receipt of a command, the system comprising:

- a sensor;
- a housing configured to be contacted by a user;
- an actuator configured to output a haptic effect to the housing; and
- a processor in communication with the sensor and the actuator, the processor configured to:
 - receive, from the sensor, a sensor signal associated with a user input;
 - recognize the user input and determine a command associated with the user input;
 - 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
 - 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.

Ex. 1001, col. 13, l. 64–col. 14, l. 17.

IV. PETITIONER'S CHALLENGES

A. Prior Art Cited in Petitioner's Challenges

Petitioner cites the following references in its challenges to patentability.

Reference and Relevant Date	Designation	Exhibit No.
U.S. Patent No. 7,336,260 B2 (issued Feb. 26, 2008)	Martin ¹	Ex. 1004
Nokia 9110 Communicator User's Manual (1999) ²	Nokia	Ex. 1008
U.S. Patent Application Pub. No. 2003/0067440 A1 (published Apr. 10, 2003)	Rank	Ex. 1010

B. Asserted Grounds of Unpatentability

Petitioner asserts the following grounds of unpatentability (Pet. 3):

Claim(s) Challenged	Statutory Basis	Reference(s)
1, 7–10, and 12	§ 103(a)	Martin
1, 7, 9, 10, and 12	§ 103(a)	Martin and Nokia
8	§ 103(a)	Martin, Nokia, and Rank

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

² Petitioner asserts that Nokia was published in 1999. Pet. 29.

V. CLAIM CONSTRUCTION

In an *inter partes* review, claim terms in an unexpired patent are given their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b); *see Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144 (2016) (holding that 37 C.F.R. § 42.100(b) “represents a reasonable exercise of the rulemaking authority that Congress delegated to the . . . Office”). Under the broadest reasonable interpretation (BRI) standard, and absent any special definitions, claim terms generally are given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art, in view of the specification. *In re Translogic Tech. Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). Any special definitions for claim terms or phrases must be set forth with reasonable clarity, deliberateness, and precision. *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). A particular embodiment appearing in the written description generally is not incorporated into a claim if the claim language is broader than the embodiment. *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993).

Petitioner and Patent Owner address the claim term “haptic effect . . . configured to emulate the command” recited in claim 8. Pet. 8–9; Prelim. Resp. 5–6. Patent Owner also discusses the claim language “if . . . otherwise . . .” recited in claim 1. Prelim. Resp. 6–9. For purposes of this decision, we need not construe explicitly the claim language identified above in order to determine whether there is a reasonable likelihood of Petitioner prevailing with respect to the challenged claims. *See* 35 U.S.C. § 314(a); *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (“[O]nly

those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy.”).

VI. ANALYSIS OF PETITIONER’S PRIOR ART CHALLENGES

A. Claims 1, 7–10, and 12 as Obvious Over Martin

Petitioner contends claims 1, 7–10, and 12 are unpatentable as obvious under 35 U.S.C. § 103(a) over Martin. Pet. 9–29. In support of its contentions, Petitioner submits the Declaration of Dr. Tony Givargis (Ex. 1002, “Givargis Decl.”). *Id.* For the reasons discussed below, we are persuaded that Petitioner has demonstrated a reasonable likelihood that it will prevail in its challenge to claims 1, 7–10, and 12 as obvious over Martin.

1. Relevant Principles of Law

A claim is unpatentable under § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) where in evidence, so-called secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

2. Overview of Martin (Ex. 1004)

Martin describes a method and system for providing tactile sensations on electronic devices. Ex. 1004, Abstract. Figure 7 of Martin is reproduced below.

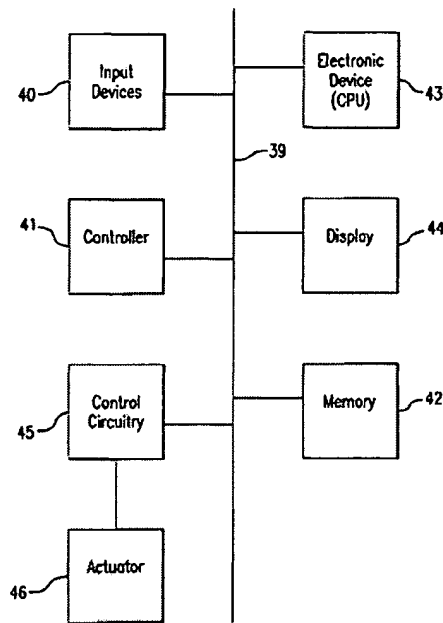


FIG. 7

Figure 7 depicts a block diagram illustrating the components of an exemplary system of Martin. *Id.* at col. 13, ll. 25–28. According to Martin, the components shown in Figure 7 communicate with each other across common communication bus 39. *Id.* at col. 13, ll. 26–28. For example, input devices 40 produce input signals, which are communicated to controller 41 over common communication bus 39. *Id.* at col. 13, ll. 28–31. Controller 41 may also receive position and pressure data associated with the input signals from the input devices. *Id.* at col. 13, ll. 31–33. In an embodiment, display 44 may be part of an input device, such as when the display includes a touchpad or touchscreen. *Id.* at col. 13, ll. 43–46. To provide tactile feedback, controller 41 commands control circuitry 45 to

drive actuator 46 to produce the desired tactile sensation in the appropriated input device, such as the touchscreen. *Id.* at col. 13, ll. 54–58.

Figure 5 of Martin is reproduced below.

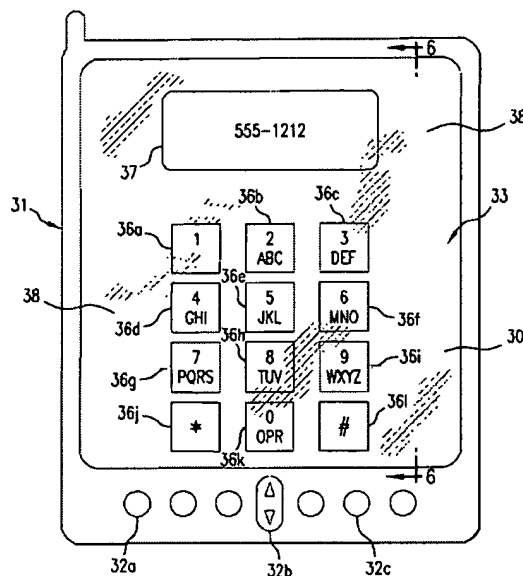


FIG. 5

Figure 5 depicts Personal Digital Assistant (PDA) 31 having pressure-sensitive touchpad 30 as an input device. *Id.* at col. 11, ll. 11–13. As shown in Figure 5, display 33 of PDA 31 displays software-generated buttons or keys, e.g., soft-keys 36a–36i, which provide a graphical user interface for the PDA. *Id.* at col. 11, ll. 41–45. As a graphical object, each soft-key occupies a distinct location on the display. *Id.* at col. 11, ll. 45–46.

In the embodiment depicted in Figure 5, the PDA can function as a mobile telephone, and the soft-keys are arranged as a telephone keypad to provide the same functionality as the mechanical keys on a conventional telephone keypad. *Id.* at col. 11, ll. 46–49. PDA 31 also includes actuator 64 (not shown in Figure 5) that generates and transmits tactile sensations to display 33 and touchpad 30. *Id.* at col. 11, ll. 22–39; Fig. 6.

When a soft-key is selected by touching touchpad 30 at an appropriate location on display 33, a controller determines the touched location on the display and identifies the soft-key corresponding to the touched location. *Id.* at col. 11, ll. 53–63. Based on this information, the controller causes the actuator to provide a corresponding tactile sensation. *Id.* at col. 11, ll. 63–65. The controller also determines when an input is ambiguous, such as when two or more soft-keys are pressed simultaneously or when an area of the display containing no graphics, e.g., area 38, is touched. *Id.* at col. 12, ll. 1–4. When a touch input is deemed ambiguous, the controller causes the actuator to output an appropriate tactile sensation. *Id.* at col. 12, ll. 1–5.

Figure 8 of Martin is reproduced below.

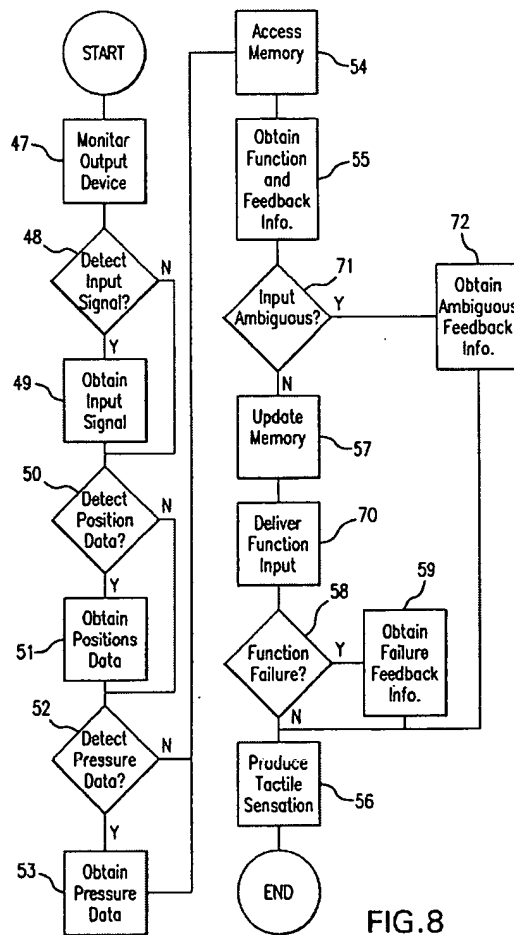


FIG. 8

Figure 8 shows a flowchart illustrating a process of detecting an input signal, the input position or location data, and the pressure data; determining the desired function corresponding to the detected data; and producing a tactile sensation corresponding to the determined function. *Id.* at col. 13, l. 52–col. 14, l. 14. In steps 54 and 55 of Figure 8, the controller, having obtained the input data from the input device, accesses a memory device and a database stored in the memory device, which contains information necessary to determine, based on the input data, the desired function and the corresponding tactile sensation. *Id.* at col. 14, ll. 15–20.

In one embodiment, this information—i.e., the associations between the detected input data, the desired functions of the input device, and the corresponding tactile sensations to be generated—is maintained in a table, such as the table shown in Figure 9. *Id.* at col. 14, ll. 21–25. Figure 9 of Martin is reproduced 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

Figure 9 shows a table of exemplar grouping of associations for various input devices.

As shown in Figure 9, the table maintains, for each input device, the possible combinations of input signals, position data, and pressure data, as well as the associated function and the distinct tactile sensation corresponding to each combination. *Id.* at col. 14, ll. 23–30. Based on the data obtained from monitoring the input device, the controller reads the table and determines the associated function and the corresponding tactile feedback. *Id.* at col. 14, ll. 32–35. The controller then causes the actuator to generate the specified tactile sensation. *Id.* at col. 11, ll. 53–66; col. 14, ll. 46–50. If the combination of the detected input signal, position data, and pressure data is not found in the table, the input is deemed ambiguous. *Id.* at col. 16, ll. 3–7. An ambiguous input can also result from simultaneous input from two input devices or an input from a portion of a touchpad that is not associated with an input device. *Id.* at col. 16, ll. 7–10. When an ambiguous input is received, the controller produces a distinct tactile sensation associated with ambiguous input, such as “Sensation 22” listed in Figure 9. *Id.* at col. 16, ll. 10–14.

3. Discussion

a. Level of Skill in the Art

The person of ordinary skill in the art is a hypothetical person who is presumed to have known the relevant art at the time of the invention. *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). In determining the level of skill in the art, various factors may be considered, including the types of problems encountered in the art, prior art solutions to those problems, the sophistication of the technology, rapidity with which innovations are made,

and educational level of active workers in the field. *Id.* In addition, we are guided by the level of skill in the art reflected by the prior art of record. *See Okajima v. Bourdeau*, 261 F.3d. 1350, 1355 (Fed. Cir. 2001).

Relying upon the Declaration of Dr. Givargis, Petitioner contends that a person of ordinary skill in the art at the time of the 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. According to Petitioner, additional graduate education could substitute for professional experience and significant experience in the field could substitute for formal education. Pet. 6–7 (citing Ex. 1002 ¶ 39). Patent Owner cites the Declaration of Yon Visell, Ph.D. (Ex. 2001), and argues that a person of ordinary skill in the art would have had at least: (1) a Bachelor's of Science degree in an engineering discipline such as Mechanical Engineering or Computer Science; or (2) at least two years of experience working with human machine interface systems, graphical user interfaces, haptic feedback systems, speech recognition systems, biomechanics, or mobile devices or equivalent embedded systems. Prelim. Resp. 4–5 (citing Ex. 2001 ¶ 30). According to Patent Owner, despite the differences between the parties' proposed level of skill in the art, the conclusions regarding unpatentability would be the same regardless of whose definition is applied. *Id.* at 5.

On this record, for purposes of this Decision, we determine that the level of skill in the art is evidenced by the prior art of record and the type of problems and solutions described in the '710 patent, and includes experience in haptic response technology in mobile systems with touchscreen. *See*

Ex. 1001, col. 2, ll. 16–29, col. 12, ll. 30–52; Ex. 1004, Abstract, col. 11, l. 11–col. 12, l. 1.

b. Claim 1

Claim 1 recites structural limitations, such as a “sensor,” a “housing,” an “actuator,” and a “processor,” as well as functional limitations performed by the claimed “processor.” Ex. 1001, col. 13, l. 64–col. 14, l. 17. Petitioner contends that the embodiment depicted in Figure 7 of Martin (reproduced in Section VI.A.2 above), by itself or in view of the teachings of other embodiments of Martin, teaches all of the structural limitations of claim 1. *See* Pet. 14–17. For example, Petitioner asserts that input devices 40 of Figure 7, such as touchpads, include a sensor. *Id.* at 14 (citing Ex. 1004, col. 15, ll. 34–35, 54–55, Fig. 7; Ex. 1002 ¶ 54). Petitioner further contends that Martin teaches “a housing configured to be contacted by a user” because Martin describes that the electronic device of Figure 7 can have a case or housing and can be incorporated into a mobile phone. *Id.* at 14–15 (citing Ex. 1004, col. 4, ll. 40–41, col. 16, ll. 59–61; Ex. 1002 ¶ 56). Similarly, Petitioner asserts that actuator 46 depicted in Figure 7 of Martin teaches “an actuator configured to output a haptic effect to the housing” in view of another embodiment of Martin, which describes that “[t]he vibrotactile actuator 6 can also be mounted to a portion of the case or housing of the electronic device in which the apparatus 1 is disposed, communicating the tactile sensations to the entire electronic device.” *Id.* at 15–16 (citing Ex. 1004, col. 4, ll. 39–42, Fig. 7). Citing the Declaration of Dr. Givargis, Petitioner contends that a person of ordinary skill in the art would have combined Martin’s embodiments, as proposed by Petitioner, because Martin envisages expressly mounting an actuator to the housing so that the tactile

sensations would be communicated to the housing. *Id.* at 15–16 (citing Ex. 1002 ¶ 58).

In addition, Petitioner contends that controller 41 depicted in Figure 7 teaches “a processor in communication with the sensor and the actuator” recited in claim 1 in view of other embodiments of Martin, such as the embodiment depicted in Figure 1, which describes that controllers can be “digital logical processors” and can “execute algorithms, and generate output as necessary to create[] the desired tactile sensations in the input device in response to the inputs received from that input device.” *Id.* at 16–17 (citing Ex. 1004, col. 4, l. 66–col. 5, l. 1, col. 5, ll. 3–30, col. 13, ll. 28–31, 54–58, Fig. 1; Ex. 1002 ¶¶ 59, 60). Petitioner contends that a person of ordinary skill in the art would have had a sufficient reason to combine the embodiments of Figures 1 and 7 because Martin expressly contemplates that a controller can be a microprocessor or a central processing unit of the electronic device. *Id.* (citing Ex. 1004, col. 5, ll. 3–30; Ex. 1002 ¶ 60).

Petitioner further contends that the operation of the controller of Martin, as described in Figures 7, 8, and 9 (reproduced in Section VI.A.2 above) and their accompanying text, teaches the functional limitations performed by the claimed “processor.” *Id.* at 17–23. For example, Petitioner contends that Martin teaches the processor is configured to “recognize the user input and determine a command associated with the user input,” as recited in claim 1, because Martin’s controller, upon receiving input from an input device, attempts to match the received input data to the entries maintained in a table shown in Figure 9 to determine the desired function associated with the input data. *Id.* at 17–19 (citing Ex. 1004, col. 13, ll. 54–58, col. 14, ll. 22–31, Fig. 9). According to Petitioner, Martin

teaches that a function associated with an input signal, e.g., “Function 1” listed in Figure 9 as corresponding to the input signal “Input 7” with a pressure of “Pressure 1” at the location “Location 1,” can represent “one set of menus from a list of menus,” i.e., a command associated with an user input. *Id.* at 18–19 (citing Ex. 1004, col. 16, ll. 33–35).

Petitioner also contends that Martin teaches the “if . . . otherwise . . .” conditional limitations recited in claim 1. These limitations recite two mutually exclusive blocks of steps performed by the processor depending on whether or not a certain condition precedent is met: (1) “if the user input is recognized and the command is determined,” generating “a first actuator signal” and transmitting it to the actuator (the “if-block” steps); or (2) “otherwise,” generating “a second actuator signal” and transmitting it to the actuator (the “otherwise-block” steps). Ex. 1001, col. 14, ll. 9–17.

Petitioner asserts that the embodiment depicted in Figure 9 of Martin teaches the “if-block” limitations. Pet. 19–21. According to Petitioner, Figure 9 of Martin shows that, when the command associated with the input signal “Input 7” is determined to be “Function 1,” Martin’s controller generates a signal to produce the tactile sensation “Sensation 20” corresponding to “Function 1.” *Id.* at 19–20 (citing Ex. 1004, col. 13, ll. 54–58, col. 14, ll. 22–27, 50–57, Fig. 9; Ex. 1002 ¶ 64). Petitioner further argues that Martin teaches transmitting the generated signal to the actuator because Martin describes that the signal generated by the controller is transmitted to the control circuitry, which, in turn, drives the actuator to produce the desired tactile sensation, e.g., “Sensation 20” corresponding to “Function 1” discussed above. *Id.* at 20–21 (citing Ex. 1004, col. 13, ll. 54–58, col. 14, ll. 22–27, 50–57; Ex. 1002 ¶ 65).

Petitioner further contends that Martin also teaches the “otherwise-block” limitations—that is, the processor generating “a second actuator signal” to cause the actuator to output a second haptic effect, and transmitting the signal to the actuator when the condition “if the user input is recognized and the command is determined” is *not* met. *Id.* at 22–23. In support of its contention, Petitioner cites Martin’s disclosure that, when the received input is *not* listed as a recognized input in the table of Figure 9, the input is considered ambiguous. *Id.* at 22 (citing Ex. 1004, col. 16, ll. 3–10, Fig. 9; Ex. 1002 ¶ 67). In that event, according to Petitioner, Martin’s controller generates the associated ambiguous tactile sensation, e.g., “Sensation 22” associated with the AMBIGUOUS input, as shown in Figure 9. *Id.* (citing Ex. 1004, col. 16, ll. 10–14). In addition, Petitioner asserts that, although Martin does not disclose explicitly causing the actuator to output “Sensation 22,” Martin nonetheless teaches transmitting the signal to the actuator to produce the ambiguous tactile sensation “Sensation 22” in view of Martin’s teaching of producing tactile sensations discussed above. *Id.* at 22–23. Petitioner contends that a person of ordinary skill in the art would have had a sufficient reason to combine the embodiments because Martin expressly contemplates that Martin’s controller generates and outputs a signal to an actuator configured to output a haptic effect. *Id.* (citing Ex. 1002 ¶ 69). According to Petitioner, the proposed combination would have represented applying a known solution to the known problem of causing a controller to output an appropriate tactile stimulation. *Id.* at 23 (citing Ex. 1002 ¶ 69).

Patent Owner does not dispute specifically Petitioner’s contentions that Martin teaches the structural limitations recited in claim 1. Instead,

Patent Owner focuses on the “if . . . otherwise . . .” conditional limitations, and contends that Martin does not teach the “otherwise” portion of the conditional limitations. Prelim. Resp. 6–9, 10–14. Addressing the meaning of the conditional limitations, Patent Owner asserts that the “otherwise” portion should be interpreted to mean that a second haptic effect is generated “if the user input is *not* recognized or a command is *not* determined.” *Id.* at 7–8 (emphasis added). Patent Owner argues that Petitioner’s contention with respect to Figure 9 of Martin amounts to the assertion that the user input is “recognized” and a command “determined” whenever any entry in the lookup table of Figure 9 is accessed (*id.* at 11), including when the entry labeled “AMBIGUOUS” is accessed (*id.* at 7, 10–11). Hence, Patent Owner argues that Martin’s disclosure regarding the ambiguous input may teach the “if-block” steps of claim 1, but not the “otherwise” portion. *Id.* at 7, 12–13. Patent Owner argues that Martin, therefore, does not render claim 1 obvious because Martin does not teach the “otherwise-block” limitations. *Id.* at 13.

We are not persuaded by Patent Owner’s argument because, under the broadest reasonable interpretation standard, a prior art reference need not satisfy the “otherwise” portion to render claim 1 obvious. *See Ex Parte Schulhauser*, No. 2013-007847, 2016 WL 6277792 (PTAB April 28, 2016) (precedential) (holding that the broadest reasonable interpretation of a claim encompassed situations in which conditional method steps “need not be reached”). As discussed above, the steps recited in the “if-block” and the “otherwise-block” are mutually exclusive from each other. Patent Owner’s reading of the claim appears to be consistent with this understanding. *See* Prelim. Resp. 8 (Patent Owner arguing that the steps in the “otherwise” portion are performed “*only* if the user input is *not* recognized or a command

is *not* determined.”) (emphases added). Hence, 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. Under *Schulhauser*, 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. *See Ex Parte Schulhauser*, 2016 WL 6277792, at *4. Therefore, Martin 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. *See id.* (“The Examiner did not need to present evidence of the obviousness of the remaining method steps of claim 1 that are not required to be performed under a broadest reasonable interpretation of the claim.”). In other words, in order to demonstrate a reasonable likelihood of prevailing with respect to claim 1, Petitioner only needs to make a sufficient showing that Martin teaches all of the structural limitations and all of the functional limitations of claim 1 up to the “if-block” limitations.

Patent Owner does not dispute Martin teaches the “if-block” or the “if step” of the “if . . . otherwise . . .” conditional limitations. *See generally* Prelim. Resp. 10–11, 13. As discussed above, Patent Owner also does not dispute Martin teaches the structural limitations or other functional limitations recited in claim 1. *See generally id.* Based on the record presented, for purposes of this Decision, we are persuaded Petitioner has demonstrated sufficiently that a person of ordinary skill in the art would have combined the teachings of Martin as Petitioner proposes, and that the proposed combination teaches all of the structural limitations and all of the

functional limitations recited in claim 1 up to the “if-block” limitations. Although we are not necessarily persuaded by Patent Owner’s characterization of Petitioner’s contentions regarding Martin’s handling of the ambiguous input, and Petitioner may have shown sufficiently that Martin teaches the “otherwise-block” limitations as well, for purposes of this Decision, we need not address the issue to determine that there is a reasonable likelihood of Petitioner prevailing with respect to claim 1.

Patent Owner further contends that Petitioner has presented insufficient supporting evidence to show Martin renders claim 1 obvious because the Givargis Declaration simply repeats the conclusory assertions made in the Petition. *Id.* at 14–15. We are not persuaded by Patent Owner’s argument because the mere fact that the content of an expert declaration is similar or essentially identical to certain portions of the Petition does not necessarily compel the conclusion that the content of the Petition or the expert declaration is unsupported or conclusory in nature. As outlined above in the context of our discussion of Petitioner’s contentions, for purposes of this Decision, we are persuaded Petitioner has presented and developed sufficient evidence to show that Martin teaches all of the structural limitations and all of the functional limitations recited in claim 1 up to the “if-block” limitations.

Based on the record presented, and for purposes of this Decision, we are persuaded that Petitioner has demonstrated sufficiently that the differences between the claimed subject matter of claim 1 and Martin are such that the subject matter, as a whole, would have been obvious to a person having ordinary skill in the art at the time of the filing of the ’710 patent. Accordingly, we are persuaded that Petitioner has demonstrated a

reasonable likelihood of prevailing in its challenge to claim 1 under 35 U.S.C. § 103(a) as obvious over Martin.

c. Claims 7–10

Claims 7–10 depend directly from claim 1. Petitioner contends that Martin teaches the additionally recited limitations of claims 7–10. Pet. 23–28. We discuss Petitioner’s contentions for each of these claims below.

Claim 7 depends from claim 1, and further recites that the system further comprises “a display in communication with the processor,” and “the processor is further configured to: generate a display signal configured to cause the display to display an image; and transmit the display signal to the display.” Ex. 1001, col. 14, ll. 38–43. Petitioner contends that Martin teaches “a display in communication with the processor” because Martin describes that display 44 depicted in Figure 7 is in communication with the controller 41 via communications bus 39. Pet. 23–24 (citing Ex. 1004, col. 13, ll. 26–28, 43–46, Fig. 7). Petitioner further asserts that Martin teaches “the processor is further configured to: generate a display signal configured to cause the display to display an image; and transmit the display signal to the display,” as recited in claim 7, because Martin describes that controller 41 controls and updates display 44. *Id.* at 24–25 (citing Ex. 1004, col. 13, ll. 46–50). Petitioner also refers back to its discussion of Martin’s disclosure of displaying menus on the display, and argues that a person of ordinary skill would have understood that Martin’s controller would cause the display to display an image because graphical user interfaces were well-known in the art at the time of the invention of the ’710 patent. *Id.* at 25 (citing *id.*, § IV.D.1.g; Ex. 1002 ¶ 73).

Claim 8 depends from claim 1, and further recites “the first haptic effect is configured to emulate the command.” Ex. 1001, col. 14, ll. 44–45. Petitioner contends that Martin describes a haptic effect in the form of a “pop,” which would be understood by a person of ordinary skill to be a vibration of short duration. Pet. 26 (citing Ex. 1004, col. 18, ll. 33–34; Ex. 1002 ¶ 76). Petitioner further asserts that Martin describes that the number of pops may correspond to “the index number of the menu option within a list of options,” such that “one pop signifies the first option, [and] two pops signifies the second option.” *Id.* (citing Ex. 1004, col. 18, ll. 33–37). Petitioner contends that a person of ordinary skill in the art would have had a sufficient reason to combine this embodiment with Martin’s teaching of menus as a function associated with a user input discussed above in the context of claim 1 because doing so would avoid the intermingling of haptic effects, i.e., improve the distinctiveness of haptic feedbacks when navigating menu options. *Id.* (citing Ex. 1002 ¶ 76). Petitioner asserts that the proposed combination teaches “the first haptic effect is configured to emulate the command,” as recited in claim 8, because the number of pops corresponds to the position of the command in the menu, and, therefore, emulates the command. *Id.* at 26–27 (citing Ex. 1002 ¶ 77).

Claim 9 depends from claim 1 and further recites “the sensor, actuator, and processor are disposed within the housing.” Ex. 1001, col. 14, ll. 46–47. Petitioner contends that, although Martin does not expressly disclose disposing a sensor, a processor, and actuator in a housing in connection with the embodiment depicted in Figures 7 and 9, it would have been obvious to a person of ordinary skill in the art to mount the components in a housing because Martin expressly contemplates mounting the electronic

device of Figure 7 in a case or housing, as discussed above in connection with the limitation of claim 1 reciting “a housing configured to be contacted by a user.” Pet. 27 (citing *id.*, § IV.D.1.c; Ex. 1002 ¶ 78).

Claim 10 depends from claim 1 and further recites “the housing comprises one of: a device configured to be worn by the user, a mobile phone, a personal digital assistant, a touch-sensitive surface, a medical alert device, a mouse, or a keyboard.” Ex. 1001, col. 14, ll. 48–51. Petitioner contends that Martin teaches the limitation recited in claim 10 because Martin describes that the electronic device of Figures 7 and 9 may be incorporated into a mobile phone or a PDA. Pet. 27–28 (citing Ex. 1004, col. 2, ll. 33–35).

Patent Owner does not respond specifically to Petitioner’s challenge to claims 7–10 beyond Patent Owner’s arguments advanced with respect to claim 1 discussed above. Based on the record presented, and for purposes of this Decision, we are persuaded that Petitioner has demonstrated sufficiently that Martin teaches the additionally recited limitations of claims 7–10. Accordingly, we are persuaded that Petitioner has demonstrated a reasonable likelihood of prevailing in its challenge to claims 7–10 under 35 U.S.C. § 103(a) as obvious over Martin.

d. Claim 12

Claim 12 depends from claim 1, and further recites “command is a request associated with an operation, and the first haptic effect is configured to provide information associated with the status of the operation.” Ex. 1001, col. 14, ll. 54–57. Petitioner contends that Martin teaches the additionally recited limitations of claim 12 because Martin describes that, when the determined function fails, e.g., when the user does not have

permission to access the menu, Martin's controller generates a distinct tactile sensation to indicate the failure, e.g., "Sensation 23" associated with "Function Failure," as shown in Figure 9. Pet. 28–29 (citing Ex. 1004, col. 18, ll. 11–16, Fig. 9; Pet., § IV.D.1.g). Petitioner argues that a failure is a "status of the operation," as recited in claim 12. *Id.* at 29.

Patent Owner contends that Martin's generation of "Sensation 23" associated with "Function Failure" relied upon by Petitioner relates to the "otherwise" portion of the "if . . . otherwise . . ." conditional limitations of claim 1, from which claim 12 depends, because, similar to Petitioner's argument with respect to the "otherwise-block" of claim 1, Petitioner argues that "Sensation 23" is generated instead of "Sensation 20" corresponding to a determined function. Prelim. Resp. 16. Hence, Patent Owner argues that Martin does not teach "the first haptic effect . . . configured to provide information associated with the status of the operation," as recited in claim 12, which relates to the "if-block" limitations, not the "otherwise-block" limitations of claim 1.

We are not persuaded by Patent Owner's argument because Patent Owner does not address Petitioner's citation of column 18, lines 11–16 of Martin to support Petitioner's argument that the function failure relates to the operation of a menu when the user input is recognized and the command is determined to be a set of menus, i.e., when the "if-block" steps are performed. *See* Pet. 28–29 (citing Ex. 1004, col. 18, ll. 11–16, Fig. 9; Pet., § IV.D.1.g).

Based on the record presented, and for purposes of this Decision, we are persuaded that Petitioner has demonstrated sufficiently that Martin teaches the limitation recited in claim 12. Accordingly, we are persuaded

that Petitioner has demonstrated a reasonable likelihood of prevailing in its challenge to claim 12 under 35 U.S.C. § 103(a) as obvious over Martin.

B. Claims 1, 7, 9, 10, and 12 as Obvious Over Martin and Nokia

Petitioner contends that claims 1, 7, 9, 10, and 12 are unpatentable under 35 U.S.C. § 103(a) as obvious over the combination of Martin and Nokia (Ex. 1008). Pet. 29–53. For the reasons discussed below, we are persuaded that Petitioner has demonstrated a reasonable likelihood that it will prevail in its challenge to claims 1, 7, 9, 10, and 12 as obvious over the combination of Martin and Nokia submitted as Exhibit 1008.

Petitioner also presents an additional or alternative ground based on the combination of Martin and a different version of Nokia (Ex. 1013). *Id.* at 29–30 n. 2. Petitioner, however, does not cite Exhibit 1013 in its unpatentability analysis based on the combination of Martin and Nokia. Hence, we decline to consider a ground based on the version of Nokia that is Exhibit 1013 because the Petition fails to identify “with particularity, each claim challenged, the grounds on which the challenge to each claim is based, and the evidence that supports the grounds for the challenge to each claim,” as required under 35 U.S.C. § 312(a)(3), with respect to Exhibit 1013.

1. Nokia As a Printed Publication

According to Petitioner, Nokia is a user manual for a device known as Nokia 9110 Communicator. Pet. 32 (citing Ex. 1008, 2). Petitioner contends that Nokia is prior art to the ’710 patent under 35 U.S.C. § 102(b) because it was published in 1999. *Id.* at 29 (citing Ex. 1009 ¶¶ 11–13). In support of its contention, Petitioner submits the Declaration of Erin Flaucher (Ex. 1009, “Flaucher Decl.”), who purports to be an employee of Microsoft

Corporation familiar with the records maintained by a division of Microsoft regarding the release and sale of the Nokia 9110 Communicator product.

Ex. 1009 ¶¶ 1–6.

Whether a reference qualifies as a “printed publication” under § 102 involves a case-by-case inquiry into the facts and circumstances surrounding the reference’s disclosure to members of the public. *In re Klopfenstein*, 380 F.3d 1345, 1350 (Fed. Cir. 2004). The key inquiry is whether the reference was made “sufficiently accessible to the public interested in the art” before the critical date. *In re Lister*, 583 F.3d 1307, 1311 (Fed. Cir. 2009) (quoting *In re Cronyn*, 890 F.2d 1158, 1160 (Fed. Cir. 1989)). A reference is considered “publicly accessible” upon a satisfactory showing that the document has been “disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter or art exercising reasonable diligence[] can locate it.” *Kyocera Wireless Corp. v. ITC*, 545 F.3d 1340, 1350 (Fed. Cir. 2008) (citation and internal quotation marks omitted).

In his Declaration, Mr. Flaucher states that the Nokia user manual (attached as Exhibit F to the Flaucher Declaration) was included with each sales package for the Nokia 9110 Communicator product, and attaches as Exhibit E the sales record for the Nokia product sold and distributed to consumers in 1999. Ex. 1009 ¶¶ 10–13. We have reviewed the Flaucher Declaration and its Exhibits E and F, and determine that, if properly authenticated and determined admissible, Petitioner’s evidence is sufficient to show that Nokia was disseminated during the relevant time frame to support a finding that the reference was publicly accessible in 1999. Patent Owner does not dispute Nokia is prior art to the ’710 patent.

On this record, we are persuaded, for purposes of this Decision, that Petitioner has presented sufficient evidence to show Nokia qualifies as prior art to the '710 patent under § 102(b) for purposes of demonstrating a reasonable likelihood of prevailing on grounds based, in part, on Nokia.

2. Overview of Nokia (Ex. 1008)

Nokia describes that the Nokia 9110 Communicator is “a wireless phone, messaging device, access terminal, and palmtop organizer in one pocketable package.” Ex. 1008, 11.³ The Nokia 9110 Communicator consists of two parts: the phone and the communicator interface. *Id.* Nokia provides a detailed description of how to use the product, such as making and answering a phone call (*id.* at 57–59), receiving and sending electronic mails (*id.* at 87–94), navigating the World Wide Web (*id.* at 95–102), and creating and editing documents (*id.* at 109–112).

3. Discussion

a. Claim 1

Similar to the ground based on Martin alone discussed above, Petitioner contends that Martin teaches all of the structural limitations recited in claim 1. Pet. 35–39. In this ground, however, Petitioner relies on the PDA embodiment depicted in Figure 5 of Martin (reproduced in Section VI.A.2 above), which discloses a PDA with a touch screen that displays soft-keys, as outlined in Section VI.A.2 above. For instance, Petitioner contends that Martin teaches a sensor in the form of touchpad 30 shown in Figure 5. *Id.* at 35. Petitioner also asserts that Martin teaches “a housing configured to

³ All citations to the page numbers for Exhibit 1008 refer to the page numbers inserted by Petitioner in the bottom, right-hand corner of each page.

be contacted by a user” because Martin’s PDA includes a housing as shown in Figure 5. *Id.*

Petitioner further contends that Martin teaches “an actuator configured to output a haptic effect to the housing” because Martin’s PDA includes actuator 64, as shown in Figure 6 (not reproduced herein), which depicts a cross sectional view of Figure 5. *Id.* at 36–37 (citing Ex. 1004, col. 11, ll. 22–29, Fig. 6). Petitioner argues that, although Martin’s PDA embodiment describes transmitting tactile sensations to the display and the touchpad, it would have been obvious to a person of ordinary skill in the art to modify the PDA embodiment to have the actuator apply the haptic effect to the housing, in view of Martin’s express disclosure of an actuator mounted on a case or housing to transmit tactile sensations to the entire electronic device. *Id.* at 38 (citing Ex. 1004, col. 4, ll. 39–48; Ex. 1002 ¶ 95).

In addition, Petitioner contends that Martin teaches “a processor in communication with the sensor and the actuator,” as recited in claim 1, because Martin’s PDA depicted in Figures 5 and 6 has a “controller (not shown) in communication with the touchpad 30,” i.e., a sensor. *Id.* at 38–39 (quoting Ex. 1004, col. 11, ll. 57–58). According to Petitioner, Martin further describes that the controller in Martin’s PDA “causes the actuator 64 to provide a corresponding tactile sensation,” and, hence, communicates with the actuator. *Id.* at 38–39 (quoting Ex. 1004, col. 11, ll. 63–65; Ex. 1002 ¶ 96). Petitioner further argues that a person of ordinary skill would have understood that the controller of Martin’s PDA is a processor in view of Martin’s express disclosure that the controller of the device depicted in Figure 1 can be a microprocessor or the central processing unit of the

electronic device. *Id.* at 39 (citing Ex. 1004, col. 4, l. 66–col. 5, l. 1, col. 5, ll. 3–30; Ex. 1002 ¶ 97).

Petitioner further contends that the operation of the controller of Martin’s PDA in view of Nokia teaches the functional limitations of claim 1. For example, Petitioner asserts that Martin teaches the processor is configured to “receive, from the sensor, a sensor signal associated with a user input,” as recited in claim 1, because the controller of Martin’s PDA depicted in Figures 5 and 6 “is in communication with the touchpad 30” (a sensor) and “is capable of determining the location on the display screen 33 that is touched by the object 24 [the user’s finger], and the softkey 36 corresponding to the touched location.” *Id.* at 40 (quoting Ex. 1004, col. 11, ll. 57–63). In other words, the controller receives a signal from the touchpad 30 (the sensor) that allows the controller to determine the location on the screen touched by the user’s finger. *Id.*

Further, Petitioner asserts that Martin in view of Nokia teaches a processor configured to “recognize the input and determine a command associated with the user’s input,” as recited in claim 1. Addressing the “recognize the input” portion, Petitioner contends that the controller of Martin’s PDA determining “softkey 36” that corresponds to the signal received from touchscreen 30 constitutes recognition of the input signal from the touchscreen. *Id.* (citing Ex. 1004, col. 11, ll. 57–63; Ex. 1002 ¶ 99). Petitioner further contends that it would have been obvious to a person of ordinary skill in the art to “determine a command associated with the user’s input” in the form of commanding the generation of the DTMF (dual tone multi-frequency) tones corresponding to the soft-keys, based on Martin’s disclosure that the “PDA can function as a mobile telephone, and

the softkeys 36 are arranged as a telephone keypad to provide the same functionality as the mechanical keys on a conventional telephone keypad” in view of Nokia’s teaching of generating DTMF tones using the keyboard during a phone call. *Id.* at 40–42 (citing Ex. 1004, col. 11, ll. 46–49; Ex. 1008, 62).

Petitioner asserts that a person of ordinary skill in the art would have had a sufficient reason to combine Martin’s PDA with Nokia’s DTMF tone generation because using DTMF tones to place a telephone call or during a phone call was well-known to persons of ordinary skill at the time of the filing of the ’710 patent, as evidenced by U.S. Patent No. 5,392,348 (Ex. 1005). *Id.* at 41–42 (citing Ex. 1005, col. 1, ll. 21–35; Ex. 1002 ¶¶ 100–102). Petitioner also argues that the need to be able to generate DTMF tones during interaction with the IVR (interactive voice response) systems used by banks and retailers (e.g., “press 1 for English”) was well-known to persons of ordinary skill at the time of the filing of the ’710 patent. *Id.* at 41 (citing Ex. 1002 ¶ 101).

Petitioner further contends that Martin teaches the “if . . . otherwise” conditional limitations recited in claim 1. *Id.* at 43–47. Petitioner asserts that Martin’s PDA embodiment teaches the “if-block” limitations—that is, “if the user input is recognized and the command is determined,” the processor generating “a first actuator signal” to cause the actuator to output a first haptic effect and transmitting the signal to the actuator. *Id.* at 43–45. According to Petitioner, the controller of Martin’s PDA uses information from the touchpad to determine the soft-key corresponding to the touched location and that, “[b]ased upon this information, the controller causes the actuator 64 to provide a corresponding tactile sensation.” *Id.* at 43 (citing

Ex. 1004, col. 11, ll. 63–65). Petitioner argues that, although Martin does not expressly disclose that the controller generates and transmits a signal to actuator 64 to cause the actuator to provide a tactile sensation, a person of ordinary skill would have found it obvious to generate an actuator signal and transmit the signal to the actuator via control circuitry as disclosed in Martin’s embodiment depicted in Figure 7, because doing so would have represented applying a known solution to the known problem of causing an actuator to provide a tactile sensation. *Id.* at 44 (citing Ex. 1004, col. 13, ll. 54–58, Fig. 7; Ex. 1002 ¶ 107).

Petitioner further contends that Martin also teaches the “otherwise-block” limitations—that is, the processor generating “a second actuator signal” to cause the actuator to output a second haptic effect, and transmitting the signal to the actuator, when the condition “if the user input is recognized and the command is determined” is *not* met. *Id.* at 46–47. In support of its contention, Petitioner cites Martin’s disclosure that the “controller also determines when an input is *ambiguous*, such as when two or more softkeys are simultaneously selected or when an area of the display corresponding to no graphics 38 is touched, and causes the actuator to output an appropriate tactile sensation.” *Id.* at 46 (citing Ex. 1004, col. 12, ll. 1–5) (emphasis added). Petitioner argues that a person of ordinary skill in the art would have understood that this “appropriate tactile sensation” is different from the “corresponding tactile sensation” generated in the “if-block” steps discussed above because Martin teaches with respect to Figure 9 that an “AMBIGUOUS” input results in a distinct “Sensation 22,” which is different from the tactile sensation, e.g., “Sensation 20,” that is generated when the

user input is recognized and the command is determined. *Id.* (citing Ex. 1004, col. 14, ll. 22–42, Fig. 9; Ex. 1002 ¶ 109).

Similar to its response in the context of the ground based on Martin alone discussed above, Patent Owner focuses on the “otherwise” portion of the “if . . . otherwise . . .” conditional limitations and does not dispute specifically Petitioner’s contentions that Martin teaches the rest of the limitations recited in claim 1, including the structural limitations and the “if-block” limitations. Prelim. Resp. 17–18. With respect to the “otherwise-block” limitations, Patent Owner refers to and relies on the same arguments it advanced in the context of the ground based on Martin alone to argue that Martin does not teach the “otherwise” conditional limitations. *Id.* Hence, Patent Owner’s argument is unpersuasive for the same reasons discussed above in Section VI.A.3.b.

Patent Owner further contends that Petitioner fails to establish a reason to combine Martin and Nokia because the Givargis Declaration “merely repeats the Petition’s conclusory statement” regarding the motivation to combine. *Id.* at 18. We are not persuaded by Patent Owner’s argument because the mere fact that the content of an expert declaration is similar or essentially identical to certain portions of the Petition does not necessarily compel the conclusion that the content of the Petition or the expert declaration is unsupported or conclusory in nature. As outlined above, for purposes of this Decision, we are persuaded that Petitioner has presented and developed sufficient evidence, and provided sufficient articulated reasoning to explain why, at the time of the filing of the ’710 patent, one of ordinary skill would have found it obvious to combine the teachings of Martin and Nokia as proposed by Petitioner.

Patent Owner additionally argues that one of ordinary skill in the art would not have been motivated to combine Martin and Nokia as Petitioner proposes because, in the context of interacting with an IVR system via DTMF tones, the functions of interest are those within the IVR system—that is, those functions initiated by DTMF tones that “select one of a predetermined number of . . . functions” (e.g., “press 1 for English”)—which may be different at different points of the menu in the IVR system, whereas the haptic effect produced by the same soft-key would always be the same. *Id.* at 19–21. We are not persuaded by Patent Owner’s argument because Patent Owner does not address Petitioner’s contention that the generation of the DTMF tones (not the functions of the IVR system) is the command associated with the user’s input. *See* Pet. 40–42.

Based on the foregoing, we are persuaded that Petitioner has provided sufficient evidence to demonstrate a reasonable likelihood of prevailing in its assertion that claim 1 is unpatentable under 35 U.S.C. § 103(a) over the combination of Martin and Nokia.

b. Claims 7, 9, and 10

Claim 7 depends from claim 1, and further recites that the system further comprises “a display in communication with the processor,” and “the processor is further configured to: generate a display signal configured to cause the display to display an image; and transmit the display signal to the display.” Ex. 1001, col. 14, ll. 38–43. Petitioner contends that Martin teaches the additionally recited limitations of claim 7 for essentially the same or similar reasons as those discussed in the context of the ground of challenged based on Martin alone. *See* Pet. 47–49.

Claim 9 depends from claim 1, and further recites “the sensor,

actuator, and processor are disposed within the housing.” Ex. 1001, col. 14, ll. 46–47. Petitioner contends that Figure 6 of Martin teaches or suggests disposing actuator 64 and sensor/touchscreen 35 within housing 18. Pet. 49–50 (citing Ex. 1004, Fig. 6; Ex. 1002 ¶ 117).

Claim 10 depends from claim 1, and further recites “the housing comprises one of: a device configured to be worn by the user, a mobile phone, a personal digital assistant, a touch-sensitive surface, a medical alert device, a mouse, or a keyboard.” Ex. 1001, col. 14, ll. 48–51. Petitioner contends that Martin teaches the limitation recited in claim 10 because Figure 5 of Martin is described as a “PDA,” meaning a personal digital assistant. Pet. 51 (citing Ex. 1004, col. 1, ll. 19–20, col. 11, ll. 11–13, Fig. 5; Ex. 1002 ¶ 118).

Patent Owner does not respond specifically to Petitioner’s challenge to claims 7, 9, and 10 beyond Patent Owner’s arguments advanced with respect to claim 1 discussed above. Based on the record presented, and for purposes of this Decision, we are persuaded that Petitioner has demonstrated sufficiently that Martin teaches the additionally recited limitations of claims 7, 9, and 10. Accordingly, we are persuaded that Petitioner has demonstrated a reasonable likelihood of prevailing in its challenge to claims 7, 9, and 10 under 35 U.S.C. § 103(a) as obvious over the combination of Martin and Nokia.

c. Claim 12

Claim 12 depends from claim 1, and further recites “command is a request associated with an operation, and the first haptic effect is configured to provide information associated with the status of the operation.” Ex. 1001, col. 14, ll. 54–57. Petitioner contends that Martin teaches the

additionally recited limitations of claim 12 for essentially the same or similar reasons as those discussed in the context of the ground of challenge based on Martin alone, except that the example of a Function Failure is described as selecting a redial feature on a telephone phone when no number is stored in the redial memory and attempting to initiate (e.g., by pressing a send button) a mobile phone call having entered an incomplete phone number. *See* Pet. 51–53 (citing Ex. 1004, col. 18, ll. 11–16, Fig. 9; Ex. 1002 ¶ 120).

Patent Owner refers to and relies on the same arguments it advanced in the context of the ground based on Martin alone to argue that Martin does not teach the additionally recited limitations of claim 12. Prelim. Resp. 21–22. Hence, Patent Owner’s argument is unpersuasive for the same or similar reasons discussed above in Section VI.A.3.d.

Based on the record presented, and for purposes of this Decision, we are persuaded that Petitioner has demonstrated sufficiently that Martin teaches the limitation recited in claim 12. Accordingly, we are persuaded that Petitioner has demonstrated a reasonable likelihood of prevailing in its challenge to claim 12 under 35 U.S.C. § 103(a) as obvious over the combination of Martin and Nokia.

*C. Claim 8 as Obvious Over the Combination of
Martin, Nokia, and Rank*

Claim 8 depends from claim 1, and further recites “the first haptic effect is configured to emulate the command.” Ex. 1001, col. 14, ll. 44–45. Petitioner contends that claim 8 is unpatentable under 35 U.S.C. § 103(a) as obvious over the combination of Martin, Nokia, and Rank (Ex. 1010). Pet. 53–56.

Rank describes a system and method for generating haptic effects based on sound output from a computer device. Ex. 1010, Abstract. In an exemplary embodiment, Rank analyzes the sound data to divide them into different frequency ranges so that the types of event associated with the sound may be distinguished based on the frequency range in which the sound is located. *Id.* ¶ 46. For example, an explosion in a game may have a low frequency sound, while a gunshot may have a higher frequency sound. *Id.* In an embodiment, the sound data is organized into five different frequency ranges, each of which is associated with a different haptic effect. *Id.* ¶ 48.

Petitioner contends that, by combining the teachings of Martin, Nokia, and Rank, the haptic effect for each soft-key of Martin's PDA can be predefined to "roughly correspond to the DTMF tone frequency," which, according to Petitioner, would emulate the command of generating the DTMF tones. Pet. 54–56.

We are not persuaded by Petitioner's argument. As Petitioner acknowledges, in the DTMF standard, each DTMF tone assigned to a telephone key comprises two frequencies. *Id.* at 55 (citing Ex. 1005, col. 1, ll. 36–47; Ex. 1002 ¶ 125). Petitioner, however, does not explain which of the two frequencies would be used to define a haptic effect that "correspond[s] to the DTMF tone frequency," as Petitioner contends, and whether, in doing so, a person of ordinary skill would have had a reasonable expectation of success in defining a distinct haptic effect for each key.

A determination of obviousness cannot be reached where the record lacks "explanation as to *how* or *why* the references would be combined to produce the claimed invention." *Trivascular, Inc. v. Samuels*, 812 F.3d

1056, 1066 (Fed. Cir. 2016). Petitioner’s analysis is insufficient because Petitioner does not explain *how* the combination of Martin, Nokia, and Rank is supposed to work in assigning or defining a haptic effect for each of the DTMF tones associated with the soft-keys of Martin’s PDA. *See Pers. Web Techs., LLC v. Apple, Inc.*, No. 2016-1174, ___ F.3d ___, 2017 WL 587132, at *6 (Fed. Cir. Feb. 14, 2017) (“[A] clear, evidence-supported account of the *contemplated workings of the combination* is a *prerequisite* to adequately explaining and supporting a conclusion that a relevant skilled artisan would have been motivated to make the combination and reasonably expect success in doing so.”) (emphases added).

Based on the foregoing, we are not persuaded that Petitioner has demonstrated a reasonable likelihood of prevailing in its challenge to claim 8 under 35 U.S.C. § 103(a) as obvious over the combination of Martin, Nokia, and Rank.

VII. CONCLUSION

Based on the arguments and evidence presented and developed in the Petition, we are persuaded that Petitioner has demonstrated a reasonable likelihood that it will prevail in showing unpatentability of claims 1, 7–10, and 12 of the ’710 patent. At this stage of the proceeding, we have not made a final determination as to the patentability of any of the challenged claims. Our final determination will be based on the record as fully developed during trial.

VIII. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that pursuant to 35 U.S.C. § 314, an *inter partes* review is hereby instituted as to claims 1, 7–10, and 12 of the '710 patent on the following grounds:

1. Claims 1, 7–10, and 12 as obvious under 35 U.S.C. § 103(a) over Martin; and
2. Claims 1, 7, 9, 10, and 12 as obvious under 35 U.S.C. § 103(a) over the combination of Martin and Nokia (Ex. 1008);

FURTHER ORDERED that no other ground of unpatentability alleged in the Petition for any claim is authorized for this *inter partes* review; and

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial, the trial commencing on the entry date of this Decision.

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