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UTILITY PATENT APPLICATION TRANSMITTAL

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

Attorney Docket No.	043508-0383796
First Inventor	Danny Grant
Title	See 1 in Addendum
Express Mail Label No.	

APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

1. ☐ **Fee Transmittal Form** (e.g., PTO/SB/17)
(Submit an original and a duplicate for fee processing)
2. ☐ **Applicant claims small entity status.**
See 37 CFR 1.27.
3. ☒ **Specification** [Total Pages 62]
Both the claims and abstract must start on a new page
(For information on the preferred arrangement, see MPEP 608.01(a))
4. ☒ **Drawing(s)** (35 U.S.C. 113) [Total Sheets 13]
5. **Oath or Declaration** [Total Sheets _____]
 - a. ☐ Newly executed (original or copy)
 - b. ☐ A copy from a prior application (37 CFR 1.63(d))
(for continuation/divisional with Box 18 completed)
 - i. ☐ **DELETION OF INVENTOR(S)**
Signed statement attached deleting inventor(s)
name in the prior application, see 37 CFR
1.63(d)(2) and 1.33(b).
6. ☒ **Application Data Sheet.** See 37 CFR 1.76
7. ☐ **CD-ROM or CD-R** in duplicate, large table or
Computer Program (Appendix)
☐ Landscape Table on CD
8. **Nucleotide and/or Amino Acid Sequence Submission**
(if applicable, items a. – c. are required)
 - a. ☐ Computer Readable Form (CRF)
 - b. ☐ Specification Sequence Listing on:
 - i. ☐ CD-ROM or CD-R (2 copies); or
 - ii. ☐ Paper
 - c. ☐ Statements verifying identity of above copies

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Alexandria VA 22313-1450

ACCOMPANYING APPLICATION PARTS

9. ☐ **Assignment Papers** (cover sheet (PTO-1595) & document(s))
Name of Assignee _____
10. ☐ **37 CFR 3.73(b) Statement** ☐ **Power of Attorney**
(when there is an assignee)
11. ☐ **English Translation Document** (if applicable)
12. ☐ **Information Disclosure Statement** (PTO/SB/08 or PTO-1449)
☐ Copies of foreign patent documents,
publications, & other information
13. ☐ **Preliminary Amendment**
14. ☐ **Return Receipt Postcard** (MPEP 503)
(Should be specifically itemized)
15. ☐ **Certified Copy of Priority Document(s)**
(if foreign priority is claimed)
16. ☐ **Nonpublication Request** under 35 U.S.C. 122(b)(2)(B)(i).
Applicant must attach form PTO/SB/35 or equivalent.
17. ☐ Other: _____

18. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in the first sentence of the specification following the title, or in an Application Data Sheet under 37 CFR 1.76:

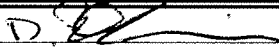
☐ Continuation ☐ Divisional ☐ Continuation-in-part (CIP) of prior application No.: _____

Prior application information: Examiner _____ Art Unit: _____

19. CORRESPONDENCE ADDRESS

☒ The address associated with Customer Number: 00909 OR ☐ Correspondence address below

Name					
Address					
City	State	Zip Code			
Country	Telephone	Email			

Signature		Date	July 21, 2010
Name (Print/Type)	D. Benjamin Esplin	Registration No. (Attorney/Agent)	58297

This collection of information is required by 37 CFR 1.53(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.

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Addendum

1. SYSTEM AND METHOD FOR PROVIDING COMPLEX HAPTIC STIMULATION DURING INPUT OF CONTROL GESTURES, AND RELATING TO CONTROL OF VIRTUAL EQUIPMENT

Attorney Docket No. 043508-0383796
Client Reference: IMM361

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Danny Grant, Robert Heubel, David Birnbaum, and Erin Ramsay

Application No.: TBA
Filed: July 21, 2010

Confirmation No: TBA
Group No.: TBA
Examiner TBA

For: SYSTEM AND METHOD FOR PROVIDING COMPLEX HAPTIC STIMULATION DURING
INPUT OF CONTROL GESTURES, AND RELATING TO CONTROL OF VIRTUAL
EQUIPMENT

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

APPLICATION DATA SHEET
37 C.F.R. § 1.76

BIBLIOGRAPHIC DATA

1. Applicant information

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2. Correspondence information

Correspondence for this application should be addressed as follows:

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3. Application information

Title of Invention: SYSTEM AND METHOD FOR PROVIDING COMPLEX HAPTIC STIMULATION DURING INPUT OF CONTROL GESTURES, AND RELATING TO CONTROL OF VIRTUAL EQUIPMENT

Docket number assigned to this application: 043508-0383796

Suggested Classification: Class:

Subclass:

Technology Center to which subject matter is assigned:

Total number of drawing sheets: 13

Type of application: Utility

Application is to be published. Suggested drawing figure for publication:

Secrecy order under § 5.2:

This application does not disclose subject matter of an application which is under a secrecy order pursuant to § 5.2.

4. Representative information

The following have a power of attorney or authorization of agent in this application:

Customer No.: 00909

5. Domestic Priority information

Domestic priority for this application is claimed as follows:

35 U.S.C. § 119(e):

Application No.: 61/227,645

Filed: July 22, 2009

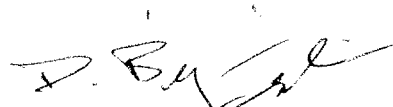
Status: Pending

Relationship: Provisional

6. Assignee information

The assignee(s) of this application is/are:

Date: July 21, 2010



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SYSTEM AND METHOD FOR PROVIDING COMPLEX HAPTIC STIMULATION DURING INPUT OF CONTROL GESTURES, AND RELATING TO CONTROL OF VIRTUAL EQUIPMENT

RELATED APPLICATIONS

(01) This application claims priority from U.S. Provisional Patent Application No. 61/227,645, filed July 22, 2009, and entitled "Interactive Touch Screen Gaming Metaphors With Haptic Feedback. The U.S. Provisional Patent Application No. 61/227,645 is hereby incorporated by reference in its entirety into the present application.

FIELD OF THE INVENTION

(02) The invention relates to a system and method of providing haptic stimulation to a user during performance of a complex control gesture, and/or during the control of virtual equipment.

BACKGROUND OF THE INVENTION

(03) Provision of haptic stimulation to users is known. Haptic stimulation provide a physical sensation to users. Haptic stimulation is used in the context of games, and virtual worlds, and in real world control systems. Such haptic stimulation may be generated to provide feedback to users that a control input has been received, that another user has input a command, that virtual or real objects have collided, exploded, or imploded, that an ambient force is present (e.g., simulated or real wind, rain, magnetism, and/or other virtual forces), and/or that other phenomena have occurred. In conventional systems, the parameters of such stimulation is typically static and

provides a simple mechanism for instructing a user that a corresponding phenomena has occurred (or will occur).

(04) Conventional game and/or virtual world systems that enable a user to control virtual equipment are known. The control and feedback schemes for interacting with virtual equipment in these conventional systems tend to be limited, and to not correlate strongly with real world control and/or feedback of corresponding real world equipment.

(05) Although basic haptic effects (e.g., vibrate) have been used in mobile and other computing devices, numerous challenges remain for developers to engage users and provide feedback to enhance the user experience

SUMMARY

(06) One aspect of the invention relates to a system configured to provide haptic stimulation to a user of a game. In one embodiment, the system comprises a user interface, an actuator, and one or more processors configured to execute computer program modules. The user interface is configured to generate output signals related to the gestures of a user. The actuator is configured to generate haptic stimulation to the user. The computer program modules comprise a gesture module, a stimulation module and an actuator control module. The gesture module is configured to monitor performance of a control gesture by the user based on the output signals of the user interface. The control gesture is a gesture associated with a command input to the game, and includes an initial portion, a first intermediate portion, and an ending portion. The stimulation module is configured to receive information related to performance of the control gesture from the gesture module, and to determine haptic stimulation to be generated for the user associated with the control gesture. The haptic stimulation

includes a first stimulation determined responsive to performance of the initial portion of the control gesture, and a second stimulation that is different from the first stimulation and is determined responsive to performance of the first intermediate portion of the control gesture. The actuator control module is configured to control the actuator to generate the stimulation determined by the stimulation module.

(07) Another aspect of the invention relates to a method of providing haptic stimulation to a user of a game. In one embodiment, the method comprises monitoring performance of a control gesture by a user, wherein the control gesture is a gesture associated with a command input to the game, and includes an initial portion, a first intermediate portion, and an ending portion; determining haptic stimulation associated with performance of the control gesture to be generated for the user, wherein the haptic stimulation includes a first stimulation determined responsive to performance of the initial portion of the control gesture, and a second stimulation that is different from the first stimulation and is determined responsive to performance of the first intermediate portion of the control gesture; and generating the determined stimulation during performance of the control gesture.

(08) Yet another aspect of the invention relates to a system configured to provide stimulation to a user of a game. In one embodiment, the system comprises a touch sensitive electronic display, an actuator, and one or more processors configured to execute computer program modules. The touch sensitive electronic display has an interface surface that is accessible for engagement by the user, and the touch sensitive user interface is configured to generate output signals related to the position at which the interface surface is engaged, and to present views of the game to the user through

the interface surface. The views presented through the interface surface include views of virtual equipment having user selectable sections that are selectable by the user to interact with the virtual equipment by engaging the interface surface at the user selectable sections of the views of the virtual equipment. The actuator is configured to generate haptic stimulation to the user. The computer program modules comprise an equipment module, a stimulation module, and an actuator control module. The equipment module is configured to determine the operating parameters of the virtual equipment in the views, and to simulate operation of the virtual equipment. The equipment module determines the operating parameters of the virtual equipment and/or simulates operation of the virtual equipment based on selections by the user of the user selectable sections of the views of the virtual equipment. The stimulation module is configured to determine haptic stimulation to be generated for the user associated with the operating parameters of the virtual equipment and/or simulated operation of the virtual equipment. The actuator control module is configured to control the actuator to generate the stimulation determined by the stimulation module.

(09) Still another aspect of the invention relates to a method of providing stimulation to a user of a game. In one embodiment, the method comprises presenting views of a game through an interface surface of a touch sensitive electronic display that is accessible for engagement by a user, wherein the views presented through the interface surface include views of virtual equipment having user selectable sections that are selectable by the user to interact with the virtual equipment by engaging the interface surface at the user selectable sections of the views of the virtual equipment; receiving selection of one of the user selectable sections via an by the user

engagement of the selected user selectable section on the interface surface;
determining the operating parameters of the virtual equipment in the views and/or
simulating operation of the virtual equipment based on the received selection;
determining, responsive to the received selection, haptic stimulation to be generated for
the user associated with the operating parameters of the virtual equipment and/or
simulated operation of the virtual equipment; and generating the determined haptic
stimulation.

(10) A still further aspect of the invention relates to a system and method for providing a game on one or more portable computing device in which a virtual object (*e.g.*, a ball) travels through views of the game displayed on the interfaces of the one or more portable computing devices. Haptic effects corresponding to the travel of the virtual object (or virtual objects) through the views are provided on the individual portable computing devices. The haptic effects may be determined based on one or more parameters of the travel of the virtual object (*e.g.*, speed, direction, acceleration, *etc.*), one or more parameters of objects and/or features with which the virtual object interacts (*e.g.*, walls, flippers, blockers, bumpers, *etc.*), and/or other parameters. The haptic effects may include haptic effects to be provided on portable computing devices that are not currently displaying the virtual object corresponding to the haptic effects. This may enhance the interactivity of the game for a group of users playing the game together on separate portable computing devices.

(11) These and other objects, features, and characteristics of the present invention, as well as the methods of operation and functions of the related elements of structure and the combination of parts and economies of manufacture, will become more

apparent upon consideration of the following description and the appended claims with reference to the accompanying drawings, all of which form a part of this specification, wherein like reference numerals designate corresponding parts in the various figures. It is to be expressly understood, however, that the drawings are for the purpose of illustration and description only and are not intended as a definition of the limits of the invention. As used in the specification and in the claims, the singular form of “a”, “an”, and “the” include plural referents unless the context clearly dictates otherwise.

BRIEF DESCRIPTION OF THE DRAWINGS

(12) FIG. 1 illustrates a system configured to provide haptic stimulation to a user, in accordance with one or more embodiments of the invention.

(13) FIG. 2 illustrates a view of a piece of virtual equipment, in accordance with one or more embodiments of the invention.

(14) FIG. 3 illustrates a view of a piece of virtual equipment, in accordance with one or more embodiments of the invention.

(15) FIG. 4 illustrates a view of a piece of virtual equipment, in accordance with one or more embodiments of the invention.

(16) FIG. 5 illustrates a method of providing haptic feedback to a user, according to one or more embodiments of the invention.

(17) FIG. 6 illustrates a method of providing haptic feedback to a user, according to one or more embodiments of the invention.

(18) FIG. 7 illustrates a portable computing device, in accordance with one or more embodiments of the invention.

(19) FIG. 8A illustrates an example of the use of a game to support multi-user play, according to one or more embodiments of the invention.

(20) FIG. 8B illustrates an example of the use of a game to support multi-user play, according to one or more embodiments of the invention.

(21) FIG. 9 illustrates an example of play areas for two respective users over a plurality of time intervals, in accordance with one or more embodiments of the invention.

(22) FIG. 10 illustrates an example of play and depicts the virtual object ricocheting off the border of a play area, according to one or more embodiments of the invention.

(23) FIG. 11 illustrate a use of haptic effects to simulate a continuous effect, in accordance with one or more embodiments of the invention.

(24) FIG. 12 illustrates a method for providing a game, according to one or more embodiments of the invention.

(25) FIG. 13 illustrates an example of an interface for an instance of a game, in accordance with one or more embodiments of the invention.

DETAILED DESCRIPTION

(26) FIG. 1 illustrates a system 10 configured to provide haptic stimulation to a user 12. In one embodiment, the haptic stimulation is provided to user 12 in conjunction with the performance of one or more control gestures through which user 12 controls, for example, a game, a real world component or piece of equipment, and/or other entity. The haptic stimulation is provided to user 12 such that as performance of a given control gesture continues, the haptic stimulation associated with the control gesture changes in accordance with the progression of the control gesture. In one embodiment,

the haptic stimulation is provided to user 12 in conjunction with control of virtual equipment by user 12. The haptic stimulation corresponds to control inputs provided to system 10 in controlling the virtual equipment. In one embodiment, system 10 includes one or more user interfaces 14, one or more actuators 16, electronic storage 18, one or more processors 20, and/or other components.

(27) Although this disclosure primarily describes the provision of haptic stimulation in conjunction with control gestures performed to control a game, this is not limiting. The provision of haptic stimulation in accordance with the principles set forth herein may be extended to other contexts in which a user provides input in the form of a control gesture (e.g., controlling a television, a computer, an automobile, a remote control vehicle or vessel, *etc.*). In implementations involving the control of real world components or systems, haptic stimulation may be used to enhance the performance of complex control gestures by users, enhance the user experience, teach users to perform control gestures, and/or provide other enhancement over conventional real world control systems. Implementations involving control of real world components or systems may include instances in which a user is present at the component being controlled (e.g., a control panel in a car, on a microwave, *etc.*), and/or instances in which a user is located remotely from the component being controlled. Control of a remote real world component or system may be accompanied by other sensory stimulation informing the user of the state of the component being controlled. Such other sensory stimulation may include, for example, real-time (or near real-time) video, audio, and/or still images provided to the user.

(28) Several embodiments are described herein as though user 12 were the only user for whom haptic stimulus is being provided. This is not limiting. Expansion of the principles and embodiments described herein is within the ability of one of ordinary skill in the art, and the description of a single user embodiment would enable the person of ordinary skill in the art to make and/or use a multiple user embodiment providing the same features to a plurality of users. A multiple user embodiment may include the provision of haptic stimulation to “passive users” (e.g., users not performing a control gesture) related to the performance of a control gesture by an “active user” (e.g., the user performing the control gesture). The haptic stimulation may further provide feedback to the passive and/or active users of other phenomena present in the multi-user environment.

(29) As used herein, a “control gesture” refers to a gesture made by a user that is a single and discrete control input having separate portions. The separate portions must be performed in specific order and/or with a specific timing to effectively achieve the control input associated with the “control gesture.” Performance of the separate portions, on their own, will not result in the control input associated with the “control gesture” as a whole (e.g., a “control gesture” is not merely a combination of other gestures, each associated with its own control input). In some examples, a “control gesture” is an abstract gesture that does not correlate with exactness to the control input to which it corresponds. Some non-limiting examples of a “control gesture” are described below.

(30) The user interface 14 includes one or more input and/or output devices configured to communicate information to and/or receive information from user 12. The

user interface 14 may include, for example, one or more content delivery devices that convey content to user 12. This content may include audio content, video content, still images, and/or other content. The content delivery devices may include, for example, electronic displays (*e.g.*, including touch-sensitive displays), audio speakers, and/or other content delivery devices. The user interface 14 may include one or more control input devices configured to generate an output signal indicating input from the user to system 10. For example, user interface 14 may include a game controller, a remote control, a keypad, a button, a switch, a keyboard, a knob, a lever, a microphone, a position detecting device (*e.g.*, an image sensor, a pressure sensor, an optical position detector, an ultrasonic position detector, a touch sensitive surface, and/or other position detecting devices), an accelerometer, a gyroscope, a digital compass, and/or other control input devices. The user interface 14 may be embodied in, or associated with, a computing device, and/or may be embodied in a control peripheral. A computing device may include one or more of a desktop computer, a laptop computer, a handheld computer, a personal digital assistant, a Smartphone, a personal music player, a portable gaming console, a gaming console, and/or other computing devices.

(31) It will be appreciated that although user interface 14 is shown in FIG. 1 as a single entity, this is for illustrative purposes only. In one embodiment, user interface 14 includes a plurality of actuators. The plurality of user interfaces 14 may be included in, carried by, and/or in contact with a single object or device. Or, the plurality of user interfaces 14 may include user interfaces included in and/or carried by a plurality of separate objects or devices.

(32) The actuators 16 are configured to generate haptic stimulus for user 12. As such, at least some of actuators 16 are in contact with the users, or in contact with objects that contact the users, during conveyance of the sensory content to the users by user interface 14. By way of non-limiting example, one or more of actuators 16 may be positioned in or on a floor surface supporting the users (*e.g.*, installed in the floor, carried by a mat lying on the floor, *etc.*), one or more of actuators 16 may be carried by a brace or other wearable item worn by the users, one or more of the actuators 16 may be carried by objects that are carried by the users (*e.g.*, carried by a controller), one or more of actuators 16 may be carried by furniture on which the users are seated or lying, one or more of actuators 16 may be carried by user interface 14, and/or one or more of the actuators 16 may be carried by or disposed in or on other objects that contact the users.

(33) As used herein, the term “haptic stimulus” refers to tactile feedback that is applied to the users. For example, such feedback may include one or more of vibrations, forces, and/or motions that are applied physically to the user by the actuators 16 and/or the objects with which both actuators 16 and the user are in contact. The actuators 16 may include any device configured to generate such feedback for application to the users. For example, actuators 16 may include one or more of a piezoelectric actuator, a pneumatic actuator, a central mass actuator, an electroactive polymer actuator, an electrostatic surface actuator, macro-fiber composite actuator, and/or other actuators. For example, a touch sensitive surface (and/or other surfaces) may be actuated to move relative to a user by an electrostatic actuator. The surface actuated by actuators 16 may be rigid, semi-rigid, flexible, and/or deformable.

(34) It will be appreciated that although actuators 16 are shown in FIG. 1 as a single entity, this is for illustrative purposes only. In one embodiment, actuators 16 include a plurality of actuators. The plurality of actuators may be included in, carried by, and/or in contact with a single object or device. Or, the plurality of actuators may include actuators included in, carried by, and/or in contact with a plurality of separate objects or devices.

(35) In one embodiment, electronic storage 18 comprises electronic storage media that electronically stores information. The electronic storage media of electronic storage 18 may include one or both of system storage that is provided integrally (i.e., substantially non-removable) with system 10 and/or removable storage that is removably connectable to system 10 via, for example, a port (e.g., a USB port, a firewire port, etc.) or a drive (e.g., a disk drive, etc.). Electronic storage 18 may include one or more of optically readable storage media (e.g., optical disks, etc.), magnetically readable storage media (e.g., magnetic tape, magnetic hard drive, floppy drive, etc.), electrical charge-based storage media (e.g., EEPROM, RAM, etc.), solid-state storage media (e.g., flash drive, etc.), and/or other electronically readable storage media. Electronic storage 18 may store software algorithms, information determined by processor 20, information received via user interface 14, and/or other information that enables system 10 to function properly. Electronic storage 18 may be a separate component within system 10, or electronic storage 18 may be provided integrally with one or more other components of system 10 (e.g., processor 20).

(36) Processor 20 is configured to provide information processing capabilities in system 10. As such, processor 20 may include one or more of a digital processor, an

analog processor, a digital circuit designed to process information, an analog circuit designed to process information, a state machine, and/or other mechanisms for electronically processing information. Although processor 20 is shown in FIG. 1 as a single entity, this is for illustrative purposes only. In some implementations, processor 20 may include a plurality of processing units. These processing units may be physically located within the same device, or processor 20 may represent processing functionality of a plurality of devices operating in coordination.

(37) As is shown in FIG. 1, processor 20 may be configured to execute one or more computer program modules. The one or more computer program modules may include one or more of a content module 22, a gesture module 24, a stimulation module 26, an equipment module 28, an actuator control module 30, and/or other modules. Processor 20 may be configured to execute modules 22, 24, 26, 28, and/or 30 by software; hardware; firmware; some combination of software, hardware, and/or firmware; and/or other mechanisms for configuring processing capabilities on processor 20.

(38) It should be appreciated that although modules 22, 24, 26, 28, and 30 are illustrated in FIG. 1 as being co-located within a single processing unit, in implementations in which processor 20 includes multiple processing units, one or more of modules 22, 24, 26, 28, and/or 30 may be located remotely from the other modules. The description of the functionality provided by the different modules 22, 24, 26, 28, and/or 30 described below is for illustrative purposes, and is not intended to be limiting, as any of modules 22, 24, 26, 28, and/or 30 may provide more or less functionality than is described. For example, one or more of modules 22, 24, 26, 28, and/or 30 may be eliminated, and some or all of its functionality may be provided by other ones of

modules 22, 24, 26, 28, and/or 30. As another example, processor 38 may be configured to execute one or more additional modules that may perform some or all of the functionality attributed below to one of modules 22, 24, 26, 28, and/or 30.

(39) The content module 22 is configured to control the provision of content to user 12 via user interface 14. If the content includes computer generated images (*e.g.*, in a game, virtual world, simulation, *etc.*), content module 22 is configured to generate the images and/or views for display to user 12 through user interface 14. If the content includes video and/or still images, content module 22 is configured to access the video and/or still images and to generate views of the video and/or still images for display on user interface 14. If the content includes audio content, content module 22 is configured to generate the electronic signals that will drive user interface 14 to output the appropriate sounds. The content, or information from which the content is derived, may be obtained by content module 22 from electronic storage 18.

(40) In one embodiment, the content provided by content module 22 is content associated with a game. In this embodiment content module 22 is configured to render views of the game for display to user 12 via user interface 14. The content module 22 further provides audio associated with the views in accordance with the machine readable-program code associated with the game.

(41) The gesture module 24 is configured to receive one or more output signals generated by user interface 14 indicating control inputs received from user 12. Based on the received one or more output signals, gesture module 24 monitors performance of one or more control gestures by user 12. In one embodiment, a control gesture being

monitored by gesture module 24 includes an initial portion, one or more intermediate portions, and an ending portion.

(42) In an embodiment in which user interface 14 includes a touch-sensitive surface through which input is received from user 12, an initial portion of a control gesture may include initiating contact with the touch-sensitive surface at one or more locations. The control gesture may dictate a location (or locations for a multi-touch control gesture) at which contact is initiated, a pressure with which contact is initiated, and/or other parameters of the initial contact between user 12 and the touch sensitive surface. If user 12 is already in contact with the touch-sensitive surface, the initial portion of the control gesture may include moving to one or more locations corresponding to the control gesture, maintaining contact (at specific location(s), or generally) with the touch-sensitive surface, motioning in one or more specific directions, making one or more specific shapes, ending contact at one or more locations on the touch-sensitive surface, and/or other actions. The one or more intermediate portions of the control gesture may include one or more of maintaining contact at one or more points without moving, motioning in a specific direction, making a specific shape, halting motion, contacting the touch-sensitive surface at one or more additional locations, ending contact at one or more locations on the touch-sensitive surface, pressing harder or softer on the touch-sensitive surface, and/or other actions. The ending portion may include one or more of ending contact at one or more locations on the touch-sensitive surface, halting motion at one or more locations, motioning in a specific direction, making a specific shape, contacting the touch-sensitive surface at one or more additional locations, pressing harder or softer on the touch-sensitive surface, and/or other actions.

(43) One or more of the actions dictated by the initial portion, the one or more intermediate portions, and/or the ending portion of the control gesture that are location-based may be associated with static locations (*e.g.*, at the same location every time), dynamic locations that do not change during the corresponding portion (*e.g.*, the location may move between performances of the control gesture, but remains fixed while the portion corresponding to the location is performed), dynamic locations that change during the corresponding portion, and/or other types of locations.

(44) In the embodiment in which user interface 14 includes a touch-sensitive surface, one of the most simple examples of a control gesture would include an initial portion of in which user 12 contacts the touch-sensitive surface. The intermediate portion may include holding the contact made during the initial portion of the control gesture. The ending portion may include removing the contact made during the initial portion of the control gesture, and maintained during the intermediate portion of the control gesture.

(45) In an embodiment in which user interface 14 includes one or more sensors configured to monitor motion of user 12 in space (*e.g.*, an imaging sensor, a pressure sensor, an accelerometer, and/or other sensors), an initial portion of a control gesture may include one or more of facing a specific direction, motioning or moving in a specific direction, motioning with a specific one or more appendages, positioning body parts with respect to each other in a specific manner (*e.g.*, holding hands in a predetermined configuration, and/or other configurations of body parts), motioning or moving in a specific shape, motioning for a specific amount of time, motioning or moving at (or above, or below) a specific rate and/or acceleration), changing a direction of motion or movement in a specific manner, and/or other actions. The one or more intermediate

portions may include one or more of changing orientation of the head, and/or other body parts to a specific direction, motioning or moving in a specific direction, motioning with a specific one or more appendages, motioning with body parts to move in a specific relationship to each other, motioning or moving in a specific shape, motioning for a specific amount of time, motioning or moving at (or above, or below) a specific rate and/or acceleration), changing a direction of motion or movement in a specific manner, halting motion or movement by one or more body parts, and/or other actions. The ending portion of the control gesture may include may include one or more of changing orientation of the head, and/or other body parts to a specific direction, motioning or moving in a specific direction, motioning with a specific one or more appendages, motioning with body parts to move in a specific relationship to each other, motioning or moving in a specific shape, motioning for a specific amount of time, motioning or moving at (or above, or below) a specific rate and/or acceleration), changing a direction of motion or movement in a specific manner, halting motion or movement by one or more body parts, and/or other actions.

(46) The gesture module 24 is configured to monitor performance of the control gestures by obtaining the output signal of user interface 14 indicating movement and/or motion of user 12, and comparing the movement and/or motion of user 12 with the control gestures. One or more of the control gestures may be a function of the content being conveyed to user 12 via user interface 14 by content module 22. For example, one or more of the control gestures may be a function of a game being conveyed to user 12 via user interface 14. One or more of the control gestures may be independent from the content being provided to user 12 via user interface 14. For example, one or

more of the control gestures may control function of user interface 14, processor 20, and/or other components.

(47) The stimulation module 26 is configured to receive information related to performance of control gestures from gesture module 24, and to determine haptic stimulation to be generated for user 12 associated with the control gestures. The haptic stimulation determined by stimulation module 26 includes haptic stimulation that is responsive to performance of the control gestures separate from the context in which they are performed. For example, in the context of a game haptic stimulation responsive to performance of a control gesture includes haptic stimulation that is not dependent on other variables within the game other than performance of the control gesture.

(48) The haptic stimulation determined by stimulation module 26 is complex and rich beyond the haptic stimulation typically associated with control gestures. For example, in conventional systems, haptic stimulation associated with control gestures tends to include a single stimulation that is provided during and/or after a control gesture. This haptic stimulation provides confirmation of the control gesture. The haptic stimulation determined by stimulation module 26, by contrast, tracks more closely with performance of the control gesture to increase the immersive experience provided by the haptic stimulation.

(49) In one embodiment, the haptic stimulation determined by stimulation module 26 corresponding to a control gesture includes a first stimulation, a second stimulation, and/or other stimulations. The first stimulation is different from the second stimulation. This means that one or more parameters of the first stimulation is different from the

second stimulation. The one or more parameters may include one or more of, for example, periodicity, force, directionality, location, and/or other parameters of haptic stimulation. Variation of the one or more parameters between the first stimulation and the second stimulation (and/or other stimulations) may be smooth, and/or may be discrete so as to create a distinct step in the parameter(s) of haptic stimulation between the first stimulation and the second stimulation.

(50) The stimulation module 26 is configured to correlate provision of the first stimulation and the second stimulation with performance of the control gesture to which the first stimulation and the second stimulation correspond. In one embodiment, the first stimulation is determined by stimulation module 26 responsive to performance of the initial portion of the control gesture and the second stimulation is determined by stimulation module 26 responsive to performance of one or more intermediate portions of the control gesture. Responsive to the ending portion of the control gesture, stimulation module 26 may determine another stimulation (e.g., a third stimulation), or may cease the provision of haptic stimulation associated with the control gesture.

(51) In one embodiment, stimulation module 26 determines haptic stimulation associated with a control gesture such that the stimulation is different between intermediate portions of the control gesture. This may result in a smooth changes in the haptic stimulation as performance of the control gesture proceeds, and/or in discrete changes in the haptic stimulation as performance of the control gesture transitions between intermediate portions.

(52) The haptic stimulation determined by stimulation module 26 may be provided to give user 12 some feedback about performance of a control gesture. This may include

stimulation that informs user 12 that a portion of the control gesture has begun and/or is currently ongoing, stimulation that prompts user 12 to begin a next portion of the control gesture, and/or stimulation that provides other information about performance of the control gesture to user 12.

(53) In one embodiment stimulation module 26 provides haptic stimulation to user 12 that indicates to user 12 that performance of a control gesture has failed. In this embodiment, responsive to failure by user 12 to perform a portion of a control gesture, or failing to properly transition from one portion of the control gesture to another portion of the control gesture, stimulation module 26 determines a stimulation for provision to user 12 that is indicative of the failure. For example, the failure stimulation may include a fizzle, and/or other stimulation.

(54) Some illustrative examples of control gestures and corresponding haptic stimulation are presented hereafter. The examples given correspond to some classes of game characters commonly found in games that include combat between players and/or between players and non-player characters. Specifically, the examples given below correspond to “casters”, “close combat warriors”, and “ranged combat warriors.” It will be appreciated that these classes of characters are not limiting. Other classes of characters, and/or hybrids included characteristics of a plurality of the classes, may be implemented in accordance with the principles set forth herein.

(55) A “caster” is a character that casts spells (or other similar attacks and/or defenses) during combat. Examples of caster characters include wizards, priests, warlocks, engineers, and/or other characters. To control a caster to cast a given spell, user 12 may be required to perform a control gesture that corresponds to the given

spell. As user 12 progresses through the portions of the control gesture, the haptic stimulation determined by stimulation module 26 corresponding to the control gesture may inform user 12 as to the progress of the control gesture. The haptic stimulation associated with the control gesture may further provide information about the power of the spell being cast (*e.g.*, greater the force and/or more rapid periodicity may indicate a more powerful spell).

(56) In one embodiment, as the control gesture proceeds between the portions of the control gesture, the force and/or rapidity of the haptic stimulation determined by stimulation module 26 may increase. This increase may be gradual as the control gesture proceeds and/or in discrete steps (*e.g.*, at transitions between the portions of the control gesture). This is not intended to be limiting, as other parameters of the haptic stimulation may be changed to indicate the progress of the control gesture. The haptic stimulation may provide feedback about the (thus far) successful progress of the control gesture, and/or prompt user 12 with respect to future performance of the control gesture (*e.g.*, to proceed to the next portion, to maintain the current portion, *etc.*). Upon performing the final portion of the control gesture, stimulation module 26 may determine haptic stimulation that indicates the spell being successfully cast. In one embodiment, user 12 may perform portions of the control gesture that effectively “store” the spell for discharge. This may store the spell for an indefinite period, or for some predetermined maximum storage time. During storage, stimulation module 26 may determine haptic stimulation that confirms the ongoing storage of the spell. If the storage period has a maximum storage time, the haptic stimulation may indicate the status of the storage period with respect to the maximum storage time.

(57) A “close combat warrior” is a character configured to fight enemies at close quarters (*e.g.*, hand-to-hand combat). Such a character may be armed with swinging weapons (*e.g.*, clubs, maces, *etc.*), stabbing and/or slashing weapons (*e.g.*, knife, axe, sword, *etc.*), and/or other close quarter weapons. As user 12 controls the character to, for example, wield a blow, stimulation module 26 may determine haptic stimulation that mimics some real-world properties of such attacks. For example, as user 12 strikes into an opponent or object, a first feedback may mimic the striking and/or cutting sensation. As user 12 withdraws a weapon after such a blow, a second feedback may mimic the withdrawal of the weapon from the object or opponent. As another example, as user 12 swings a weapon in a ready position (*e.g.*, swinging a ball on a chain) a first feedback determined by stimulation module 26 may mimic the real world sensation that would be the result of such an activity in real life. Releasing the weapon from the ready position (*e.g.*, striking an opponent or object with the swinging ball) may result in the determination by stimulation module 26 of a second stimulation that mimics the feel of such an attack. The intensity of an attack may be determined based on an amount of time a control gesture (or some portion thereof) is performed, the range of motion of a control gesture, a speed of motion during a control gesture, pressure of the contact between the user and a touch screen included in user interface 14, and/or other parameters of a control gesture (or some portion thereof).

(58) In some implementations, the user interface 14 includes a touch screen in which displays of the content associated with a game is presented by content module 22. In such implementations, the location at which the control gesture is made impacts the manner in which the game is controlled and/or the haptic stimulation determined by

stimulation module 26 (for the user inputting the gesture and/or other users). For example, in controlling a close combat warrior, a user may input an attacking control gesture in a manner that indicates a specific portion of an enemy at which the attack should be directed (*e.g.*, a leg, an arm, the head, the torso, *etc.*). Similarly, in controlling a close combat warrior, a user may input a defense or blocking control gesture in a manner that indicates a specific portion of a character being controlled that should be defended or blocked (*e.g.*, a leg, an arm, the head, the torso, *etc.*). This location-based aspect of the control gesture may be taken into account in determining the success and/or impact of the corresponding control, and/or in determining the haptic stimulation that corresponds to the control gesture. Multiple attacks may be triggered by touching multiple locations on the touch screen of user interface 14.

(59) A “ranged combat warrior” is a character that is configured and armed for attacking enemies from a range. This may include characters armed, for example, to release projectiles such as arrows, stones, bullets, rockets, and/or other projectiles. By way of non-limiting example, user 12 may control a ranged combat warrior to fire a bow and arrow. In this example, different haptic stimulation may be determined by stimulation module 26 for notching the arrow, drawing the bow (and varying the haptic stimulation to indicate increasing string tension), releasing the string, the bowstring striking the forearm of the character upon release, and/or other portions of the control gesture associated with firing an arrow. The intensity and/or speed of an attack or projectile may be determined based on an amount of time a control gesture (or some portion thereof) is performed, the range of motion of a control gesture, a speed of motion during a control gesture, pressure of the contact between the user and a touch

screen included in user interface 14, and/or other parameters of a control gesture (or some portion thereof).

(60) The target at which a ranged attack is directed and/or the path of a projectile emitted as part of a ranged attack may be determined based on a control gesture. For example, if user interface includes a touch screen, the user performing a control gesture may contact a portion of the touch screen on which the target of the ranged attack is displayed (e.g., as part of the control gesture). Similarly, the user may trace on the touch screen a path of a projectile emitted during a ranged attack. The tracing of the path of the projectile may form at least part of the control gesture initiating the attack. The target and/or the path indicated by the control gesture may impact the determination of the corresponding haptic stimulation determined by stimulation module 26.

(61) Game content may include boxes, rooms, gates, vehicles, and/or other objects or items that are “locked”, and must be opened through performance of some control gesture. In some implementations, in response to a user selecting such an object or item, stimulation module 26 may determine haptic stimulation indicating to the user that the selected object or item is locked. Performance by the user of a control gesture to unlock the object or item may result in the determination of haptic stimulation by stimulation module 26 corresponding to the control gesture.

(62) In one embodiment, the haptic stimulation determined stimulation module 26 for a given control gesture may vary based on characteristics of a character in a game being controlled by user 12. For example, the haptic stimulation may vary as a function

of character skill, character fatigue, character injury, weapon type, weapon disrepair, and/or other characteristics.

(63) Changing the haptic stimulation based on character fatigue and/or injury may be a way of handicapping user 12 as a character that was fatigued or injured would be. This may include altering the force, periodicity, and/or other parameters of the haptic stimulation to inhibit precise control by user 12 (e.g., by increasing the force), to inhibit perception of cues and prompts in the haptic stimulation (e.g., by reducing force, increasing the force of portions of the haptic stimulation that do not provide cues and prompts, reducing response time to cues and/or prompts, *etc.*), and/or otherwise handicapping user 12.

(64) Varying the haptic stimulation based on character skill may provide a gradual and/or graduated “unlocking” of skills and abilities. For a character with more training and/or skill in a given ability, stimulation module 26 may determine haptic stimulation that provides more clear and/or more easily followed guide to performing a control gesture corresponding to the given ability. For example, as the skill of the character increases, the haptic stimulation determined by stimulation module 26 for the character may provide more definite cues and/or prompts (e.g., see the examples above with respect to character fatigue) that guide user 12 through the control gesture. This enables user 12 to utilize the control gesture without being fully trained in the corresponding ability, but may impact the reproducibility of the control gesture for the user unless further training and/or other skill-building is sought.

(65) Altering the haptic stimulation determined for a control gesture based on the equipment of a character may incentivize maintaining repair of equipment and/or

obtaining upgraded equipment without making such activities mandatory. Instead of a digital determination of whether a control gesture is available to user 12, the stimulation module 26 provides haptic stimulation that makes the control gesture easier and/or more enjoyable with “better” virtual equipment.

(66) The equipment module 28 is configured to provide control over virtual equipment for user 12. Within the context of a game being provided to user 12 by system 10, user 12 may control virtual equipment (e.g., directly or through a character that is using the virtual equipment. In such cases, content module 22 provides to user 12, via user interface 14 views of the virtual equipment. The equipment module 28 is configured to determine the operating parameters of the virtual equipment, and to simulate its operation.

(67) In one embodiment in which user interface 14 includes a touch sensitive electronic display, equipment module 28 determines the operating parameters of the virtual equipment and/or simulates operation of the virtual equipment based on selections by user 12 of user selectable sections of the views of the virtual equipment. The user selectable sections of the virtual equipment may be located in the views of the virtual equipment that correspond to sections of the virtual equipment analogous to sections of equipment that would be engaged in real life to configure operating parameters of equipment and/or to operate equipment. The operating parameters of the virtual equipment that are configurable by engaging user selectable sections of the views of the virtual equipment include one or more of an amount of loaded rounds of ammunition, a level of disrepair, a stopping power, a projectile velocity, an ammunition type, a noise level, and/or other operating parameters.

(68) By way of illustration, FIG. 2 shows a view of a piece of virtual equipment 32 (e.g., a gun). In the view shown in FIG. 2, piece of virtual equipment 32 includes a plurality of selectable sections 34 (illustrated in FIG. 2 as section 34a, section 34b, section 34c, and section 34d). By selecting section 34a, user 12 may configure the handle/stock of piece of virtual equipment 32. By selecting section 34b, user 12 may configure the ammunition of piece of virtual equipment 32. By selecting section 34c, user 12 may configure the sights of piece of virtual equipment 32. By selecting section 34d, user 12 may configure the barrel/muzzle of piece of virtual equipment 32.

(69) Selection of one of selectable sections 34 to configure piece of virtual equipment 32 may include simply selecting the desired selectable section 34, and then selecting a new configuration for the selected section 34. In one embodiment, reconfiguration is made through a touch and drag type of interaction. For example, user 12 may engage an area on user interface 14 that corresponds to ammunition and “drag” the ammunition to section 34b to reload piece of virtual equipment 32. Similarly, user 12 may select and drag a silencer (and/or other muzzle or barrel feature) to section 34d of piece of virtual equipment 32 to change the sound characteristics of piece of virtual equipment 32 (and/or other characteristics).

(70) As another illustrative example, FIG. 3 shows a view of a virtual firearm 36 having a plurality of selectable sections 38 (shown in FIG. 3 as section 38a, section 38b, section 38c, and section 38d). The selectable sections 38 of stimulation module 26 may be selected in a fashion similar to the one discussed above with respect to FIG. 2.

(71) As yet another illustrative example, FIG. 4 shows a view of a piece of virtual equipment 40 configured to show the proximity of various items to a user (or to a character being controlled by a user) in a game. The piece of virtual equipment 40 includes a plurality of selectable sections 42 (shown in FIG. 4 as section 42a, section 42b, section 42c, section 42d, and section 42e). Individual ones of selectable sections 42 correspond to individual modes of piece of virtual equipment 40 such that selection of one of selectable sections 42 results in piece of virtual equipment 40 operating in accordance with the selected mode. For example, in a first mode piece of virtual equipment 40 may provide an indication of the proximity of other characters, in a second mode piece of virtual equipment 40 may provide an indication of the proximity of enemies, in a third mode piece of virtual equipment 40 may provide an indication of the proximity of one or more resources (*e.g.*, gold, food, ammunition, power-ups, *etc.*).

(72) Returning now to FIG. 1, in one embodiment, stimulation module 26 is configured to determine haptic stimulation to be generated for the user that is associated with the operating parameters of the virtual equipment and/or the simulated operation of the virtual equipment. This may include, for example, varying the haptic stimulation based on the current operating parameters of a piece of virtual equipment, determining haptic stimulation during the reconfiguration of a piece of virtual equipment to reflect changes being made in the piece of virtual equipment, and/or other aspects of configuration and/or operation of virtual equipment.

(73) By way of non-limiting example, if a virtual firearm is reloaded by user 12, stimulation module 26 determines haptic feedback indicating the reload. The new ammunition is different from previously used ammunition, stimulation module 26

determines haptic feedback upon firing of the firearm that is different from the haptic stimulation determined during firing of the previously used ammunition.

(74) In one embodiment, actuators 16 are configured to actuate the touch sensitive electronic display that presents the views of the virtual equipment to user 12. In this embodiment, delivery of the haptic stimulation determined by stimulation module 26 to user 12 as user 12 engages the touch sensitive electronic display results in a more immersive virtual equipment control experience. For example, as user 12 engages the touch sensitive display to reload a gun, or to switch out a piece of equipment, haptic stimulation is provided to user 12 through the touch sensitive surface that corresponds to the control being exerted over the gun.

(75) The actuator control module 30 is configured to control actuators 16 to generate the haptic stimulus determined by stimulation module 26. This includes communicating the haptic stimulus to be generated from processor 22 to actuators 16. The haptic stimulus to be generated may be communicated over wired communication links, wireless communication links, and/or other communication links between processor 22 and actuators 16.

(76) FIG. 5 illustrates a method 44 of determining and/or providing haptic stimulation to a user. The haptic stimulation may be determined and/or provided to the user in conjunction with a game, and/or in other contexts. The operations of method 44 presented below are intended to be illustrative. In some embodiments, method 44 may be accomplished with one or more additional operations not described, and/or without one or more of the operations discussed. Additionally, the order in which the operations of method 44 are illustrated in FIG. 5 and described below is not intended to be limiting.

(77) In some embodiments, method 44 may be implemented in one or more processing devices (e.g., a digital processor, an analog processor, a digital circuit designed to process information, an analog circuit designed to process information, a state machine, and/or other mechanisms for electronically processing information). The one or more processing devices may include one or more devices executing some or all of the operations of method 44 in response to instructions stored electronically on an electronic storage medium. The one or more processing devices may include one or more devices configured through hardware, firmware, and/or software to be specifically designed for execution of one or more of the operations of method 44.

(78) At an operation 46, performance of an initial portion of a control gesture by a user is monitored. Performance of the initial portion of the control gesture may be monitored based on the output signal of a user interface similar to or the same as user interface 14 (shown in FIG. 1 and described above). In one embodiment, operation 46 is performed by a gesture module similar to or the same as gesture module 24 (shown in FIG. 1 and described above).

(79) At an operation 48, responsive to performance of the initial portion of the control gesture, a first haptic stimulation is determined. The first haptic stimulation corresponds to the initial portion of the control gesture. In one embodiment, operation 48 is performed by a stimulation module 26 similar to or the same as stimulation module 26 (shown in FIG. 1 and described above).

(80) At an operation 50, the first haptic stimulation is generated for the user. In one embodiment, operation 50 is performed by one or more actuators similar to or the same as actuators 16 (shown in FIG. 1 and described above).

(81) At an operation 52, a determination is made as to whether a first intermediate portion of the control gesture has been performed by the user. Responsive to the first intermediate portion of the control gesture having been performed, method 44 proceeds to an operation 54. In one embodiment operation 52 is performed by a gesture module similar to or the same as gesture module 24 (shown in FIG. 1 and described above).

(82) At operation 54, a second haptic stimulation is determined. The second haptic stimulation corresponds to the first intermediate portion of the control gesture. In one embodiment, operation 54 is performed by a stimulation module similar to or the same as stimulation module 26 (shown in FIG. 1 and described above).

(83) At an operation 56, the second haptic stimulation is generated for the user. In one embodiment, operation 56 is performed by one or more actuators similar to or the same as actuators 16 (shown in FIG. 1 and described above).

(84) Referring back to operation 52, responsive to the first intermediate portion of the control gesture not having been performed, method 44 proceeds to an operation 58 at which a determination is made as to whether the control gesture has failed. This may be determined based on the output signal of a user interface similar to or the same as user interface 14 (shown in FIG. 1 and described above). The determination of whether the control gesture has failed may be made, for example, based on an amount of time since performance of the initial portion of the control gesture, if actions not included in the control gesture have been performed since performance of the initial portion of the control gesture, and/or other factors. In one embodiment, operation 58 is performed by a gesture module similar to or the same as gesture module 24 (shown in FIG. 1 and described above).

(85) Responsive to a determination at operation 58 that the control gesture has not failed, method 44 returns to operation 52. Responsive to a determination at operation 58 that the control gesture has failed, method 44 proceeds to an operation 60. At operation 60, haptic stimulation is determined that indicates failure of the control gesture. In one embodiment, operation 60 is performed by a stimulation module similar to or the same as stimulation module 26 (shown in FIG. 1 and described above).

(86) Upon determination of the haptic stimulation at operation 60, the determined haptic stimulation is generated for the user at operation 62. In one embodiment, operation 62 is performed by one or more actuators similar to or the same as actuators 16 (shown in FIG. 1 and described above).

(87) Referring back to operation 52, further responsive to determination that the first intermediate portion of the control gesture has been performed, method 44 proceeds to an operation 64. At operation 64, a determination is made as to whether an ending portion of the control gesture has been performed. Responsive to a determination that the control gesture has ended, method 44 ends the provision of haptic stimulation associated with the control gesture. In one embodiment, a final haptic stimulation associated with the completion of the control gesture is further determined and generated. In one embodiment, operation 64 is performed by a gesture module similar to or the same as gesture module 24 (shown in FIG. 1 and described above).

(88) Responsive to a determination at operation 64 that the ending portion of the control gesture has not yet been performed, method 44 proceeds to an operation 66. At operation 66, a determination is made as to whether the control gesture has failed. This may be determined based on the output signal of a user interface similar to or the same

as user interface 14 (shown in FIG. 1 and described above). The determination of whether the control gesture has failed may be made, for example, based on an amount of time since performance of the first intermediate portion of the control gesture, if actions not included in the control gesture have been performed since performance of the first intermediate portion of the control gesture, and/or other factors. In one embodiment, operation 66 is performed by a gesture module similar to or the same as gesture module 24 (shown in FIG. 1 and described above).

(89) Responsive to a determination at operation 66 that the control gesture has not failed, method 44 returns to operation 64. Responsive to a determination at operation 66 that the control gesture has failed, method 44 proceeds to operations 60 and 62.

(90) In one embodiment, the control gesture includes more than one intermediate portion. In this embodiment, method 44 is expanded between operations 52 and 64 to monitor the additional intermediate portion(s) and generate corresponding haptic stimulation in a manner similar to that shown and described for the first intermediate portion.

(91) FIG. 6 illustrates a method 68 of determining and/or providing haptic stimulation to a user. The haptic stimulation may be determined and/or provided to the user in conjunction with a game, and/or in other contexts. The operations of method 68 presented below are intended to be illustrative. In some embodiments, method 68 may be accomplished with one or more additional operations not described, and/or without one or more of the operations discussed. Additionally, the order in which the operations of method 68 are illustrated in FIG. 6 and described below is not intended to be limiting.

(92) In some embodiments, method 68 may be implemented in one or more processing devices (e.g., a digital processor, an analog processor, a digital circuit designed to process information, an analog circuit designed to process information, a state machine, and/or other mechanisms for electronically processing information). The one or more processing devices may include one or more devices executing some or all of the operations of method 68 in response to instructions stored electronically on an electronic storage medium. The one or more processing devices may include one or more devices configured through hardware, firmware, and/or software to be specifically designed for execution of one or more of the operations of method 68.

(93) At an operation 70, a view of virtual equipment is presented to the user via a touch sensitive electronic display. The view includes selectable sections that are selectable by the user to interact with the virtual equipment shown in the view. In one embodiment, the view of the virtual equipment is determined by a content module similar to or the same content module 22 (shown in FIG. 1 and described above).

(94) At an operation 72, selection of one of the selectable sections of the view of the virtual equipment is received. The selection may be received through the touch sensitive electronic display through which the view is presented.

(95) At an operation 74, operation of the virtual equipment is simulated and/or one or more parameters of the virtual equipment is adjusted based on the selection received at operation 72. In one embodiment, operation 74 is performed by an equipment module similar to or the same as equipment module 28 (shown in FIG. 1 and described above).

(96) At an operation 76, haptic stimulation associated with the operation of the virtual equipment and/or the adjustment of the operating parameters of the virtual equipment

effected at operation 74 is determined. In one embodiment, operation 76 is performed by a stimulation module similar to or the same as stimulation module 26 (shown in FIG. 1 and described above).

(97) At an operation 78, the haptic stimulation determined at operation 76 is generated for the user. In one embodiment, operation 78 is performed by one or more actuators similar to or the same as actuators 16 (shown in FIG. 1 and described above).

(98) As was mentioned above, the description of complex haptic stimulation in response to gesture-based control for a single user is not intended to be limiting. Haptic stimulation generated in response to gesture-based control in a multi-user environment is also contemplated. The haptic stimulation provided to a given user may include haptic feedback that is responsive to gesture-based controls of another user and/or other phenomena.

(99) FIG. 7 is a diagram illustrating an example 100 of a portable computing device configured in accordance with one or more aspects of the present invention.

Particularly, a tablet computer 102 is shown. Tablet computer 102 includes a screen 104 mounted to a body 106, with the top surface 108 representing a surface with which a user interacts. In this example, top surface 108 is bordered by body 106, but the screen area could extend all the way to the edges of the tablet. Tablet computer 102 can use any number or type of touch-sensing technologies to determine when a user has touched on or near surface 106. For example, surface 108 may include a resistance or capacitance-based touch sensing system and/or an optical touch sensing system.

(100) Although a tablet computer is shown in this example, it can be understood that any touch-enabled computing device can be used. For instance, a smaller device such as a cellular telephone or media player may feature a touch-enabled display and can provide haptic outputs in accordance with the present subject matter. As another example, a haptically-enabled display surface associated with and interfaced to another computing device (e.g., a desktop or server computer) can be used. For example, surface 108 may represent a larger touch-enabled surface such as a table upon which a screen image is projected from above or below. A flat surface is depicted here, although the present subject matter could be applied for use in devices with curved surface and/or non-smooth surfaces. Gestures input to the computer (or other computing device) via touch may be control gestures. It will be appreciated that the description of gestures involving touch are not intended to limit the scope of control gestures discussed herein. Control gestures may include (with or without touch gestures) manipulation of a component or body (e.g., “tilt” controls), manipulation of one or more stick controls, manipulation of one or more buttons, manipulation of one or more switches, and/or manipulation of or interaction with other interface features.

(101) FIG. 7 illustrates an example of the architecture of a computing device 102 at 110. Computing device 102 comprises one or more processors 112 configured to execute computer program modules, a memory 114 such as RAM, ROM, or other memory technology, a display interface 116, a haptic interface 118, I/O interface 120, and network interface 122. Any suitable display technology can be used. In some embodiments, an LCD display is used.

(102) Haptic interface 118 can comprise suitable components for driving one or more actuators used to play back haptic effects so as to provide a physical sensation to a user of device 102. For example, some or all of display 104 may include embedded actuators so that targeted physical output can be provided to a portion of the display to provide a physical effect where the user touches surface 108. Additional actuators may be used to provide haptic output via other surfaces of tablet 102, such as its sides and the surface opposite surface 108 (i.e., the back of the device). It will be appreciated that the location of the actuator relative to the desired physical effect can vary. For example, in order to produce an effect at a first part of the screen, an actuator at a second part of the screen (or elsewhere in the device) may be driven so that the properties of intervening components of the screen and/or device influence what is felt at the first part of the screen.

(103) In one embodiment, the tablet comprises an actuator having an eccentric rotating mass motor. The actuator is coupled either directly or indirectly to a surface of the tablet housing. Powering the motor causes vibration on the surface that a user can feel. By varying the magnitude and freq of the signal sent to the actuator, various effects are possible. As another example, an actuator may be used to raiser or lower sections of the screen to create ridges, troughs, or other features. As a further example, an actuator can comprise a piezoelectric. For example, a piezoelectric actuator can be embedded, at least partially, in an inorganic polymer matrix, such as silicone. As yet a further example, an actuator may comprise a macro-fiber composite actuator or piezocomposite actuator. Such actuators may be formed as a thin layer of piezoelectric fibers suspended in a matrix (e.g., epoxy). The fibers may communicate electrically

with polyimide electrodes. Many other types of actuators may be used, and so this exemplary description of actuators is not meant to be limiting.

(104) I/O interface 120 can be used by processor(s) 112 to receive input and provide output using any suitable components. For example, I/O interface 120 may link to speakers and/or a microphone for receiving voice input and providing audio output. As another example, I/O interface 120 may provide a connection to peripheral devices such as a mouse or stylus used to provide input to the device, or to an imaging sensor used to capture still images and/or video.

(105) Network interface 122 can be used to link device 102 to a network using one or more networking technologies. For instance interface 122 may provide a connection to suitable components for connecting to an IEEE 802.11 (Wi-Fi) or 802.16 (Wimax) network, or a connection using Bluetooth technology. As another example, interface 122 may allow communication via a telephone, Ethernet, or other wired connection or may support other wireless technology such as communication via an IR port.

(106) Computing device 102 can comprise additional components—for example, one or more storage components (e.g., magnetic or solid-state hard disk drives) can be included. If computing device 102 comprises a cellular telephone, appropriate RF components may be included as well.

(107) Memory 114 tangibly embodies one or more program components that configure computing device 102 to operate in an intended manner. For example, memory 114 can include one or more applications, an operating system, and can also include stored data. As illustrated, memory 114 also includes a program component 124 for providing an interactive game in accordance with one or more aspects noted below.

(108) Generally, the game can configure computing device 102 to present a play area 126 via display 104, track the movement of a virtual object 128 (e.g., a ball) in the play area, and respond to user interactions to launch and deflect the virtual object during play using paddle 130. Additionally, the game can be configured to play back haptic effects as the virtual object moves through and encounters features of the play area. The haptic effects can be selected to provide a sensation that differs based on the particular features that are encountered. In this example, play area includes a top T, bottom B, left side L, and right side R. The game can be configured so that the virtual object is deflected by paddle 130 prior to reaching left side L. If multiple players are involved, the virtual object may exit at one or more sides T, B, or R and pass to another user's screen as noted below.

(109) FIG. 8A illustrates an example 200A of the use of a game to support multi-user play. The game program can support sending and receiving data to facilitate tracking the position of the virtual object in a play area that comprises multiple screens. In this example a first device 202 is interfaced to a second device 204 via a network 206. Network 206 may comprise a local area network, a wide area network, or may represent a direct connection between devices 202 and 204. By interfacing multiple devices running an instance of the game, a user can experience haptic effects when the virtual object encounters features in another user's screen. Such haptic effects may include haptic effects determined in accordance with a control gesture input on another user's screen.

(110) For example, if the play area 126 of FIG. 7 is used, then when virtual object 128 exits at right side R of a first device it may enter the screen at right side R of the second

device. As another example, the devices may have mirror-image layouts; that is, device 202 may feature paddle 130 along left side L while device 204 includes paddle 130 along right side R. In that case, when the virtual object reaches right side R of the play area of the first device, it may enter the play area at left side L of the other device, headed towards right side R and paddle 130 in the play area of the other device.

(111) Server 208 is depicted to illustrate that in some embodiments, multi-user play may be facilitated by a server. However, as noted above, in some embodiments game program is configured to directly interface with other instances without need of a server.

(112) FIG. 8B illustrates another example 200B of a multi-user play. In this example, three devices 202, 204, and 210 are interfaced via a first network 206. A second network 214 facilitates interaction with a fourth device 212. For example, network 206 may comprise a local area network connection while network 214 may comprise a wide-area network connection. Compass 216 is illustrated to show that in some embodiments the relative position of multiple players can be considered. For example, as the “westmost” player, device 202 may include paddle 130 at left side L. Device 204 may have its paddle positioned along top side T, since device 204 is “northmost.” Device 210 may have its paddle positioned along bottom side B, while device 212 may have its paddle positioned along right side R. Alternatively, the paddle may remain on the same side of the screen for each user but with appropriate mapping between edges to maintain the relative position of the users around the shared play area.

(113) It will be understood that in various embodiments the game can be configured to dynamically adjust the behavior and connections between the play areas based on factors such as each device’s orientation, the relative position of the players, and other

considerations such as the relative size of screen areas. As will be noted below, the virtual object can move from one screen to another in other manners in addition to or instead of encountering the boundaries of the play area.

(114) FIG. 9 illustrates an example of play areas 302A and 302B for two respective users A and B over a plurality of time intervals (I), (II), and (III). Each play area 302 includes a respective paddle 304. At time interval (I), virtual object 306 has been launched or deflected from paddle 304B towards the boundary of play area 302B. As shown at time interval (II), exit point 308 from play area 302B is mapped to an entry point 310 in play area 302A. The mapping may allow the virtual object to pass instantly between the play areas or there may be a delay based on the distance between the players (e.g., as determined by GPS and/or other triangulation or proximity detection techniques). In any event, time interval (II) depicts virtual object 306 encountering paddle 304A. For example, user A may have moved paddle 304A by sliding his or her fingers along the display surface of his device to intercept virtual object 306.

(115) When virtual object 306 encounters paddle 304A, a haptic effect H1 is selected and played back. As illustrated, haptic effect H1 is localized to the point at which user A touches paddle 304A (and/or another part of play area 302). As was noted above, the sensation can be generated by commanding one or more actuators to provide motion or another effect; the actuators may be located at the point at which the effect is intended to be felt and/or elsewhere. FIG. 9 shows effect H1 as “(((H1)))” in play area 302A and as “(H1)” in play area 302B since the effect is also played back for player B and localized to player B’s touch point. However, as indicated the intensity of effect H1 differs as between players A and B.

(116) The haptic effect can be selected based on the simulated physics of the game. For example, the paddles 304 may represent a hard surface, and so effect H1 may comprise a strong, sharp effect. Since a deflection is meant to represent a “hit,” effect H1 may be the strongest effect in the game. The “hit” is played back to user B to alert user B that the virtual object will be returned and user B can prepare to deflect the incoming virtual object. The hit may be played back to player B with a suitable indicator of direction—for instance, the effect may be designed to feel like it originated from the left, rather than the top or bottom; this may be helpful when three or more users are playing together.

(117) By playing back the haptic effect even for a collision (or other event) occurring in a different player’s screen, the game can enhance the perception that the players are sharing a space even though the players cannot view one another’s play areas. Thus, the players may become more immersed in the game and may have a more compelling game experience.

(118) FIG. 10 illustrates another example of play and depicts the virtual object ricocheting off the border of a play area. Particularly, three time intervals (I), (II), and (III) are again shown. Play areas 402A and 402B correspond to players A and B, while paddles 404 and virtual object 406 are also illustrated. As shown at time interval (I), virtual object 406 is launched with a trajectory towards a point 408 at the top boundary of play area 402. Interval (II) illustrates when virtual object 406 encounters point 408. A “bounce” haptic effect H2 is played back to players A and B, localized to their touch points at respective paddles 404A and 404B.

(119) Since the “bounce” occurs in play area 402B and is at a closer distance to paddle 404B than paddle 404A, it is depicted as “((H2))” in play area 402B and “(H2)” in play area 402A since the bounce is “louder” for player B. As shown at time interval (III), after the bounce the virtual object passes to play area 402A. Alerted to the bounce, player A may attempt to intercept the virtual object and prevent it from reaching the goal area behind paddle 404A.

(120) FIG. 11 is a diagram illustrating another aspect of the present subject matter. In addition to or instead of haptic effects played in response to events changing the virtual object trajectory or other “discrete” events, haptic effects can be played back to simulate a continuous effect. In this example, play areas 502 for two players A and B are shown in a time interval (I) and a time interval (II). For purposes of illustration, play areas 502 are shown in a “landscape,” rather than “portrait” orientation. Each play area features a respective paddle 504 as well, and virtual object 506 is depicted.

(121) Each play area of this example also includes seams 508 represented by dotted lines. For example, seams 508 may represent boundaries between planks in a wooden surface depicted in the play area. To simulate a wood panel back ground, a continuous low rumble effect to correlate with the virtual object rolling across the surface can be combined with click effects to correlate with the virtual object encountering seams 508. This effect is shown as “H3” in FIG. 11. At time interval (I), the effect is shown as “((H3))” for players B and “(H3)” for player A since the virtual object is closer to paddle 504B than paddle 504A. At time interval (II), effect H3 is louder for paddle 504A since virtual object 506 is moving towards player A. Although the background effect is shown in conjunction with seams 508, a background effect could be included to simulate a

surface alone (i.e. a continuous surface) or could vary as the simulated background surface changes (e.g., from a wood area to a metal area to a concrete area, etc.).

(122) FIG. 12 is a flowchart illustrating illustrative steps in a method 600 for providing a game in accordance with the present subject matter. Block 602 represents setting up one or more play areas. For example, if two users desire to play, respective play areas can be initialized and mappings between the shared boundaries (and/or other entry-exit points) can be determined.

(123) Block 604 occurs while play continues. At least one instance of the game can track the position and motion of the virtual object based on interaction with paddles, obstacles, and characteristics of the play area based on a model simulating physics of the game. For example, the model can provide for changes in the virtual object's speed and direction based on simulating momentum, mass, and material characteristics of the virtual object and the other items in the play area.

(124) At block 606, based on the position and motion of the virtual object at, before, and/or after an event, one or more haptic effects to play back can be determined. For example, if the virtual object encounters a boundary or other object in the play area, a haptic effect associated with the physical interaction between the virtual object and boundary/object can be selected for playback. Different boundaries/objects may result in different effects. For example, a border or paddle may result in a "hard" effect, while obstacles included in the play area may have "soft" effects. Simulated properties of the virtual object can be taken into account as well—the game may support a mode with a hard (e.g., steel) virtual object or a soft (e.g., rubber) virtual object with appropriate changes in the haptic output scheme.

(125) Additionally or alternatively the haptic effect can relate to a background effect. For instance, as was noted above, a continuous haptic effect simulating passage of the virtual object over a simulated surface can be provided based on characteristics of that surface. As another example, the surface may include material or an obstacle for the virtual object to pass through and a suitable haptic effect can be provided to simulate passage through the material/obstacle.

(126) At block 608, the game determines the position of the virtual object relative to the haptic delivery point(s) to adjust how the haptic effect is to be output. For instance, a haptic delivery point can include the point at which a user touches the screen of a device. The "loudness" (i.e., intensity) of the haptic effect can be inversely proportional to the distance between the delivery point and the virtual object. Directionality may also be applied. For example, if a ricochet occurs on another screen, the haptic effect that is presented may include a directional component or may be otherwise be presented to give an indication of where the ricochet occurred.

(127) At block 610, suitable signals are sent to the actuators to generate the haptic effect(s) having the desired volume. For example, the game can consult a library of signal patterns for use in generating different haptic effects and use the signal patterns to command one or more actuators embedded in the screen and/or other portions of the device. The haptic effects may include sounds and/or visual elements as well.

(128) For multi-user play, each respective instance of the game can determine the virtual object's position and motion while in that instance's play area and pass that information to the other instances. When the virtual object exits the play area, information regarding the virtual object's motion (e.g., a vector with direction and speed)

can be used to continue tracking by the instance of the game whose play area is to receive the virtual object.

(129) In some embodiments, when an event occurs and/or when background effects are provided, the haptic effect is selected by the instance of the game whose play area contains the virtual object when the haptic effect is to be triggered and that information is provided to the other instances of the game. For example, in a game involving player A and player B, if the virtual object collides with an obstacle, border, or paddle in player A's play area, the instance of the game on player A's device can provide player B's device the desired haptic effect along with information about the collision and position thereof for use by the instance of the game on player B's device in determining a volume or directionality for the effect.

(130) FIG. 13 is a diagram illustrating an example of an interface 700 for an instance of a game configured in accordance with aspects of the present subject matter. In this example, a pinball-like game is presented in which the play area 702 includes a border 704, 706 that extends inward from the screen boundaries. The objective of the game is to prevent a virtual object (not shown), such as a ball or other object, from reaching 708 by deflecting the virtual object using paddle 710. To begin play, the virtual object may be launched from paddle 710 or may appear elsewhere in play area 702.

(131) Interface 700 includes a plurality of control buttons 712, 714, 716, and 718 which may be used to provide inputs and access menus. For example, buttons 712 and 714 may comprise play and pause buttons, while button 716 provides a "launch" command and button 718 exits the game or launches a menu for configuring, saving, or exiting the

game. In some embodiments, control buttons 712-718 may be provided with suitable haptic effects to simulate pushing a physical button.

(132) Turning to play area 702, a plurality of simulated lights 720 can be provided to enhance the visual experience; the lights may or may not act as obstacles. A bumper 722 may cause the virtual object to “bounce” in response to a collision in a manner different from a ricochet from border 704, 706. For example, border 704, 706 may be presented as a simulated metal border which causes a sharp ricochet effect. Bumper 722 may feature an initial amount of “give” before imparting force on the virtual object in a manner similar to that of a pinball machine bumper. Accordingly, when the virtual object encounters border 704, 706 or bumper 722, different respective haptic effects may be played back at the point(s) at which the user contacts the screen to provide different sensations in accordance with the simulated physical response of the borders/bumper. Additionally, as was noted above, the intensity of the effect can depend on distance from the point(s) at which the user contacts the screen.

(133) This example features metal bars 724, 726, and 728, which may provide a still further response to collisions with a virtual object and may be assigned their own respective haptic effect. Arrows 730 may comprise a visual effect and/or may result in an acceleration of the virtual object into xylophone structure 732. In this example, xylophone structure 732 comprises a plurality of keys (732A, 732B, 732C identified), with each ascending key having its own associated haptic effect. For example, as the virtual object moves from key 732A to 732B to 732C, the haptic effect may increase in pitch along with corresponding xylophone sound effects. At the same time, the haptic effect may decrease in intensity as the virtual object moves away.

(134) In some embodiments, point 734 represents an exit from the play area and into a second user's play area, which is identical to play area 702. When the virtual object enters play area 702, it may be returned via chute 736 along with an accompanying "rattle" representing passage through the chute. As was noted above, each haptic effect in one user's play area can also be played back in the other user's (or users') play area(s) but with a corresponding decrease in intensity based on the separation from the site of the event causing the haptic effect and the user's point of contact with the screen.

(135) Some embodiments feature one or more instances of a vortex as shown at 738. Vortex 738 can comprise a portion of play area 702 that attracts the virtual object toward opening 740. If the virtual object reaches opening 740, the virtual object may pass into another play area. When the virtual object initially contacts vortex 738, a first haptic effect representing the "pull" of the vortex may be played back, with the effect becoming stronger until (and if) the virtual object reaches opening 740. At that point, an "exit" effect may be played back to represent the virtual object's exit from the vortex in another play area. This can, for instance, alert the user of the play area receiving the virtual object to move his or her paddle 710 into position.

(136) In some embodiments, if the virtual object is not deflected from goal area 708, a haptic effect representing entry of area 708 is presented, such as absorption of the virtual object or an explosion. At that point, depending upon the rules of the game, the virtual object may be provided for launch again via paddle 710 for another round. In some embodiments, the game proceeds until one player reaches a predetermined score level (e.g., 7 goals) and/or score differential (ahead by 3 goals). As another

example, point values may be associated with hitting certain obstacles (e.g., bumper 722, bars 724, 726, 728, lights 720) or passing through all keys of xylophone structure 732. Embodiments may support moving or destroying obstacles (e.g., breaking through bricks) during the course of play, with suitable haptic effects provided based on motion or destruction of the obstacles.

(137) In some embodiments, a computing device may be sensitive to distance of a user's fingers or stylus from the touch screen and/or touch pressure. These features may be used during play of the game and/or in configuring the game application. For instance, if the device indicates that the user is not touching the screen or another haptically-enabled area, haptic effects can be turned off to reduce power consumption. As another example, the user may be able to hover to provide input. For instance, the area at which buttons 712-716 are presented may ordinarily appear as brushed metal, but the buttons may appear in response to a user hovering or touching the area.

(138) In several examples above, game play proceeded based on movement of a paddle using touch. Additionally or alternatively, gameplay may depend on tilt sensors and/or accelerometers. For example, users may be able to tilt or swing their devices to affect the movement of the virtual object and/or paddle position. Haptic effects can be delivered at the point(s) at which the users grip their respective devices. In some embodiments, the game may use multiple paddles per user or may use no paddles at all, with all input based on tilt/acceleration.

(139) Several examples of multi-user play were provided. In some embodiments, single-user play is also supported. For example, a play area may be completely closed, with the virtual object returning towards the paddle and goal area. As another example,

single user play may proceed with one or more other players simulated, with the other players having a respective simulated play area and with corresponding haptic feedback when the virtual object enters the simulated play area.

(140) Although the invention has been described in detail for the purpose of illustration based on what is currently considered to be the most practical and preferred embodiments, it is to be understood that such detail is solely for that purpose and that the invention is not limited to the disclosed embodiments, but, on the contrary, is intended to cover modifications and equivalent arrangements that are within the spirit and scope of the appended claims. For example, it is to be understood that the present invention contemplates that, to the extent possible, one or more features of any embodiment can be combined with one or more features of any other embodiment.

What is claimed is:

1. A system configured to provide haptic stimulation to a user, the system comprising:
 - a user interface configured to generate output signals related to the gestures of a user;
 - an actuator configured to generate haptic stimulation to the user; and
 - one or more processors configured to execute computer program modules, the computer program modules comprising:
 - a gesture module configured to monitor performance of a control gesture by the user based on the output signals of the user interface,
 - wherein the control gesture is a gesture associated with a command input to the system, and includes an initial portion, a first intermediate portion, and an ending portion;
 - a stimulation module configured to receive information related to performance of the control gesture from the gesture module, and to determine haptic stimulation to be generated for the user associated with the control gesture,
 - wherein the haptic stimulation includes a first stimulation determined responsive to performance of the initial portion of the control gesture, and a second stimulation that is different from the first stimulation and is determined responsive to performance of the first intermediate portion of the control gesture; and

an actuator control module configured to control the actuator to generate the stimulation determined by the stimulation module.

2. The system of claim 1, wherein the stimulation module is configured such that the haptic stimulation associated with the control gesture includes a third stimulation different from the first stimulation and the second stimulation that is determined responsive to performance of the ending portion of the control gesture.
3. The system of claim 1, wherein the control gesture further includes a second intermediate portion, and wherein the stimulation module is configured such that the haptic stimulation associated with the control gesture includes a third stimulation different from the first stimulation and the second stimulation that is determined responsive to performance of the second intermediate portion of the control gesture.
4. The system of claim 3, wherein the second stimulation is determined to signal to the user that the second intermediate portion of the control gesture should be commenced.
5. The system of claim 1, wherein the command input associated with the control gesture is a single, discrete command.

6. The system of claim 1, wherein the second stimulation is determined by adjusting one or more parameters of the first stimulation.
7. The system of claim 6, wherein the one or more parameters of the first stimulation that are adjusted to determine the second stimulation include one or more of periodicity, force, directionality, or location.
8. The system of claim 1, wherein the first intermediate portion of the control gesture includes maintaining contact with a touch sensitive surface for a predetermined period of time.
9. The system of claim 1, wherein the gesture module is configured to identify a control gesture failure responsive to the users commencing performance of the control gesture and not successfully performing all of the portions of the control gesture, and wherein the stimulation module is configured such that the haptic stimulation associated with the control gesture includes a third stimulation different from the first stimulation and the second stimulation that is determined responsive to identification of a control gesture failure by the gesture module.
10. The system of claim 1, wherein the stimulation module is configured such that the first stimulation and/or the second stimulation are determined in part based on one or more of a skill-level, fatigue, or injury of a character in a game under the control of the user.

11. A method of providing haptic stimulation to a user of a system, the method comprising:
 - monitoring performance of a control gesture by a user,
 - wherein the control gesture is a gesture associated with a command input to the system, and includes an initial portion, a first intermediate portion, and an ending portion;
 - determining haptic stimulation associated with performance of the control gesture to be generated for the user,
 - wherein the haptic stimulation includes a first stimulation determined responsive to performance of the initial portion of the control gesture, and a second stimulation that is different from the first stimulation and is determined responsive to performance of the first intermediate portion of the control gesture;
 - and
 - generating the determined stimulation during performance of the control gesture.
12. The method of claim 11, wherein the haptic stimulation associated with the control gesture includes a third stimulation different from the first stimulation and the second stimulation that is determined responsive to performance of the ending portion of the control gesture.

13. The method of claim 11, wherein the control gesture further includes a second intermediate portion, and wherein the haptic stimulation associated with the control gesture further includes a third stimulation different from the first stimulation and the second stimulation that is determined responsive to performance of the second intermediate portion of the control gesture.
14. The method of claim 13, wherein the second stimulation is determined to signal to the user that the second intermediate portion of the control gesture should be commenced.
15. The method of claim 11, wherein the command input associated with the control gesture is a single, discrete command.
16. The method of claim 11, wherein the second stimulation is determined by adjusting one or more parameters of the first stimulation.
17. The method of claim 16, wherein the one or more parameters of the first stimulation that are adjusted to determine the second stimulation include one or more of periodicity, force, directionality, or location.
18. The method of claim 11, wherein the first intermediate portion of the control gesture includes maintaining contact with an interface surface of a touch sensitive surface for a predetermined period of time.

19. The method of claim 11, wherein responsive to identification of a control gesture failure during monitoring of performance of the control gesture the haptic stimulation associated with the control gesture includes a third stimulation different from the first stimulation and the second stimulation.
20. The method of claim 11, wherein the first stimulation and/or the second stimulation are determined in part based on one or more of a skill-level, fatigue, or injury of a character in a game under the control of the user.
21. A system configured to provide stimulation to a user of a game, the system comprising:
 - a touch sensitive electronic display having an interface surface accessible for engagement by the user, the touch sensitive user interface being configured to generate output signals related to the position at which the interface surface is engaged, and to present views of the game to the user through the interface surface,
 - wherein the views presented through the interface surface include views of virtual equipment having user selectable sections that are selectable by the user to interact with the virtual equipment by engaging the interface surface at the user selectable sections of the views of the virtual equipment;
 - an actuator configured to generate haptic stimulation to the user; and

one or more processors in operative communication with the touch sensitive electronic display and the actuator, the one or more processors being configured to execute computer program modules, the computer program modules comprising:

an equipment module configured to determine the operating parameters of the virtual equipment in the views, and to simulate operation of the virtual equipment,

wherein the equipment module determines the operating parameters of the virtual equipment and/or simulates operation of the virtual equipment based on selections by the user of the user selectable sections of the views of the virtual equipment;

a stimulation module configured to determine haptic stimulation to be generated for the user associated with the operating parameters of the virtual equipment and/or simulated operation of the virtual equipment,

an actuator control module configured to control the actuator to generate the stimulation determined by the stimulation module.

22. The system of claim 21, wherein the virtual equipment includes a projectile weapon.
23. The system of claim 22, wherein the operating parameters of the virtual equipment based on selections by the user of the user selectable sections of the views of the virtual equipment include one or more of an amount of loaded

rounds of ammunition, a level of disrepair, a stopping power, a projectile velocity, an ammunition type, or a noise level.

24. The system of claim 21, wherein the actuator is configured to actuate the touch sensitive electronic display.
25. The system of claim 21, wherein the actuator is configured to actuate the interface surface.
26. The system of claim 21, wherein the operating parameters of the virtual equipment include activation and deactivation of individual pieces of virtual equipment.
27. The system of claim 21, wherein the user selectable sections of the views of the virtual equipment correspond to sections of the virtual equipment analogous to sections of equipment that would be engaged in real life to configure operating parameters and/or operate the equipment.
28. The system of claim 21, wherein the equipment module is configured to add or remove one or more components of a piece of virtual equipment based on the user engaging user selectable sections of a view of the piece of virtual equipment.

29. The system of claim 28, wherein the removal and/or addition of one or more components of the piece of virtual equipment are reflected in the views of virtual equipment presented to the user through the interface surface.
30. The system of claim 21, wherein equipment module is configured to change equipment modes of a piece of virtual equipment based on the user engaging user selectable section of a view of the piece of virtual equipment.
31. A method of providing stimulation to a user of a game, the method comprising:
- presenting views of a game through an interface surface of a touch sensitive electronic display that is accessible for engagement by a user,
 - wherein the views presented through the interface surface include views of virtual equipment having user selectable sections that are selectable by the user to interact with the virtual equipment by engaging the interface surface at the user selectable sections of the views of the virtual equipment;
 - receiving selection of one of the user selectable sections via an by the user engagement of the selected user selectable section on the interface surface;
 - determining the operating parameters of the virtual equipment in the views and/or simulating operation of the virtual equipment based on the received selection;

determining, responsive to the received selection, haptic stimulation to be generated for the user associated with the operating parameters of the virtual equipment and/or simulated operation of the virtual equipment; and
generating the determined haptic stimulation.

32. The method of claim 31, wherein the virtual equipment includes a projectile weapon.
33. The method of claim 32, wherein the operating parameters of the virtual equipment determined based on selection of the selected user selectable section include one or more of an amount of loaded rounds of ammunition, a level of disrepair, a stopping power, a projectile velocity, an ammunition type, or a noise level.
34. The method of claim 31, wherein the haptic stimulation is generated to actuate the touch sensitive electronic display.
35. The method of claim 31, wherein the haptic stimulation is generated to actuate the interface surface.
36. The method of claim 31, wherein the operating parameters of the virtual equipment determined based on selection of the selected user selectable section include activation and deactivation of individual pieces of virtual equipment.

37. The method of claim 31, wherein the user selectable sections of the views of the virtual equipment correspond to sections of the virtual equipment analogous to sections of equipment that would be engaged in real life to configure operating parameters and/or operate the equipment.
38. The method of claim 31, further comprising adding or removing one or more components of a piece of virtual equipment based on the user engaging user selectable sections of a view of the piece of virtual equipment.
39. The method of claim 38, wherein the removal and/or addition of one or more components of the piece of virtual equipment are reflected in the views of virtual equipment presented to the user through the interface surface.
40. The method of claim 31, wherein further comprising changing equipment modes of a piece of virtual equipment based on the user engaging user selectable section of a view of the piece of virtual equipment.

ABSTRACT

A system is configured to provide haptic stimulation to a user. In one embodiment, the haptic stimulation is provided to the user in conjunction with the performance of one or more control gestures through which the user controls, for example, a game, a real world component or piece of equipment, and/or other entity. In one embodiment, the haptic stimulation is provided to the user in conjunction with control of virtual equipment by the user.

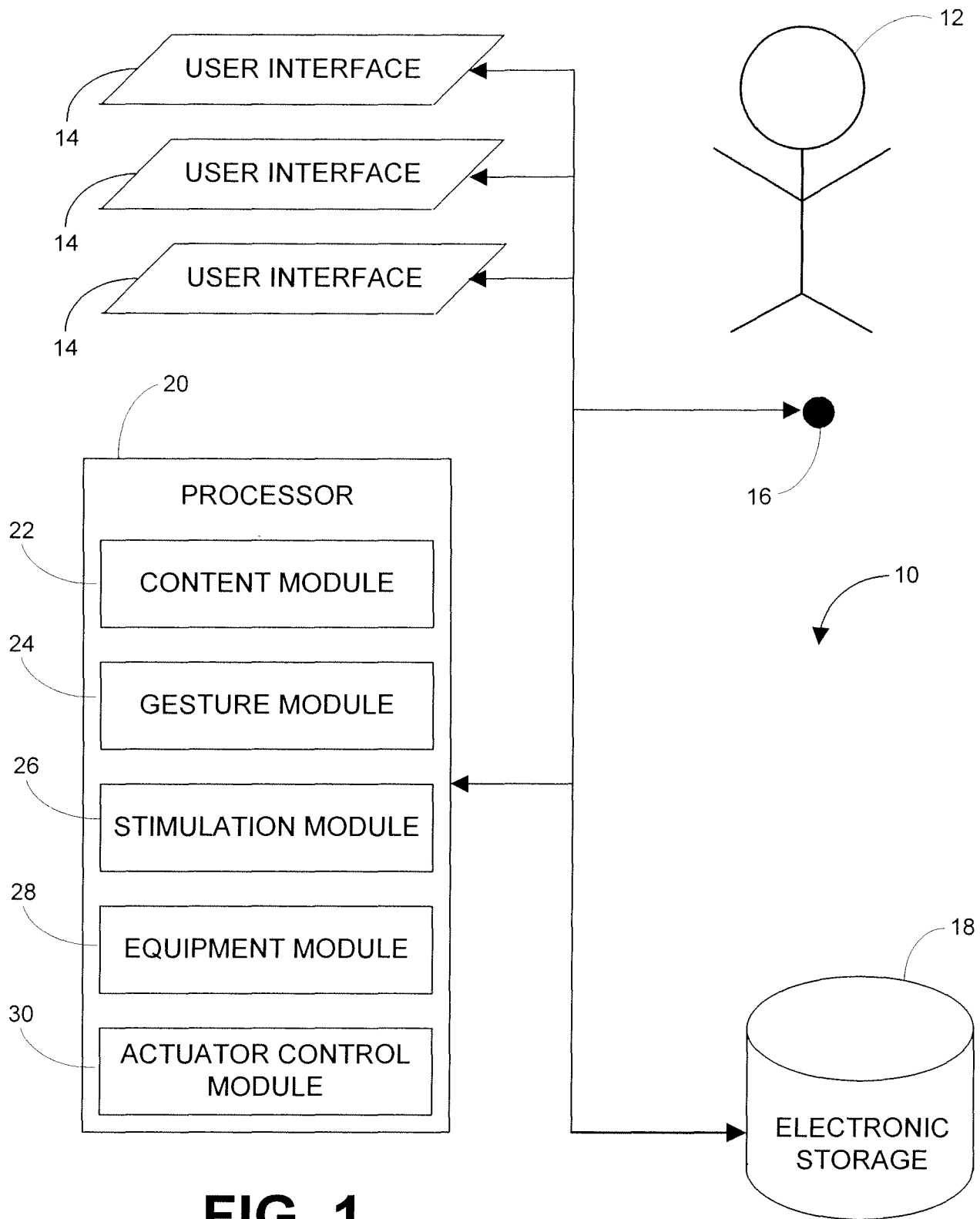


FIG. 1

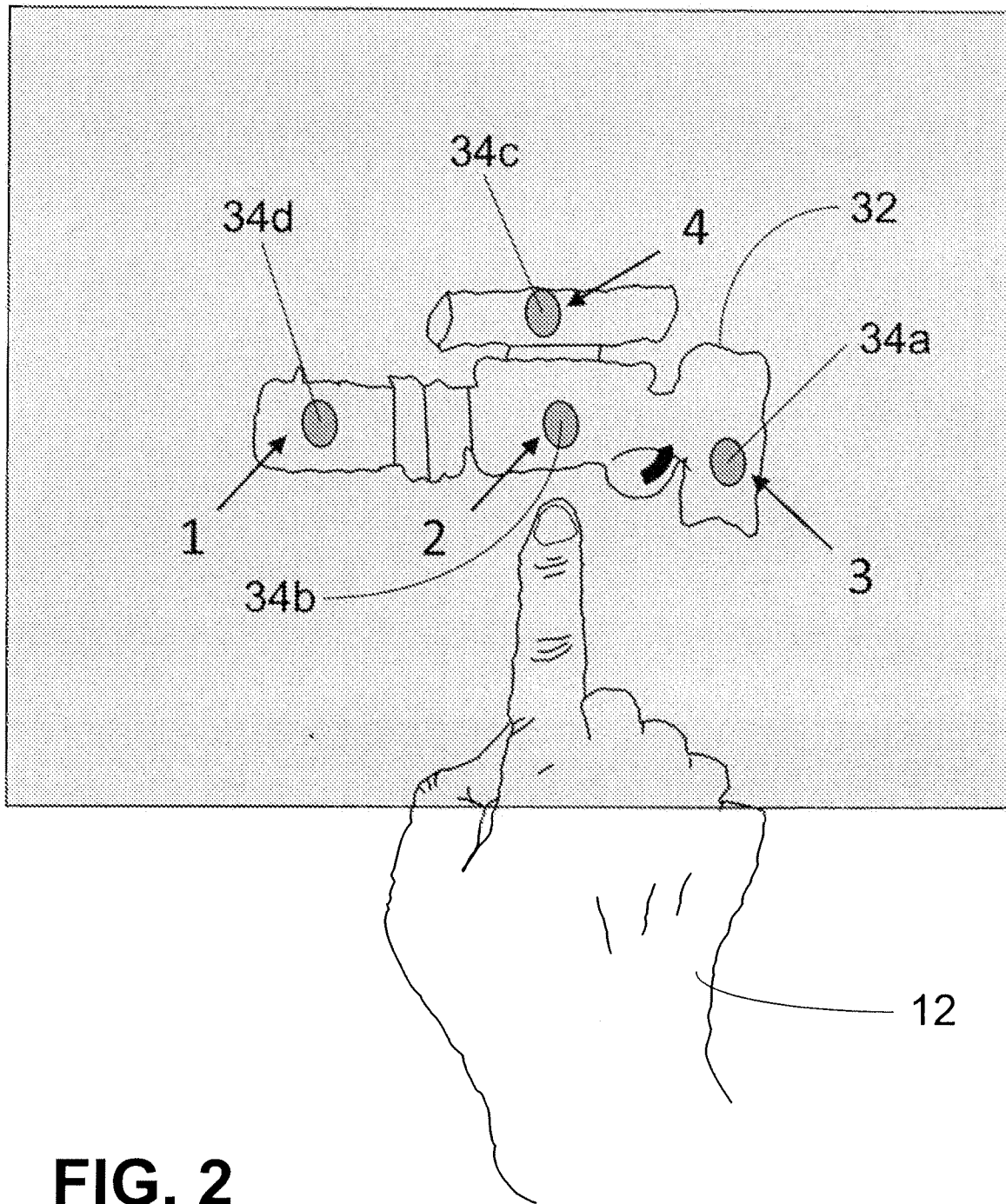


FIG. 2

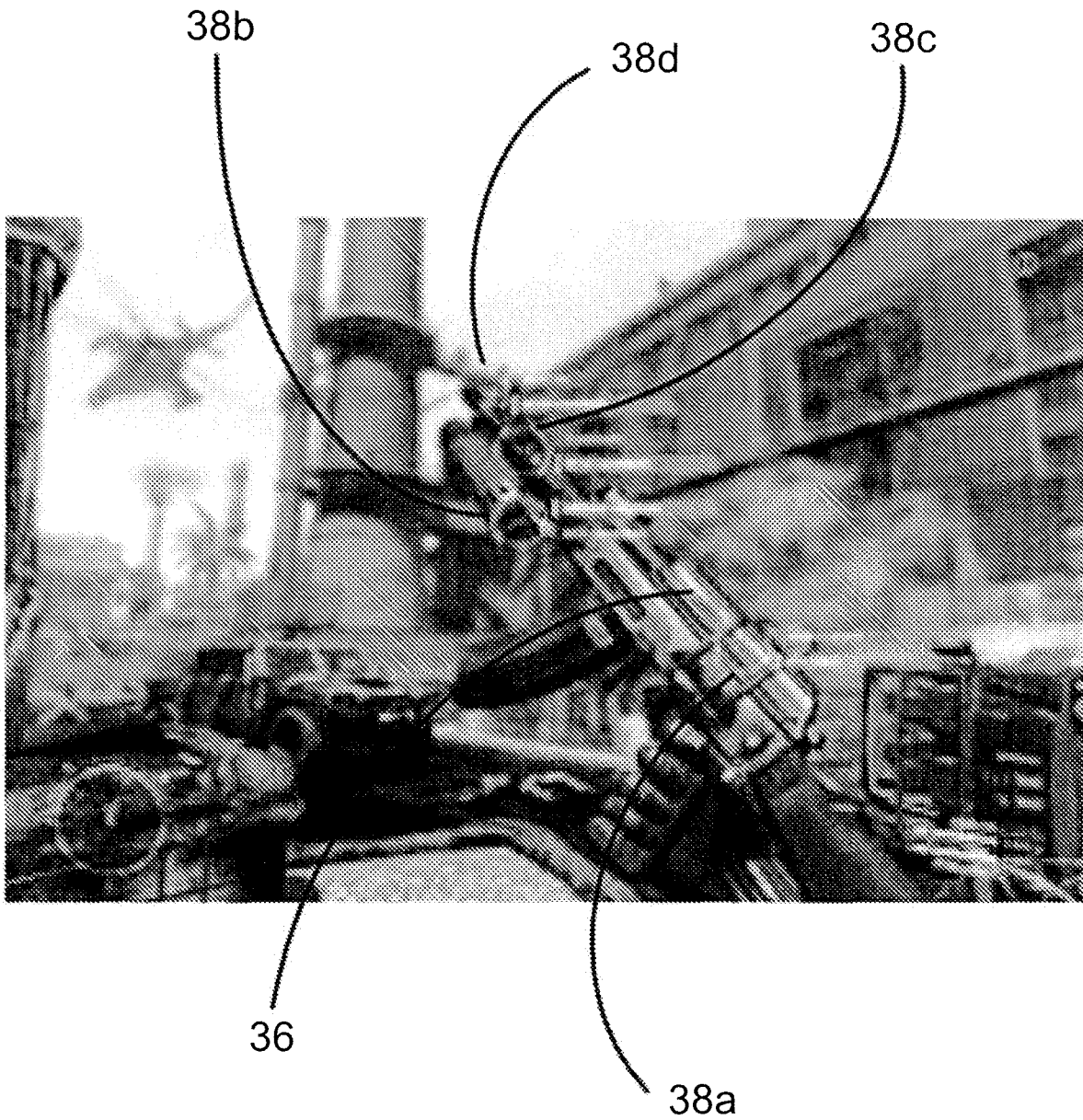


FIG. 3

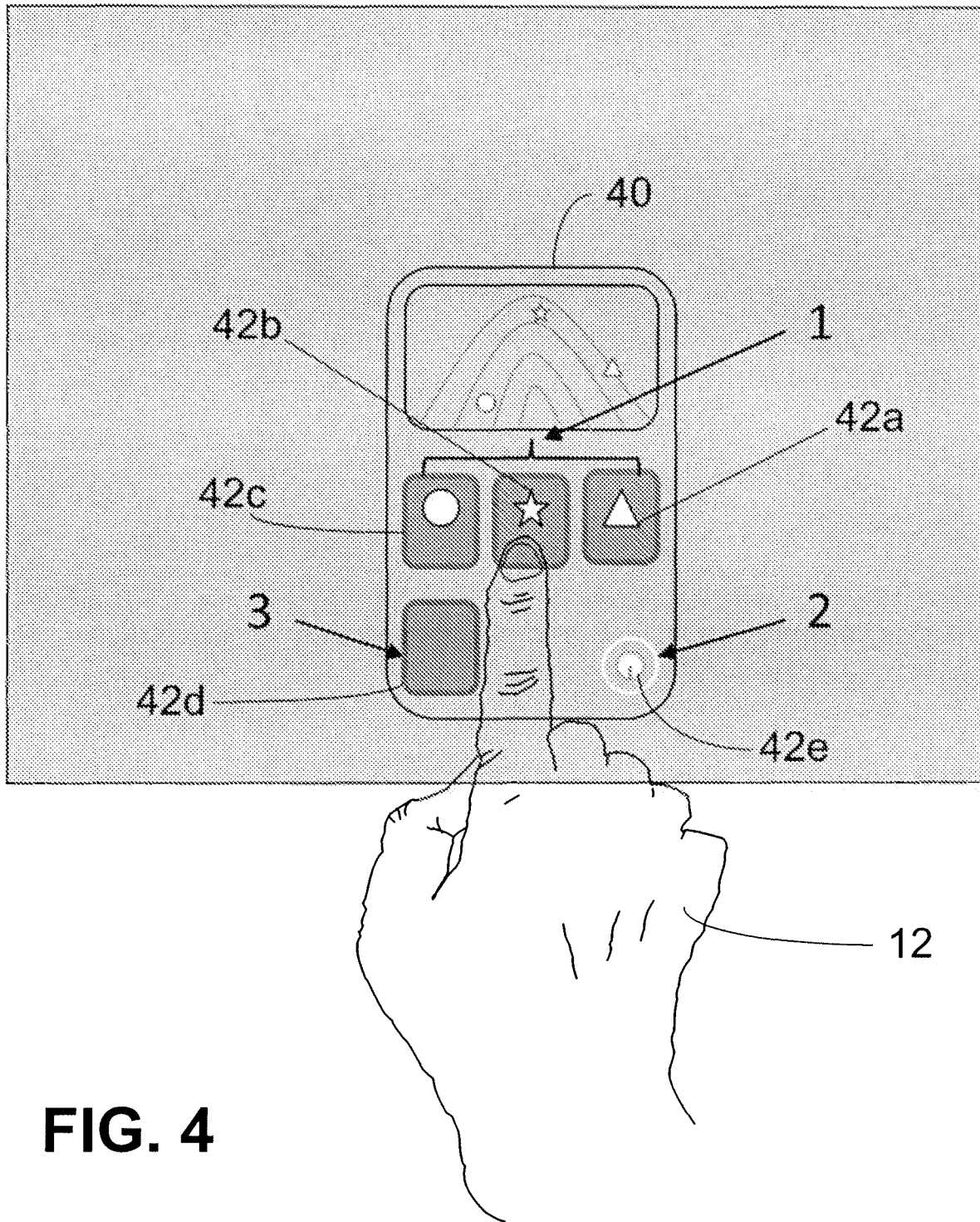


FIG. 4

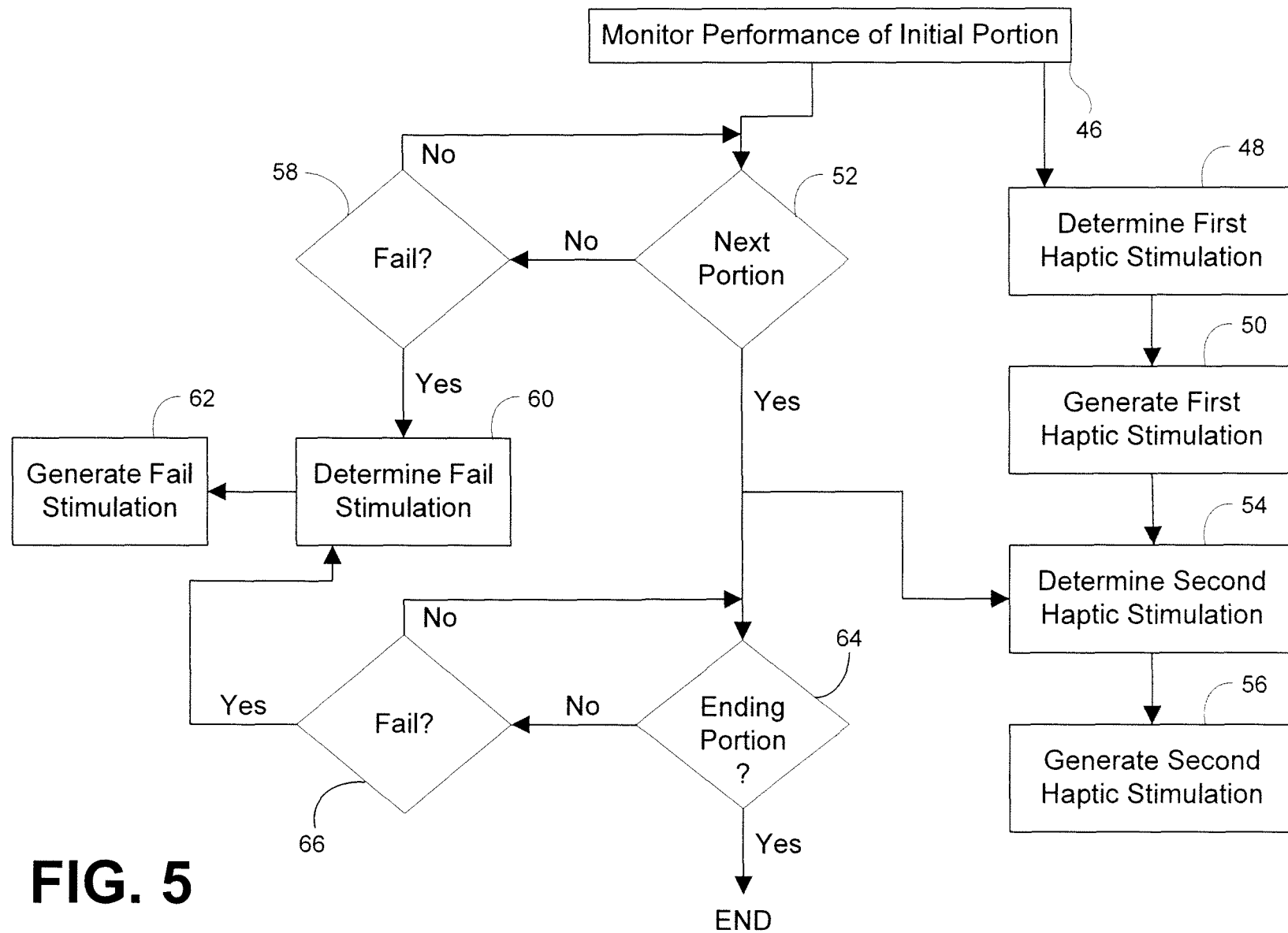


FIG. 5

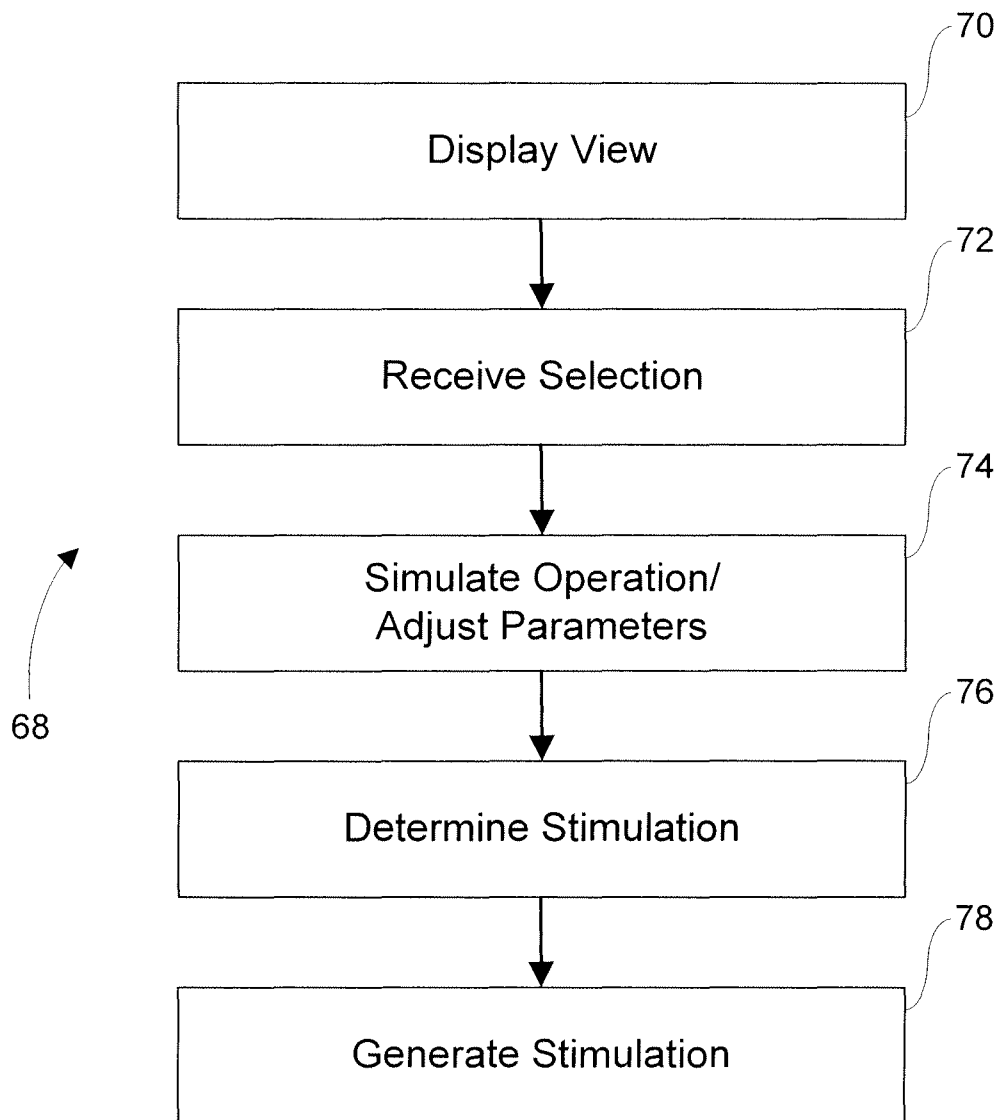


FIG. 6

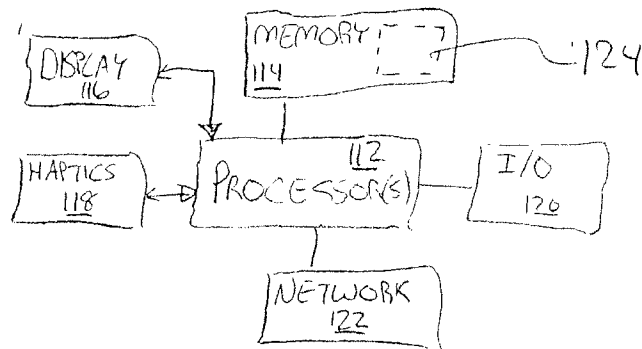
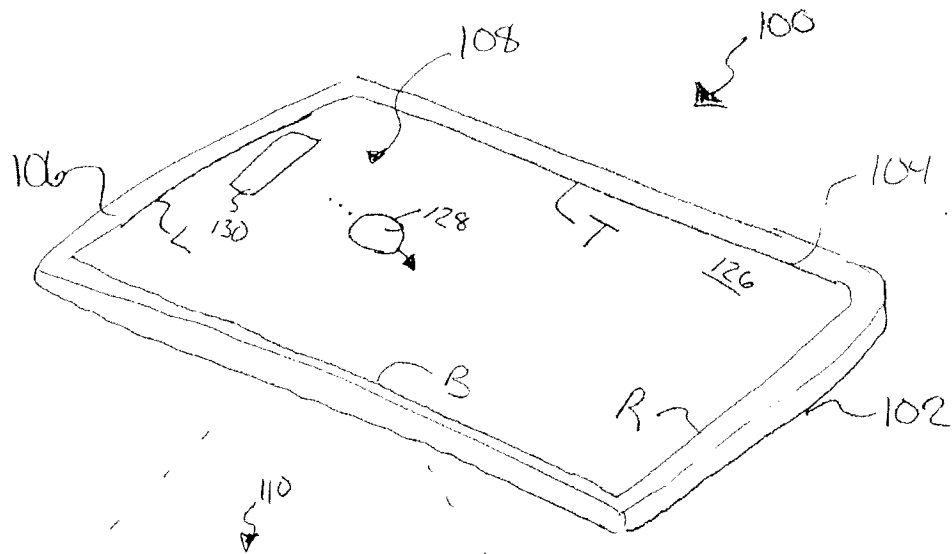


FIG. 7

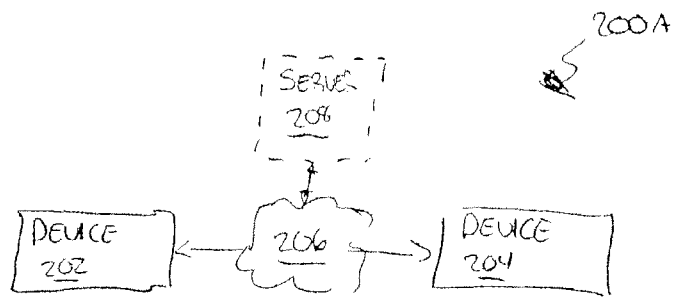


FIG. 8A

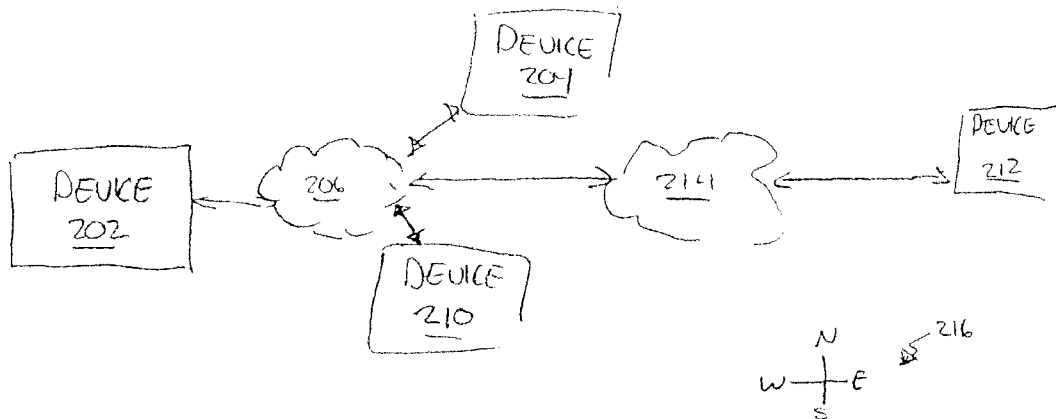


FIG. 8B

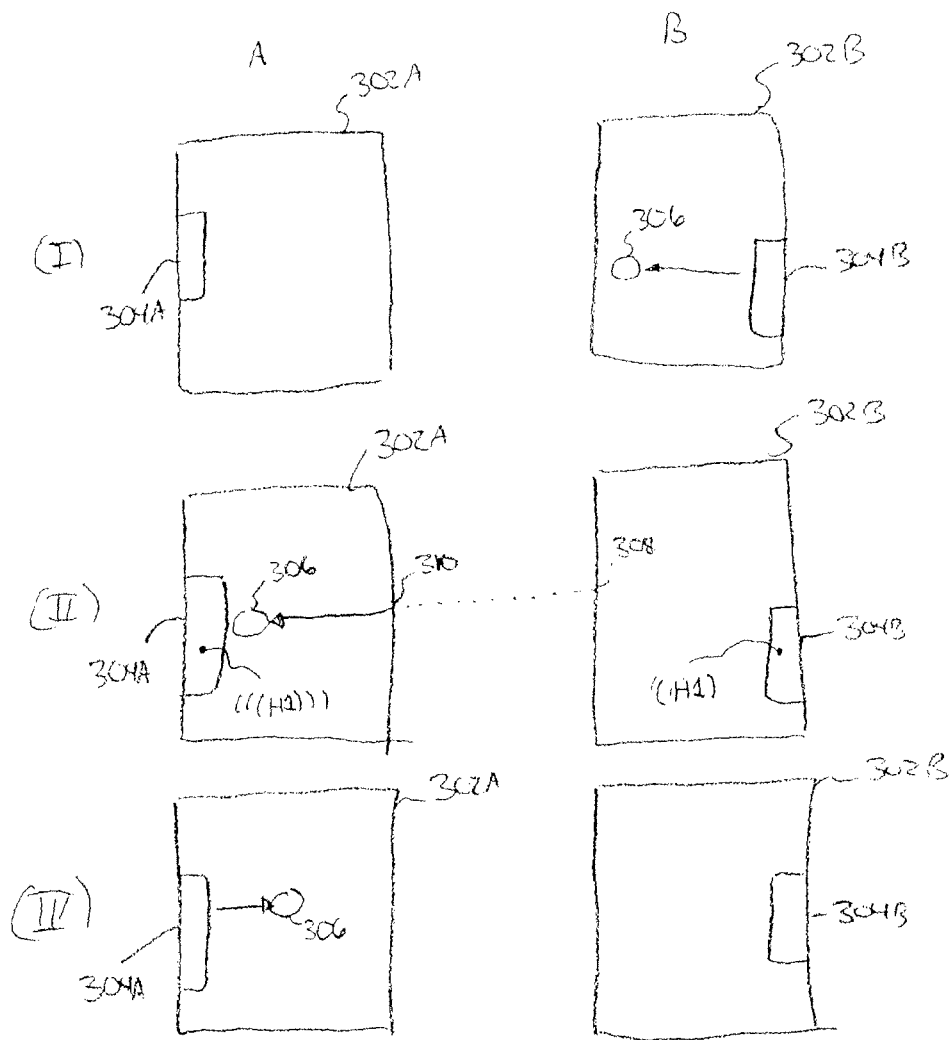


FIG. 9

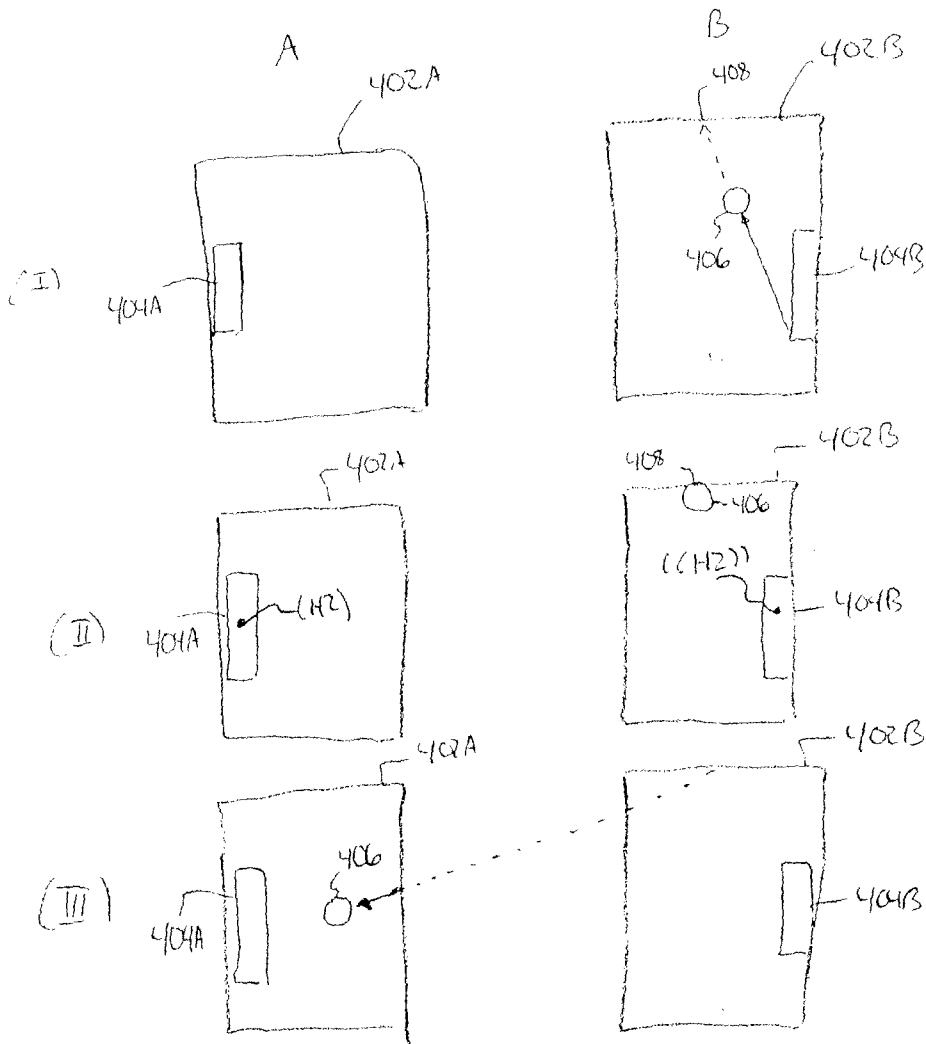


FIG. 10

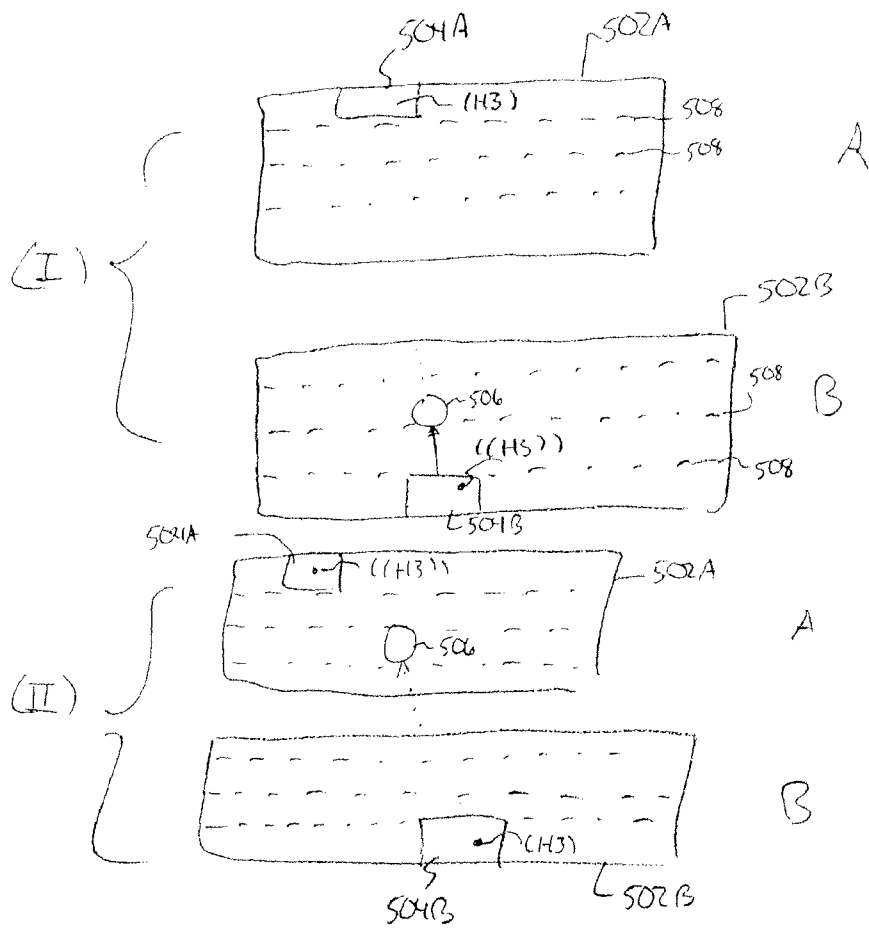


FIG. 11

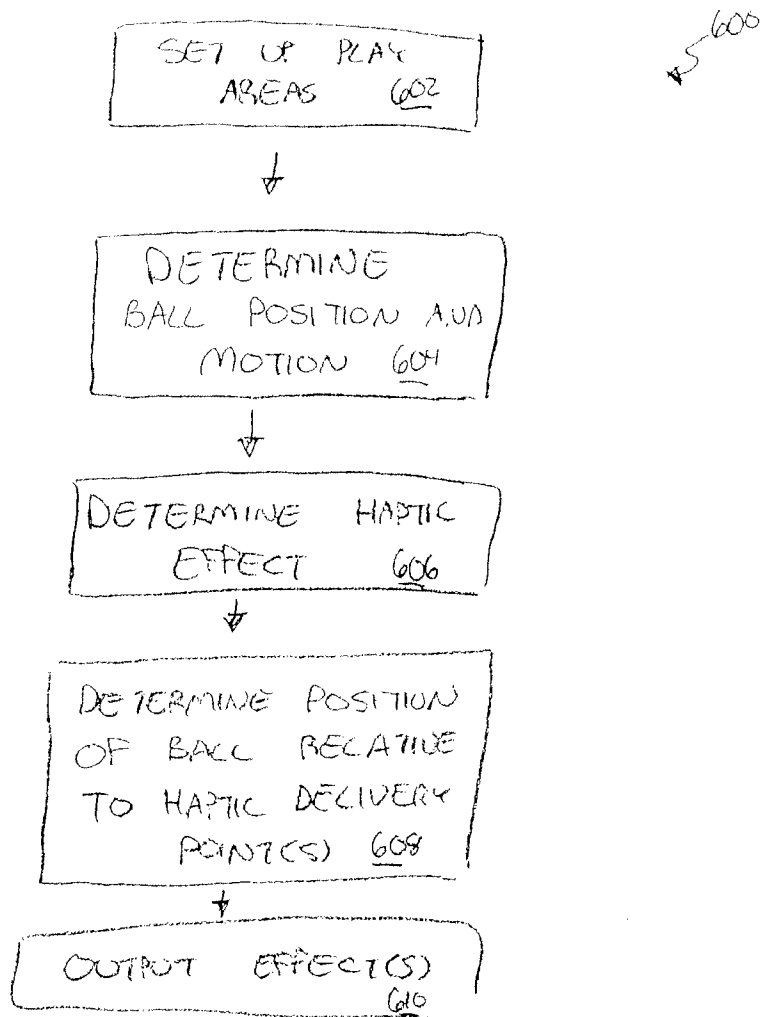


FIG. 12

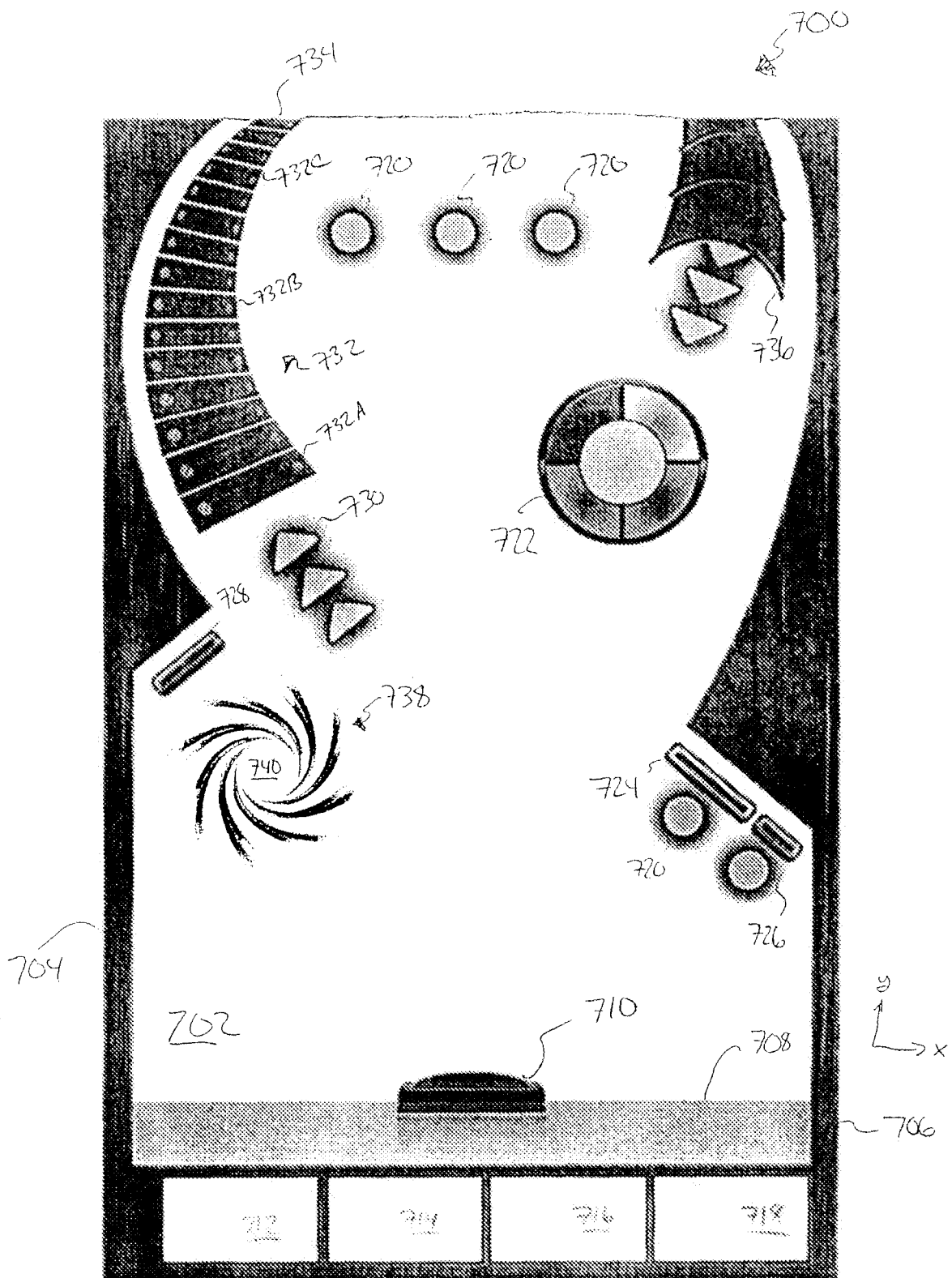


FIG. 13

Electronic Acknowledgement Receipt

EFS ID:	8062694
Application Number:	12840797
International Application Number:	
Confirmation Number:	1778
Title of Invention:	SYSTEM AND METHOD FOR PROVIDING COMPLEX HAPTIC STIMULATION DURING INPUT OF CONTROL GESTURES, AND RELATING TO CONTROL OF VIRTUAL EQUIPMENT
First Named Inventor/Applicant Name:	Danny Grant
Customer Number:	00909
Filer:	D. Benjamin Esplin/Robin Eschenbruecher
Filer Authorized By:	D. Benjamin Esplin
Attorney Docket Number:	043508-0383796
Receipt Date:	21-JUL-2010
Filing Date:	
Time Stamp:	16:25:56
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	no
------------------------	----

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Transmittal of New Application	UtilityTransmittal.pdf	67221 84e3b848962e2f95766bc4e221c813ce0050164f	no	2

Warnings:

Information:

2	Application Data Sheet	ApplicationDataSheet.pdf	52060 b12930540982b61fd5d4ec65e5c9b9205f2 b12b2	no	2
Warnings:					
Information:					
This is not an USPTO supplied ADS fillable form					
3		Specification.pdf	2167132 469fa22e599b05c118365d588be4be7151ff 3144	yes	62
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Specification		1	50	
	Claims		51	61	
	Abstract		62	62	
Warnings:					
Information:					
4	Drawings-only black and white line drawings	Drawings.pdf	367202 442f7992a881d54718349f07578fcb39574e 62a1	no	13
Warnings:					
Information:					
Total Files Size (in bytes):			2653615		
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. <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. <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. <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.					

SCORE Placeholder Sheet for IFW Content

Application Number: 12840797

Document Date: 7/21/2010

The presence of this form in the IFW record indicates that the following document type was received in electronic format on the date identified above. This content is stored in the SCORE database.

- Drawings – Other than Black and White Line Drawings

Since this was an electronic submission, there is no physical artifact folder, no artifact folder is recorded in PALM, and no paper documents or physical media exist. The TIFF images in the IFW record were created from the original documents that are stored in SCORE.

To access the documents in the SCORE database, refer to instructions developed by SIRA.

At the time of document entry (noted above):

- Examiners may access SCORE content via the eDAN interface.
- Other USPTO employees can bookmark the current SCORE URL (<http://es/ScoreAccessWeb/>).
- External customers may access SCORE content via the Public and Private PAIR interfaces.

Date

07/21/10

PTO/SB/06 (12-04)

Approved for use through 7/31/2006. OMB 0651-0032

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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

12/840,797

APPLICATION AS FILED – PART I

(Column 1)

(Column 2)

SMALL ENTITY

OR

SMALL ENTITY

FOR	NUMBER FILED	NUMBER EXTRA
BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A
SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A
EXAMINATION FEE (37 CFR 1.16(o), (p), or (q))	N/A	N/A
TOTAL CLAIMS (37 CFR 1.16(i))	40 minus 20 =	20
INDEPENDENT CLAIMS (37 CFR 1.16(h))	4 minus 3 =	1
APPLICATION SIZE FEE (37 CFR 1.16(s))	If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$270 (\$135 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR	
MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))		

RATE (\$)	FEE (\$)
N/A	
N/A	
N/A	
x\$26	
x\$110	
195	
TOTAL	

OR

RATE (\$)	FEE (\$)
N/A	330
N/A	540
N/A	220
x\$52	1040
x\$220	220
390	
TOTAL	2350

* 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

OR

OTHER THAN SMALL ENTITY

AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total (37 CFR 1.16(i))	*	Minus **	=
Independent (37 CFR 1.16(h))	*	Minus ***	=
Application Size Fee (37 CFR 1.16(s))			
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))			

RATE (\$)	ADDITIONAL FEE (\$)
X =	
X =	
N/A	
TOTAL ADD'T FEE	

OR

RATE (\$)	ADDITIONAL FEE (\$)
X =	
X =	
N/A	
TOTAL ADD'T FEE	

(Column 1)

(Column 2)

(Column 3)

SMALL ENTITY

OR

AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total (37 CFR 1.16(i))	*	Minus **	=
Independent (37 CFR 1.16(h))	*	Minus ***	=
Application Size Fee (37 CFR 1.16(s))			
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))			

RATE (\$)	ADDITIONAL FEE (\$)
X =	
X =	
N/A	
TOTAL ADD'T FEE	

OR

RATE (\$)	ADDITIONAL FEE (\$)
X =	
X =	
N/A	
TOTAL ADD'T 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.

Meta Platforms Exhibit 1007

Page 0083



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 NUMBER	FILING or 371(c) DATE	GRP ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	TOT CLAIMS	IND CLAIMS
12/840,797	07/21/2010	3764	0.00	043508-0383796	40	4

CONFIRMATION NO. 1778

909

PILLSBURY WINTHROP SHAW PITTMAN, LLP
P.O. BOX 10500
MCLEAN, VA 22102

FILING RECEIPT



OC000000042834927

Date Mailed: 08/03/2010

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**

Applicant(s)

Danny Grant, Laval, CANADA;
Robert Heubel, San Leandro, CA;
David Birnbaum, Oakland, CA;
Erin Ramsay, Montreal, CANADA;

Power of Attorney: None

Domestic Priority data as claimed by applicant

This appln claims benefit of 61/227,645 07/22/2009

Foreign Applications

If Required, Foreign Filing License Granted: 07/30/2010

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 12/840,797**

Projected Publication Date: To Be Determined - pending completion of Missing Parts

Non-Publication Request: No

Early Publication Request: No

Title

SYSTEM AND METHOD FOR PROVIDING COMPLEX HAPTIC STIMULATION DURING INPUT OF CONTROL GESTURES, AND RELATING TO CONTROL OF VIRTUAL EQUIPMENT

Preliminary Class

482

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).

LICENSE FOR FOREIGN FILING UNDER**Title 35, United States Code, Section 184****Title 37, Code of Federal Regulations, 5.11 & 5.15****GRANTED**

The applicant has been granted a license under 35 U.S.C. 184, if the phrase "IF REQUIRED, FOREIGN FILING LICENSE GRANTED" followed by a date appears on this form. Such licenses are issued in all applications where

the conditions for issuance of a license have been met, regardless of whether or not a license may be required as 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).



UNITED STATES PATENT AND TRADEMARK OFFICE

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www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/840,797	07/21/2010	Danny Grant	043508-0383796

CONFIRMATION NO. 1778

FORMALITIES LETTER



OC000000042834928

909
PILLSBURY WINTHROP SHAW PITTMAN, LLP
P.O. BOX 10500
MCLEAN, VA 22102

Date Mailed: 08/03/2010

NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

FILED UNDER 37 CFR 1.53(b)

Filing Date Granted

Items Required To Avoid Abandonment:

An application number and filing date have been accorded to this application. The item(s) indicated below, however, are missing. Applicant is given **TWO MONTHS** from the date of this Notice within which to file all required items and pay any fees required below to avoid abandonment. 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 statutory basic filing fee is missing.
Applicant must submit \$330 to complete the basic filing fee for a non-small entity. If appropriate, applicant may make a written assertion of entitlement to small entity status and pay the small entity filing fee (37 CFR 1.27).
- The oath or declaration is missing.
A properly signed oath or declaration in compliance with 37 CFR 1.63, identifying the application by the above Application Number and Filing Date, is required.
Note: If a petition under 37 CFR 1.47 is being filed, an oath or declaration in compliance with 37 CFR 1.63 signed by all available joint inventors, or if no inventor is available by a party with sufficient proprietary interest, is required.

The application is informal since it does not comply with the regulations for the reason(s) indicated below.

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

- Replacement drawings in compliance with 37 CFR 1.84 and 37 CFR 1.121(d) are required. The drawings submitted are not acceptable because:
 - The drawings have a line quality that is too light to be reproduced (weight of all lines and letters must be heavy enough to permit adequate reproduction) or text that is illegible (reference characters, sheet numbers, and view numbers must be plain and legible) see 37 CFR 1.84(l) and (p)(1)); See Figure(s) 7-13.

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.

The applicant needs to satisfy supplemental fees problems indicated below.

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

- Additional claim fees of **\$1260** as a non-small entity, including any required multiple dependent claim fee, are required. Applicant must submit the additional claim fees or cancel the additional claims for which fees are due.
- To avoid abandonment, a surcharge (for late submission of filing fee, search fee, examination fee or oath or declaration) as set forth in 37 CFR 1.16(f) of **\$130** for a non-small entity, must be submitted with the missing items identified in this notice.

SUMMARY OF FEES DUE:

Total additional fee(s) required for this application is **\$2480** for a non-small entity

- **\$330** Statutory basic filing fee.
- **\$130** Surcharge.
- The application search fee has not been paid. Applicant must submit **\$540** to complete the search fee.
- The application examination fee has not been paid. Applicant must submit **\$220** to complete the examination fee for a non-small entity.
- Total additional claim fee(s) for this application is **\$1260**
 - **\$220** for **1** independent claims over 3.
 - **\$1040** for **20** total claims over 20.

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://portal.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.

/rgreen/

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

Attorney Docket: 043508-0383796
Client Reference: IMM361

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re PATENT APPLICATION of: Confirmation No: 1778

DANNY A. GRANT, ET AL.

Application No.: 12/840,797 Group Art Unit: TBA

Filed: July 21, 2010 Examiner: TBA

Title: SYSTEM AND METHOD FOR PROVIDING COMPLEX HAPTIC STIMULATION
DURING INPUT OF CONTROL GESTURES, AND RELATING TO CONTROL OF VIRTUAL
EQUIPMENT

RESPONSE TO NOTICE TO FILE MISSING PARTS OF NONPROVISIONAL APPLICATION

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

Sir:

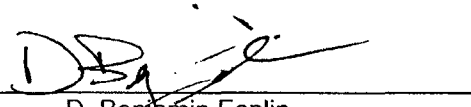
In response to the Notice to File Missing Parts of Nonprovisional Application, mailed August 3, 2010, Applicant herewith submits the following:

- Supplemental Application Data Sheet
- Transmittal of Replacement Drawing Sheets
- Replacement Drawing Sheets of Figures 7-13 (7 pages)
- Executed Combined Declaration and Power of Attorney of Inventors

The required fees are being paid via EFS-Web with the filing of this response.

Respectfully submitted,
PILLSBURY WINTHROP SHAW PITTMAN LLP

By


D. Benjamin Esplin
Registration No. 58297
Telephone: (858) 847.4126

Date: October 4, 2010
P.O. Box 10500
McLean, VA 22102
Customer No.: 93383

402315132v1

Attorney Docket No. 043508-0383796
Client Reference: IMM361

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Danny A. Grant, Robert W. Heubel, David M. Birnbaum, and Erin B. Ramsay

Application No.: 12/840,797 Confirmation No: 1778

Filed: July 21, 2010 Group No.: TBA

Examiner TBA

For: SYSTEM AND METHOD FOR PROVIDING COMPLEX HAPTIC STIMULATION DURING
INPUT OF CONTROL GESTURES, AND RELATING TO CONTROL OF VIRTUAL
EQUIPMENT

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

SUPPLEMENTAL APPLICATION DATA SHEET
37 C.F.R. § 1.76(c)

The following information is being modified as indicated below:

BIBLIOGRAPHIC DATA

I. Applicant information is being modified.

First applicant: Danny A. Grant
Citizenship: Canadian
Residence: 1784 de Lunebourg Laval, QC H7M 2A1 Canada

Second applicant: Robert W. Heubel
Citizenship: American
Residence: 652 Begier Avenue San Leandro, CA 94577 USA

Third applicant: David M. Birnbaum
Citizenship: American
Residence: 311 Oak Street #327 Oakland, CA 94607 USA

Fourth applicant: Erin B. Ramsay
Citizenship: Canadian
Residence: 2012 Harvard Ave. #104 Montreal, QC H4A 2V9 Canada

2. Correspondence information is being modified.

Correspondence for this application should be addressed as follows:

Customer No.: ~~00909~~ 93383

3. Application information

Title of Invention: SYSTEM AND METHOD FOR PROVIDING COMPLEX HAPTIC STIMULATION DURING INPUT OF CONTROL GESTURES, AND RELATING TO CONTROL OF VIRTUAL EQUIPMENT

Docket number assigned to this application: 043508-0383796

Suggested Classification: Class:

Subclass:

Technology Center to which subject matter is assigned:

Total number of drawing sheets: 13

Type of application: Utility

Application is to be published. Suggested drawing figure for publication:

Secrecy order under § 5.2:

This application does not disclose subject matter of an application which is under a secrecy order pursuant to § 5.2.

4. Representative information is being modified.

The following have a power of attorney or authorization of agent in this application:

Customer No.: ~~00909~~ 93383

5. Domestic Priority information

Domestic priority for this application is claimed as follows:

35 U.S.C. § 119(e):

Application No.: 61/227,645

Filed: July 22, 2009

Status: Pending

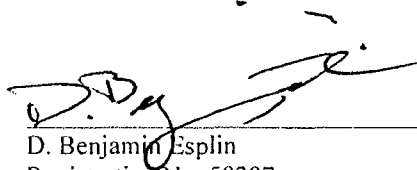
Relationship: Provisional

6. Assignee information is being modified.

The assignee of this application is:

IMMERSION CORPORATION
801 Fox Lane
San Jose, CA 95131

Date: October 4, 2010



D. Benjamin Esplin
Registration No. 58297
PILLSBURY WINTHROP SHAW PITTMAN LLP
P.O. Box 10500
McLean, VA 22102
(858) 847.4126
Customer No. 00909

Attorney Docket: 043508-0383796
Client Reference: IMM361

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re PATENT APPLICATION of:
Danny A. GRANT, et al.

Confirmation Number: 1778

Application No.: 12/840,797

Group Art Unit: TBA

Filed: July 21, 2010

Examiner: TBA

Title: SYSTEM AND METHOD FOR PROVIDING COMPLEX HAPTIC STIMULATION
DURING INPUT OF CONTROL GESTURES, AND RELATING TO CONTROL OF
VIRTUAL EQUIPMENT

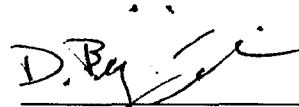
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF REPLACEMENT DRAWING SHEETS

Attached are seven (7) replacement drawing sheets (Figures 7-13) for this application. Please substitute these drawing figures for the corresponding figures on file in the above-identified application.

Date: October 4, 2010

PILLSBURY WINTHROP SHAW PITTMAN LLP
P.O. Box 10500
McLean, VA 22102
(858) 847-4126
Customer Number: 93383



D. BENJAMIN ESPLIN
Registration No. 58297

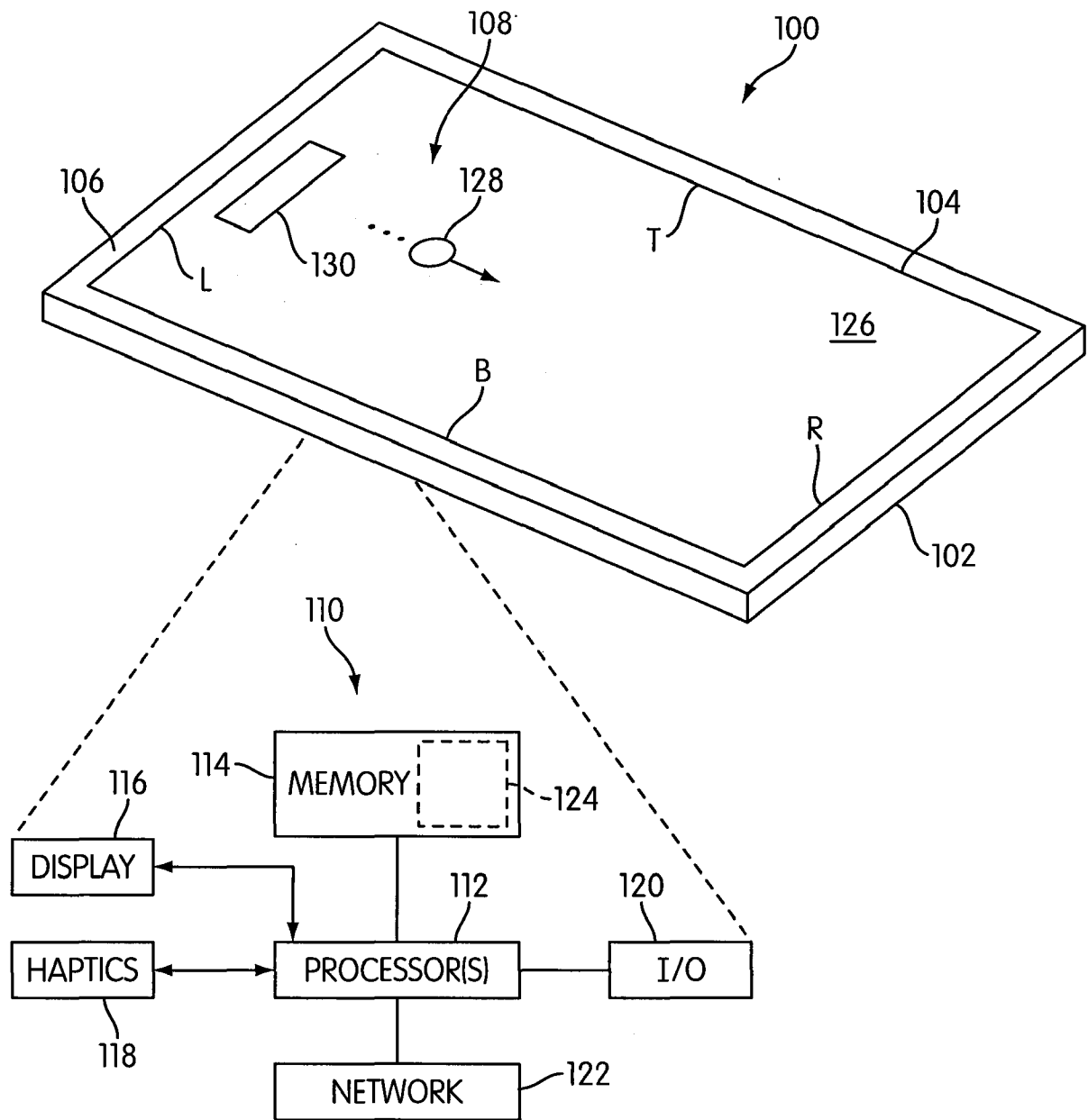


FIG. 7

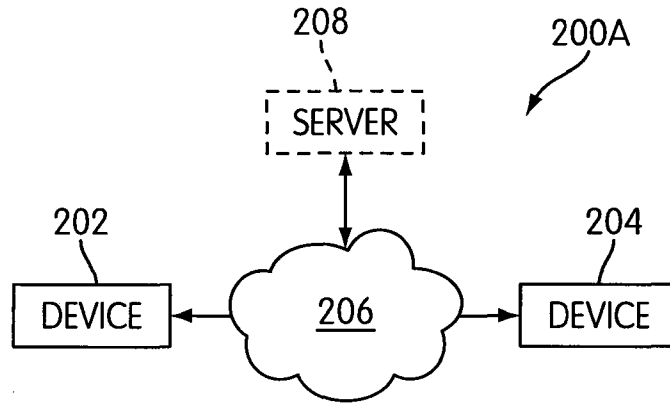


FIG. 8A

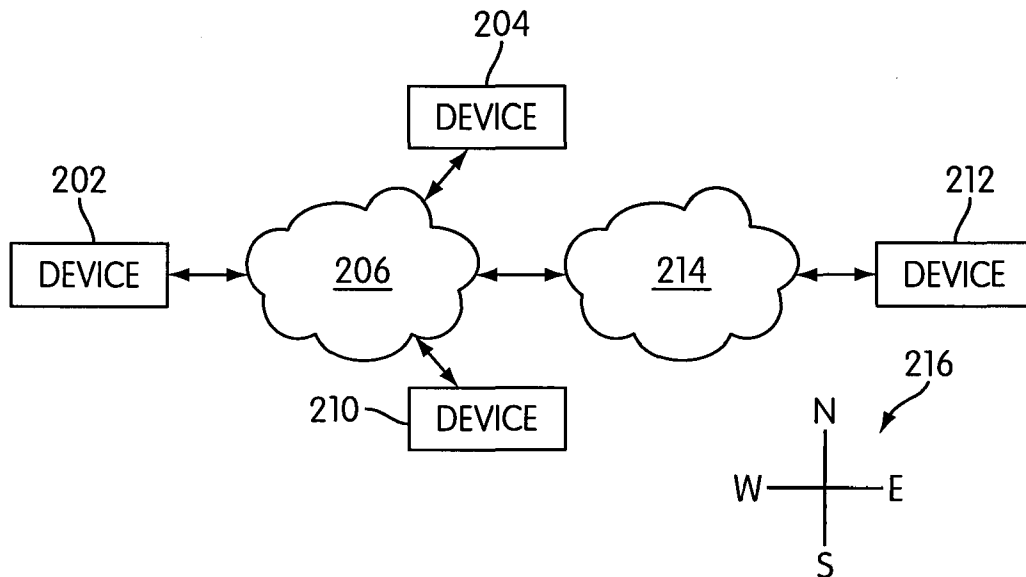


FIG. 8B

REPLACEMENT SHEET

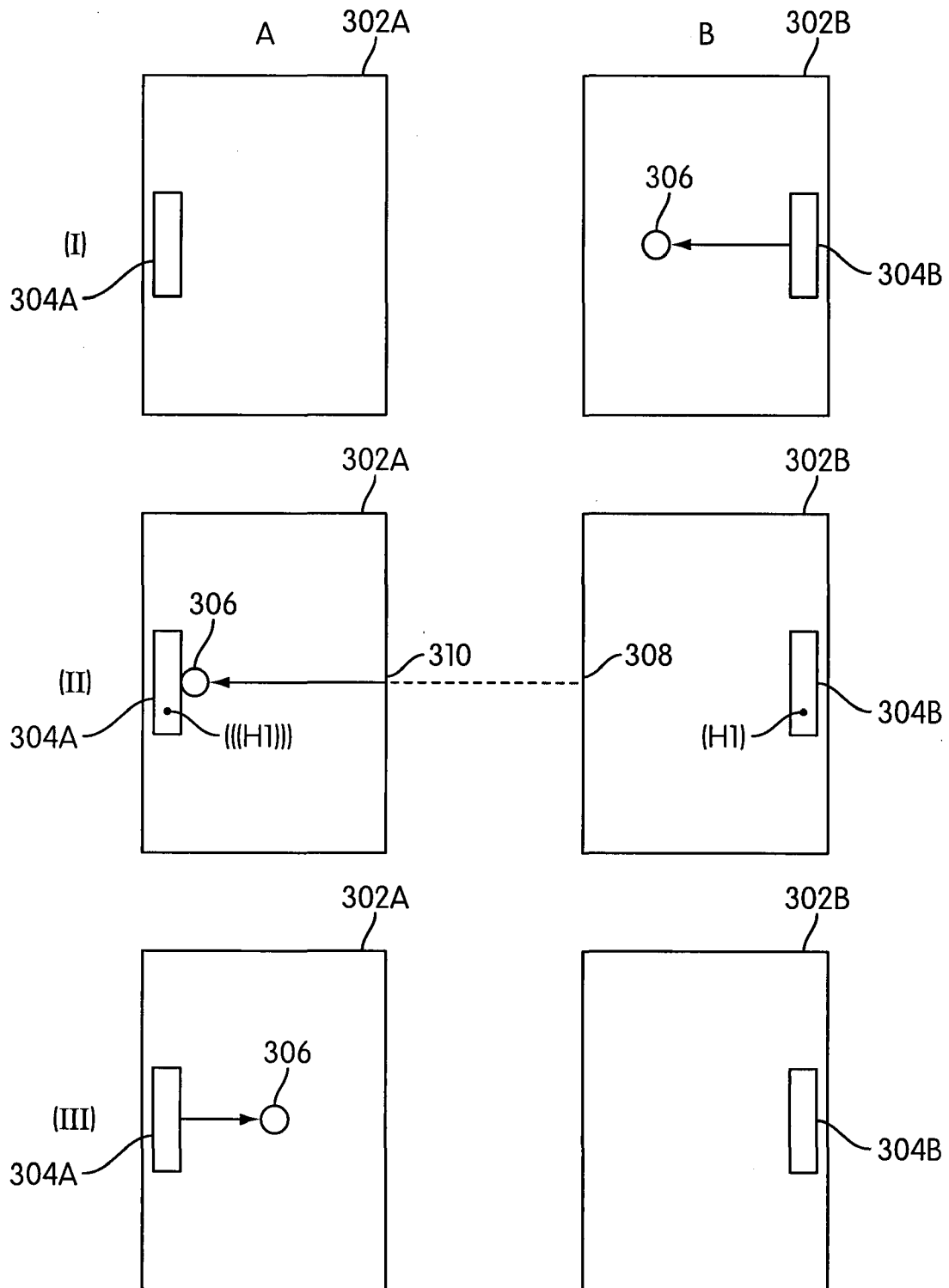


FIG. 9

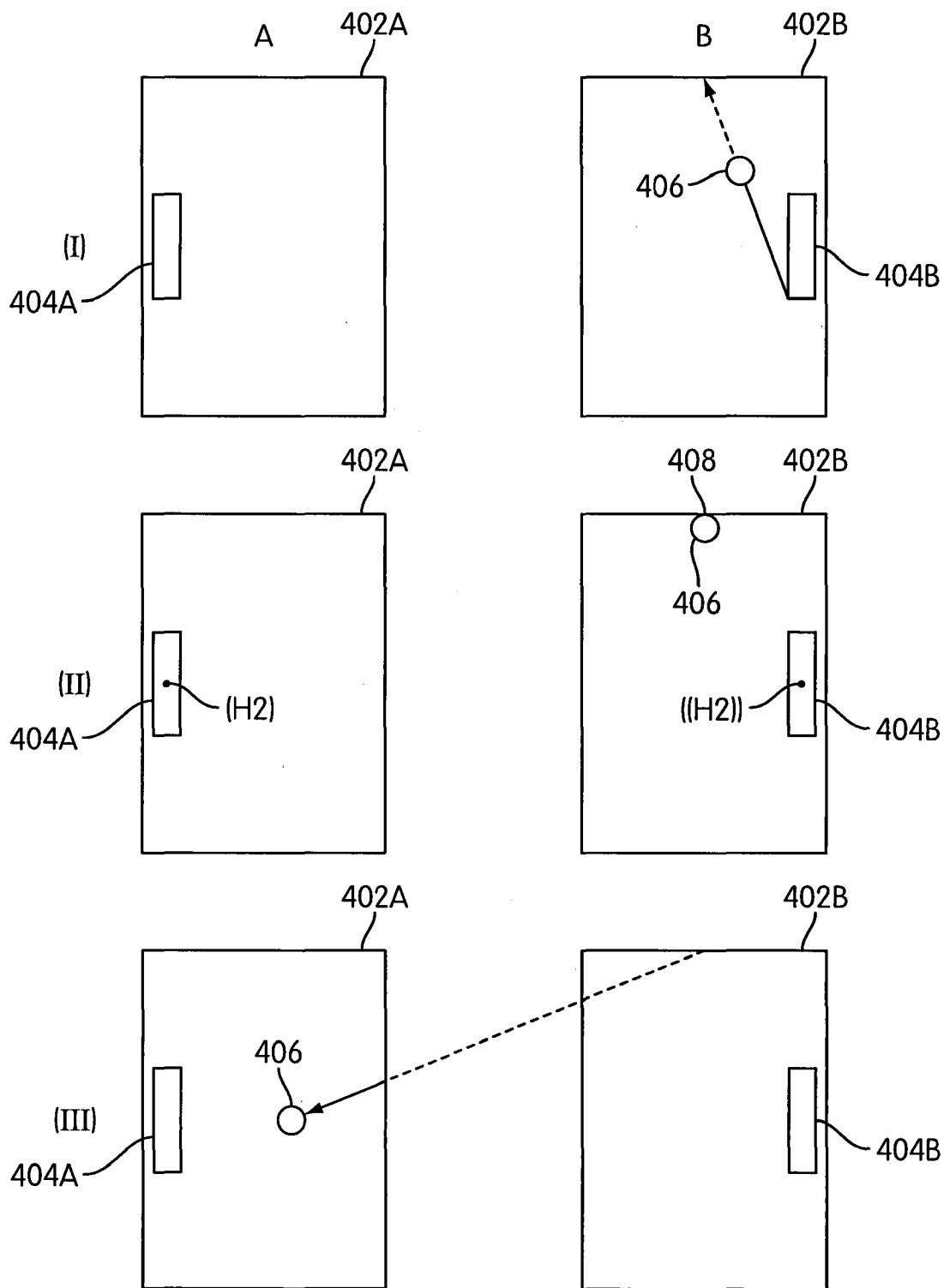


FIG. 10

REPLACEMENT SHEET

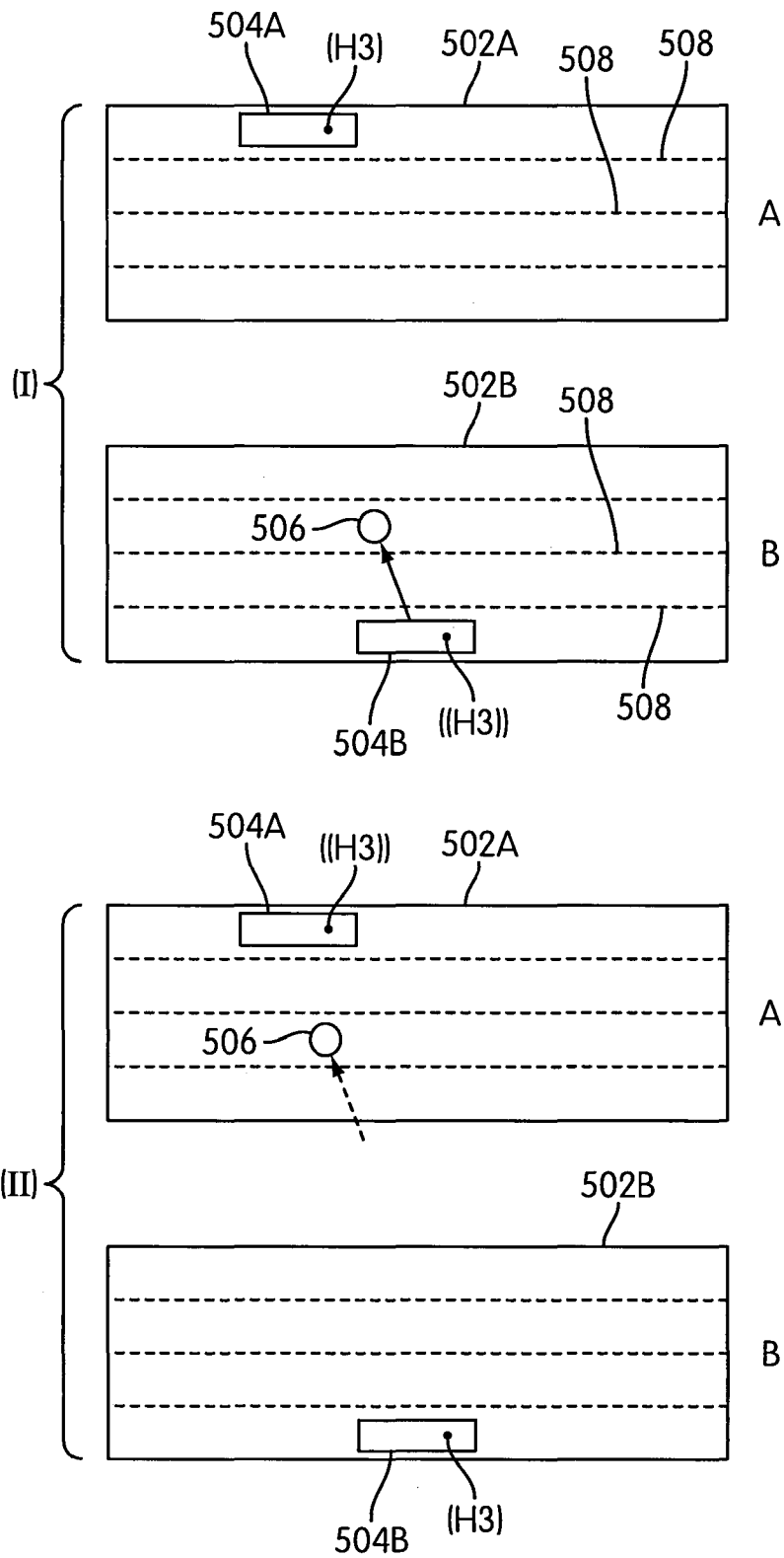


FIG. 11

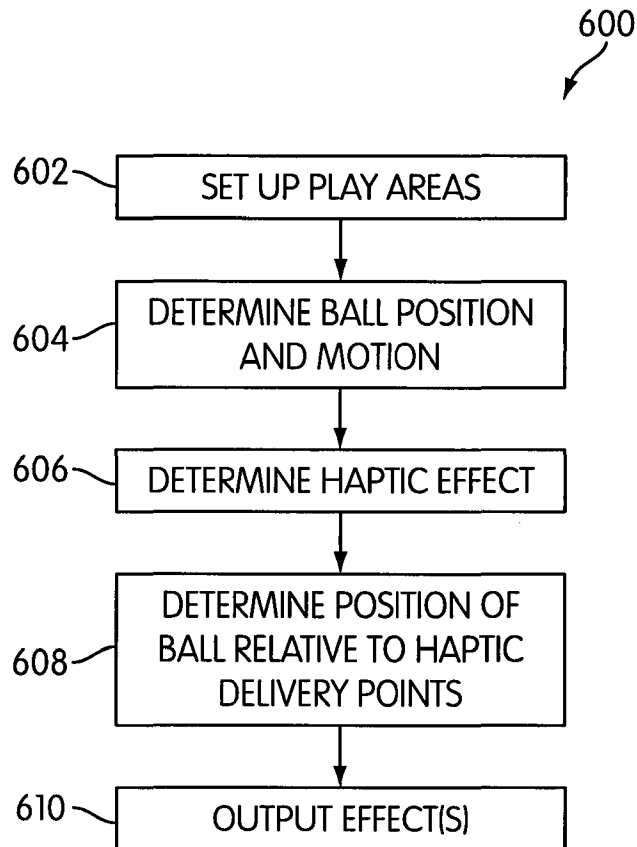


FIG. 12

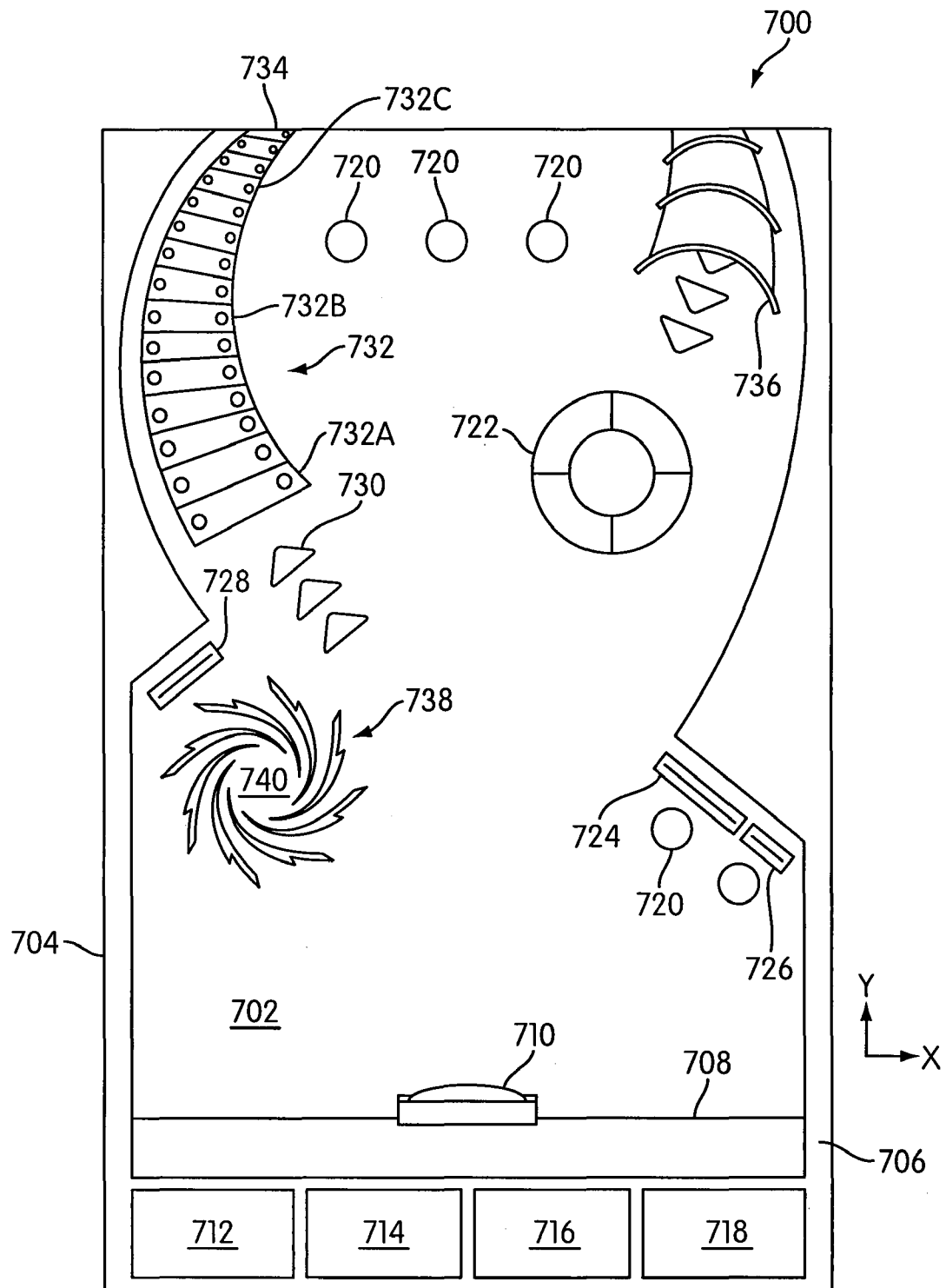


FIG. 13

FOR UTILITY
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DECLARATION

RULE 63 (37 C.F.R. 1.63)
DECLARATION AND POWER OF ATTORNEY
FOR PATENT APPLICATION
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

As a below named inventor, I hereby declare that my residence, post office address and citizenship are as stated below next to my name, and I believe I am an original, first and joint inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled SYSTEM AND METHOD FOR PROVIDING COMPLEX HAPTIC STIMULATION DURING INPUT OF CONTROL GESTURES, AND RELATING TO CONTROL OF VIRTUAL EQUIPMENT, the specification of which was filed on July 21, 2010 as U.S. Application No. 12/840,797.

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above. I acknowledge the duty to disclose to the Office all information known to me to be material to patentability as defined in 37 C.F.R. 1.56. Except as noted below, I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT International Application which designated at least one other country than the United States, listed below and have also identified below any foreign application for patent or inventor's certificate, or PCT International Application, filed by me or my assignee disclosing the subject matter claimed in this application and having a filing date (1) before that of the application on which priority is claimed, or (2) if no priority claimed, before the filing date of this application:

PRIOR FOREIGN APPLICATION(S)

Number	Country	Filed	Date First Laid Open Or Published	Date Patented or Granted	Priority Claimed

Except as noted below, I hereby claim domestic priority benefit under 35 U.S.C. 119(e) or 120 and/or 365(c) of the indicated United States applications listed below and PCT international applications listed above or below and, if this is a continuation-in-part (CIP) application, insofar as the subject matter disclosed and claimed in this application is in addition to that disclosed in such prior applications, I acknowledge the duty to disclose to the Office all information known to me to be material to patentability as defined in 37 C.F.R. 1.56 which became available between the filing date of each such prior application and the national or PCT international filing date of this application:

PRIOR U.S. PROVISIONAL, NONPROVISIONAL AND/OR PCT APPLICATION(S)

Application Number	Filed	Status pending, abandoned, patented expired	Priority Claimed
61/227,645	July 22, 2009	expired	Yes

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 Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

And I hereby appoint Pillsbury Winthrop Shaw Pittman LLP, Intellectual Property Group, (to whom all communications are to be directed), and persons of that firm who are associated with USPTO Customer No. 93383 individually and collectively my attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith and with the resulting patent, and I hereby authorize them to delete from that Customer No. names of persons no longer with their firm, to add new persons of their firm to that Customer No., and to act and rely on instructions from and communicate directly with the person/assignee/attorney/firm/organization who/which first sends/sent this case to them and by whom/which I hereby declare that I have consented after full disclosure to be represented unless/until I instruct the above firm and/or an attorney of that firm in writing to the contrary.

Power of Attorney to Customer Number

93383

INVENTOR'S SIGNATURE:

Date:

Name	DANNY	A.	GRANT
	First	Middle Initial	Family Name
Residence	Laval, QC	Canada	Canada
	City	State/Foreign Country	Country of Citizenship
Mailing Address	1784 de Lunebourg, Laval, QC H7M 2A1, Canada		

INVENTOR'S SIGNATURE:

Date:

Name	ROBERT	W.	HEUBEL
	First	Middle Initial	Family Name
Residence	San Leandro	CA	U.S.A.
	City	State/Foreign Country	Country of Citizenship
Mailing Address	652 Begier Avenue, San Leandro, CA 94577		

402250096v1

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	City	State/Foreign Country	Country of Citizenship
Mailing Address	652 Begier Avenue, San Leandro, CA 94577		

INVENTOR'S SIGNATURE:

Date:

Name	DAVID	M.	BIRNBAUM
	First	Middle Initial	Family Name
Residence	Oakland	CA	U.S.A.
	City	State/Foreign Country	Country of Citizenship
Mailing Address	311 Oak Street #327, Oakland, CA 94607		

INVENTOR'S SIGNATURE:

Date:

Name	ERIN	B.	RAMSAY
	First	Middle Initial	Family Name
Residence	Montreal, QC	Canada	Canada
	City	State/Foreign Country	Country of Citizenship
Mailing Address	2012 Harvard Ave. #104, Montreal, QC H4A 2V9, Canada		

Atty. Dkt. No. 043508-0383796

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Mailing Address	2012 Harvard Ave. #104, Montreal, QC H4A 2V9, Canada		

Atty. Dkt. No. 043508-0383796

402250096v1

Electronic Patent Application Fee Transmittal

Application Number:	12840797			
Filing Date:	21-Jul-2010			
Title of Invention:	SYSTEM AND METHOD FOR PROVIDING COMPLEX HAPTIC STIMULATION DURING INPUT OF CONTROL GESTURES, AND RELATING TO CONTROL OF VIRTUAL EQUIPMENT			
First Named Inventor/Applicant Name:	Danny Grant			
Filer:	D. Benjamin Esplin/Jennifer Sallee			
Attorney Docket Number:	043508-0383796			
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	330	330
Utility Search Fee	1111	1	540	540
Utility Examination Fee	1311	1	220	220
Pages:				
Claims:				
Claims in excess of 20	1202	20	52	1040
Independent claims in excess of 3	1201	1	220	220
Miscellaneous-Filing:				

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Late filing fee for oath or declaration	1051	1	130	130
Petition:				
Patent-Appeals-and-Interference:				
Post-Allowance-and-Post-Issuance:				
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				2480

Electronic Acknowledgement Receipt

EFS ID:	8557089
Application Number:	12840797
International Application Number:	
Confirmation Number:	1778
Title of Invention:	SYSTEM AND METHOD FOR PROVIDING COMPLEX HAPTIC STIMULATION DURING INPUT OF CONTROL GESTURES, AND RELATING TO CONTROL OF VIRTUAL EQUIPMENT
First Named Inventor/Applicant Name:	Danny Grant
Customer Number:	00909
Filer:	D. Benjamin Esplin/Jennifer Sallee
Filer Authorized By:	D. Benjamin Esplin
Attorney Docket Number:	043508-0383796
Receipt Date:	04-OCT-2010
Filing Date:	21-JUL-2010
Time Stamp:	17:54:07
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$2480
RAM confirmation Number	4368
Deposit Account	033975
Authorized User	

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)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

Meta Platforms Exhibit 1007

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		Filing.pdf	550477 ffd5510b4466e37c4180364510a0b4d6e8b aa9cf	yes	18

Multipart Description/PDF files in .zip description

Document Description	Start	End
Applicant Response to Pre-Exam Formalities Notice	1	1
Application Data Sheet	2	4
Transmittal Letter	5	5
Drawings-only black and white line drawings	6	12
Oath or Declaration filed	13	18

Warnings:**Information:**

2	Fee Worksheet (PTO-875)	fee-info.pdf	40628 9aeb1637448611de0ff132ef5270acb1f07 06dc	no	2
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Warnings:**Information:****Total Files Size (in bytes):** 591105

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.



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
12/840,797	07/21/2010	3764	2480	043508-0383796	40	4

CONFIRMATION NO. 1778

93383

Pillsbury Winthrop Shaw Pittman LLP (Immersion)

P.O. Box 10500

McLean, VA 22102

UPDATED FILING RECEIPT



Date Mailed: 10/15/2010

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**

Applicant(s)

Danny A. Grant, Laval, CANADA;
Robert W. Heubel, San Leandro, CA;
David M. Birnbaum, Oakland, CA;
Erin B. Ramsay, Montreal, CANADA;

Assignment For Published Patent Application

IMMERSION CORPORATION, San Jose, CA

Power of Attorney: The patent practitioners associated with Customer Number 93383

Domestic Priority data as claimed by applicant

This appln claims benefit of 61/227,645 07/22/2009

Foreign Applications

If Required, Foreign Filing License Granted: 07/30/2010

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 12/840,797**

Projected Publication Date: 01/27/2011

Non-Publication Request: No

Early Publication Request: No

Title

SYSTEM AND METHOD FOR PROVIDING COMPLEX HAPTIC STIMULATION DURING INPUT OF CONTROL GESTURES, AND RELATING TO CONTROL OF VIRTUAL EQUIPMENT

Preliminary Class

482

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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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/840,797	07/21/2010	Danny A. Grant	043508-0383796

CONFIRMATION NO. 1778

PUBLICATION NOTICE



OC000000045704356

93383
Pillsbury Winthrop Shaw Pittman LLP (Immersion)
P.O. Box 10500
McLean, VA 22102

Title: SYSTEM AND METHOD FOR PROVIDING COMPLEX HAPTIC STIMULATION DURING INPUT OF CONTROL GESTURES, AND RELATING TO CONTROL OF VIRTUAL EQUIPMENT

Publication No. US-2011-0021272-A1

Publication Date: 01/27/2011

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



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/840,797	07/21/2010	Danny A. Grant	043508-0383796	1778

93383 7590 06/18/2012
Pillsbury Winthrop Shaw Pittman LLP (Immersion)
P.O. Box 10500
McLean, VA 22102

EXAMINER

ELISCA, PIERRE E

ART UNIT	PAPER NUMBER
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3718

NOTIFICATION DATE	DELIVERY MODE
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06/18/2012

ELECTRONIC

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.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docket_ip@pillsburylaw.com

Office Action Summary	Application No. 12/840,797	Applicant(s) GRANT ET AL.	
	Examiner PIERRE E. ELISCA	Art Unit 3718	

-- 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 21 July 2010.
- 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) 1-40 is/are pending in the application.
- 5a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 6) ☒ Claim(s) 1-10 and 21-30 is/are allowed.
- 7) ☒ Claim(s) 11-20 and 31-40 is/are rejected.
- 8) ☐ Claim(s) ____ is/are objected to.
- 9) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

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).
- 12) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 13) ☐ 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) ☐ Notice of References Cited (PTO-892) | 4) ☐ Interview Summary (PTO-413) |
| 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) ☐ Information Disclosure Statement(s) (PTO/SB/08) | 5) ☐ Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____. | 6) ☐ Other: ____. |

DETAILED ACTION

1. This communication is in response to Application no. 12/840,797 filed on 07/21/2010.

2. Claims 1-40 are currently pending and have been examined.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 11 and 31 and all dependent claims are rejected under 35 U.S.C. §101 because the claimed invention is directed to non-statutory subject matter. Based on Supreme Court precedent¹ and recent Federal Circuit decisions, a §101 process must (1) be tied to another statutory class (such as a particular apparatus) or (2) transform underlying subject matter (such as an article or materials) to a different state or thing. See *In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008).

An example of a method claim that would not qualify as a statutory process would be a claim that recited purely mental steps.

To meet prong (1), the method step should positively recite the other statutory class (the thing or product) to which it is tied. This may be accomplished by having the claim

¹ See also *Diamond v. Diehr*, 450 U.S. 175, 184 (1981); *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972); *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1876).

Art Unit: 3718

positively recite the machine that accomplishes the method steps. Alternatively or to meet prong (2), the method step should positively recite identifying the material that is being changed to a different state or positively recite the subject matter that is being transformed.

Applicant is advised to amend claims 11 as follows: claim 11, line 7, ---determining by a processor, ---. Appropriate correction is required.

Applicant is also advised to amend claim 31 as follows: claim 31, line 11, ---determining by a processor, ---. Appropriate correction is required.

Allowable Subject Matter

5. Claims 1-10 and 21-30 are in condition for allowance.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to PIERRE E. ELISCA whose telephone number is (571)272-6706. The examiner can normally be reached on 6:30 to 5:00. Hotelier.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 571 272 4690. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 3718

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.

/PIERRE E. ELISCA/
Primary Examiner, Art Unit 3718

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE PATENT : Danny A. GRANT *et al.*
APPLICATION OF :
SERIAL NO. : 12/840,797
FILING DATE : July 21, 2010
ART UNIT : 3718
EXAMINER : P.E. ELISCA
FOR : SYSTEM AND METHOD FOR PROVIDING COMPLEX HAPTIC
STIMULATION DURING INPUT OF CONTROL GESTURES,
AND RELATING TO CONTROL OF VIRTUAL EQUIPMENT

RESPONSE

Mail Stop Amendment

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

Dear Sir:

In response to the Office Action mailed **June 18, 2012** ("Office Action"), please consider the following amendments and remarks in the above-identified application:

Amendments to the Claims are reflected in the listing of claims beginning on page **2** of this paper.

Remarks/Arguments begin on page **12** of this paper.

It is believed that no extensions of time or fees for net addition of claims are required beyond those that may otherwise be provided for in documents accompanying this paper. However, if additional extensions of time are necessary to prevent abandonment of this application, then such extensions of time are hereby petitioned for under 37 C.F.R. § 1.136(a), and any fees required therefore (including fees for net addition of claims) are hereby authorized to be charged to our Deposit Account No. 033975 (Ref. No. 043508-0383796).

CLAIM AMENDMENTS

This **listing of claims** will replace all prior versions, and listings, of claims in the application:

1. **(Currently Amended)** A system configured to provide haptic stimulation to a user, the system comprising:

a user interface configured to generate output signals related to the gestures of a user;

a haptic device ~~an actuator~~ configured to generate haptic stimulation to the user;
and

one or more processors configured to execute computer program modules, the computer program modules comprising:

a gesture module configured to monitor performance of a control gesture by the user based on the output signals of the user interface,

wherein the control gesture is a gesture associated with a command input to the system, and includes an initial portion, a first intermediate portion, and an ending portion;

a stimulation module configured to receive information related to performance of the control gesture from the gesture module, and to determine haptic stimulation to be generated for the user associated with the control gesture,

wherein the haptic stimulation includes a first stimulation determined responsive to performance of the initial portion of the control gesture, and a second stimulation that is different from the first stimulation and is determined responsive to performance of the first intermediate portion of the control gesture; and

a ~~an actuator~~ control module configured to control the haptic device ~~actuator~~ to generate the stimulation determined by the stimulation module.

2. **(Original)** The system of claim 1, wherein the stimulation module is configured such that the haptic stimulation associated with the control gesture includes a third stimulation different from the first stimulation and the second stimulation that is determined responsive to performance of the ending portion of the control gesture.

3. **(Original)** The system of claim 1, wherein the control gesture further includes a second intermediate portion, and wherein the stimulation module is configured such that the haptic stimulation associated with the control gesture includes a third stimulation different from the first stimulation and the second stimulation that is determined responsive to performance of the second intermediate portion of the control gesture.

4. **(Original)** The system of claim 3, wherein the second stimulation is determined to signal to the user that the second intermediate portion of the control gesture should be commenced.

5. **(Original)** The system of claim 1, wherein the command input associated with the control gesture is a single, discrete command.

6. **(Original)** The system of claim 1, wherein the second stimulation is determined by adjusting one or more parameters of the first stimulation.

7. **(Original)** The system of claim 6, wherein the one or more parameters of the first stimulation that are adjusted to determine the second stimulation include one or more of periodicity, force, directionality, or location.

8. **(Original)** The system of claim 1, wherein the first intermediate portion of the

control gesture includes maintaining contact with a touch sensitive surface for a predetermined period of time.

9. **(Original)** The system of claim 1, wherein the gesture module is configured to identify a control gesture failure responsive to the users commencing performance of the control gesture and not successfully performing all of the portions of the control gesture, and wherein the stimulation module is configured such that the haptic stimulation associated with the control gesture includes a third stimulation different from the first stimulation and the second stimulation that is determined responsive to identification of a control gesture failure by the gesture module.

10. **(Original)** The system of claim 1, wherein the stimulation module is configured such that the first stimulation and/or the second stimulation are determined in part based on one or more of a skill-level, fatigue, or injury of a character in a game under the control of the user.

11. **(Currently Amended)** A computer-implemented method of providing haptic stimulation to a user of a system, the method being implemented in the system which includes a haptic device and one or more physical processors configured to execute computer program modules, the method comprising:

monitoring, on the one or more processors, performance of a control gesture by a user,

wherein the control gesture is a gesture associated with a command input to the system, and includes an initial portion, a first intermediate portion, and an ending portion;

determining, on the one or more processors, haptic stimulation associated with performance of the control gesture to be generated for the user,

wherein the haptic stimulation includes a first stimulation determined responsive

to performance of the initial portion of the control gesture, and a second stimulation that is different from the first stimulation and is determined responsive to performance of the first intermediate portion of the control gesture; and

generating, with the haptic device, the determined stimulation during performance of the control gesture.

12. **(Original)** The method of claim 11, wherein the haptic stimulation associated with the control gesture includes a third stimulation different from the first stimulation and the second stimulation that is determined responsive to performance of the ending portion of the control gesture.

13. **(Original)** The method of claim 11, wherein the control gesture further includes a second intermediate portion, and wherein the haptic stimulation associated with the control gesture further includes a third stimulation different from the first stimulation and the second stimulation that is determined responsive to performance of the second intermediate portion of the control gesture.

14. **(Currently Amended)** The method of claim 13, wherein the second stimulation is determined by the one or more processors to signal to the user that the second intermediate portion of the control gesture should be commenced.

15. **(Original)** The method of claim 11, wherein the command input associated with the control gesture is a single, discrete command.

16. **(Currently Amended)** The method of claim 11, wherein the second stimulation is determined by the one or more processors by adjusting one or more parameters of the first stimulation.

17. **(Original)** The method of claim 16, wherein the one or more parameters of the first stimulation that are adjusted to determine the second stimulation include one or more of periodicity, force, directionality, or location.

18. **(Original)** The method of claim 11, wherein the first intermediate portion of the control gesture includes maintaining contact with an interface surface of a touch sensitive surface for a predetermined period of time.

19. **(Original)** The method of claim 11, wherein responsive to identification of a control gesture failure during monitoring of performance of the control gesture the haptic stimulation associated with the control gesture includes a third stimulation different from the first stimulation and the second stimulation.

20. **(Currently Amended)** The method of claim 11, wherein the first stimulation and/or the second stimulation are determined by the one or more processors in part based on one or more of a skill-level, fatigue, or injury of a character in a game under the control of the user.

21. **(Currently Amended)** A system configured to provide stimulation to a user of a game, the system comprising:

a touch sensitive electronic display having an interface surface accessible for engagement by the user, the touch sensitive user interface being configured to generate output signals related to the position at which the interface surface is engaged, and to present views of the game to the user through the interface surface,

wherein the views presented through the interface surface include views of virtual equipment having user selectable sections that are selectable by the user to interact

with the virtual equipment by engaging the interface surface at the user selectable sections of the views of the virtual equipment;

a haptic device ~~an actuator~~ configured to generate haptic stimulation to the user;
and

one or more processors in operative communication with the touch sensitive electronic display and the haptic device ~~actuator~~, the one or more processors being configured to execute computer program modules, the computer program modules comprising:

an equipment module configured to determine the operating parameters of the virtual equipment in the views, and to simulate operation of the virtual equipment,

wherein the equipment module determines the operating parameters of the virtual equipment and/or simulates operation of the virtual equipment based on selections by the user of the user selectable sections of the views of the virtual equipment;

a stimulation module configured to determine haptic stimulation to be generated for the user associated with the operating parameters of the virtual equipment and/or simulated operation of the virtual equipment,

a ~~an actuator~~ control module configured to control the haptic device ~~actuator~~ to generate the stimulation determined by the stimulation module.

22. **(Original)** The system of claim 21, wherein the virtual equipment includes a projectile weapon.

23. **(Original)** The system of claim 22, wherein the operating parameters of the virtual equipment based on selections by the user of the user selectable sections of the views of the virtual equipment include one or more of an amount of loaded rounds of ammunition, a level of disrepair, a stopping power, a projectile velocity, an ammunition type, or a noise level.

24. **(Currently Amended)** The system of claim 21, wherein the haptic device ~~actuator~~ is configured to actuate the touch sensitive electronic display.

25. **(Currently Amended)** The system of claim 21, wherein the haptic device ~~actuator~~ is configured to actuate the interface surface.

26. **(Original)** The system of claim 21, wherein the operating parameters of the virtual equipment include activation and deactivation of individual pieces of virtual equipment.

27. **(Original)** The system of claim 21, wherein the user selectable sections of the views of the virtual equipment correspond to sections of the virtual equipment analogous to sections of equipment that would be engaged in real life to configure operating parameters and/or operate the equipment.

28. **(Original)** The system of claim 21, wherein the equipment module is configured to add or remove one or more components of a piece of virtual equipment based on the user engaging user selectable sections of a view of the piece of virtual equipment.

29. **(Original)** The system of claim 28, wherein the removal and/or addition of one or more components of the piece of virtual equipment are reflected in the views of virtual equipment presented to the user through the interface surface.

30. **(Original)** The system of claim 21, wherein equipment module is configured to change equipment modes of a piece of virtual equipment based on the user engaging

user selectable section of a view of the piece of virtual equipment.

31. **(Currently Amended)** A computer-implemented method of providing stimulation to a user of a game, the method being implemented in a system including a haptic device, a touch sensitive electronic display, and one or more physical processors configured to execute computer program modules, the method comprising:

presenting views of a game through an interface surface of [[a]] the touch sensitive electronic display that is accessible for engagement by a user,

wherein the views presented through the interface surface include views of virtual equipment having user selectable sections that are selectable by the user to interact with the virtual equipment by engaging the interface surface at the user selectable sections of the views of the virtual equipment;

receiving selection of one of the user selectable sections via an by the user engagement of the selected user selectable section on the interface surface;

determining, on the one or more processors, the operating parameters of the virtual equipment in the views and/or simulating operation of the virtual equipment based on the received selection;

determining on the one or more processors, responsive to the received selection, haptic stimulation to be generated for the user associated with the operating parameters of the virtual equipment and/or simulated operation of the virtual equipment; and

generating the determined haptic stimulation with the haptic device.

32. **(Original)** The method of claim 31, wherein the virtual equipment includes a projectile weapon.

33. **(Original)** The method of claim 32, wherein the operating parameters of the virtual equipment determined based on selection of the selected user selectable section

include one or more of an amount of loaded rounds of ammunition, a level of disrepair, a stopping power, a projectile velocity, an ammunition type, or a noise level.

34. **(Original)** The method of claim 31, wherein the haptic stimulation is generated to actuate the touch sensitive electronic display.

35. **(Original)** The method of claim 31, wherein the haptic stimulation is generated to actuate the interface surface.

36. **(Original)** The method of claim 31, wherein the operating parameters of the virtual equipment determined based on selection of the selected user selectable section include activation and deactivation of individual pieces of virtual equipment.

37. **(Original)** The method of claim 31, wherein the user selectable sections of the views of the virtual equipment correspond to sections of the virtual equipment analogous to sections of equipment that would be engaged in real life to configure operating parameters and/or operate the equipment.

38. **(Original)** The method of claim 31, further comprising adding or removing one or more components of a piece of virtual equipment based on the user engaging user selectable sections of a view of the piece of virtual equipment.

39. **(Original)** The method of claim 38, wherein the removal and/or addition of one or more components of the piece of virtual equipment are reflected in the views of virtual equipment presented to the user through the interface surface.

40. **(Currently Amended)** The method of claim 31, ~~wherein~~ further comprising changing equipment modes of a piece of virtual equipment based on the user engaging user selectable section of a view of the piece of virtual equipment.

REMARKS

By this paper, claims 1, 11, 14, 16, 20-21, 24-25, 31, and 40 are amended, and no claims are added or cancelled. Accordingly, claims 1-40 are all of the pending claims. Support for the amendments presented above is provided throughout the specification and claims as originally filed. Applicants expressly reserve the right to prosecute the subject matter of the unamended and/or cancelled claims, or any other subject matter supported by the Specification, in one or more continuation applications. In view of the foregoing amendments and the following remarks, reconsideration and allowance of all the pending claims is anticipated.

Claim Rejections – 35 USC § 101

Claims 11 and 31 currently stand rejected under 35 U.S.C. § 101 for allegedly reciting non-statutory subject matter. Applicants traverse this rejection at least on the grounds that claims 11 and 31 recite subject matter that is statutory under § 101. However, solely in an effort to expedite prosecution, Applicants have amended claims 11 and 31 to further clarify the statutory nature of the recited subject matter. For example, claims 11 and 31 have been amended to further recite physical components of a machine tied to the recited methods. For at least this reason the rejection of claims 11 and 31 under § 101 should be withdrawn.

Allowable Subject Matter

Applicants thank the Examiner for indicating that claims 1-10 and 21-30 are in condition for allowance.

CONCLUSION

Having addressed each of the foregoing objections and rejections, it is respectfully submitted that a full and complete response has been made to the outstanding Office Action and, as such, the application is in condition for allowance. Notice to that effect is anticipated.

If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Date: September 7, 2012

Respectfully submitted,

By: /D. Benjamin Esplin/
D. Benjamin Esplin
Reg. No. 58,297

Customer No. 93383

PILLSBURY WINTHROP SHAW PITTMAN LLP
1650 Tysons Boulevard
McLean, Virginia 22102
619-234-5000

Electronic Acknowledgement Receipt

EFS ID:	13689710
Application Number:	12840797
International Application Number:	
Confirmation Number:	1778
Title of Invention:	SYSTEM AND METHOD FOR PROVIDING COMPLEX HAPTIC STIMULATION DURING INPUT OF CONTROL GESTURES, AND RELATING TO CONTROL OF VIRTUAL EQUIPMENT
First Named Inventor/Applicant Name:	Danny A. Grant
Customer Number:	93383
Filer:	D. Benjamin Esplin/Maxine Cutietta
Filer Authorized By:	D. Benjamin Esplin
Attorney Docket Number:	043508-0383796
Receipt Date:	07-SEP-2012
Filing Date:	21-JUL-2010
Time Stamp:	17:20:24
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		0383796_Response_Filed09072012.pdf	63875 34a9d924f5725bb56935f6b4311f6d51ba3b192f	yes	13

	Multipart Description/PDF files in .zip description		
	Document Description	Start	End
	Amendment/Req. Reconsideration-After Non-Final Reject	1	1
	Claims	2	11
	Applicant Arguments/Remarks Made in an Amendment	12	13
Warnings:			
Information:			
Total Files Size (in bytes):		63875	
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. <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. <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. <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.			

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 12/840,797		Filing Date 07/21/2010		☐ To be Mailed	
APPLICATION AS FILED – PART I										
(Column 1)			(Column 2)			SMALL ENTITY ☐ OR		OTHER THAN SMALL ENTITY		
FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)	OR	RATE (\$)	FEE (\$)			
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A				
☐ SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A			N/A				
☐ 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 \$	=	OR	X \$	=			
INDEPENDENT CLAIMS (37 CFR 1.16(h))	minus 3 =	*	X \$	=		X \$	=			
☐ 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).									
☐ 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			TOTAL				
APPLICATION AS AMENDED – PART II										
(Column 1)			(Column 2)			SMALL ENTITY OR		OTHER THAN SMALL ENTITY		
AMENDMENT	09/07/2012	CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR	RATE (\$)	ADDITIONAL FEE (\$)
	Total (37 CFR 1.16(i))	* 40	Minus	** 40	= 0	X \$	=	OR	X \$60=	0
	Independent (37 CFR 1.16(h))	* 4	Minus	***4	= 0	X \$	=	OR	X \$250=	0
	☐ Application Size Fee (37 CFR 1.16(s))									
	☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))							OR		
						TOTAL ADD'L FEE		OR	TOTAL ADD'L FEE	0
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT		HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR	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))									
	☐ 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 number found in the appropriate box in column 1.										

Legal Instrument Examiner:
/LINDA A. WASHINGTON/

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
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

93383 7590 12/11/2012
Pillsbury Winthrop Shaw Pittman LLP (Immersion)
P.O. Box 10500
McLean, VA 22102

EXAMINER

ELISCA, PIERRE E

ART UNIT

PAPER NUMBER

3718

DATE MAILED: 12/11/2012

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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12/840,797

07/21/2010

Danny A. Grant

043508-0383796

1778

TITLE OF INVENTION: SYSTEM AND METHOD FOR PROVIDING COMPLEX HAPTIC STIMULATION DURING INPUT OF CONTROL GESTURES, AND RELATING TO CONTROL OF VIRTUAL EQUIPMENT

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1770	\$300	\$0	\$2070	03/11/2013

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 SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

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.

93383 7590 12/11/2012
Pillsbury Winthrop Shaw Pittman LLP (Immersion)
P.O. Box 10500
McLean, VA 22102

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.
-----------------	-------------	----------------------	---------------------	------------------

12/840,797

07/21/2010

Danny A. Grant

043508-0383796

1778

TITLE OF INVENTION: SYSTEM AND METHOD FOR PROVIDING COMPLEX HAPTIC STIMULATION DURING INPUT OF CONTROL GESTURES, AND RELATING TO CONTROL OF VIRTUAL EQUIPMENT

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1770	\$300	\$0	\$2070	03/11/2013

EXAMINER	ART UNIT	CLASS-SUBCLASS
ELISCA, PIERRE E	3718	463-030000

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)

☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.

☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

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.

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/840,797	07/21/2010	Danny A. Grant	043508-0383796	1778

93383 7590 12/11/2012
Pillsbury Winthrop Shaw Pittman LLP (Immersion)
P.O. Box 10500
McLean, VA 22102

EXAMINER

ELISCA, PIERRE E

ART UNIT	PAPER NUMBER
----------	--------------

3718

DATE MAILED: 12/11/2012

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 271 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 271 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.	Applicant(s)	
	12/840,797	GRANT ET AL.	
	Examiner	Art Unit	
	PIERRE E. ELISCA	3718	

-- 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 9/7/2012.
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 1-40. 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).
 - 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)

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. ☒ Notice of References Cited (PTO-892) 2. ☐ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date _____ 3. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material 4. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____ | <ol style="list-style-type: none"> 5. ☐ Examiner's Amendment/Comment 6. ☒ Examiner's Statement of Reasons for Allowance 7. ☐ Other _____ |
|--|---|

/PIERRE E. ELISCA/
Primary Examiner, Art Unit 3718

REASONS FOR ALLOWANCE

1. This is an Examiner's statement of reason for allowance.
2. Regarding the claimed terms, the Examiner notes that a "general term must be understood in the context in which the inventor presents it." *In re Glaug* 283 F.3d 1335, 1340, 62 USPQ2d 1151, 1154 (Fed. Cir. 2002). Therefore the Examiner must interpret the claimed terms as found on pages 1-50 of the specification. Clearly almost all the general terms in the claims may have multiple meanings. So where a claim term "is susceptible to various meanings, . . . the inventor's lexicography must prevail" *Id.* Using these definitions for the claims, the claimed invention was not reasonably found in the prior art.
3. The closest prior art Son, Seunghwan et al (U.S. PG Pub 2011/0050601A1) which discloses a mobile terminal that includes a touch screen and a controller. The controller operates in a first message composition mode for composing a message according to a first message format. However, Son singularly or in combination fails to disclose the recited feature:

As per claims 1, 11, 21, and 31 "wherein the haptic stimulation includes a first stimulation determined responsive to performance of the initial portion of the control gesture, and a second stimulation that is different from the first stimulation and is determined responsive to performance of the first intermediate portion of the control

Art Unit: 3718

gesture, and a control module configured to control the haptic device to generate the stimulation determined by the stimulation module”.

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to PIERRE E. ELISCA whose telephone number is (571)272-6706. The examiner can normally be reached on 6:30 to 5:00. Hotelier.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 571 272 4690. 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.

/PIERRE E. ELISCA/
Primary Examiner, Art Unit 3718

Application/Control Number: 12/840,797
Art Unit: 3718

Page 4

Notice of References Cited	Application/Control No. 12/840,797	Applicant(s)/Patent Under Reexamination GRANT ET AL.	
	Examiner PIERRE E. ELISCA	Art Unit 3718	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2011/0050601	03-2011	SON et al.	345/173
	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.

Refine Search

Search Results

Terms	Documents
L1 and haptic near3 stimulat\$3	2

Database:

[US Pre-Grant Publication Full-Text Database](#)
[US Patents Full-Text Database](#)
 US Patents OCR Backfile
 EPO Abstracts Database
 JPO Abstracts Database
 Derwent World Patents Index
 IBM Technical Disclosure Bulletin Database

Search Type: ☒ Prior Art ☐ Interference

Search:

L2

[Refine Search](#)

[Recall Text](#)

[Clear](#)

[Interrupt](#)

Search History

DATE: Thursday, December 06, 2012

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[Create Case](#)

Set
Name
 Side by
 Side

Query

Hit
Count

Set
Name
 Result
 Set

Set Name
 Grid

Prior Art Searches

DB=PGPB,USPT; PLUR=YES; OP=OR

<u>L2</u>	L1 and haptic near3 stimulat\$3	2	<u>L2</u>	<u>L2</u>	Review
<u>L1</u>	(stimulat\$3 near3 user\$1) and generat\$3 near3 signal\$1 and stimulat\$3 near3 module	236	<u>L1</u>	<u>L1</u>	all

END OF SEARCH HISTORY

<i>Index of Claims</i> 	Application/Control No. 12840797	Applicant(s)/Patent Under Reexamination GRANT ET AL.
	Examiner PIERRE E ELISCA	Art Unit 3718

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

☒ Claims renumbered in the same order as presented by applicant			☐ CPA			☐ T.D.			☐ R.1.47		
CLAIM		DATE									
Final	Original	12/06/2012									
	1	=									
	2	=									
	3	=									
	4	=									
	5	=									
	6	=									
	7	=									
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	9	=									
	10	=									
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	30	=									
	31	=									
	32	=									
	33	=									
	34	=									
	35	=									
	36	=									

<i>Index of Claims</i> 	Application/Control No. 12840797	Applicant(s)/Patent Under Reexamination GRANT ET AL.
	Examiner PIERRE E ELISCA	Art Unit 3718

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

☒ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47										
CLAIM		DATE								
Final	Original	12/06/2012								
	37	=								
	38	=								
	39	=								
	40	=								

Search Notes 	Application/Control No. 12840797	Applicant(s)/Patent Under Reexamination GRANT ET AL.
	Examiner PIERRE E ELISCA	Art Unit 3718

SEARCHED			
Class	Subclass	Date	Examiner
463	30	12/6/2012	P.E
463	22	12/6/2012	P.E

SEARCH NOTES		
Search Notes	Date	Examiner
West Search	12/6/2012	P.E

INTERFERENCE SEARCH			
Class	Subclass	Date	Examiner
463	30	12/6/2012	P.E
463	22	12/6/2012	P.E

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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

BIB DATA SHEET

CONFIRMATION NO. 1778

SERIAL NUMBER 12/840,797	FILING or 371(c) DATE 07/21/2010 RULE	CLASS 463	GROUP ART UNIT 3718	ATTORNEY DOCKET NO. 043508-0383796		
APPLICANTS Danny A. Grant, Laval, CANADA; Robert W. Heubel, San Leandro, CA; David M. Birnbaum, Oakland, CA; Erin B. Ramsay, Montreal, CANADA; ** CONTINUING DATA ***** This appln claims benefit of 61/227,645 07/22/2009 ** FOREIGN APPLICATIONS ***** ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** 07/30/2010						
Foreign Priority claimed ☐ Yes ☒ No 35 USC 119(a-d) conditions met ☐ Yes ☒ No Verified and Acknowledged <u>/PIERRE E ELISCA/</u> Examiner's Signature		☐ Met after Allowance P.E Initials	STATE OR COUNTRY CANADA	SHEETS DRAWINGS 13	TOTAL CLAIMS 40	INDEPENDENT CLAIMS 4
ADDRESS Pillsbury Winthrop Shaw Pittman LLP (Immersion) P.O. Box 10500 McLean, VA 22102 UNITED STATES						
TITLE SYSTEM AND METHOD FOR PROVIDING COMPLEX HAPTIC STIMULATION DURING INPUT OF CONTROL GESTURES, AND RELATING TO CONTROL OF VIRTUAL EQUIPMENT						
FILING FEE RECEIVED 2480	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:		☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit			

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

**Request
for
Continued Examination (RCE)
Transmittal**Address to:
Mail Stop RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Application Number	12/840,797
Filing Date	July 21, 2010
First Named Inventor	DANNY A. GRANT
Art Unit	3718
Examiner Name	Pierre E. Elisca
Attorney Docket Number	043508-0383796

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.

Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. See Instruction Sheet for RCEs (not to be submitted to the USPTO) on page 2.

1. **Submission required under 37 CFR 1.114** Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

- a. ☐ Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

i. ☐ Consider the arguments in the Appeal Brief or Reply Brief previously filed on _____

ii. ☐ Other _____

- b. ☒ Enclosed

i. ☐ Amendment/Reply

iii. ☒ Information Disclosure Statement (IDS)

ii. ☐ Affidavit(s)/ Declaration(s)

iv. ☐ Other _____

2. **Miscellaneous**

Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a

- a. ☐ period of _____ months. (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(l) required)

- b. ☐ Other _____

3. **Fees**

The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.

The Director is hereby authorized to charge the following fees any underpayment of fees or credit any overpayments to

- a. ☒ Deposit Account No. 033975

i. ☒ RCE fee required under 37 CFR 1.17(e)

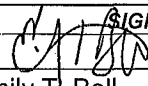
ii. ☐ Extension of time fee (37 CFR 1.136 and 1.17)

iii. ☐ Other _____

- b. ☐ Check in the amount of \$ _____ enclosed

- c. ☐ Payment by credit card (Form PTO-2038 enclosed)

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.**SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED**

Signature		Date	January 31, 2013
Name (Print/Type)	Emily T. Bell	Registration No.	47418

CERTIFICATE OF MAILING OR TRANSMISSION

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 or facsimile transmitted to the U.S. Patent and Trademark Office on the date shown below.

Signature

Name (Print/Type)

Date

This collection of information is required by 37 CFR 1.114. 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: Mail Stop RCE, 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.

American LegalNet, Inc.
www.FormsWorkFlow.com

Meta Platforms Exhibit 1007

Docket Number: 043508-0383796
Client Reference: IMM361

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re the Application of:

Group Art Unit: 3718

DANNY A. GRANT, et al.

Application No.: 12/840,797

Examiner: Pierre E. Elisca

Filed: July 21, 2010

Confirmation No.: 1778

For: SYSTEM AND METHOD FOR PROVIDING COMPLEX HAPTIC STIMULATION DURING INPUT OF CONTROL GESTURES, AND RELATING TO CONTROL OF VIRTUAL EQUIPMENT

INFORMATION DISCLOSURE STATEMENT

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

Sir:

Pursuant to 37 CFR 1.56, the attention of the Patent and Trademark Office is hereby directed to the references listed on the attached PTO-1449. Unless otherwise indicated herein, one copy of each non-US patent reference is attached. It is respectfully requested that the information be expressly considered during the prosecution of this application, and that the references be made of record therein and appear among the "References Cited" on any patent to issue therefrom. Applicants respectfully request the Examiner return an initialed copy of the enclosed Form PTO-1449 to Applicants with the next Office communication to indicate that the references have been considered, per MPEP § 609.

This Information Disclosure Statement is being filed with a Request for Continued Examination. No certification or fee is required.

Respectfully Submitted,

PILLSBURY WINTHROP SHAW PITTMAN LLP



Emily T. Bell
Registration Number 47418
Customer Number: 93383

Date: January 31, 2013
Telephone: (703) 770-7900
Facsimile: (703) 770-7901
P.O. Box 10500
McLean, VA 22102

Atty. Dkt. No.	M#	Client Ref.
043508	0383796	IMM361

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

Applicant: Danny A. Grant, et al.	
Appln. No.: 12/840,797	
Filing Date: July 21, 2010	
Examiner: Pierre E. Elisca	Group Art Unit: 3718

Date: January 31, 2013 Page 1 of 1

U.S. PATENT DOCUMENTS

Examiner's Initials*	Document Number	Date MM/YYYY	Name (Family Name of First Inventor)	Class	Sub Class	Filing Date (if appropriate)
	AR 2008/0024459	01/2008	POUPYREV et al.			
	BR 2007/0150826	06/2007	ANZURES et al.			
	CR 2005/0212760	09/2005	MARVIT et al.			
	DR 2007/0279392	12/2007	ROSENBERG et al.			
	ER 2007/0265096	11/2007	KOUNO et al.			
	FR 2005/0245302	11/2005	BATHICHE et al.			
	GR					
	HR					
	IR					
	JR					
	KR					
	LR					

FOREIGN PATENT DOCUMENTS

	Document Number	Date MM/YYYY	Country	Inventor Name	English Abstract		Translation Readily Available	
					Enclosed	No	Enclose	No
	MR WO 2009/071750	06/2009	WIPO	MÄENPÄÄ			X	
	NR WO 99/38064	07/1999	WIPO	KEYSON			X	
	OR							
	PR							
	QR							

OTHER (Including in this order Author, Title, Periodical Name, Date, Pertinent Pages, etc.)

	RR	International Search Report as issued for International Application No. PCT/US2010/042795, dated January 12, 2011.			X	
	SR	International Preliminary Report on Patentability, including the Written Opinion, as issued for International Application No. PCT/US2010/042795, dated February 2, 2012.			X	
	TR	International Search Report as issued for International Application No. PCT/US2010/042805, dated October 29, 2010.			X	
	UR	International Preliminary Report on Patentability, including the Written Opinion, as issued for International Application No. PCT/US2010/042805, dated February 2, 2012.			X	

Examiner _____ Date Considered: _____

*EXAMINER: Initial if citation 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.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 43508-388102	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, Item 5 below.	
International application No. PCT/US2010/042795	International filing date (day/month/year) 21/07/2010	(Earliest) Priority Date (day/month/year) 22/07/2009
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 6 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

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2010/042795

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-9, 11-19

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2010/042795

A. CLASSIFICATION OF SUBJECT MATTER

INV. G06F3/01 G06F3/048

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

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2008/024459 A1 (POUPYREV IVAN [JP] ET AL) 31 January 2008 (2008-01-31) paragraphs [0045] - [0071]; figure 1 paragraphs [0077] - [0089]; figures 3-5 paragraphs [0102] - [0114]; figures 8-9 paragraphs [0118] - [0125], [0128]; figure 11	1-9, 11-19
X	WO 2009/071750 A1 (NOKIA CORP [FI]; MAEENPAEAE JANI CHRISTIAN [FI]) 11 June 2009 (2009-06-11) page 5, line 13 - page 6, line 26; figure 1 page 7, lines 21-34 page 9, line 19 - page 10, line 2; figure 3 ----- -/--	1-9, 11-19



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.

"&" document member of the same patent family

Date of the actual completion of the international search

1 November 2010

Date of mailing of the international search report

12/01/2011

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

Charcos Lloréns, V

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2010/042795

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2007/150826 A1 (ANZURES FREDDY A [US] ET AL ANZURES FREDDY ALLEN [US] ET AL) 28 June 2007 (2007-06-28) paragraphs [0050] - [0092]; figures 2-7 -----	1-9, 11-19
A	US 2005/212760 A1 (MARVIT DAVID L [US] ET AL) 29 September 2005 (2005-09-29) abstract paragraph [0104] -----	9, 19

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2010/042795

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2008024459 A1	31-01-2008	CN 101118469 A JP 2008033739 A	06-02-2008 14-02-2008
WO 2009071750 A1	11-06-2009	CN 101889258 A EP 2217990 A1 US 2009167507 A1	17-11-2010 18-08-2010 02-07-2009
US 2007150826 A1	28-06-2007	US 2009106679 A1 WO 2007076211 A1	23-04-2009 05-07-2007
US 2005212760 A1	29-09-2005	US 2010328201 A1	30-12-2010

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-9, 11-19

Relative to the generation of additional stimulations for a further intermediate gesture portion, in order to inform the user of input progress for a complex gesture.

2. claims: 10, 20

Relative to the adaptation of stimulations based on characteristics of a character in a game, in order to provide an indication of application status.

3. claims: 21-40

Relative to the presentation of user selectable sections of virtual equipment in a game, in order to allow user configuration of the virtual equipment and of the haptic stimulations associated thereto.

ADVANCE E-MAIL

From the INTERNATIONAL BUREAU

PCT

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

(PCT Rule 44bis.1(c))

To:

ESPLIN, D., Benjamin
Pillsbury Winthrop Shaw Pittman LLP
P.O. Box 10500
McLean, VA 22102
ETATS-UNIS D'AMERIQUE

Date of mailing (day/month/year)

02 February 2012 (02.02.2012)

Applicant's or agent's file reference

43508-388102

IMPORTANT NOTICE

International application No.

PCT/US2010/042795

International filing date (day/month/year)

21 July 2010 (21.07.2010)

Priority date (day/month/year)

22 July 2009 (22.07.2009)

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

Authorized officer

Philippe Bécamel

Facsimile No. +41 22 338 82 70

e-mail: pt01.pct@wipo.int

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 43508-388102	FOR FURTHER ACTION		See item 4 below
International application No. PCT/US2010/042795	International filing date (<i>day/month/year</i>) 21 July 2010 (21.07.2010)	Priority date (<i>day/month/year</i>) 22 July 2009 (22.07.2009)	
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237			
Applicant IMMERSION CORPORATION			

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).

2. This REPORT consists of a total of 9 sheets, including this cover sheet.

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.

3. This report contains indications relating to the following items:

- | | | |
|-------------------------------------|--------------|---|
| ☒ | Box No. I | Basis of the report |
| ☐ | 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 Article 35(2) with regard to novelty, inventive step or 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 |

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).

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 24 January 2012 (24.01.2012) Authorized officer Philippe Bécamel e-mail: pt01.pct@wipo.int
---	--	--

Form PCT/IB/373 (January 2004)

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

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

To: see form PCT/ISA/220		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/US2010/042795	International filing date (day/month/year) 21.07.2010	Priority date (day/month/year) 22.07.2009	
International Patent Classification (IPC) or both national classification and IPC INV. G06F3/01 G06F3/048			
Applicant IMMERSSION 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 P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Fax: +31 70 340 - 3016		Date of completion of this opinion see form PCT/ISA/210	Authorized Officer Charcos Lloréns, V Telephone No. +31 70 340-9118



**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2010/042795

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:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2010/042795

Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of

☐ the entire international application

☒ claims Nos. 10, 20-40

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international search (*specify*):

☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed (*specify*):

☒ no international search report has been established for the whole application or for said claims Nos. 10, 20-40

☐ a meaningful opinion could not be formed without the sequence listing; the applicant did not, within the prescribed time limit:

☐ furnish a sequence listing on paper complying with the standard provided for in Annex C of the Administrative Instructions, and such listing was not available to the International Searching Authority in a form and manner acceptable to it.

☐ furnish a sequence listing in electronic form complying with the standard provided for in Annex C of the Administrative Instructions, and such listing was not available to the International Searching Authority in a form and manner acceptable to it.

☐ pay the required late furnishing fee for the furnishing of a sequence listing in response to an invitation under Rules 13ter.1(a) or (b).

☐ See Supplemental Box for further details

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2010/042795

Box No. IV Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees, the applicant has, within the applicable time limit:
- ☐ paid additional fees
 - ☐ paid additional fees under protest and, where applicable, the protest fee
 - ☐ paid additional fees under protest but the applicable protest fee was not paid
 - ☒ not paid additional fees
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is
- ☐ complied with
 - ☒ not complied with for the following reasons:
see separate sheet
4. Consequently, this report has been established in respect of the following parts of the international application:
- ☐ all parts.
 - ☒ the parts relating to claims Nos. 1-9, 11-19

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>3, 4, 9, 13, 14, 19</u>
	No: Claims	<u>1, 2, 5-8, 11, 12, 15-18</u>
Inventive step (IS)	Yes: Claims	
	No: Claims	<u>1-9, 11-19</u>
Industrial applicability (IA)	Yes: Claims	<u>1-9, 11-19</u>
	No: Claims	

2. Citations and explanations

see separate sheet

1 Reference is made to the following documents:

- D1 US 2008/024459 A1 (POUPYREV IVAN [JP] ET AL) 31 January 2008 (2008-01-31)
- D2 WO 2009/071750 A1 (NOKIA CORP [FI]; MAENPAAE JANI CHRISTIAN [FI]) 11 June 2009 (2009-06-11)
- D3 US 2007/150826 A1 (ANZURES FREDDY A [US] ET AL ANZURES FREDDY ALLEN [US] ET AL) 28 June 2007 (2007-06-28)
- D4 US 2005/212760 A1 (MARVIT DAVID L [US] ET AL) 29 September 2005 (2005-09-29)

Re Item IV.

2 The present application does not comply with the requirements of unity of invention in the sense of Rule 13 PCT.

2.1 The prior-art document D1 discloses:

A system configured to provide haptic stimulation to a user (Fig. 1), the system comprising:

- a user interface configured to generate output signals related to the gestures of a user ("pressure sensing unit 10", par. [0056]; "2D position sensing unit 105", par. [0057]; Fig. 1);
- an actuator configured to generate haptic stimulation to the user ("haptic feedback generating unit 102... formed with... actuators", par. [0055]); and
- one or more processors ("controller section 20", par. [0059], [0062], Fig. 1) configured to execute computer program modules ("Various functions may be realized by executing corresponding software", par. [0060]), the computer program modules comprising:
 - a gesture module configured to monitor performance of a control gesture by the user based on the output signals of the user interface ("the GUI controller 112 can calculate if there was enough pressure... on the screen to change the state of the button", par. [0068], Fig. 1; "a history of the previous input and a history of the previous states of the GUI objects is used", par. [0071]),

wherein the control gesture is a gesture associated with a command input to the system ("To actuate the GUI object", par. [0119]), and includes an initial portion, a first intermediate portion, and an ending portion ("The user touches... to pass a selection threshold, ... presses further to pass the actuation threshold... however... To actuate the GUI object, the user should press further to the confirmation threshold", par. [0119]; see also par. [0087]);

- a stimulation module configured to receive information related to performance of the control gesture from the gesture module, and to determine haptic stimulation to be generated for the user associated with the control gesture ("The GUI controller 112... sends the commands to the tactile interface controller 111 that generates appropriate commands for driving the tactile signal generation unit", par. [0070], Fig. 1),

wherein the haptic stimulation includes a first stimulation determined responsive to performance of the initial portion of the control gesture (As the user touches... a tactile feedback is provided", par. [0119]), and a second stimulation that is different from the first stimulation and is determined responsive to performance of the first intermediate portion of the control gesture ("The user presses further... where a different tactile feedback is provided", par. [0119]); and

- an actuator control module configured to control the actuator to generate the stimulation determined by the stimulation module ("The signal generating unit 106 generates and provides a signal... for driving... the... actuators", par. [0063], Fig. 1).

- 2.2 Therefore, D1 discloses the subject-matter of the independent claim 1 for a system and, *mutatis mutandis*, that of the independent claim 11 for a corresponding method.
- 2.3 D1 further discloses the subject-matter of the corresponding claims 2 and 12 ("the confirmation threshold... provides still another tactile feedback", par. [0119]), which are therefore also not new (Article 33(2) PCT).
- 2.4 The question of unity of invention is thus to be assessed with regard to the dependent claims 3-10 and 12-20 (PCT Guidelines 10.08) and the remaining independent claims 21 and 31. More particularly, due to claim dependencies, unity of invention is assessed based on claims 3, 5, 6, 8-10, 13, 15, 16, 18-20.

- 2.5 From the comparison between document D1 and the first invention as defined by claim 3 the following special technical feature can be identified: an additional stimulation is generated for a further intermediate gesture portion. This solves the problem of how to inform the user of input progress for a complex gesture (see also par. (50)-(51) of the application).
- 2.6 From the comparison between document D1 and the second invention as defined by claim 10 the following special technical feature can be identified: the stimulations are based on characteristics of a character in a game. This solves the problem of how to provide an indication of application status (see also par. (61)-(63) of the application).
- 2.7 From the comparison between document D1 and the third invention as defined by claim 21 the following special technical features can be identified: user selectable sections are presented on views of virtual equipment in a game and the virtual equipment operation and the associated haptic stimulations are determined based on user selections.
- 2.8 The above analysis shows that the inventions defined respectively by claims 3, 10 and 21, even when compared separately with one another, have different special technical features dealing with different, independent problems. Therefore, the single general inventive concept required by Rule 13 (1) PCT is missing, and the requirement for unity of invention referred to in Rule 13 PCT is not fulfilled.
- 2.9 It is concluded that the claims on file cover the following different inventions:
- Invention I: Claims 1-9, 11-19, which relate to the generation of additional stimulations for a further intermediate gesture portion, in order to inform the user of input progress for a complex gesture.
 - Invention II: Claims 10, 20, which relate to the adaptation of stimulations based on characteristics of a character in a game, in order to provide an indication of application status.
 - Invention III: Claims 21-40, which relate to the presentation of user selectable sections of virtual equipment in a game, in order to allow user configuration of the virtual equipment and of the haptic stimulations associated thereto.
- 2.10 It is further noted that the above analysis has been made only for assessing compliance of the claims with the requirements of Rule 13 PCT and does not imply a comprehensive assessment of compliance with Article 33(1) PCT.

Re Item V.

- 3 The present application does not meet the criteria of Article 33(2) PCT, because the subject-matter of the corresponding independent claims 1 and 11 is not new (see non-unity reasoning *supra*).
- 4 Dependent claims 2-9 and 12-19 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 (see documents D1-D4 and corresponding passages cited in the search report). In particular, the attention is drawn to the following:
- 4.1 Claims 2, 12: see non-unity reasoning *supra*.
- 4.2 Claims 3, 13: as a mere matter of design, in accordance with circumstances and without the exercise of inventive activity, the skilled person departing from D1 would define gestures with further intermediate portions and associate further tactile feedback to each of these portions (see also par. [0104],[0107] in D1).
- 4.3 Claims 4, 14: in D1 the different tactile feedback sensations signal to the user that the respective gesture portion is completed and that the following gesture portion, if any, should be commenced.
- 4.4 Claims 5, 15: in D1 the control gesture is a single, discrete command of actuation of a GUI object (see e.g. par. [0119]).
- 4.5 Claims 6-7, 16-17: see D1 (par. [0063], [0103]-[0106]).
- 4.6 Claims 8, 18: see D1 (par. [0089], [0122]).
- 4.7 Claims 9, 19: it is well known to provide feedback associated with failure to complete an input gesture (see also par. [0092] in D3 and par. [0104] in D4).

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference 43508-388103	FOR FURTHER ACTION see Form PCT/ISA/220 as well as, where applicable, Item 5 below.	
International application No. PCT/US2010/042805	International filing date (day/month/year) 21/07/2010	(Earliest) Priority Date (day/month/year) 22/07/2009
Applicant IMMERSSION 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:

INTERACTIVE TOUCH SCREEN GAMING METAPHORS WITH HAPTIC FEEDBACK ACROSS PLATFORMS

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. 3
☐ 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

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2010/042805

A. CLASSIFICATION OF SUBJECT MATTER

INV. G06F3/01 A63F13/12
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 A63F

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 99/38064 A2 (KONINKL PHILIPS ELECTRONICS NV [NL]; PHILIPS SVENSKA AB [SE]) 29 July 1999 (1999-07-29) the whole document -----	1-21
X	US 2007/279392 A1 (ROSENBERG LOUIS B [US] ET AL) 6 December 2007 (2007-12-06) paragraphs [0011] - [0015] paragraphs [0042] - [0044]; figure 3 paragraphs [0081] - [0093]; figures 11-12 -----	1-21
X	US 2007/265096 A1 (KOUNO TSUTOMU [JP] ET AL) 15 November 2007 (2007-11-15) paragraphs [0020] - [0058]; figures 1-10 ----- -/--	1-21

☒ 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.

& document member of the same patent family

Date of the actual completion of the international search

22 October 2010

Date of mailing of the international search report

29/10/2010

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

Charcos Lloréns, V

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2010/042805

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2005/245302 A1 (BATHICHE STEVEN [US] ET AL BATHICHE STEVEN [US] ET AL) 3 November 2005 (2005-11-03) paragraphs [0001], [0011] - [0013], [0059] - [0061] -----	3, 10, 17

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2010/042805

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9938064	A2	29-07-1999	DE 69904883 D1 20-02-2003
			DE 69904883 T2 20-11-2003
			JP 4121564 B2 23-07-2008
			JP 2001517347 T 02-10-2001
			TW 404846 B 11-09-2000
			US 6518951 B1 11-02-2003
US 2007279392	A1	06-12-2007	US 2010148943 A1 17-06-2010
US 2007265096	A1	15-11-2007	JP 2007301270 A 22-11-2007
US 2005245302	A1	03-11-2005	EP 1621985 A2 01-02-2006
			JP 2005317032 A 10-11-2005
			US 2008231611 A1 25-09-2008

ADVANCE E-MAIL

From the INTERNATIONAL BUREAU

PCT

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

(PCT Rule 44bis.1(c))

To:

ESPLIN, D., Benjamin
Pillsbury Winthrop Shaw Pittman LLP
P.O. Box 10500
McLean, VA 22102
ETATS-UNIS D'AMERIQUE

Date of mailing (day/month/year)

02 February 2012 (02.02.2012)

Applicant's or agent's file reference

43508-388103

IMPORTANT NOTICE

International application No.

PCT/US2010/042805

International filing date (day/month/year)

21 July 2010 (21.07.2010)

Priority date (day/month/year)

22 July 2009 (22.07.2009)

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

Authorized officer

Simin Baharlou

Facsimile No. +41 22 338 82 70

e-mail: pt09.pct@wipo.int

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 43508-388103	FOR FURTHER ACTION		See item 4 below
International application No. PCT/US2010/042805	International filing date (<i>day/month/year</i>) 21 July 2010 (21.07.2010)	Priority date (<i>day/month/year</i>) 22 July 2009 (22.07.2009)	
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237			
Applicant IMMERSION CORPORATION			

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).

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

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.

3. This report contains indications relating to the following items:

- | | | |
|-------------------------------------|--------------|---|
| ☒ | Box No. I | Basis of the report |
| ☐ | 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 Article 35(2) with regard to novelty, inventive step or 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 |

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).

		Date of issuance of this report 24 January 2012 (24.01.2012)
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland		Authorized officer Simin Baharlou
Facsimile No. +41 22 338 82 70		e-mail: pt09.pct@wipo.int

Form PCT/IB/373 (January 2004)

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/US2010/042805

International filing date (day/month/year)
21.07.2010

Priority date (day/month/year)
22.07.2009

International Patent Classification (IPC) or both national classification and IPC
INV. G06F3/01 A63F13/12

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
P.B. 5818 Patentlaan 2
NL-2280 HV Rijswijk - Pays Bas
Tel. +31 70 340 - 2040
Fax: +31 70 340 - 3016

Date of completion of
this opinion

see form
PCT/ISA/210

Authorized Officer

Charcos Lloréns, V

Telephone No. +31 70 340-9118



**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US2010/042805

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>3, 6, 7, 10, 13, 14, 17, 20, 21</u>
	No: Claims	<u>1, 2, 4, 5, 8, 9, 11, 12, 15, 16, 18, 19</u>
Inventive step (IS)	Yes: Claims	
	No: Claims	<u>1-21</u>
Industrial applicability (IA)	Yes: Claims	<u>1-21</u>
	No: Claims	

2. Citations and explanations

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 99/38064 A2 (KONINKL PHILIPS ELECTRONICS NV [NL]; PHILIPS SVENSKA AB [SE]) 29 July 1999 (1999-07-29)
- D2 US 2007/279392 A1 (ROSENBERG LOUIS B [US] ET AL) 6 December 2007 (2007-12-06)
- D3 US 2007/265096 A1 (KOUNO TSUTOMU [JP] ET AL) 15 November 2007 (2007-11-15)
- D4 US 2005/245302 A1 (BATHICHE STEVEN [US] ET AL BATHICHE STEVEN [US] ET AL) 3 November 2005 (2005-11-03)

2 The present application does not meet the criteria of Article 33(2) PCT, because the subject-matter of claim 1 is not new. Indeed, D1 discloses:

A system (Figure 2) configured to provide haptic effects to a first user of a multi-user application, the system comprising:

a first computing platform associated with the first user ("Using respective interconnected terminals, a first and a second user...", p. 3 l. 10-11), the first computing platform comprising:

- a first user interface configured to receive control inputs from the first user ("manipulating respective actuators... integrated in the terminals", p. 3 l. 14; p. 5 l. 18-19; "local actuator... for receiving mechanical input from a local user", p. 6 l. 7);
- a first haptic interface configured to generate haptic effects perceptible to the first user ("trackballs with force feedback", p. 3 l. 15, 17-20; "local actuator... outputting mechanical feedback to the local user", p. 6 l. 6-7);
- a first set of one or more processors ("local processing unit", p. 5 l. 19) configured:
 - to execute a first instance of the multi-user application (p. 3 l. 8-14), the multi-user application being configured to interface with an object based on control inputs received from the first user and

based on control inputs received from a second user via a second computing platform executing a second instance of the multi-user application ("tactual environment objects", p. 3 l. 24-26; "user-manipulatable tactual environment objects", p. 4 l. 3-6); and

- to determine haptic effects that are to be generated by the first haptic interface, such haptic effects comprising a first haptic effect conveying information to the first user related to a first control input of the second user to the second computing platform ("a user can confront an other user with a tactual environment object that is visually but not tactually hidden from him", p. 2 l. 15-17; "by moving his tank through a magnet... the other users will experience an attractive force", p. 4 l. 25-28; see also p. 5 l. 3-6).

- 3 For the sake of completeness, it is pointed out that claim 1 is also not new (Article 33(2) PCT) in view of D2 (see in particular abstract, Fig. 11 and par. [0087], [0092], [0093]).
- 4 Furthermore, the subject-matter of claim 1 only differs from that of D3 (see e.g. par. [0020], [0024]) in that claim 1 provides haptic interfaces to generate haptic effects conveying information related to inputs of the other user. However, this is well known, see D1 or D2 as examples. Therefore, as a matter of design and in accordance with circumstances, the skilled person departing from D3 would implement said distinguishing feature without the exercise of inventive step (Article 33(3) PCT).
- 5 Notwithstanding the above, it seems that conveying information related to inputs of the other user amounts to a presentation of information for entertainment purposes, rather than solves a technical problem. Accordingly, such a feature does not contribute to inventive step, nor does its implementation, which is based on conventional technical means (standard haptic interfaces and network messages).
- 6 The same reasoning applies *mutatis mutandis* to the corresponding independent claims 8 and 15, which therefore are also considered not new (Article 33(2) PCT) over D1 or D2, nor inventive (Article 33(3) PCT) over D3.
- 7 Dependent claims 2-7, 9-14, 16-21 do not contain any 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, see documents D1-D4 and corresponding passages cited in the search report.

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
11 June 2009 (11.06.2009)

PCT

(10) International Publication Number
WO 2009/071750 A1

(51) International Patent Classification:
G06F 3/041 (2006.01)

(21) International Application Number:
PCT/FI2008/050713

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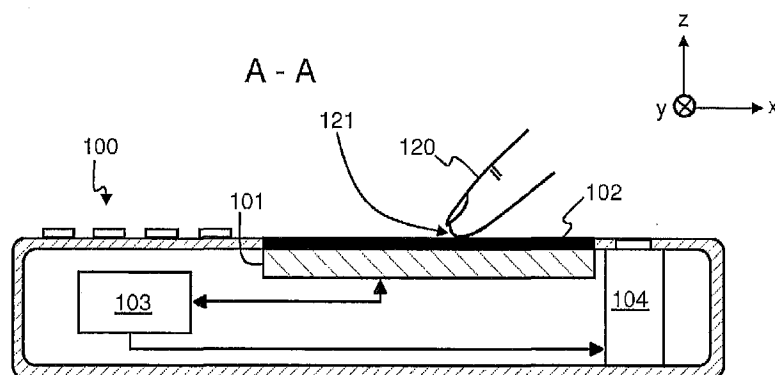


Fig. 1b

(57) Abstract: The invention relates to a user interface of an electronic device. The user interface comprises a touch sensitive display panel (101) and an actuator (104) that is arranged to generate a signal that is detectable for a human being. The actuator is arranged to alter a property of the signal as a response to a situation in which an external object (120) is slid on a surface (102) of the touch sensitive display panel. The property of the signal can be, for example, amplitude or frequency of mechanical vibration generated to a housing of the electronic device. The signal represents a feedback to a user of the electronic device and it makes the user interface more illustrative when the touch sensitive display panel is used for controlling a quantity having a continuous nature, e.g. volume of voice generated with a speaker element.

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A user interface

Field of the invention

The invention relates to a user interface of an electronic device. The invention further relates to a method and a computer program for controlling an electronic device.

Background

Electronic devices such as mobile communication terminals and palmtop computers are typically equipped with digital devices capable of supporting various services and application functions. As a consequence, designing user interfaces for electronic devices of the kind mentioned above presents unique challenges in view of limited size, a limited number of controls that can be accommodated on such devices, and a need for quick, simple, and intuitive device operation. Especially in conjunction with mobile devices the challenge related to a user interface is exacerbated because such devices are designed to be small, lightweight and easily portable. Consequently, mobile devices typically have limited display panels, keypads, keyboards and/or other input and output devices.

Touch sensitive display panels provide such advantages that a display screen and a keyboard can be integrated together and placing of press buttons of the keyboard can be made freely modifiable. Therefore, considerable savings in the size of a user interface can be achieved. A touch sensitive display panel is inherently suitable for implementing press keys and other control devices with the aid of which discrete control actions, such as pressing a press button, can be directed to an electronic device. On the other hand, using a touch sensitive display panel it is more challenging to implement a control device with the aid of which a quantity having a continuous and non-discrete nature could be adjusted. The quantity having a continuous and non-discrete nature can be, for example, strength of voice generated with a speaker element, brightness of an image shown on a display screen, or a gain of a microphone circuitry.

In a solution according to the prior art a user interface of an electronic device includes both a touch sensitive display panel and mechanical control devices. Display functionalities and at least part of control devices for discrete control actions are implemented with the aid of the touch sensitive display panel. Control actions

for adjusting quantities having a continuous nature are carried out using the mechanical control devices. A mechanical control device can be, for example, a mechanical slide or a rotatable knob. The mechanical control devices require room in the user interface, they are vulnerable to impurities, and their placing in the user interface cannot be altered according to different needs in different operational situations of the electronic device.

Summary

In accordance with a first aspect of the invention a novel user interface is provided. The user interface comprises:

- 10 - a touch sensitive display panel,
- a controller arranged to control an electronic device on the basis of a position of an external object on a surface of the touch sensitive display panel, and
- an actuator arranged to generate a signal that is detectable for a human being,
- 15 ing,

wherein the actuator is arranged to alter a property of said signal as a response to a situation in which the external object is slid on the surface of the touch sensitive display panel.

The signal that is detectable for a human being represents a feedback to a user of the user interface and it makes the user interface more illustrative when the touch sensitive display panel is used for controlling an electronic device by sliding a finger or some other object on the touch sensitive display panel. In a user interface according to an embodiment of the invention a sliding control device and/or a rotatable control device for controlling quantities having a continuous nature are implemented with the aid of the touch sensitive display panel. The signal that is detectable for a human being can be used for giving to the user a conception of an instantaneous value or strength of the quantity that is being adjusted with the sliding control device or the rotatable control device.

In accordance with a second aspect of the invention a novel method that can be used for controlling an electronic device is provided. The method comprises:

- 30 - controlling an electronic device on the basis of a position of an external object on a surface of a touch sensitive display panel,

- generating a signal that is detectable for a human being, and
- altering a property of said signal as a response to a situation in which the external object is slid on the surface of the touch sensitive display panel.

In accordance with a third aspect of the invention a novel electronic device is provided. The electronic device comprises:

- a touch sensitive display panel,
- a controller arranged to control an electronic device on the basis of a position of an external object on a surface of the touch sensitive display panel, and
- 10 - an actuator arranged to generate a signal that is detectable for a human being,

wherein the actuator is arranged to alter a property of said signal as a response to a situation in which the external object is slid on the surface of the touch sensitive display panel.

- 15 The electronic device can be, for example, a mobile communication terminal, a palmtop computer, a portable play station, or a measurement instrument such as an oscilloscope. The electronic device can also be a combination of a mobile communication terminal, a palmtop computer, and a portable play station. The electronic device can also be, for example, a domestic appliance or an apparatus
- 20 for industrial use. A domestic appliance can be e.g. a dishwasher or a washing machine. The apparatus for industrial use can be e.g. a part of control room equipment.

In accordance with a fourth aspect of the invention a novel computer program is provided for making a processor unit to control an electronic device that includes:

- 25 - a touch sensitive display panel, and
- an actuator arranged to generate a signal that is detectable for a human being.

The computer program comprises computer executable instructions for making the processor unit:

- to control the electronic device on the basis of a position of an external object on a surface of the touch sensitive display panel, and
- to alter a property of said signal as a response to a situation in which the external object is slid on the surface of the touch sensitive display panel.

- 5 A computer readable medium can be encoded with the above-mentioned computer executable instructions.

In accordance with a fifth aspect of the invention a novel interface module is provided. The interface module comprises:

- a touch sensitive display panel,
- 10 - a controller capable of controlling an electronic device on the basis of a position of an external object on a surface of the touch sensitive display panel, and
- an actuator arranged to generate a signal that is detectable for a human being,

- 15 wherein the actuator is arranged to alter a property of said signal as a response to a situation in which the external object is slid on the surface of the touch sensitive display panel.

A number of embodiments of the invention are described in accompanied dependent claims.

- 20 Various embodiments of the invention both as to constructions and to methods of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings.

- 25 The embodiments of the invention presented in this document are not to be interpreted to pose limitations to the applicability of the appended claims. The verb "to comprise" is used in this document as an open limitation that does not exclude the existence of also unrecited features. The features recited in depending claims are mutually freely combinable unless otherwise explicitly stated.

Brief description of the figures

The embodiments of the invention that are presented in the sense of examples and their advantages are explained in greater detail below with reference to the accompanying drawings, in which:

- 5 figures 1a and 1b show an electronic device comprising a user interface according to an embodiment of the invention,
- figures 2a and 2b show an electronic device according to an embodiment of the invention,
- figure 3 is a flow chart of a method according to an embodiment of the invention,
- 10 and
- figure 4 shows an interface module according to an embodiment of the invention.

Description of the embodiments

- A user interface according to an embodiment of the invention comprises: (i) a touch sensitive display panel, (ii) means for controlling an electronic device on the
- 15 basis of a position of an external object on a surface of the touch sensitive display panel, (iii) means for generating a signal that is detectable for a human being, and (iv) means for altering a property of said signal as a response to a situation in which the external object is slid on the surface of the touch sensitive display panel.

- Figure 1a shows an electronic device 100 comprising a user interface according to
- 20 an embodiment of the invention. Figure 1b shows the A-A section view of the electronic device. The user interface of the electronic device comprises a touch sensitive display panel 101 and a controller 103 that is arranged to control the electronic device on the basis of a position of an external object 120 on a surface 102 of the touch sensitive display panel 101. The position of the external object can ex-
- 25 pressed, for example, with the x- and y-coordinates of a spot 121 where the external object touches the touch sensitive display panel. In the exemplifying situation shown in figures 1a and 1b the external object 120 is a finger of a user of the electronic device 100. The external object 120 could as well be e.g. a pen or a stylus. The user interface comprises an actuator 104 that is arranged to generate a signal
- 30 that is detectable for a human being, i.e. for the user of the electronic device. The actuator is arranged to alter a property of the signal that can be detected by the user when the external object 120 is slid on the surface 102 of the touch sensitive

display panel. The user interface of the electronic device can comprise also a mechanical keyboard 110 and/or other control devices for exchanging information between the electronic device and the user. In the exemplifying situation shown in figures 1a and 1b a sliding control device 111 for controlling a quantity having a continuous nature is implemented with the aid of the touch sensitive display panel 101. The quantity that can be adjusted with the sliding control device can be, for example, strength of voice generated with a speaker element, background brightness of the touch sensitive display panel, or a gain of a microphone circuitry. The above-mentioned quantity can be increased by sliding the external object in the direction of an arrow 112 on the surface of the touch sensitive display panel. The above-mentioned quantity can be decreased by sliding the external object in the direction of an arrow 112' on the surface of the touch sensitive display panel.

In a user interface according to an embodiment of the invention the actuator 104 is a vibration generator. The vibration generator can be, for example, an electromechanical vibration generator or a piezo-electric vibration generator. The controller 103 is arranged to alter amplitude of mechanical vibration produced with the vibration generator as a response to the situation in which the external object is slid on the surface of the touch sensitive display panel. The amplitude is increased preferably when the external object is slid in the direction of the arrow 112 and the amplitude is decreased preferably when external object is slid in the direction of the arrow 112'. Therefore, the user of the electronic device gets feedback from the electronic device via his/her sense of touch. In a user interface according to another embodiment of the invention, the controller 103 is arranged to alter frequency of mechanical vibration produced with the vibration generator as a response to the situation in which the external object is slid on the surface of the touch sensitive display panel.

In a user interface according to an embodiment of the invention a part 104' of the touch sensitive display panel 101 is used as the actuator that is arranged to generate a signal that is detectable for a human being, i.e. for the user of the electronic device. The controller 103 is arranged to alter intensity of light shown on the part 104' of the touch sensitive display panel as a response to the situation in which the external object is slid on the surface of the touch sensitive display panel.

In a user interface according to an embodiment of the invention the actuator 104 is an oscillator capable of generating voice. The controller 103 is arranged to alter amplitude of the voice produced with the oscillator as a response to the situation in which the external object is slid on the surface of the touch sensitive display panel.

In a user interface according to another embodiment of the invention, the controller 103 is arranged to alter frequency of the voice produced with the oscillator as a response to the situation in which the external object is slid on the surface of the touch sensitive display panel.

- 5 In a user interface according to an embodiment of the invention the actuator 104 is a light source. The controller 103 is arranged to alter intensity of light produced with the light source as a response to the situation in which the external object is slid on the surface of the touch sensitive display panel. In a user interface according to another embodiment of the invention, the controller 103 is arranged to alter
10 color of light produced with the light source as a response to the situation in which the external object is slid on the surface of the touch sensitive display panel.

- In a user interface according to an embodiment of the invention the actuator 104 is arranged to alter the property of the signal generated by it as a response to a situation in which the external object is slid along a pre-determined path on the surface of the touch sensitive display panel. The pre-determined path can be defined
15 e.g. by a displayed symbol of a control device 111. The pre-determined path can be a linear path in which case a sliding control device is implemented with the aid of the touch sensitive display surface as shown in figure 1b. As an alternative, the pre-determined path can be a circular path in which case a rotatable control device
20 is implemented with the aid of the touch sensitive display surface.

- It is also possible that the control device is arranged to alter the property of the signal that is detectable for a human being as a response to a situation in which the external object is slid in a pre-determined direction, e.g. in the x-direction, on the surface of the touch sensitive display panel. In this case, the electronic device
25 can be controlled by sweeping the surface of the touch sensitive display panel starting from an arbitrary point of the touch sensitive display panel. The direction and the length of the sweep can be used for determining the effect of a control action.

- An electronic device according to an embodiment of the invention comprises: (i) a
30 touch sensitive display panel, (ii) means for controlling the electronic device on the basis of a position of an external object on a surface of the touch sensitive display panel, (iii) means for generating a signal that is detectable for a human being, and (iv) means for altering a property of said signal as a response to a situation in which the external object is slid on the surface of the touch sensitive display panel.

Figure 2a shows an electronic device 200 according to an embodiment of the invention. Figure 2b shows the A-A section view of the electronic device. The electronic device can be a mobile communication terminal, a palmtop computer, a portable play station, or a combination of them. The electronic device comprises a touch sensitive display panel 201 and a controller 203 that is arranged to control the electronic device on the basis of a position of an external object 220 on a surface 202 of the touch sensitive display panel 201. The position of the external object can be expressed, for example, with the x- and y-coordinates of a spot in which the external object touches the touch sensitive display panel. In the exemplifying situation shown in figures 2a and 2b the external object 220 is a finger of a user of the electronic device 200. The electronic device comprises an actuator 204 that is arranged to generate a signal that is detectable for a human being, i.e. for the user of the electronic device. The actuator is arranged to alter a property of the signal that can be detected by the user as a response to a situation in which the external object 220 is slid on the surface 202 of the touch sensitive display panel. In the exemplifying situation shown in figures 2a and 2b a rotatable control device 211 for controlling a quantity having a continuous nature is implemented with the aid of the touch sensitive display panel 201. The quantity that can be adjusted with the rotatable control device 211 can be, for example, strength of voice generated with a speaker element 205, background brightness of the touch sensitive display panel 201, or amplitude of an electrical signal produced with a microphone 206. The above-mentioned quantity can be increased by sliding the external object along a circular path clockwise according to an arrow 212 on the surface of the touch sensitive display panel. The above-mentioned quantity can be decreased by sliding the external object along the circular path counter-clockwise according to the arrow 212 on the surface of the touch sensitive display panel.

In an electronic device according to an embodiment of the invention the actuator 204 is a vibration generator. The controller 203 is arranged to alter amplitude of mechanical vibration produced with the vibration generator as a response to the situation in which the external object is slid on the surface of the touch sensitive display panel. In an electronic device according to another embodiment of the invention the controller 203 is arranged to alter frequency of the mechanical vibration produced with the vibration generator as a response to the situation in which the external object is slid on the surface of the touch sensitive display panel.

In an electronic device according to an embodiment of the invention the actuator 204 is arranged to alter the property of the signal generated with it as a response to a

situation in which the external object is slid along a pre-determined path on the surface of the touch sensitive display panel. The pre-determined path can be a circular path in which case a rotatable control device is implemented with the aid of the touch sensitive display surface as shown in figure 2b. As an alternative, the
5 pre-determined path can be a linear path in which case a sliding control device is implemented with the aid of the touch sensitive display surface.

In an electronic device according an embodiment of the invention the controller 203 is arranged to control, on the basis of the position of the external object on the surface of the touch sensitive display panel, a gain of an amplifier circuitry 207
10 coupled to the speaker element 205.

In an electronic device according an embodiment of the invention the controller 203 is arranged to control, on the basis of the position of the external object on the surface of the touch sensitive display panel, a gain of an amplifier circuitry 208 coupled to the microphone 206.

15 It should be noted that an electronic device according to an embodiment of the invention is not necessarily a portable electronic device. An electronic device according to an embodiment of the invention can be as well, for example, a domestic appliance or fixed industrial equipment.

Figure 3 is a flow chart of a method according to an embodiment of the invention
20 for controlling an electronic device. Phase 301 comprises controlling the electronic device on the basis of a position of an external object on a surface of a touch sensitive display panel. Phase 302 comprises generating a signal that is detectable for a human being. Phase 303 comprises altering a property of said signal as a response to a situation in which the external object is slid on the surface of the touch
25 sensitive display panel. The external object can be e.g. a finger of a user of the electronic device, a pen, or a stylus.

In a method according to an embodiment of the invention the detectable signal is mechanical vibration generated to the housing of the electronic device and amplitude of the mechanical vibration is altered as a response to the situation in which
30 the external object is slid on the surface of the touch sensitive display panel. The mechanical vibration can be generated, for example, with an electromechanical vibration generator or a piezo-electric vibration generator.

In a method according to an embodiment of the invention the detectable signal is mechanical vibration generated to the housing of the electronic device and fre-

quency of said mechanical vibration is altered as a response to the situation in which the external object is slid on the surface of the touch sensitive display panel.

In a method according to an embodiment of the invention the detectable signal is voice and amplitude of the voice is altered as a response to the situation in which
5 the external object is slid on the surface of the touch sensitive display panel.

In a method according to an embodiment of the invention the detectable signal is voice and frequency of the voice is altered as a response to the situation in which the external object is slid on the surface of the touch sensitive display panel.

In a method according to an embodiment of the invention the detectable is light
10 and intensity of the light is altered as a response to the situation in which the external object is slid on the surface of the touch sensitive display.

In a method according to an embodiment of the invention the detectable signal is light and color of the light is altered as a response to the situation in which the external object is slid on the surface of the touch sensitive display.

15 In a method according to an embodiment of the invention the property of the detectable signal is altered as a response to a situation in which the external object is slid along a pre-determined path on the surface of the touch sensitive display panel. The pre-determined path can be, for example, a linear path on the surface of the touch sensitive display panel or a circular path on the surface of the touch
20 sensitive display panel.

Figure 4 shows an interface module 400 according to an embodiment of the invention. The interface module can be used as a building block of an electronic device that can be e.g. a mobile phone, a domestic appliance, or industrial equipment. The interface module comprises a touch sensitive display panel 401 and a control-
25 ler 403 that is capable of controlling an electronic device on the basis of a position of an external object on a surface of the touch sensitive display panel 401. The position of the external object can expressed, for example, with the x- and y-coordinates of a spot in which the external object touches the touch sensitive display panel. The interface module comprises an actuator 404 that is arranged to
30 generate a signal that is detectable for a human being. The actuator is arranged to alter a property of the detectable signal as a response to a situation in which the external object is slid on the surface of the touch sensitive display panel. The interface module comprises connector pads 450 via which electrical signals can be conducted to/from the interface module. The interface module can be used, for

example, for implementing a control device with the aid of which a quantity having a continuous nature can be controlled and tactile, audio, and/or visual feedback depending on the type of the actuator 404 can be given to a user of the control device.

- 5 In an interface module according to an embodiment of the invention the actuator 404 is arranged to alter the property of the signal generated by it as a response to a situation in which the external object is slid along a pre-determined path on the surface of the touch sensitive display panel. The pre-determined path can be, for example, a linear path on the surface of the touch sensitive display panel or a circular path on the surface of the touch sensitive display panel.
- 10

A computer program according to an embodiment of the invention comprises software modules for making a processor unit to control an electronic device that includes:

- a touch sensitive display panel, and
- 15 - an actuator arranged to generate a signal that is detectable for a human being.

The software modules comprise computer executable instructions for making the processor unit:

- 20 - to control the electronic device on the basis of a position of an external object on a surface of the touch sensitive display panel, and
- to alter a property of said signal as a response to a situation in which the external object is slid on the surface of the touch sensitive display panel.

The processor unit in which the computer program can be executed can be e.g. the controller 203 of the electronic device 200 shown in figures 2a and 2b.

- 25 The software modules can be, for example, sub-routines and/or functions.

In a computer program according to an embodiment of the invention the computer executable instructions are capable of making the processor unit to alter the property of the detectable signal as a response to a situation in which the external object is slid along a pre-determined path on the surface of the touch sensitive display panel. The pre-determined path can be, for example, a linear path on the sur-

30

face of the touch sensitive display panel or a circular path on the surface of the touch sensitive display panel.

A computer program according to an embodiment of the invention can be stored in a computer readable medium. The computer readable medium can be, for example, an optical compact disk or an electronic memory device like a RAM (random access memory) or a ROM (read only memory).

While there have been shown and described and pointed out fundamental novel features of the invention as applied to embodiments thereof, it will be understood that various omissions and substitutions and changes in the form and details of the devices and methods described may be made by those skilled in the art without departing from the spirit of the invention. For example, it is expressly intended that all combinations of those elements and/or method steps which perform substantially the same function in substantially the same way to achieve the same results are within the scope of the invention. Moreover, it should be recognized that structures and/or elements and/or method steps shown and/or described in connection with any disclosed form or embodiment of the invention may be incorporated in any other disclosed or described or suggested form or embodiment as a general matter of design choice. The specific examples provided in the description given above should not be construed as limiting. Therefore, the invention is not limited merely to the embodiments described above, many variants being possible without departing from the scope of the inventive idea.

What is claimed is:

1. A user interface comprising:

- a touch sensitive display panel,
- a controller arranged to control an electronic device on the basis of a position of an external object on a surface of the touch sensitive display panel, and
- an actuator arranged to generate a signal that is detectable for a human being,

wherein the actuator is arranged to alter a property of said signal as a response to a situation in which the external object is slid on the surface of the touch sensitive display panel.

2. A user interface according to claim 1, wherein the actuator is a vibration generator that is arranged to alter amplitude of mechanical vibration produced with the vibration generator as a response to the situation in which the external object is slid on the surface of the touch sensitive display panel.

3. A user interface according to claim 1, wherein the actuator is a vibration generator that is arranged to alter frequency of mechanical vibration produced with the vibration generator as a response to the situation in which the external object is slid on the surface of the touch sensitive display panel.

4. A user interface according to claim 1, wherein the actuator is an oscillator that is arranged to alter amplitude of voice produced with the oscillator as a response to the situation in which the external object is slid on the surface of the touch sensitive display panel.

5. A user interface according to claim 1, wherein the actuator is an oscillator that is arranged to alter frequency of voice produced with the oscillator as a response to the situation in which the external object is slid on the surface of the touch sensitive display panel.

6. A user interface according to claim 1, wherein the actuator is a light source that is arranged to alter intensity of light produced with the light source as a response to the situation in which the external object is slid on the surface of the touch sensitive display panel.

7. A user interface according to claim 1, wherein the actuator is a light source that is arranged to alter color of light produced with the light source as a response to the situation in which the external object is slid on the surface of the touch sensitive display panel.
- 5 8. A user interface according to claim 1, wherein the actuator is arranged to alter the property of said signal as a response to a situation in which the external object is slid along a pre-determined path on the surface of the touch sensitive display panel.
9. A user interface according to claim 8, wherein the pre-determined path is one
10 of the following: a linear path on the surface of the touch sensitive display panel and a circular path on the surface of the touch sensitive display panel.
10. A user interface according to claim 2 or 3, wherein the vibration generator is one of the following: an electromechanical vibration generator and a piezo-electric vibration generator.
- 15 11. A method comprising:
- controlling an electronic device on the basis of a position of an external object on a surface of a touch sensitive display panel,
 - generating a signal that is detectable for a human being, and
 - altering a property of said signal as a response to a situation in which the
20 external object is slid on the surface of the touch sensitive display panel.
12. A method according to claim 11, wherein said signal is mechanical vibration and amplitude of said mechanical vibration is altered as a response to the situation in which the external object is slid on the surface of the touch sensitive display panel.
- 25 13. A method according to claim 11, wherein said signal is mechanical vibration and frequency of said mechanical vibration is altered as a response to the situation in which the external object is slid on the surface of the touch sensitive display panel.
14. A method according to claim 11, wherein said signal is voice and amplitude
30 of said voice is altered as a response to the situation in which the external object is slid on the surface of the touch sensitive display panel.

15. A method according to claim 11, wherein said signal is voice and frequency of said voice is altered as a response to the situation in which the external object is slid on the surface of the touch sensitive display panel.
16. A method according to claim 11, wherein said signal is light and intensity of said light is altered as a response to the situation in which the external object is slid on the surface of the touch sensitive display.
17. A method according to claim 11, wherein said signal is light and color of said light is altered as a response to the situation in which the external object is slid on the surface of the touch sensitive display.
18. A method according to claim 11, wherein the property of said signal is altered as a response to a situation in which the external object is slid along a pre-determined path on the surface of the touch sensitive display panel.
19. A method according to claim 11, wherein the pre-determined path is one of the following: a linear path on the surface of the touch sensitive display panel and a circular path on the surface of the touch sensitive display panel.
20. A method according to claim 12 or 13, wherein the mechanical vibration is generated with one of the following: an electromechanical vibration generator and a piezo-electric vibration generator.
21. An electronic device comprising:
- a touch sensitive display panel,
 - a controller arranged to control an electronic device on the basis of a position of an external object on a surface of the touch sensitive display panel, and
 - an actuator arranged to generate a signal that is detectable for a human being,
- wherein the actuator is arranged to alter a property of said signal as a response to a situation in which the external object is slid on the surface of the touch sensitive display panel.
22. An electronic device according to claim 21, wherein the actuator is a vibration generator that is arranged to alter amplitude of mechanical vibration produced with

the vibration generator as a response to the situation in which the external object is slid on the surface of the touch sensitive display panel.

23. An electronic device according to claim 21, wherein the actuator is a vibration generator that is arranged to alter frequency of mechanical vibration produced with the vibration generator as a response to the situation in which the external object is slid on the surface of the touch sensitive display panel.

24. An electronic device according to claim 21, wherein the actuator is arranged to alter the property of said signal as a response to a situation in which the external object is slid along a pre-determined path on the surface of the touch sensitive display panel.

25. An electronic device according to claim 24, wherein the pre-determined path is one of the following: a linear path on the surface of the touch sensitive display panel and a circular path on the surface of the touch sensitive display panel.

26. An electronic device according to claim 21, wherein the controller is arranged to control a gain of an amplifier circuitry coupled to a speaker element on the basis of the position of the external object on the surface of the touch sensitive display panel.

27. An electronic device according to claim 21, wherein the controller is arranged to control a gain of an amplifier circuitry coupled to a microphone on the basis of the position of the external object on the surface of the touch sensitive display panel.

28. An electronic device according to claim 21, wherein the electronic device is at least one of the following: a mobile communication terminal, a palmtop computer, and a portable play station.

29. A computer readable medium storing a computer program for making a processor unit to control an electronic device that includes:

- a touch sensitive display panel, and
- an actuator arranged to generate a signal that is detectable for a human being,

the computer program comprising computer executable instructions for making the processor unit:

- to control the electronic device on the basis of a position of an external object on a surface of the touch sensitive display panel, and
- to alter a property of said signal as a response to a situation in which the external object is slid on the surface of the touch sensitive display panel.

5 30. A computer readable medium according to claim 29, wherein the computer executable instructions are capable of making the processor unit to alter the property of said signal as a response to a situation in which the external object is slid along a pre-determined path on the surface of the touch sensitive display panel.

31. An interface module comprising:

- 10 - a touch sensitive display panel,
- a controller capable of controlling an electronic device on the basis of a position of an external object on a surface of the touch sensitive display panel, and
- 15 - an actuator arranged to generate a signal that is detectable for a human being,

wherein the actuator is arranged to alter a property of said signal as a response to a situation in which the external object is slid on the surface of the touch sensitive display panel.

20 32. An interface module according to claim 31, wherein the actuator is arranged to alter the property of said signal as a response to a situation in which the external object is slid along a pre-determined path on the surface of the touch sensitive display panel.

33. A user interface comprising:

- a touch sensitive display panel,
- 25 - means for controlling an electronic device on the basis of a position of an external object on a surface of the touch sensitive display panel,
- means for generating a signal that is detectable for a human being, and

- means for altering a property of said signal as a response to a situation in which the external object is slid on the surface of the touch sensitive display panel.

1 / 4

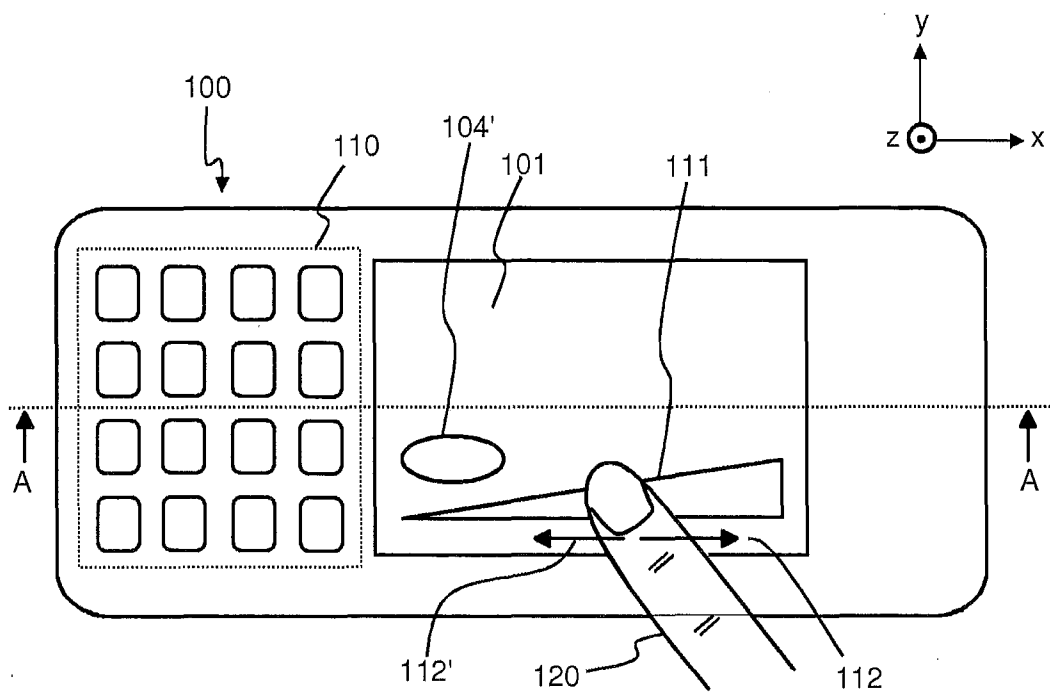


Fig. 1a

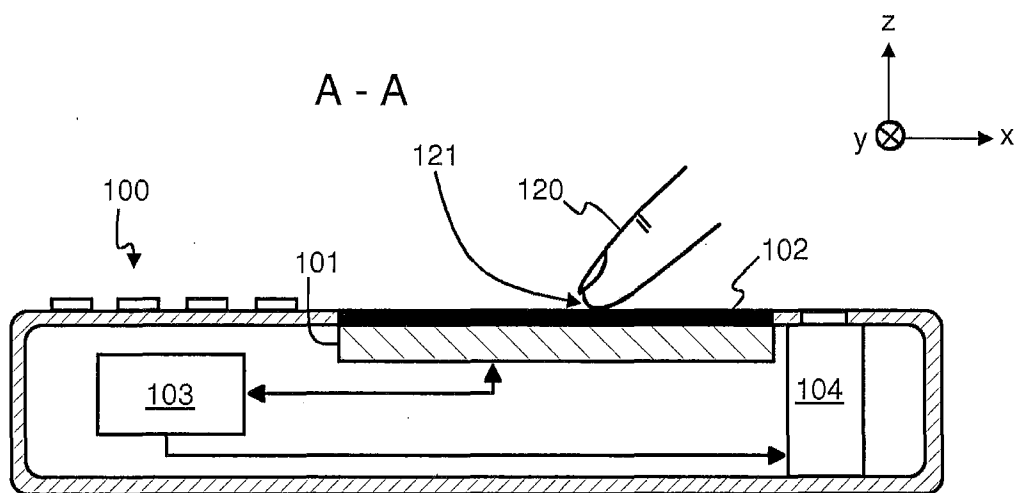


Fig. 1b

2 / 4

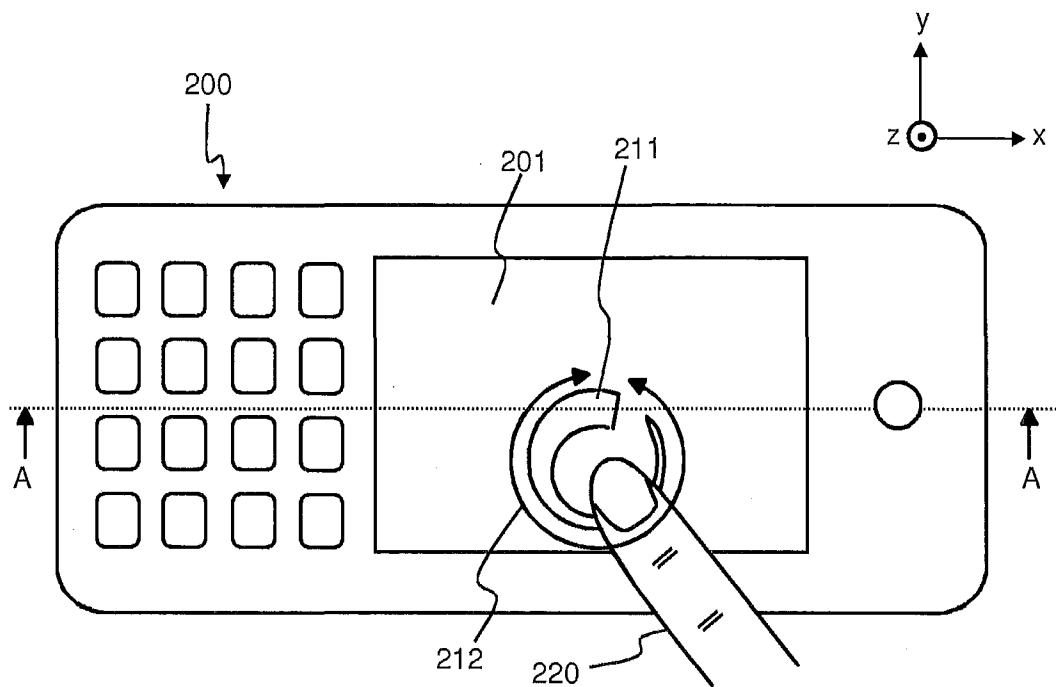


Fig. 2a

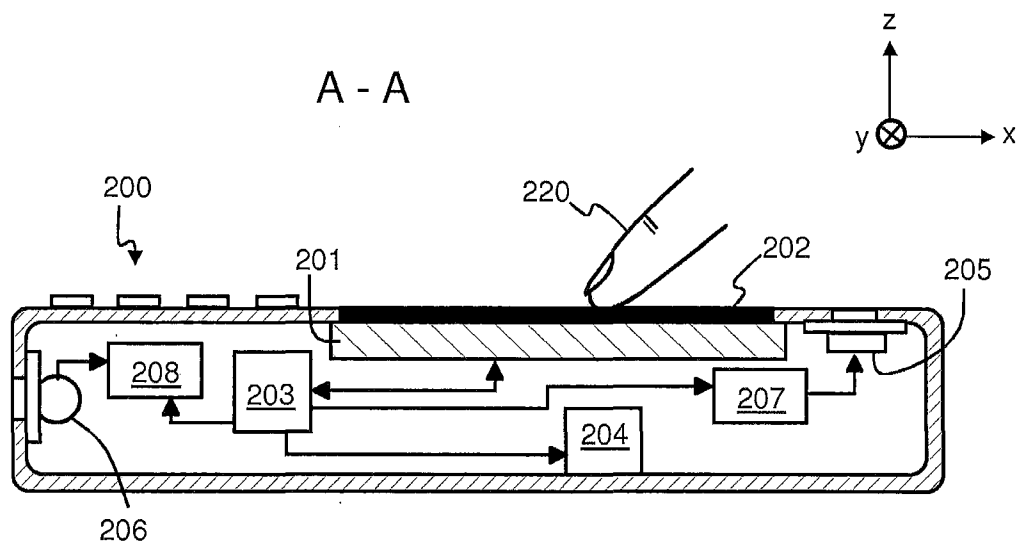
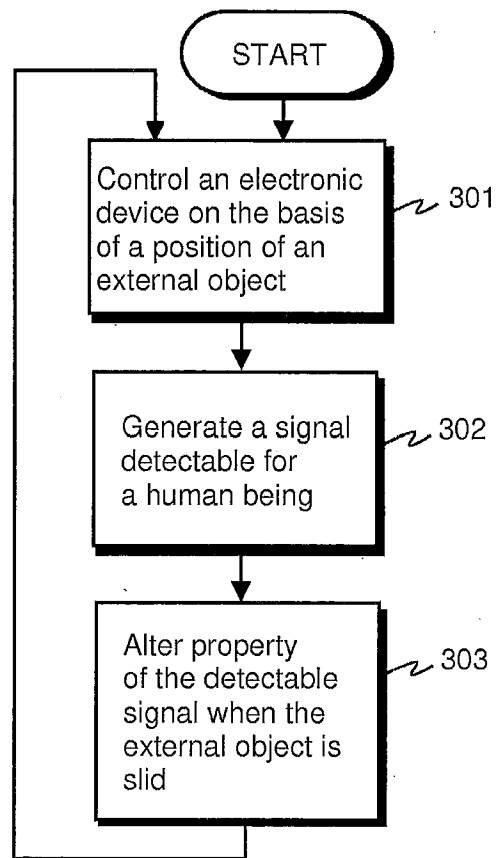


Fig. 2b

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**Fig. 3**

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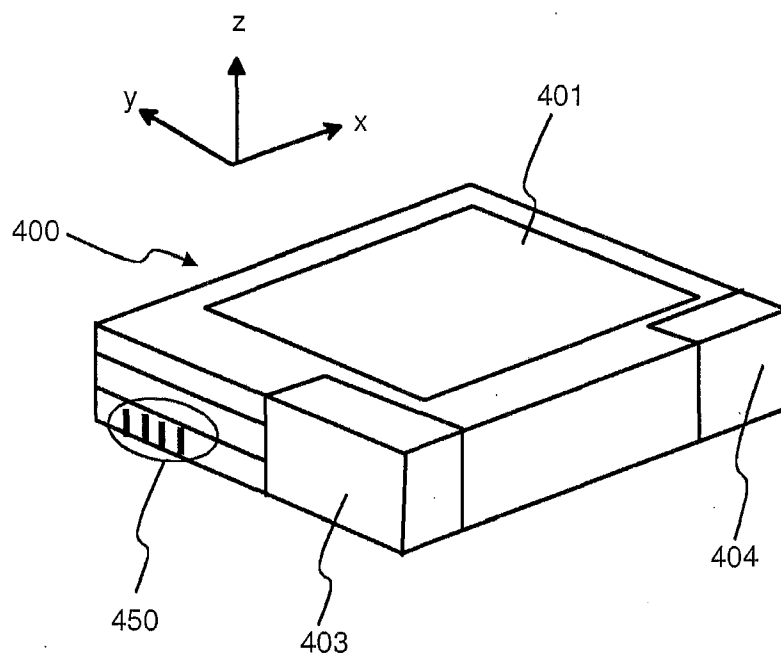


Fig. 4

INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI2008/050713

A. CLASSIFICATION OF SUBJECT MATTER

See extra sheet

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: G06F, G09G, H01H, H03K

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

FI, SE, NO, DK

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

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2007/0222765 A1 (NYSSONEN, T.) 27 September 2007 (27.09.2007), figures 2a, 2b, 2c, 3a, 3b, 3c, 5a, 5b, claims 1-26, [0002], [0005]-[0016], [0042]-[0053], [0057]-[0058], [0062]	1-33
A	US 2002/0008691 A1 (HANAJIMA, M. et al.) 24 January 2002 (24.01.2002), figure 6, claims 1-7, [0010]-[0018], [0052]-[0059]	1-33
A	US 2007/0276525 A1 (ZADESKY, S. P. et al.) 29 November 2007 (29.11.2007), figure 1, claims 1-30, [0014], [0015]-[0022], [0059]-[0061]	1-33
A	EP 1731993 A1 (TAKASHIMA, K. et al.) 13 December 2006 (13.12.2006), figures 5, 13A, 13B, 13C, claims 1-12, [0006]-[0012], [0038]-[0039], [0089]-[0092]	1-33
A	US 2006/0007182 A1 (SATO, T. et al.) 12 January 2006 (12.01.2006), figure 4, claims 1-8, [0005]-[0019], [0038]-[0039], [0073]-[0074]	1-33



Further documents are listed in the continuation of Box C.



See patent family annex.

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Date of the actual completion of the international search

27 March 2009 (27.03.2009)

Date of mailing of the international search report

02 April 2009 (02.04.2009)

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/FI2008/050713

Patent document cited in search report	Publication date	Patent family members(s)	Publication date
US 2007/0222765 A1	27/09/2007	None	
US 2002/0008691 A1	24/01/2002	JP 11203044 A	30/07/1999
US 2007/0276525 A1	29/11/2007	JP 2008262595 A JP 2008251053 A DE 20221878U U1 DE 20221853U U1 KR 20080018243 A US 2008098330 A1 US 2008094352 A1 US 2008018615 A1 US 2007290990 A1 US 2007242057 A1 KR 20070061598 A JP 2007141272 A DE 20221758U U1 DE 20221757U U1 US 2007080938 A1 US 2007083822 A1 US 2007080936 A1 US 2007013671 A1 AU 2002337950 A1 WO 03036642 A2 EP 1438719 A2 WO 03036457 A2 JP 2005507112T T EP 1438651 A2 CN 1668992 A US 2003095096 A1 US 2003076301 A1 US 2003076306 A1	30/10/2008 16/10/2008 09/10/2008 31/07/2008 27/02/2008 24/04/2008 24/04/2008 24/01/2008 20/12/2007 18/10/2007 13/06/2007 07/06/2007 31/05/2007 31/05/2007 12/04/2007 12/04/2007 12/04/2007 18/01/2007 06/05/2003 01/05/2003 21/07/2004 01/05/2003 10/03/2005 21/07/2004 14/09/2005 22/05/2003 24/04/2003 24/04/2003
EP 1731993 A1	13/12/2006	US 2008296072 A1 CN 1938675 A KR 20070002026 A WO 2005093556 A1 JP 2005284416 A	04/12/2008 28/03/2007 04/01/2007 06/10/2005 13/10/2005

International application No.
PCT/FI2008/050713

Patent document cited in search report	Publication date	Patent family members(s)	Publication date
US 2006/0007182 A1	12/01/2006	JP 2006024039 A	26/01/2006
.....			

CLASSIFICATION OF SUBJECT MATTER

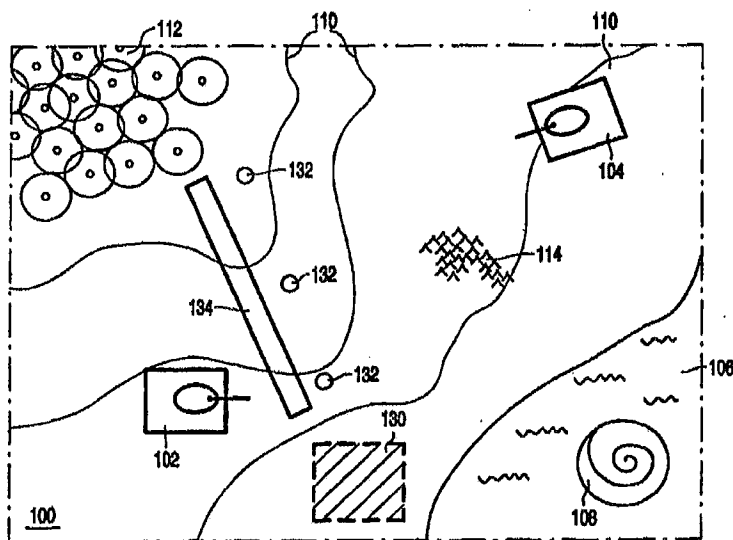
Int.Cl.
G06F 3/041 (2006.01)



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : G06F 3/00	A2	(11) International Publication Number: WO 99/38064 (43) International Publication Date: 29 July 1999 (29.07.99)
(21) International Application Number: PCT/IB99/00035 (22) International Filing Date: 14 January 1999 (14.01.99) (30) Priority Data: 98200180.2 23 January 1998 (23.01.98) EP (71) Applicant: KONINKLIJKE PHILIPS ELECTRONICS N.V. [NL/NL]; Groenewoudseweg 1, NL-5621 BA Eindhoven (NL). (71) Applicant (for SE only): PHILIPS AB [SE/SE]; Kottbygatan 7, Kista, S-164 85 Stockholm (SE). (72) Inventor: KEYSON, David, V.; Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL). (74) Agent: GRAVENDEEL, Cornelis; Prof. Holstlaan 6, NL-5656 AA Eindhoven (NL).	(81) Designated States: JP, European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>Without international search report and to be republished upon receipt of that report.</i>	

(54) Title: MULTIPERSON TACTUAL VIRTUAL ENVIRONMENT



(57) Abstract

The invention relates to a method and a terminal for providing a common virtual environment to a plurality of users, for example a game environment. According to the method, each user is provided with an actuator allowing for receiving mechanical input from the user as well as for outputting mechanical feedback to the user. The user controls with the mechanical input a position of a corresponding user object (102) with respect to the virtual environment, and receives tactual cues as originating from tactual environment objects (130, 132, 134) and from distant user objects (104) that are present in the virtual environment. According to the invention, the user can position at least one of the tactual environment objects (130, 132, 134) by appropriate positioning actions.

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Multiperson Tactual Virtual Environment.

The invention relates to a method of providing a common virtual environment to a plurality of users, at least one user being provided with a local actuator for receiving mechanical input from the user and for outputting mechanical feedback to the user, the method comprising the steps of:

5 adjusting for the at least one user, in response to the mechanical input, a position of a corresponding user object with respect to the virtual environment comprising tactual environment objects, and

 presenting to the at least one user, through the mechanical feedback, tactual cues as originating from the tactual environment objects and from distant user objects. The
10 invention further relates to a terminal for use with such a method.

US Patent 5,405,152 describes a multiplayer game in which each player is represented by a corresponding icon on a screen. The screen further displays a virtual
15 environment through which each player can virtually move by manipulating a corresponding user actuator. Points can be scored by virtually colliding with other players. In the known method, a central processing unit keeps track of the players' virtual positions and sends command signals to the players' actuators in case of particular events such as an icon colliding with another icon or with tactual environment objects in the virtual environment
20 like planets and regions of turbulence. The command signals provoke the relevant user actuator to provide the player with mechanical feedback in conformance with the event, thereby adding realism to the playing of the game.

 A disadvantage of the known method is that the virtual environment that is presented has limited attractivity.
25

It is an object of the invention to provide a method as specified in the preamble, which provides a more interesting tactual virtual environment. To this end, the method according to the invention is characterized by the step of positioning at least one of

the tactual environment objects in response to positioning actions by at least one of the users. Besides simple movement of a tactual environment object from one place to another in the virtual environment, positioning also means creation of a tactual environment object into the virtual environment or removal of a tactual environment object from the virtual environment.

- 5 Thus, the invention enables a user to create, move and remove obstacles that are actually felt by the other users, thereby enabling him to customize the virtual environment to his own wishes and to have a greater influence on the course of events.

An advantage of the measure of Claim 2 is that the users can adjust the tactual properties of individual tactual environment objects, thereby providing the users with
10 a still larger hold on the look and feel of the virtual environment.

An advantage of the measure of Claim 3 is that the tactual properties of the users themselves are dynamic. In a game environment for example, a user just having taken in food provokes a heavier blow when colliding with an other user, indicating that his strength has increased.

- 15 An advantage of the measure of Claim 4 is that a user can confront an other user with a tactual environment object that is visually but not tactually hidden from him. Preferably, only the user from which such an invisible object originates is presented with a visual representation of the object. This further enriches the virtual environment.

An advantage of the measure of Claim 5 is that more processing can be
20 done locally. Specifically, the tactual feedback resulting from the virtual environment can be initiated locally in contrast with the known method centrally initiating all tactual feedback. In this way, the amount of required communication and central processing is reduced. These demands would otherwise increase to unacceptable levels as a result of the increased hold that users have on the look and feel of the virtual environment as offered by the invention.

- 25 The library can be part of the application software or be application-independent. In the latter case, the library could be incorporated in the system software of which applications can make use of. In this manner, the library is accessible to a multitude of applications. The library can also be located within the actuator.

These and other aspects of the invention will be apparent from and
30 elucidated with reference to the embodiments described hereinafter.

In the drawings:

Figure 1 shows a schematic view of a scene from a video game in which

the invention is applied,

Figure 2 shows a set-up in which the method according to the invention can be applied, and

Figure 3 shows a functional block diagram of a terminal through which a
5 virtual environment can be presented and manipulated according to the invention.

Figure 1 shows a schematic view of a scene from a video game in which the invention is applied. It shows a visual representation of a virtual environment ('theater of
10 war') 100 for a tank battle. Using respective interconnected terminals, a first and a second user move user objects, namely a tank 102 and a tank 104, respectively, through a natural area. Each user is presented with the visual representation of the virtual environment of
Figure 1 on displays that are integrated in the terminals. The users control the movement of their tanks by manipulating respective actuators that are also integrated in the terminals. Here
15 we assume the actuators are trackballs with force feedback, as disclosed for example in EP-A 489 469 (PHN 13,522, US Patent Application serial no. 08/678,115) and EP-A 760 118 (PHN 15,232, US Patent Application serial no. 08/615,559). Such a trackball comprises a rotatable member that is mounted in a housing and motors for transmitting forces to a user via the rotatable member. By means of these forces, the users are enabled to feel the virtual
20 environment 100 while moving their tanks 102, 104. These forces are determined by the tactual properties of tactual environment objects that are present in the virtual environment.

In Figure 1, examples of such tactual environment objects are a river 106 comprising a kind of maelstrom 108, a hilly terrain, the slopes of which being indicated by contours 110, a forest 112 and bumpy surface 114. Each of these tactual environment objects
25 has certain tactual properties that are translated into tactual cues when a user object enters a region of influence of the tactual environment object or actually collides with such an object. For example, when one of the tanks 102, 104 enters the river 106, the corresponding user will actually feel that he can more freely manipulate the actuator, thereby suggesting that he looses grip. When approaching the maelstrom 108, the user will feel a force in a direction
30 tangential to the maelstrom 108. Beyond a certain point, he will enter a violent spin that is felt through the actuator. The user feels a gradient of terrain altitude via the actuator as a force that is proportional to a gradient of terrain altitude in correspondence with the contours 110. When moving through the forest 112, the user will feel a succession of blows opposite to the direction of movement, representing the snapping of trees. The bumpy surface 114 can

be felt via the actuator as a vibration of the member. These objects are hard-programmed, this means that they are not user manipulatable.

According to an aspect of the invention, in addition to the hard-programmed tactual environment objects, users can create, move and remove certain user-manipulatable tactual environment objects. In Figure 1, user-manipulatable tactual environment objects are a pit 130, anti-tank blocks 132 and a wall 134. They are assumed to be part of a defense line that is erected during the game by the first user. When either one of the users moves his corresponding tank 102 or 104 beyond a certain point into the pit 130, his control over the tank diminishes and a force on the member in the direction of movement will establish a virtual pull on the tank, dragging the latter into the pit 130. In this way, the user feels his tank virtually slipping into the pit 130. The pit 130 is assumed to be made invisible to the second user, but it can be seen by the first user, who actually 'dug' it. The anti-tank blocks 132 establish impenetrable obstacles that provoke a rigid force on the actuator member impeding a movement of the member beyond a certain position. The wall 134 has a similar effect, but is assumed to break down when rammed by a tank that has a momentum beyond a certain minimum threshold, thereby allowing the passing through of the tank.

Any one of the tactual environment objects 130, 132 and 134 can be moved or removed by appropriate positioning actions of either user. By dragging and dropping tactual environment objects on top of one another, the user can create new tactual feedback effects, that are composed of a combination of the original effects. Alternatively, either player can adjust the tactual properties of these objects by appropriate adjustment actions. For example, by decreasing the depth of the pit 130, the pull that is felt by the users when moving into the pit 130 is lowered. Furthermore, by appropriate alteration actions the users can alter the tactual properties of the tanks. For example, by moving his tank through a magnet somewhere in the virtual environment, either one of the users can 'magnetize' his tank. Subsequently, the other users will experience an attractive force in the direction of the magnetized tank. The magnetization gradually wears off.

Particularly in a strategy game like this tank battle game, the advantages of the invention are apparent. The user can manipulate the environment as if he were a military engineer. Moreover, the tactual properties of the user objects are not static, as in the known method, but can be altered by the users. This all broadens the hold of the user on the course of events and increases the level of his participation.

The mechanical influence of a tactual environment object, be it a hard-

programmed one or one that is positioned by the users, is in some cases limited to a small area, like with a virtual wall, which upon colliding with a user object provokes the actuator corresponding to that user object to simulate an impact. Alternatively, a tactual environment object's mechanical influence on the users can extend over an arbitrary large part of the virtual environment, e.g. when the tactual environment object virtually incurs some kind of gravitational force.

Besides tactual environment objects, that are environment objects having tactual properties that can be felt by the users, the virtual environment could furthermore contain environment objects that have no tactual properties. An example of such an environment object is a visual mark on the ground or a cloud of gas, etc.

Instead of presenting the users with a plan view, the visual presentation of the virtual environment to the user could simulate the perspective of the user objects, like is usually done in virtual reality. The number of users that can simultaneously move through the virtual environment is not principally limited to two, as in the present embodiment. The method of the invention could be used in combination with an arbitrary number of users.

Figure 2 shows a setup in which the method according to the invention can be applied. A central server 210 is connected to a number of terminals 220 via a network. Each of the terminals 220 is a box in which an actuator 230 being a force feedback trackball, a local processing unit 240, a display and speakers (not shown) are incorporated. Alternatively, the processing unit 240 is incorporated in a settop-box and that the trackball is included in a remote that cooperates with the settop-box. A visual and an auditory representation of the virtual environment is presented via a television set that is a further part of each terminal 220. Alternatively, each terminal includes a personal computer with additional peripherals, such as a stand-alone force feedback trackball, modem, etc.

The central server 210 is responsible for keeping the virtual environment consistent. Hereto, the terminals 220 regularly sent scripts to the central server 210. The scripts contain information about the actions performed by the each user and the position of the corresponding user objects. A script could contain information about positioning actions of users, by which a tactual environment object is positioned or about adjustment actions, by which tactual properties of a tactual environment object are adjusted. Similarly, a script could contain information about an alteration action performed by a user, by which tactual properties of his user object are altered. The central server interprets the scripts and redistributes the information that should be present at the other terminals. During this process, the central server 210 can filter out and manipulate information before the

redistribution step. Other tasks of the central server 210 are managing user accounts, identifying users at login time and recording user profiles. A different distribution of the various tasks over the central server 210 and the terminals 220 can be imagined.

Figure 3 shows a functional block diagram of a terminal through which a
5 virtual environment can be presented and manipulated according to the invention. The terminal has a communication manager 330 for sharing the virtual environment with distant terminals. A local actuator 345 is provided for receiving mechanical input from a local user as well as for outputting mechanical feedback to the local user. An application manager 310 is arranged for adjusting for the local user, in response to the mechanical input, a position of
10 a corresponding local user object with respect to the virtual environment. A virtual environment presentation manager 320 is included for presenting to the local user, through the mechanical feedback, tactual cues as originating from tactual environment objects and from distant user objects that are present in the virtual environment.

A device driver 340 provides a link between the virtual environment
15 presentation manager 320 and the application manager 310 on the one hand, and the tactual feedback actuator 345 on the other hand. Besides a tactual representation, the virtual environment presentation manager 320 also provides the user with a visual and an auditory representation of the virtual environment. Hereto, the virtual environment presentation manager 320 is linked to device drivers 350 and 360, controlling a built-in display 355 and
20 built-in speakers 365, respectively. Main control unit 380 has a scheduling function, it allocates hardware resources within the terminal to the elements 310, 320, 330 so that they can perform their tasks. Alternatively, each one of the elements 310, 320, 330 can be realized with dedicated hardware, in which case the separate control unit 380 is redundant. The various tasks can also be differently organized within the terminal.

25 According to an aspect of the invention, the application manager is arranged for positioning at least one of the tactual environment objects in response to positioning actions by the local user. Upon identifying such a positioning action, the application manager 310 takes care of updating the virtual environment both locally through the virtual environment presentation manager 320 and at the distant terminals through the
30 communication manager 330. The same applies to adjustment actions and alteration actions of the user, by which tactual properties of tactual environment objects and user objects, respectively, are modified.

According to an aspect of the invention, the virtual environment presentation manager is arranged for keeping a topography of the virtual environment and for

obtaining tactual properties of a particular tactual environment object within the topography by referencing a locally present library 370 of generic tactual fields. With both the topography and the library 370 being located within the terminal, all information for generating the tactual feedback is locally present. Thus, extensive communication with the
5 central server is avoided and the generation of the tactual feedback can be performed locally. The library 370 is stored in a memory and can be updated through downloading additional tactual fields or through creation and modification of tactual fields by the local user.

It should be noted that the above-mentioned embodiments illustrate rather than limit the invention and that those skilled in the art will be able to design many
10 alternative embodiments without departing from the scope of the appended claims. In the claims, any reference signs placed between parentheses shall not be construed as limiting the claim. The invention can be implemented by means of hardware comprising several distinct elements, and by means of a suitably programmed computer. In the device claim enumerating several means, several of these means can be embodied by one and the same
15 item of hardware.

CLAIMS:

1. Method of providing a common virtual environment to a plurality of users, at least one user being provided with a local actuator (345) for receiving mechanical input from said at least one user and for outputting mechanical feedback to said at least one user, said method comprising the steps of:

5 adjusting for said at least one user, in response to the mechanical input, a position of a corresponding user object (102) with respect to the virtual environment comprising tactual environment objects (130, 132, 134), and

presenting to said at least one user, through said mechanical feedback, tactual cues as originating from the tactual environment objects (130, 132, 134) and from distant
10 user objects (104),

characterized in that the method comprises the step of positioning at least one of the tactual environment objects (130, 132, 134) in response to positioning actions by at least one of the users.

2. Method as claimed in Claim 1, comprising the step of adjusting tactual
15 properties of at least one of the tactual environment objects (130, 132, 134) in response to adjustment actions by at least one of the users.

3. Method as claimed in Claim 1, comprising the step of altering tactual properties of at least one of the user objects (102, 104) in response to alteration actions by at least one of the users.

20 4. Method as claimed in Claim 1, comprising the step of visually hiding at least one of the tactual environment objects (130, 132, 134) for at least one of the users.

5. Method as claimed in Claim 1, wherein said at least one user is provided with local processing means, the method comprising the steps of

keeping a topography of the virtual environment in said local processing means
25 and

obtaining tactual properties of a particular tactual environment object within said topography by referencing a library of generic tactual fields that is kept in said local processing means.

6. Terminal for presenting a virtual environment to a local user, the terminal

comprising

communication means (330) for sharing said virtual environment with distant terminals,

5 a local actuator (345) for receiving mechanical input from the local user as well as for outputting mechanical feedback to the local user,

an application manager (310) for adjusting for the local user, in response to said mechanical input, a position of a corresponding local user object (102) with respect to the virtual environment comprising tactual environment objects (130, 132, 134), and

10 a virtual environment presentation manager (320) for presenting to the local user, through said mechanical feedback, tactual cues as originating from said tactual environment objects (130, 132, 134) and from distant user objects (104),

characterized in that the application manager (310) is arranged for positioning at least one of the tactual environment objects (130, 132, 134) in response to positioning actions by the local user.

15 7. Terminal as claimed in Claim 6, wherein the application manager (310) is arranged for adjusting tactual properties of at least one of the tactual environment objects (130, 132, 134) in response to adjustment actions by the local user.

8. Terminal as claimed in Claim 6, wherein the application manager (310) is arranged for altering tactual properties of the local user object (102) in response to alteration
20 actions by the local user.

9. Terminal as claimed in Claim 6, wherein the application manager (310) is arranged for visually hiding at least one of the tactual environment objects (130, 132, 134) for the local user.

10. Terminal as claimed in Claim 6, wherein the virtual environment
25 presentation manager (320) is arranged for keeping a topography of the virtual environment and for obtaining tactual properties of a particular one of the tactual environment objects (130, 132, 134) within said topography by referencing a locally present library (370) of generic tactual fields.

1/2

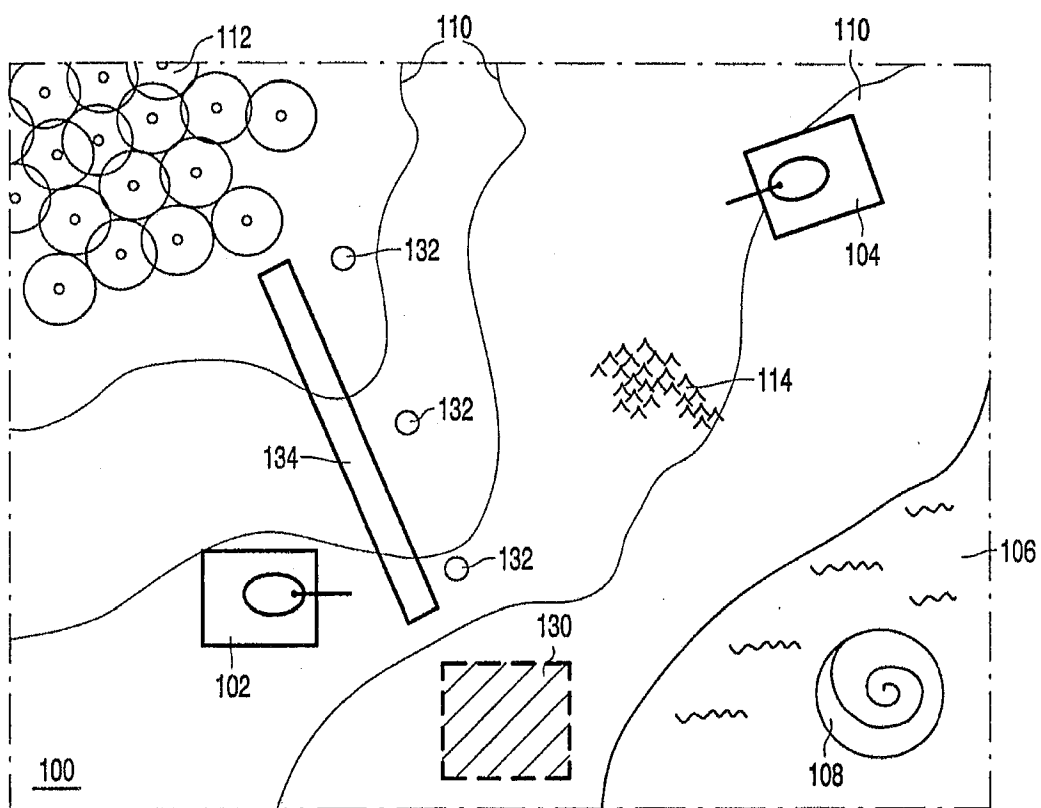


FIG. 1

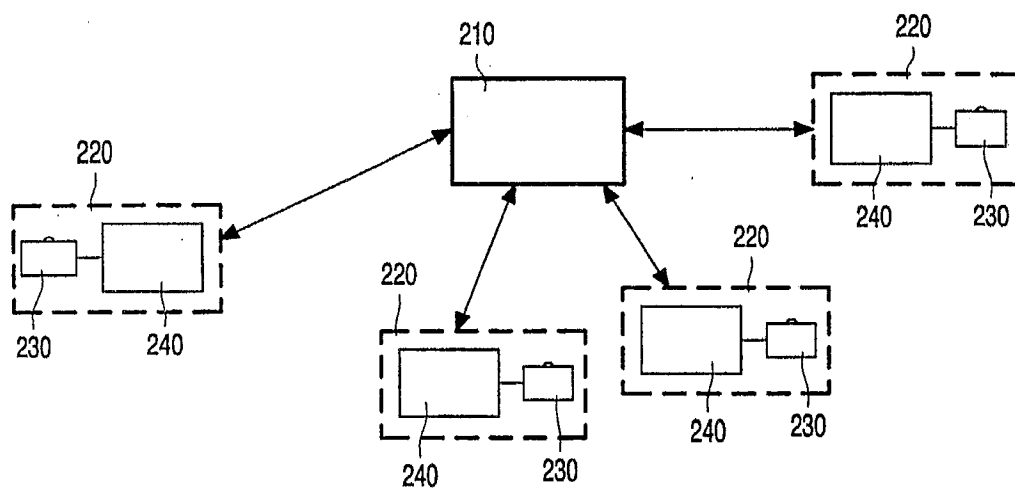


FIG. 2

2/2

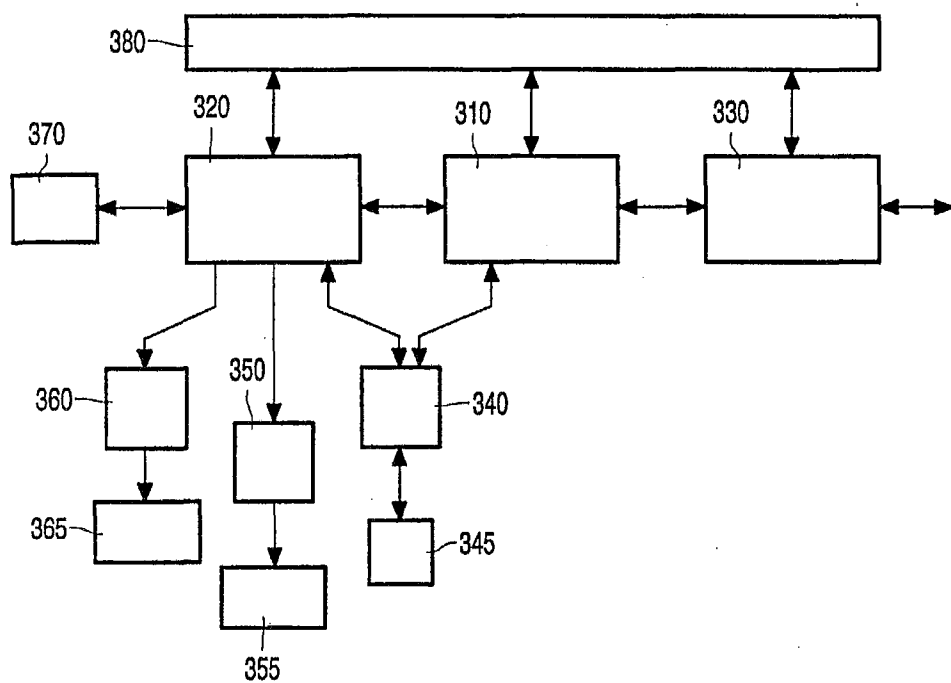


FIG. 3

Electronic Patent Application Fee Transmittal

Application Number:	12840797			
Filing Date:	21-Jul-2010			
Title of Invention:	SYSTEM AND METHOD FOR PROVIDING COMPLEX HAPTIC STIMULATION DURING INPUT OF CONTROL GESTURES, AND RELATING TO CONTROL OF VIRTUAL EQUIPMENT			
First Named Inventor/Applicant Name:	Danny A. Grant			
Filer:	Emily T. Bell/Jennifer Sallee			
Attorney Docket Number:	043508-0383796			
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:				
Request for continued examination	1801	1	930	930
Total in USD (\$)				930

Electronic Acknowledgement Receipt

EFS ID:	14846810
Application Number:	12840797
International Application Number:	
Confirmation Number:	1778
Title of Invention:	SYSTEM AND METHOD FOR PROVIDING COMPLEX HAPTIC STIMULATION DURING INPUT OF CONTROL GESTURES, AND RELATING TO CONTROL OF VIRTUAL EQUIPMENT
First Named Inventor/Applicant Name:	Danny A. Grant
Customer Number:	93383
Filer:	Emily T. Bell/Jennifer Sallee
Filer Authorized By:	Emily T. Bell
Attorney Docket Number:	043508-0383796
Receipt Date:	31-JAN-2013
Filing Date:	21-JUL-2010
Time Stamp:	17:29:52
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$930
RAM confirmation Number	4431
Deposit Account	033975
Authorized User	

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)

Charge any Additional Fees required under 37 C.F.R. Section 1.17 (Patent application and reexamination processing fees)

Meta Platforms Exhibit 1007

Charge any Additional Fees required under 37 C.F.R. Section 1.19 (Document supply fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.20 (Post Issuance fees)

Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:

Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1		Filing.pdf	2972687 69cb983721f170a11dd227d3f7066901b46df50a	yes	69
	Multipart Description/PDF files in .zip description				
	Document Description		Start	End	
	Request for Continued Examination (RCE)		1	1	
	Transmittal Letter		2	2	
	Information Disclosure Statement (IDS) Form (SB08)		3	3	
	Non Patent Literature		4	9	
	Non Patent Literature		10	19	
	Non Patent Literature		20	23	
	Non Patent Literature		24	29	
	Foreign Reference		30	56	
	Foreign Reference		57	69	
Warnings:					
Information:					
2	Fee Worksheet (SB06)	fee-info.pdf	30842 0feed8028bed0f5464ed2d7b5f49a9101c9c4eba	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			3003529		

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.

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 12/840,797		Filing Date 07/21/2010		☐ To be Mailed	
APPLICATION AS FILED – PART I										
(Column 1)			(Column 2)			SMALL ENTITY ☐ OR		OTHER THAN SMALL ENTITY		
FOR	NUMBER FILED	NUMBER EXTRA	RATE (\$)	FEE (\$)	OR	RATE (\$)	FEE (\$)			
☐ BASIC FEE (37 CFR 1.16(a), (b), or (c))	N/A	N/A	N/A			N/A				
☐ SEARCH FEE (37 CFR 1.16(k), (l), or (m))	N/A	N/A	N/A			N/A				
☐ 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 \$	=			
☐ 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).									
☐ MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j))										
			TOTAL			TOTAL				
* 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	01/31/2013	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR	RATE (\$)	ADDITIONAL FEE (\$)	
Total (37 CFR 1.16(i))	*	40	Minus	** 40	=	0		X \$62=	0	
Independent (37 CFR 1.16(h))	*	4	Minus	***4	=	0		X \$250=	0	
☐ Application Size Fee (37 CFR 1.16(s))										
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))										
					TOTAL ADD'L FEE			TOTAL ADD'L FEE	0	
(Column 1)			(Column 2)			SMALL ENTITY OR		OTHER THAN SMALL ENTITY		
AMENDMENT		CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA	RATE (\$)	ADDITIONAL FEE (\$)	OR	RATE (\$)	ADDITIONAL FEE (\$)	
Total (37 CFR 1.16(i))	*		Minus	**	=			X \$	=	
Independent (37 CFR 1.16(h))	*		Minus	***	=			X \$	=	
☐ Application Size Fee (37 CFR 1.16(s))										
☐ FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j))										
					TOTAL ADD'L FEE			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.										

Legal Instrument Examiner:
/TAMARA DARKO/

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
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

NOTICE OF ALLOWANCE AND FEE(S) DUE

93383 7590 02/26/2013
Pillsbury Winthrop Shaw Pittman LLP (Immersion)
P.O. Box 10500
McLean, VA 22102

EXAMINER

ELISCA, PIERRE E

ART UNIT

PAPER NUMBER

3718

DATE MAILED: 02/26/2013

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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12/840,797

07/21/2010

Danny A. Grant

043508-0383796

1778

TITLE OF INVENTION: SYSTEM AND METHOD FOR PROVIDING COMPLEX HAPTIC STIMULATION DURING INPUT OF CONTROL GESTURES, AND RELATING TO CONTROL OF VIRTUAL EQUIPMENT

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1770	\$300	\$0	\$2070	05/28/2013

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 SMALL ENTITY status shown above.

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is the same, pay the TOTAL FEE(S) DUE shown above.

B. If the status above is to be removed, check box 5b on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and twice the amount of the ISSUE FEE shown above, or

If the SMALL ENTITY is shown as NO:

A. Pay TOTAL FEE(S) DUE shown above, or

B. If applicant claimed SMALL ENTITY status before, or is now claiming SMALL ENTITY status, check box 5a on Part B - Fee(s) Transmittal and pay the PUBLICATION FEE (if required) and 1/2 the ISSUE FEE shown above.

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.

93383 7590 02/26/2013
Pillsbury Winthrop Shaw Pittman LLP (Immersion)
P.O. Box 10500
McLean, VA 22102

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.
-----------------	-------------	----------------------	---------------------	------------------

12/840,797

07/21/2010

Danny A. Grant

043508-0383796

1778

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APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1770	\$300	\$0	\$2070	05/28/2013

EXAMINER	ART UNIT	CLASS-SUBCLASS
ELISCA, PIERRE E	3718	463-030000

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)

☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27.

☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

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.



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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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/840,797	07/21/2010	Danny A. Grant	043508-0383796	1778

93383 7590 02/26/2013
Pillsbury Winthrop Shaw Pittman LLP (Immersion)
P.O. Box 10500
McLean, VA 22102

EXAMINER

ELISCA, PIERRE E

ART UNIT	PAPER NUMBER
----------	--------------

3718

DATE MAILED: 02/26/2013

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 271 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 271 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.	Applicant(s)	
	12/840,797	GRANT ET AL.	
	Examiner	Art Unit	
	PIERRE E. ELISCA	3718	

-- 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 1/31/2013.
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 1-40. 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).
 - 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)

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. ☒ Notice of References Cited (PTO-892) 2. ☒ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date <u>1/31/2013</u> 3. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material 4. ☐ Interview Summary (PTO-413),
Paper No./Mail Date ____. | <ol style="list-style-type: none"> 5. ☐ Examiner's Amendment/Comment 6. ☒ Examiner's Statement of Reasons for Allowance 7. ☐ Other ____. |
|--|---|

/PIERRE E. ELISCA/
Primary Examiner, Art Unit 3718

REASONS FOR ALLOWANCE

1. This is an Examiner's statement of reason for allowance.
2. Regarding the claimed terms, the Examiner notes that a "general term must be understood in the context in which the inventor presents it." *In re Glaug* 283 F.3d 1335, 1340, 62 USPQ2d 1151, 1154 (Fed. Cir. 2002). Therefore the Examiner must interpret the claimed terms as found on pages 1-50 of the specification. Clearly almost all the general terms in the claims may have multiple meanings. So where a claim term "is susceptible to various meanings, . . . the inventor's lexicography must prevail" *Id.* Using these definitions for the claims, the claimed invention was not reasonably found in the prior art.
3. The closest prior art Son, Seunghwan et al (U.S. PG Pub 2011/0050601A1) which discloses a mobile terminal that includes a touch screen and a controller. The controller operates in a first message composition mode for composing a message according to a first message format. However, Son singularly or in combination fails to disclose the recited feature:

As per claims 1, 11, 21, and 31 "wherein the haptic stimulation includes a first stimulation determined responsive to performance of the initial portion of the control gesture, and a second stimulation that is different from the first stimulation and is determined responsive to performance of the first intermediate portion of the control

Art Unit: 3718

gesture, and a control module configured to control the haptic device to generate the stimulation determined by the stimulation module”.

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to PIERRE E. ELISCA whose telephone number is (571)272-6706. The examiner can normally be reached on 6:30 to 5:00. Hotelier.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 571 272 4690. 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.

/PIERRE E. ELISCA/
Primary Examiner, Art Unit 3718

Application/Control Number: 12/840,797
Art Unit: 3718

Page 4

Notice of References Cited	Application/Control No. 12/840,797	Applicant(s)/Patent Under Reexamination GRANT ET AL.	
	Examiner PIERRE E. ELISCA	Art Unit 3718	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date MM-YYYY	Name	Classification
*	A	US-2011/0050601	03-2011	SON et al.	345/173
	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. 12840797	Applicant(s)/Patent Under Reexamination GRANT ET AL.
	Examiner PIERRE E ELISCA	Art Unit 3718

CPC- SEARCHED		
Symbol	Date	Examiner

CPC COMBINATION SETS - SEARCHED		
Symbol	Date	Examiner

US CLASSIFICATION SEARCHED			
Class	Subclass	Date	Examiner
463	30	12/6/2012	P.E
463	22	12/6/2012	P.E

SEARCH NOTES		
Search Notes	Date	Examiner
West Search	12/6/2012	P.E

INTERFERENCE SEARCH			
US Class/ CPC Symbol	US Subclass / CPC Group	Date	Examiner
463	30	12/6/2012	P.E
463	22	12/6/2012	P.E

--	--

Atty. Dkt. No.	M#	Client Ref.
043508	0383796	IMM361

INFORMATION DISCLOSURE STATEMENT BY APPLICANT

Applicant: Danny A. Grant, et al.

Appln. No.: 12/840,797

Filing Date: July 21, 2010

Date: January 31, 2013 Page 1 of 1

Examiner: Pierre E. Elisca Group Art Unit: 3718

U.S. PATENT DOCUMENTS

Examiner's Initials*	Document Number	Date MM/YYYY	Name (Family Name of First Inventor)	Class	Sub Class	Filing Date (if appropriate)
/PE/	AR 2008/0024459	01/2008	POUPYREV et al.			
/PE/	BR 2007/0150826	06/2007	ANZURES et al.			
/PE/	CR 2005/0212760	09/2005	MARVIT et al.			
/PE/	DR 2007/0279392	12/2007	ROSENBERG et al.			
/PE/	ER 2007/0265096	11/2007	KOUNO et al.			
/PE/	FR 2005/0245302	11/2005	BATHICHE et al.			
	GR					
	HR					
	IR					
	JR					
	KR					
	LR					

FOREIGN PATENT DOCUMENTS

	Document Number	Date MM/YYYY	Country	Inventor Name	English Abstract		Translation Readily Available	
					Enclosed	No	Enclose	No
/PE/	MR WO 2009/071750	06/2009	WIPO	MÄENPÄÄ			X	
/PE/	NR WO 99/38064	07/1999	WIPO	KEYSON			X	
	OR							
	PR							
	QR							

OTHER (Including in this order Author, Title, Periodical Name, Date, Pertinent Pages, etc.)

/PE/	RR	International Search Report as issued for International Application No. PCT/US2010/042795, dated January 12, 2011.			X	
/PE/	SR	International Preliminary Report on Patentability, including the Written Opinion, as issued for International Application No. PCT/US2010/042795, dated February 2, 2012.			X	
/PE/	TR	International Search Report as issued for International Application No. PCT/US2010/042805, dated October 29, 2010.			X	
/PE/	UR	International Preliminary Report on Patentability, including the Written Opinion, as issued for International Application No. PCT/US2010/042805, dated February 2, 2012.			X	

Examiner /Pierre Elisca/ Date Considered: 02/19/2013

*EXAMINER: Initial if citation 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.

<i>Index of Claims</i> 	Application/Control No. 12840797	Applicant(s)/Patent Under Reexamination GRANT ET AL.
	Examiner PIERRE E ELISCA	Art Unit 3718

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

☒ Claims renumbered in the same order as presented by applicant				☐ CPA		☐ T.D.		☐ R.1.47	
CLAIM		DATE							
Final	Original	12/06/2012	02/19/2013						
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	2	=	=						
	3	=	=						
	4	=	=						
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	36	=	=						

<i>Index of Claims</i> 	Application/Control No. 12840797	Applicant(s)/Patent Under Reexamination GRANT ET AL.
	Examiner PIERRE E ELISCA	Art Unit 3718

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

☒ Claims renumbered in the same order as presented by applicant				☐ CPA		☐ T.D.		☐ R.1.47	
CLAIM		DATE							
Final	Original	12/06/2012	02/19/2013						
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	38	=	=						
	39	=	=						
	40	=	=						



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 Alexandria, Virginia 22313-1450
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BIB DATA SHEET

CONFIRMATION NO. 1778

SERIAL NUMBER 12/840,797	FILING or 371(c) DATE 07/21/2010 RULE	CLASS 463	GROUP ART UNIT 3718	ATTORNEY DOCKET NO. 043508-0383796		
APPLICANTS Danny A. Grant, Laval, CANADA; Robert W. Heubel, San Leandro, CA; David M. Birnbaum, Oakland, CA; Erin B. Ramsay, Montreal, CANADA; ** CONTINUING DATA ***** This appln claims benefit of 61/227,645 07/22/2009 ** FOREIGN APPLICATIONS ***** ** IF REQUIRED, FOREIGN FILING LICENSE GRANTED ** 07/30/2010						
Foreign Priority claimed ☐ Yes ☒ No 35 USC 119(a-d) conditions met ☐ Yes ☒ No Verified and Acknowledged <u>/PIERRE E ELISCA/</u> Examiner's Signature		☐ Met after Allowance P.E Initials	STATE OR COUNTRY CANADA	SHEETS DRAWINGS 13	TOTAL CLAIMS 40	INDEPENDENT CLAIMS 4
ADDRESS Pillsbury Winthrop Shaw Pittman LLP (Immersion) P.O. Box 10500 McLean, VA 22102 UNITED STATES						
TITLE SYSTEM AND METHOD FOR PROVIDING COMPLEX HAPTIC STIMULATION DURING INPUT OF CONTROL GESTURES, AND RELATING TO CONTROL OF VIRTUAL EQUIPMENT						
FILING FEE RECEIVED 2480	FEES: Authority has been given in Paper No. _____ to charge/credit DEPOSIT ACCOUNT No. _____ for following:			☐ All Fees ☐ 1.16 Fees (Filing) ☐ 1.17 Fees (Processing Ext. of time) ☐ 1.18 Fees (Issue) ☐ Other _____ ☐ Credit		

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.

93383 7590 02/26/2013
Pillsbury Winthrop Shaw Pittman LLP (Immersion)
P.O. Box 10500
McLean, VA 22102

Certificate of Mailing or Transmission

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(Depositor's name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/840,797	07/21/2010	Danny A. Grant	043508-0383796	1778

TITLE OF INVENTION: SYSTEM AND METHOD FOR PROVIDING COMPLEX HAPTIC STIMULATION DURING INPUT OF CONTROL GESTURES, AND RELATING TO CONTROL OF VIRTUAL EQUIPMENT

APPLN. TYPE	SMALL ENTITY	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	NO	\$1770	\$300	\$0	\$2070	05/28/2013

EXAMINER	ART UNIT	CLASS-SUBCLASS
ELISCA, PIERRE E	3718	463-030000

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,
(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.
1 Pillsbury Winthrop Shaw Pittman LLP
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 3.111. 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, California

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 033975 (enclose an extra copy of this form).

5. Change in Entity Status (from status indicated above)

- ☐ a. Applicant claims SMALL ENTITY status. See 37 CFR 1.27. ☐ b. Applicant is no longer claiming SMALL ENTITY status. See 37 CFR 1.27(g)(2).

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 May 24, 2013

Typed or printed name Emily T. Bell

Registration No. 47418

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.

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Attorney Docket: 043508-0383796
Client Reference: IMM361

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re PATENT APPLICATION of:

Confirmation Number: 1778

Danny A. GRANT, et al.

Application No.: 12/840,797

Group Art Unit: 3718

Filed: July 21, 2010

Examiner: Pierre E. Elisca

Title: SYSTEM AND METHOD FOR PROVIDING COMPLEX HAPTIC STIMULATION
DURING INPUT OF CONTROL GESTURES, AND RELATING TO CONTROL OF VIRTUAL
EQUIPMENT

COMMENTS ON STATEMENT OF REASONS FOR ALLOWANCE

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

Sir:

In the Notice of Allowability dated February 26, 2013, the Examiner has set forth "Reasons for Allowance." Applicant respectfully traverses these Reasons. Specifically, it is submitted that the subject matter of the allowed claims are patentable for their respective claimed elements and limitations as a whole. That is, the patentability of the claims rests on the combination of recited elements and limitations. As such, Applicant submits that no one element or limitation in particular should be deemed to impart or be required for patentability of the claims. Furthermore, Applicant submits that the dependent claims are allowable not only for their dependence on the allowed independent claims, but also for the additional subject matter recited in each of those dependent claims.

Respectfully submitted,

PILLSBURY WINTHROP SHAW PITTMAN LLP



EMILY T. BELL
Reg. No. 47,418
Tel. No. 703.770.7661
Fax No. 703.770.7901

Date: May 24, 2013
P.O. Box 10500
McLean, VA 22102
703.770.7900

Electronic Patent Application Fee Transmittal

Application Number:	12840797			
Filing Date:	21-Jul-2010			
Title of Invention:	SYSTEM AND METHOD FOR PROVIDING COMPLEX HAPTIC STIMULATION DURING INPUT OF CONTROL GESTURES, AND RELATING TO CONTROL OF VIRTUAL EQUIPMENT			
First Named Inventor/Applicant Name:	Danny A. Grant			
Filer:	Emily T. Bell/Monique Wardrick			
Attorney Docket Number:	043508-0383796			
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

Description	Fee Code	Quantity	Amount	Sub-Total in USD(\$)
Extension-of-Time:				
Miscellaneous:				
Total in USD (\$)				2080

Electronic Acknowledgement Receipt

EFS ID:	15868356
Application Number:	12840797
International Application Number:	
Confirmation Number:	1778
Title of Invention:	SYSTEM AND METHOD FOR PROVIDING COMPLEX HAPTIC STIMULATION DURING INPUT OF CONTROL GESTURES, AND RELATING TO CONTROL OF VIRTUAL EQUIPMENT
First Named Inventor/Applicant Name:	Danny A. Grant
Customer Number:	93383
Filer:	Emily T. Bell/Monique Wardrick
Filer Authorized By:	Emily T. Bell
Attorney Docket Number:	043508-0383796
Receipt Date:	24-MAY-2013
Filing Date:	21-JUL-2010
Time Stamp:	15:32:11
Application Type:	Utility under 35 USC 111(a)

Payment information:

Submitted with Payment	yes
Payment Type	Deposit Account
Payment was successfully received in RAM	\$2080
RAM confirmation Number	3149
Deposit Account	033975
Authorized User	

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Charge any Additional Fees required under 37 C.F.R. Section 1.21 (Miscellaneous fees and charges)

File Listing:					
Document Number	Document Description	File Name	File Size(Bytes)/ Message Digest	Multi Part /.zip	Pages (if appl.)
1	Issue Fee Payment (PTO-85B)	043508-0383796_PTOL-85-FeeTransmittal.pdf	53613 3042e3f240d49a4adb3b0901887f3a3b72eb4830	no	1
Warnings:					
Information:					
2	Post Allowance Communication - Incoming	043508-0383796_Comments-on-Statement.pdf	24365 bc680625c4fa400a5b197d21110a1d5812e98c1d	no	1
Warnings:					
Information:					
3	Fee Worksheet (SB06)	fee-info.pdf	32625 7f8c494e603c2155e9c57fed9acabe8c1bf55463	no	2
Warnings:					
Information:					
Total Files Size (in bytes):			110603		
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. <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. <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. <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.					



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APPLICATION NO.	ISSUE DATE	PATENT NO.	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/840,797	06/25/2013	8469806	043508-0383796	1778

93383 7590 06/05/2013
Pillsbury Winthrop Shaw Pittman LLP (Immersion)
P.O. Box 10500
McLean, VA 22102

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 271 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):

Danny A. Grant, Laval, CANADA;
Robert W. Heubel, San Leandro, CA;
David M. Birnbaum, Oakland, CA;
Erin B. Ramsay, Montreal, CANADA;

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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(c).

I hereby appoint:



Practitioners associated with 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 assignments documents attached to this form in accordance with 37 CFR 3.73(c).

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



The address associated with Customer Number:

34300

OR

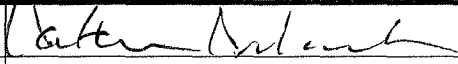
☐	Firm or Individual Name			
	Address			
	City	State	Zip	
	Country			
	Telephone	Email		

Assignee Name and Address: Immersion Corporation
50 Rio Robles
San Jose, CA 95134

A copy of this form, together with a statement under 37 CFR 3.73(c) (Form PTO/AIA/96 or equivalent) is required to be Filed in each application in which this form is used. The statement under 37 CFR 3.73(c) may be completed by one of The practitioners appointed in this form, 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	10/29/15
Name	Catherine Maresh	Telephone	(408) 350-8755
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.

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STATEMENT UNDER 37 CFR 3.73(b)

Applicant/Patent Owner: Grant et al.

Application No./Patent No.: 8,469,806

Filed/Issue Date: June 25, 2013

Titled: **SYSTEM AND METHOD FOR PROVIDING COMPLEX HAPTIC STIMULATION DURING INPUT OF CONTROL GESTURES, AND RELATING TO CONTROL OF VIRTUAL EQUIPMENT**

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 025088, Frame 0367, 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.

/Zachary S. Kelton/

3/8/2016

Signature

Date

Zachary S. Kelton

Attorney

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.**

Meta Platforms Exhibit 1007

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

Page 00251

Electronic Acknowledgement Receipt

EFS ID:	25135227
Application Number:	12840797
International Application Number:	
Confirmation Number:	1778
Title of Invention:	SYSTEM AND METHOD FOR PROVIDING COMPLEX HAPTIC STIMULATION DURING INPUT OF CONTROL GESTURES, AND RELATING TO CONTROL OF VIRTUAL EQUIPMENT
First Named Inventor/Applicant Name:	Danny A. Grant
Customer Number:	93383
Filer:	Zachary S. Kelton/Amber Johnson
Filer Authorized By:	Zachary S. Kelton
Attorney Docket Number:	043508-0383796
Receipt Date:	08-MAR-2016
Filing Date:	21-JUL-2010
Time Stamp:	14:49:42
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	Miscellaneous Incoming Letter	Transmittal.pdf	79279 f52e62cc98300636fa487a4dc7ccfb7feedc8c10	no	1

Warnings:

Information:

2	Power of Attorney	ImmersionPOA.pdf	81286 f4b3bcb36a69b8341252b6238aa8e8ea2d53a216	no	1
Warnings:					
Information:					
3	Assignee showing of ownership per 37 CFR 3.73	Statement.pdf	72222 56fe81adf86f1d7c6b83ac8a315db7548c63685c	no	1
Warnings:					
Information:					
Total Files Size (in bytes):			232787		
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. <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. <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. <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.					

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application of : Grant et al.
Patent No. : 8,469,806
Issued : June 25, 2013
For : SYSTEM AND METHOD FOR PROVIDING COMPLEX
HAPTIC STIMULATION DURING INPUT OF CONTROL
GESTURES, AND RELATING TO CONTROL OF
VIRTUAL EQUIPMENT
Examiner : Elisca, P.
Art Unit : 3718
Conf. No. : 1778

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

TRANSMITTAL

Commissioner:

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

1. Power of Attorney to Prosecute Applications Before the USPTO; and
2. Statement Under 37 C.F.R 3.73(b).

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

Respectfully submitted,

Date: 3/8/2016

By: /Zachary S. Kelton/
Zachary S. Kelton
Reg. No. 71,345

Kilpatrick Townsend & Stockton LLP
1001 West Fourth Street
Winston-Salem, NC 27101
(336) 607-7300

Certificate of Electronic Filing

I hereby certify that this correspondence is being electronically filed with the United States Patent Office via EFS Web on March 8, 2016 .

/Amber C Johnson/
Amber C. Johnson



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
12/840,797	07/21/2010	Danny A. Grant	

34300
Kilpatrick Townsend and Stockton, LLP
1001 W Fourth Street
Winston-Salem, NC 27101

CONFIRMATION NO. 1778
POA ACCEPTANCE LETTER



Date Mailed: 03/10/2016

NOTICE OF ACCEPTANCE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 03/08/2016.

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
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APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO./TITLE
12/840,797	07/21/2010	Danny A. Grant	

93383
Pillsbury Winthrop Shaw Pittman LLP (Immersion)
P.O. Box 10500
McLean, VA 22102

CONFIRMATION NO. 1778
POWER OF ATTORNEY NOTICE



OC000000081340017

Date Mailed: 03/10/2016

NOTICE REGARDING CHANGE OF POWER OF ATTORNEY

This is in response to the Power of Attorney filed 03/08/2016.

- 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/

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 Western District of Texas on the following

☐ Trademarks or ☐ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO. 6:22-cv-541	DATE FILED 5/26/2022	U.S. DISTRICT COURT Western District of Texas
PLAINTIFF IMMERSION CORPORATION		DEFENDANT META PLATFORMS, INC.
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 8,469,806	6/25/2013	Immersion Corporation
2 8,896,524	11/25/2014	Immersion Corporation
3 9,727,217	8/8/2017	Immersion Corporation
4 10,248,298	4/2/2019	Immersion Corporation
5 10,269,222	4/23/2019	Immersion Corporation

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ 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
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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

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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DOCKET NO. 6:22-cv-541	DATE FILED 5/26/2022	U.S. DISTRICT COURT Western District of Texas
PLAINTIFF IMMERSION CORPORATION		DEFENDANT META PLATFORMS, INC.
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1 10,664,143	5/26/2020	Immersion Corporation
2		
3		
4		
5		

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ 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
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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