US010124246B2

(12) **United States Patent**
Yanev et al.

(10) **Patent No.: US 10,124,246 B2**
(45) **Date of Patent: Nov. 13, 2018**

(54) **PRESSURE SENSITIVE PERIPHERAL DEVICES, AND ASSOCIATED METHODS OF USE**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 328 days.

(21) Appl. No.: **14/257,868**

(22) Filed: **Apr. 21, 2014**

(65) **Prior Publication Data**

US 2015/0301613 A1 Oct. 22, 2015

(51) **Int. Cl.**
A63F 13/06 (2006.01)
A63F 13/20 (2014.01)
(Continued)

(52) **U.S. Cl.**
CPC ***A63F 13/06*** (2013.01); ***A61B 5/6897*** (2013.01); ***G06F 3/0338*** (2013.01);
(Continued)

(58) **Field of Classification Search**
CPC A63F 13/06
See application file for complete search history.

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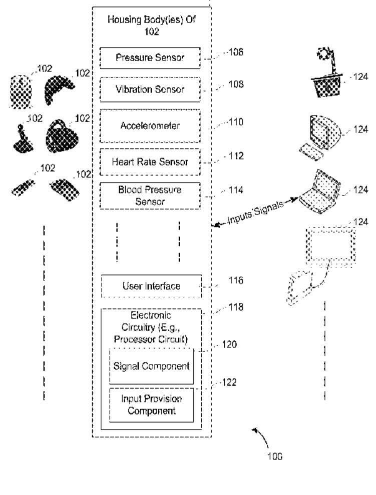
(57) **ABSTRACT**

Facilitating a user to provide inputs to a computing platform by applying varying pressure to one or more external points on a pressure sensitive peripheral device is disclosed. The pressure sensitive peripheral device may include one or more pressure sensors disposed within a housing body or housing bodies of the pressure sensitive peripheral device. The pressure sensors may provide pressure signals conveying information associated with compressive forces applied to the housing body or bodies of the pressure sensitive peripheral device. Inputs to control one or more aspects of a computing platform coupled to the pressure sensitive peripheral device may be provided based on the pressure signals. The one or more aspects of the computing platform may include one or more aspects of a graphical user interface on a display associated with the computing platform, operational aspects of the computing platform and/or any other aspects of the computing platform.

27 Claims, 4 Drawing Sheets



(51) **Int. Cl.**

G06F 3/0338	(2013.01)
G06F 3/038	(2013.01)
G06F 3/041	(2006.01)
A61B 5/00	(2006.01)
G06F 19/00	(2018.01)
A61B 5/021	(2006.01)
A63B 71/06	(2006.01)
A61B 5/024	(2006.01)
A63B 21/02	(2006.01)
A63B 23/035	(2006.01)
A63B 23/16	(2006.01)
A63B 21/00	(2006.01)

(52) **U.S. Cl.**

CPC ***G06F 3/0383*** (2013.01); ***G06F 3/0414*** (2013.01); ***G06F 19/00*** (2013.01); ***G06F 19/3481*** (2013.01); *A61B 5/021* (2013.01); *A61B 5/02438* (2013.01); *A63B 21/028* (2013.01); *A63B 21/4035* (2015.10); *A63B 23/03508* (2013.01); *A63B 23/16* (2013.01); *A63B 71/0622* (2013.01); *A63B 2220/51* (2013.01); *A63B 2220/56* (2013.01); *A63B 2225/50* (2013.01)

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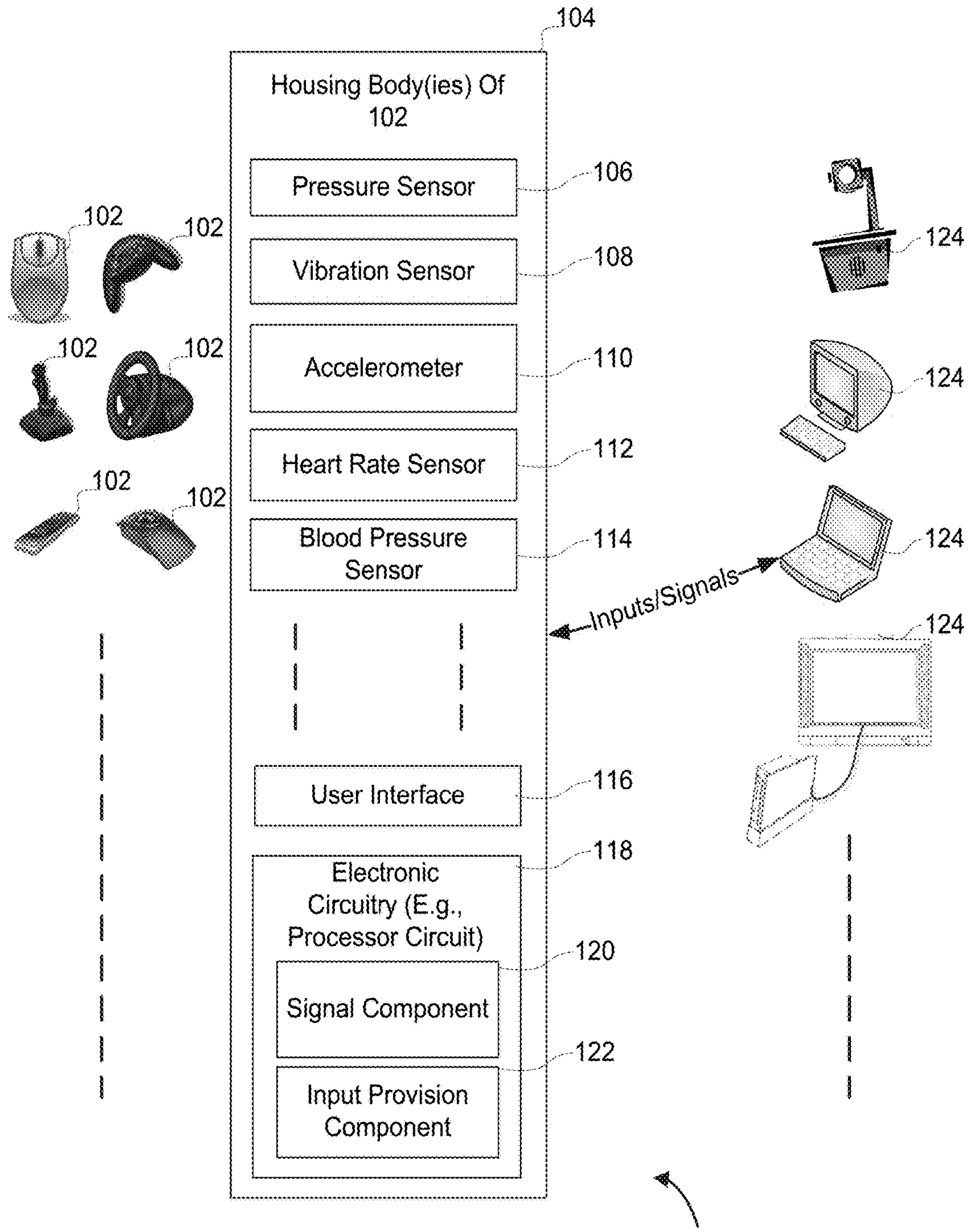
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Housing Body(ies) Of 102
Pressure Sensor
106
Vibration Sensor
108
Accelerometer
110
Heart Rate Sensor
112
Blood Pressure Sensor
114
User Interface
116
Electronic Circuitry (E.g., Processor Circuit)
118
Signal Component
120
Input Provision Component
122
102
102
102
102
102
102
124
124
124
124
Inputs/Signals
100

FIG. 1

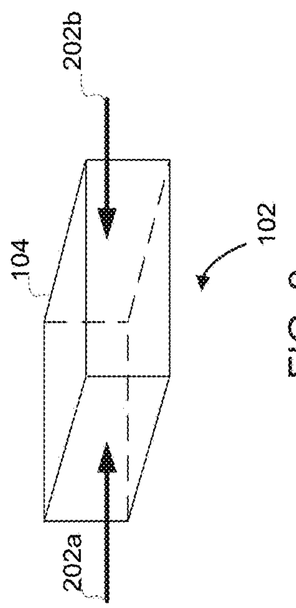

FIG. 2

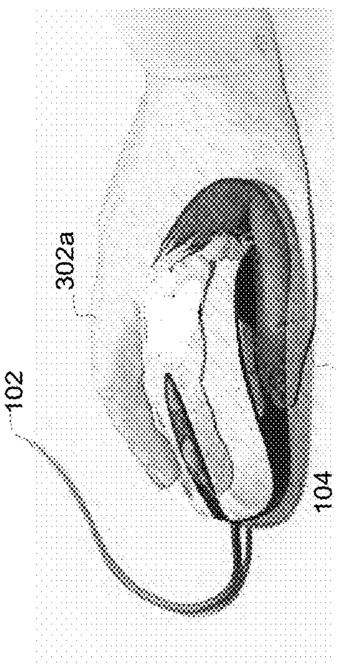

FIG. 3

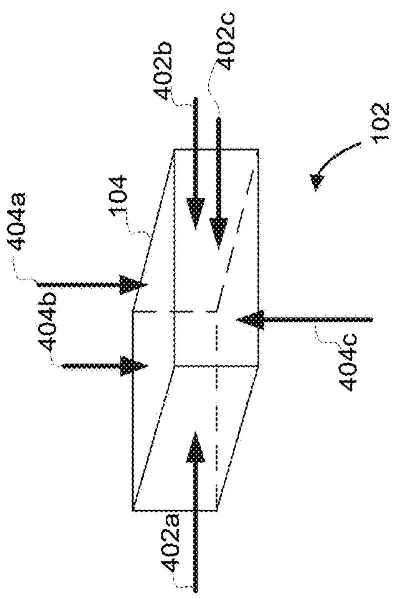

FIG. 4

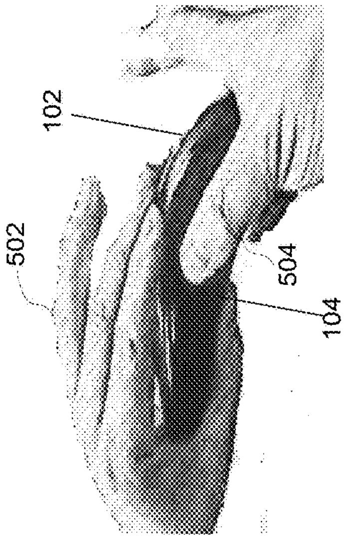

FIG. 5

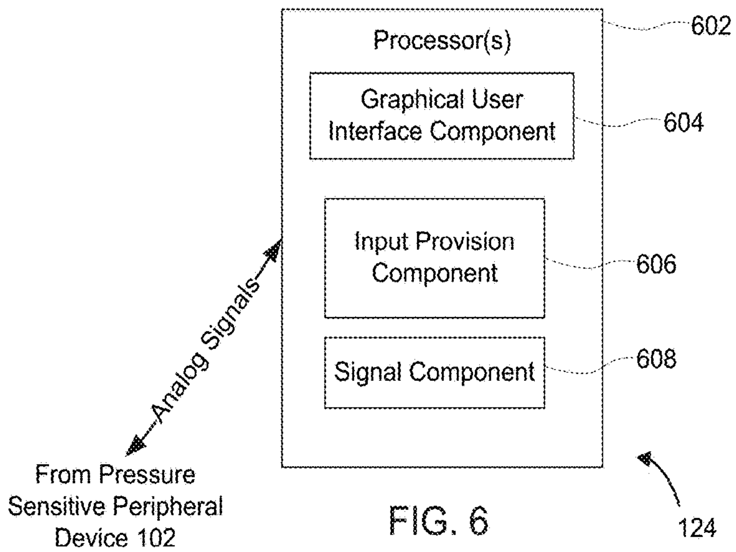

FIG. 6

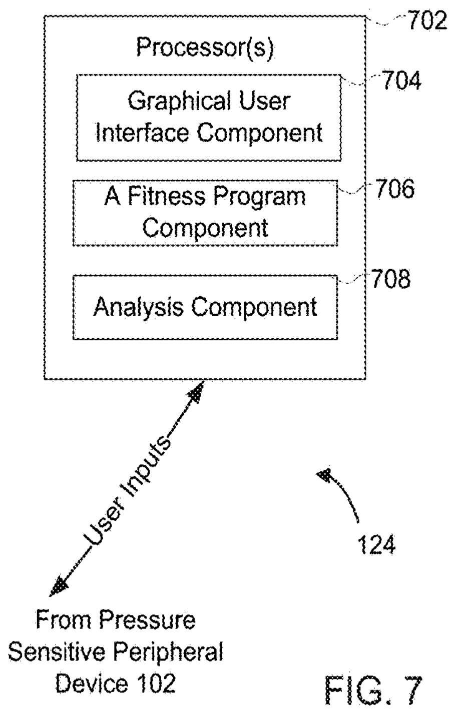

FIG. 7

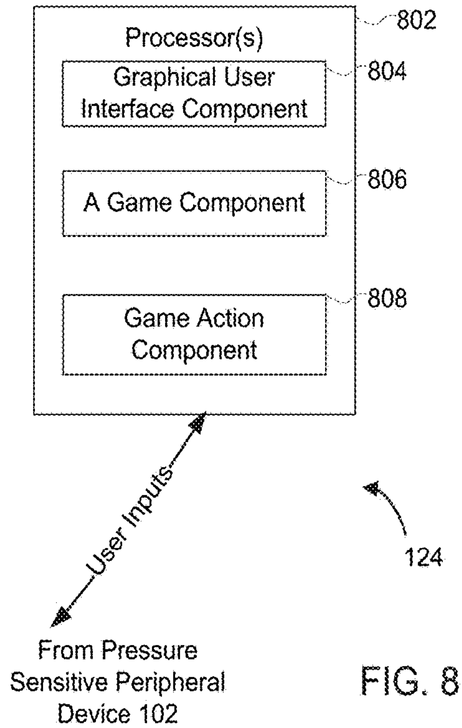

FIG. 8

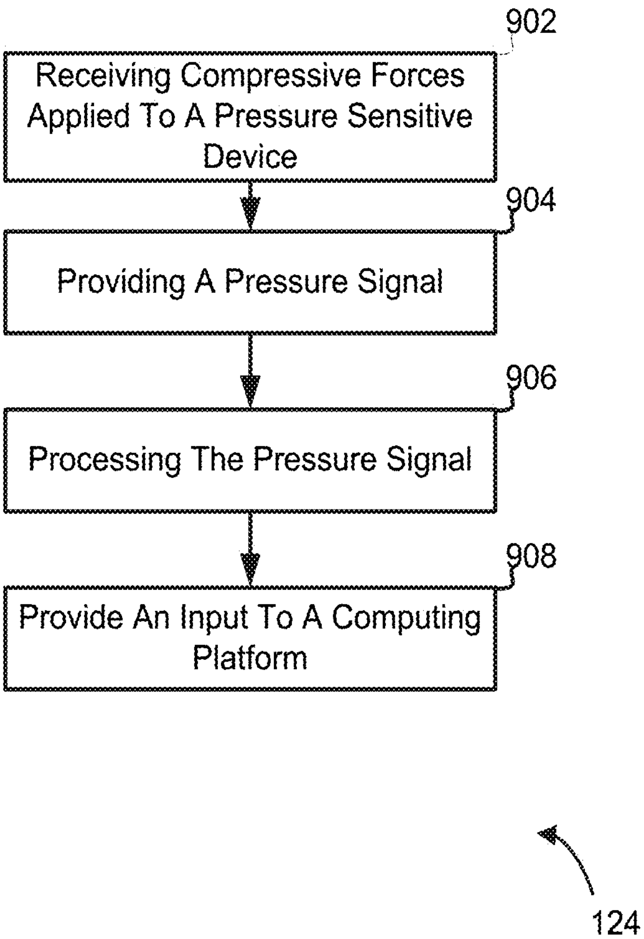
902
Receiving Compressive Forces Applied To A Pressure Sensitive Device
904
Providing A Pressure Signal
906
Processing The Pressure Signal
908
Provide An Input To A Computing Platform
124

FIG. 9

PRESSURE SENSITIVE PERIPHERAL DEVICES, AND ASSOCIATED METHODS OF USE

FIELD OF THE DISCLOSURE

This disclosure relates to facilitating user input to a computing platform with the user input being facilitated through pressure or force applied to a pressure sensitive peripheral device.

BACKGROUND

Peripheral devices (e.g., computer mice, gamepads, joysticks, driving wheels, remote controls, trackball mice, portable pointing devices, and/or other peripheral devices) for providing inputs to computing platforms are generally known. These devices may be typically configured to facilitate translation of two dimensional or three dimensional motions into control inputs. For example, a computer mouse may enable a user to provide inputs for controlling a graphical user interface (e.g., moving a cursor, selecting items, and/or other control inputs) on a display of a computing platform by clicking buttons on the computer mouse and/or moving the computer mouse on a surface. As another example, a joystick may enable the user to provide the control inputs by pivoting the stick on a base of the joystick.

SUMMARY

One aspect of the disclosure relates to a peripheral device configured to facilitate user input to a computing platform through a pressure sensor disposed at the peripheral device. As used herein, such a peripheral device may be referred to as a pressure sensitive peripheral device. Exemplary implementations may allow a user to simply squeeze the pressure sensitive peripheral device to provide inputs to a computing platform coupled to the pressure sensitive peripheral device. A user may achieve this by applying compressive pressure to the pressure sensitive peripheral device by applying opposing forces to a housing body or housing bodies of the pressure sensitive peripheral device. The inputs so provided by the user may be used to control one or more aspects of the computing platform. This may enhance control of the computing platform by enabling the user to provide extra sets of inputs through squeezing the pressure sensitive peripheral devices. In some implementations, the pressure sensitive peripheral device may facilitate physical exercise by the user. Such exercise may include isometric exercise, dynamic exercise, and/or other types of exercise that involve squeezing, compressing, and/or otherwise applying a pressure and/or force to the pressure sensitive peripheral device. The pressure sensitive peripheral device may be configured to quantify information associated with the physical exercise and/or information associated with the health or wellness of the user.

In some implementations, the pressure sensitive peripheral device may include components such as a heart rate sensor, blood pressure sensor, vibration sensor, accelerometer, user interface, electronic circuitry configured to process signals, and/or any other components for providing additional inputs to the computing platform.

A pressure sensitive peripheral device may comprise a housing body. The housing body may be configured to house a pressure sensor of the pressure sensitive peripheral device. The pressure sensor may be configured to provide a pressure signal conveying information associated with a compressive pressure applied to the housing body. In some implementations, the pressure signal may be provided responsive to the housing body being squeezed by two opposing forces applied to opposing surfaces of the housing body. By way of non-limiting example, one of the opposing forces may be provided by a body part of a user (e.g., finger, hand, knee, and/or other body parts), a fixed surface (e.g., a tabletop, a doorway, and/or other fixed surface), an accessory (e.g., a strap, a stick, and/or other accessory), and/or other objects.

The pressure sensor may be configured to transmit the pressure signal to electronic circuitry for processing. In exemplary implementations, the electronic circuitry may include, without limitation, processor circuits disposed within the pressure sensitive peripheral device (e.g., disposed within the housing body of the pressure sensitive peripheral device), circuitry included in the computing platform, and/or any other types of electronic circuitry. The electronic circuitry may be configured to receive the pressure signal provided by the pressure sensor and provide inputs to the computing platform based on the pressure signal received from the pressure sensor. The electronic circuitry may include a signal component configured to receive and process pressure signals provided by the pressure sensors; an input provision component configured to provide an input to the computing platform based on the received pressures signals for controlling one or more aspects of the computing platform. The inputs may be used to control one or more aspects of a graphical user interface on a display associated with the computing platform.

By way of non-limiting example, the one or more aspects of the graphical user interface may include one or more of input of a value, selection from a menu, scrolling, moving a pointer, manipulation of a virtual object, entry of a password or a code by the user in the graphical user interface, interaction with a fitness program, interaction with a rehabilitation program, interaction with a medical treatment program, interaction with a game by the user through the graphical user interface, and/or other aspects of the graphical user interface.

In some implementations, the inputs provided based on the pressure signal may be used to control operational aspects of the computing platform that does not necessarily involve controlling of graphical user interface on a display associated with the computing platform. For example, a user may be enabled to adjust the volume a level of a sound output by the computing platform, turn on or off the computing platform, adjust the resolution of a video output by the computing platform, switch between network mode (e.g., connected through Wi-Fi) or non-network mode (e.g., no network connections), adjust brightness of the display coupled to the computing platform, and/or any other operational aspects of the computing platform.

A value inputted based on the pressure signal may be an analog value or a digital value. Digital values having very fine granularity may be interpreted by a user as quasi-analog input. By way of non-limiting example, a user may squeeze the pressure sensitive peripheral device with varying forces in order to enter a value on a quasi-analog meter presented on the display where smaller forces correspond to smaller values on the meter and larger forces correspond to larger values on the meter. As another example, a user may enter a height of the user in a text field presented on the display where smaller forces correspond to shorter heights and larger forces correspond to taller heights.

Entry of a password or code based on the pressure signal may be achieved by a sequence of squeezes performed on the pressure sensitive peripheral device. For example, a user

may perform different magnitudes and/or different durations of squeezes on the pressure sensitive peripheral device. To illustrate, a user may perform a specific combination of short and long squeezes on the pressure sensitive peripheral device as a password. Combinations of squeezes on different locations of the pressure sensitive peripheral device may be used as a password, according to some implementations.

Manipulation of a virtual object based on the pressure signal may be further based on an accelerometer signal conveying a position and/or a change in position of the pressure sensitive peripheral device. For example, a virtual object may be "grasped" by squeezing the pressure sensitive peripheral device. The position of the virtual object may be controlled through corresponding a position and/or a change in position of the pressure sensitive peripheral device. The accelerometer signal may be provided by an accelerometer (not depicted) and/or other position detection device included in the pressure sensitive peripheral device. In one implementation, exertion and release of pressure may respectively result in zoom-in and zoom-out of a three-dimensional virtual space.

A fitness program may include squeezing pressure sensitive peripheral device. This may be used during isometric and/or dynamic exercise routines. The fitness program may include squeezing the pressure sensitive peripheral device with a threshold force, for a threshold duration of time, for a number of repetitions, moving the pressure sensitive peripheral device along a curve line while squeezing the pressure sensitive peripheral device, a fitness program consist of count base exercises (example push-ups) when the device with count the number of repetition and/or other exercise metrics.

A game may include game actions that may be initiated by user through squeezing the pressure sensitive peripheral device. The game actions may include movement with a force (e.g., thrusting, dashing, turbo charge, and/or other movements), a combat action with a force (e.g., jabbing, heaving, waving with a corresponding force, and/or other combat actions), firing a shot, changing camera angles, selecting next weapon, accelerating, looking around, changing virtual character/units/avatar under control, and/or any other game actions.

The pressure sensor may be configured to provide multiple contemporaneous pressure signals to the electronic circuitry for processing. The electronic circuitry may be configured to interpret the multiple contemporaneous pressure signals and provide the control input to the computing platform based on the interpretation.

In some implementations, the pressure signals provided by the pressure sensor for controlling the one or more aspects of operation of the pressure sensitive peripheral device may be interpreted based on a position on the pressure sensitive peripheral device on which the opposing forces were applied. By way of non-limiting example, squeezing front and rear surfaces of the pressure sensitive peripheral device may correspond to one input, while squeezing top and bottom surfaces of the pressure sensitive peripheral device may correspond to another input.

In some implementations, the compressive pressure applied to the housing body may be quantified on an arbitrary scale such as a scale between one and ten, a scale between one and five stars, and/or other arbitrary scale. For example, without limitation, the compressive pressure or force (or other suitable metric) applied to the housing body may be quantified in absolute units such as pounds (lb), kilograms (kg), Newtons (N), pounds per square inch (PSI), Pascals (Pa), Newtons per meters squared (N/m^2), and/or other absolute units.

These and other features, and characteristics of the present technology, 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

FIG. **1** illustrates a system configured to facilitate receipt of user input using a pressure sensitive peripheral device with a pressure sensor, in accordance with one or more implementations.

FIG. **2** illustrates one example of squeezing pressure sensitive peripheral device shown in FIG. **1** for providing inputs to a computing platform also shown in FIG. **1**.

FIG. **3** illustrates one example of applying the compressive forces to the pressure sensitive peripheral device as illustrated in FIG. **2**.

FIG. **4** illustrates one example of the housing body of a pressure sensitive peripheral device shown in FIG. **1** being squeezed by multiple forces.

FIG. **5** illustrates one example of applying the compressive forces to the pressure sensitive peripheral device as illustrated in FIG. **4**.

FIG. **6** illustrates one example of computing platform **124** shown in FIG. **1** for facilitating receiving user inputs from a pressure sensitive peripheral device.

FIG. **7** illustrates another example of computing platform **124** shown in FIG. **1** for facilitating receiving user inputs from a pressure sensitive peripheral device.

FIG. **8** illustrates yet another example of computing platform **124** shown in FIG. **1** for facilitating receiving user inputs from a pressure sensitive peripheral device also shown in FIG. **1**.

FIG. **9** illustrates an exemplary method of facilitating receipt of user input using a pressure sensitive peripheral device with a pressure sensor in accordance with the disclosure.

DETAILED DESCRIPTION

FIG. **1** illustrates a system **100** configured to facilitate receipt of user input to a computing platform **124** using a pressure sensitive peripheral device **102** with a pressure sensor **106** disposed within a housing body **104** of the pressure sensitive peripheral device **102**, in accordance with one or more implementations. As illustrated, examples of a pressure sensitive peripheral device **102** may include a pressure sensitive device having a form factor similar to a mouse, a gamepad, a joystick, a driving wheel, a remote control, a trackball, and/or any other peripheral devices. As also illustrated, examples of computing platform **124** may include a laptop computer, a desktop computer, a projector system, a game console, a netbook, a smart TV, a settop box, and any other computing platforms **124**. It should be understood that the examples of pressure sensitive peripheral device **102** and the computing platforms **124** are not intended to be limiting and include any variations of the examples numerated. For example a pressure-sensitive device can be integrated into the computing platform **124**, or can communicate with it via a wireless connection. For instance, pressure sensitive peripheral device **102** having a mouse-like form factor in accordance with the disclosure may include a mechanical, optical, laser, 3-D, tactile, ergonomic, gaming, and/or any other kinds of mouse technologies.

Exemplary implementations of pressure sensitive peripheral device **102** may allow a user to simply squeeze pressure sensitive peripheral device **102** in order to control one or more aspects of a graphical user interface on a display associated with the computing platform **124**; and/or to control one or more operational aspects of the computing platform **124**. To achieve this, the user may simply apply compressive pressure to pressure sensitive peripheral device **102** by applying opposing forces to housing body **104** of the sensitive peripheral device **102**. By way of non-limiting example, the one or more aspects of the graphical user interface controlled by squeezing pressure sensitive peripheral device **102** may include one or more of input of a value, selection from a menu, manipulation of a virtual object, entry of a password or a code, scrolling, moving a pointer by the user in the graphical user interface, interaction with a fitness program, interaction with a rehabilitation program, interaction with a medical treatment program, interaction with a game by the user through the graphical user interface, and/or other aspects of the graphical user interface. The one or more aspects of the computing platform controlled by the squeezing the pressure sensitive peripheral device **102** may include adjusting the volume a level of a sound output by the computing platform, turning on or off the computing platform, adjusting the resolution of a video output by the computing platform, switching between network mode (e.g., connected through Wi-Fi) or non-network mode, adjusting brightness of the display coupled to the computing platform, and/or any other operational aspects of the computing platform.

As shown, the pressure sensitive peripheral device **102** may comprise a housing body **104**. The housing body **104** may be configured to house components of pressure sensitive peripheral device **102**. The housing body **104** may form a shell that encloses components of pressure sensitive peripheral device **102**. The housing body **104** may be a unitary body or may be comprised on two or more pieces that are joined together to form housing body **104**. The housing body **104** may be made of one or more materials such as a plastic and/or other durable, semi-rigid materials suitable to form outer surfaces of pressure sensitive peripheral devices. In some implementations, pressure sensitive peripheral device **102** may include more than one housing body **104**. In those implementations, the multiple housing bodies **104** may be configured to provide an open and closed configuration (e.g., the common "clamshell" design). Compressive pressure may be applied to such implementations in the closed configuration.

As shown, the pressure sensor **106** may be disposed within housing body **104**. The pressure sensor **106** may be configured to provide a pressure signal conveying information associated with a compressive pressure or force applied to housing body **104** of the pressure sensitive peripheral device **102**. Such information may include or be used to determine magnitude of a pressure or force, duration of a pressure or force, a pressure or force magnitude profile as a function of time, a quantity of compressive forces, and/or other information related to compressive force exerted on the housing body **104**. By way of non-limiting example, pressure sensor **106** may comprise a stress gauge configured to facilitate measuring stress undergone by housing body **104**, a deflection gauge configured to facilitate measuring a deflection undergone by housing body **104**, and/or other devices suitable for facilitating pressure or force measurements. In some implementations, pressure sensitive peripheral device **102** may include two or more pressure sensors that are the same as or similar to pressure sensor **106**. The two or more pressure sensors **106** may provide separate pressure signals, or the two or more pressure sensors **106** may provide signals that are combined into a single pressure signal.

The pressure sensor **106** may provide the pressure signal responsive to housing body **104** being squeezed by two opposing forces applied to opposing surfaces of housing body **104**. The opposing forces may be applied by a user's hand, fingers, knees, and/or any other body parts of the user, and/or objects under a control of the user. For example, a user may squeeze pressure sensitive peripheral device **102** between two hands. As another example, pressure sensitive peripheral device **102** may be squeezed between a hand and a stationary surface (e.g., a tabletop). In some implementations, pressure sensitive peripheral device **102** may be configured to be removably coupled with an accessory (not depicted). The accessory may be configured to facilitate squeezing housing body **104** by two opposing forces applied to opposing surfaces of housing body **104**. The accessory may include a strap, an elastic band, a stick, and/or other accessories. The accessory may include a device configured to adapt pressure sensitive peripheral device **102** to operate as a weight scale.

Examples of opposing surfaces may include a front surface and a rear surface, a top surface and a bottom surface, a left surface and a right surface, diagonally opposing surfaces, and/or other opposing surfaces of pressure sensitive peripheral device **102** (e.g., different parts of a spherical surface). In some implementations, the two opposing forces may be applied to any opposing surfaces of housing body **104**. Squeezing housing body **104** by two opposing forces applied to opposing surfaces of housing body **104** does not include clicking, (e.g., clicking buttons disposed on the pressure sensitive peripheral device **102**), tapping and/or dragging on a surface of the pressure sensitive peripheral device **102**, or other input methods that merely require determining a presence of a physical contact (e.g., touching versus not touching a pressure sensitive pad, depressing versus not depressing a button, and/or other binary inputs). Opposing forces may be applied to entire opposing surfaces and/or portions of opposing surfaces. For example, a user may squeeze pressure sensitive peripheral device **102** using two opposing palms that cover entire opposing surfaces. As another example, a user may squeeze pressure sensitive peripheral device **102** using a thumb and index finger that contact portions of opposing surfaces.

FIG. **2** illustrates one example of squeezing the pressure sensitive peripheral device shown in FIG. **1** for providing inputs to a computing platform also shown in FIG. **1**. It will be described with reference to FIG. **1**. As shown in this example, two opposing forces **202***a* and **202***b* may be applied to the housing body **104** of the pressure sensitive peripheral device **102** to squeeze the pressure sensitive peripheral device **102**. As illustrated in this example, the two opposing forces **202***a* and **202***b* may be applied to two opposing surfaces of the housing body **104**, left and right surfaces of the housing body **104** shown in this example, to squeeze the pressure sensitive peripheral device **102**. However, this is not intended to be limiting. In some other examples wherein the housing body **104** is spherical or semi-spherical, it is contemplated that the opposing forces **202***a* and **202***b* may be applied to different parts of the spherical housing body **104** to squeeze the pressure sensitive peripheral device **102**.

FIG. **3** illustrates one example of applying the compressive forces to the pressure sensitive peripheral device as illustrated in FIG. **2**. It will be described with reference to FIGS. **1-2**. As shown in this example, a user may squeeze the pressure sensitive peripheral device **102** (i.e., a pressure sensitive mouse **102** in this example) to apply the compressive forces illustrated in FIG. **2**. As illustrated, a user may squeeze the pressure sensitive mouse **102** with fingers **302***a* and **302***b* to provide inputs to the computing platform **104**.

Returning to FIG. **1**, in some implementations, pressure sensor **106** may be configured to provide multiple pressure signals conveying information associated with multiple forces applied to housing body **104**. Individual ones of the multiple pressure signals may be provided responsive to housing body **104** being squeezed multiple of forces applied to multiple sets of opposing surfaces of housing body **104**, or multiple parts of the surface of housing body **104**. In those implementations, the pressure sensors may be configured to provide contemporaneous or near-contemporaneous pressure signals in response to the multiple forces squeezing the housing body **104**.

FIG. **4** illustrates one example of the housing body of a pressure sensitive peripheral device shown in FIG. **1** being squeezed by multiple forces. It will be described with reference to FIG. **1**. As shown in this example, the housing body **104** of the pressure sensitive peripheral device **102** may be squeezed by a first set of forces **402**A-**402**C on the left and right surfaces of the housing body **104**. As illustrated in FIG. **4**, multiple forces (e.g., force **402**B and **402**C shown in FIG. **4**) may be applied on any one of the surface. As described above, the pressure sensor **106** disposed within the housing body **104** may provide contemporaneous pressure signals to convey information indicating multiple pressures on the housing body **104** as a result of the first set of forces **402**A-C.

Also shown in FIG. **4** is a second set of forces **404**A-D applied to the top and bottom surfaces of the housing body **104** of the pressure sensitive peripheral device **102**. This illustrates multiple forces **404**A-C may be applied simultaneously or near simultaneously with the first set of forces **402**A-C to squeeze the housing body **104** on different surfaces. The pressure sensor **106** within the housing body **104** is configured, in this example, to provide pressure signals conveying information about the multiple forces **404**A-C, in addition to providing the pressure signals conveying information about the first set of forces **402**A-C. This may be achieved by disposing multiple pressure sensors **106** within the housing body **104** for detecting compressive forces exerted on different sets of opposing surfaces of the housing body **104**. However, it should be understood, in some other examples, a single pressure sensor **106** may be employed in the pressure sensitive peripheral device **102** for detecting the multiple compressive forces exerted on the multiple sets of the compressive forces. In those examples, the pressure sensor **106** may output a single pressure signal at a given time point with encoded information regarding the multiple compressive forces.

FIG. **5** illustrates one example of applying the compressive forces to the pressure sensitive peripheral device as illustrated in FIG. **4**. It will be described with reference to FIG. **4**. As illustrated in FIG. **4**, a user may use left hand fingers **502** to squeeze the top and bottom surfaces of the housing body **104** of the pressure sensitive mouse **102** shown in FIG. **5** to exert forces **404**A-C as shown in FIG. **4**. As also illustrated in FIG. **4**, the user may simultaneously use right hand fingers **504** to squeeze the right and left surfaces of the housing body **104** to exert forces **402**A-C as shown in FIG. **4**. As described above, responsive to such squeezing of the housing body **104** by the user, the pressure sensor **106** within the pressure sensitive mouse **102** may provide pressure signal(s) to convey information regarding the multiple compressive forces, **402**A-C and **404**A-C, exerted on the housing body **104** of the pressure sensitive mouse **102**. As described below, the squeezing of the pressure sensitive mouse **102** shown in FIG. **5** may enable the user to perform isometric fitness routine(s) to interact with a fitness program, rehabilitation program, treatment program and/or other programs on the computing platform **124**.

Returning to FIG. **1**, in some examples, the pressure sensor **106** may be configured such that a pressure signal regarding compressive forces on two opposing surfaces may be provided only when the compressive forces has breached certain threshold. For example, to achieve this, the pressure sensor **106** may measure the compressive forces and compare the measured forces with a threshold pressure value preconfigured with the pressure sensor **106** or with the pressure sensitive peripheral device **102**. In that example, the pressure signal may be provided by the pressure sensor **106** only when the comparison indicates the measured compressive forces is greater than the threshold pressure value.

In some implementations, the pressure sensitive peripheral device **102** may include a vibration sensor **108**. The vibration sensor **108** may be configured to provide a vibration signal conveying information regarding a vibration of the pressure sensitive peripheral device **102**. The information conveyed by the vibration signal may include a rate of vibration, a magnitude of the vibration, directions of the vibration, and/or any other information regarding the vibration of the pressure sensitive peripheral device **102**.

In some implementations, the pressure sensitive peripheral device **102** may include an accelerometer **110**. The accelerometer **110** may provide rotation signals conveying information regarding a ration of the pressure sensitive peripheral device **102**. For example, the accelerometer **110** may include a tilt sensor (not depicted) to detect a rotation of the pressure sensitive peripheral device **102**. The information conveyed by the rotation signals may include a direction of the rotation, a degree of the rotation, a rate of the rotation, and/or any other rotation information regarding the pressure sensitive peripheral device **102**.

In some implementations, the pressure sensitive peripheral device **102** may include a heart rate sensor **112**. The heart rate sensor **112** may be configured to provide a heart rate output signal that conveys information related to a heart rate of a user associated with pressure sensitive peripheral device **102**. The heart rate sensor **118** may utilize electrocardiography (ECG or EKG). The heart rate output signal may be used to monitor heart rate in real time or record heart rate data for later observation and/or analysis. In some implementations, heart rate sensor **112** is integrated into pressure sensitive peripheral device **102** such that heart rate sensor **112** may measure a user's heart rate by way of physical contact between the user and pressure sensitive peripheral device **102**. The heart rate sensor **112** may communicatively couple with a heart rate monitor that is separate and distinct from pressure sensitive peripheral device **102**, according to some implementations. Examples of separate and distinct heart rate monitors may include a chest strap, a finger clip, a garment with an integrated heart rate monitor, and/or other devices configured to probe heart rate.

In some implementations, the pressure sensitive peripheral device **102** may include a blood pressure sensor **114**. The blood pressure sensor **114** may be configured to generate a blood pressure output signal that conveys information related to a blood pressure of a user associated with pressure sensitive peripheral device **102**. The blood pressure sensor **114** may be based on one or more non-invasive technologies including near IR detection, ultrasound, dielectric spectroscopy, and/or other non-invasive technologies for determining glucose concentration, in accordance with some implementations.

Other component sensors, although not shown in FIG. **1**, may be included in the pressure sensitive peripheral device **102**. For example, in one implementation, the pressure sensitive peripheral device **102** includes a motion sensor for providing motion signals conveying information related to motion and/or orientation of the pressure sensitive peripheral device **102**. In another implementation, the pressure sensitive peripheral device includes pedometer conveying information related to a number of steps taken by the user of the pressure sensitive peripheral device **102**.

In some implementations, the pressure sensitive peripheral device **102** may include a user interface **116**. The user interface **116** may include a touch sensitive surface, one or more buttons, a touch pad, a touch pointer, and any other types of user interface that may be suitably provided on housing body **104** of the pressure sensitive peripheral device **102**. The user interface **116** may be configured to receive user inputs for controlling the pressure sensitive peripheral device **102** and/or as well as the computing platform **124**. In some implementations, the control inputs received from the user interface **116** may be separate and independent from the inputs received from the pressure sensor **106**; and in some other implementations, the control inputs received from the user interface **116** may augment the inputs received from the pressure sensor **106**. For example, in one implementation, a user may be enabled to select a type of compressive forces to be applied by the user on the housing body **104** of the pressure sensitive peripheral device **102** (e.g., squeezing the pressure sensitive peripheral device **102** from the side) through a touch sensitive interface **118** and applying the selected compressive forces to the pressure sensitive peripheral device **104**. In that implementation, the user interface **116** may be configured to provide the user selection of the type of compressive forces being applied by the user to the pressure sensor **106** and/or electronic circuitry **118**. In this way, the pressure applied by the user may be more accurately measured and determined.

In some implementations, the pressure sensitive peripheral device **102** may include electronic circuitry **118**. The electronic circuitry **118** may be configured to provide signal processing capabilities in pressure sensitive peripheral device **102**. As such, electronic circuitry **118** 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. The electronic circuitry **118** may be configured to process pressure signals provided by the pressure sensor **106** and other signals provided by other sensors described above and herein. The electronic circuitry **118** may be configured to generate and provide control inputs to the computing platform **124** based on the received signals. As illustrated, to achieve these functionalities, the electronic circuitry **118** may include a signal component, an input provision component, and/or any other component(s).

Although electronic circuitry **118** is shown in FIG. **1** as a single entity, this is for illustrative purposes only. In some implementations, electronic circuitry **118** may include a plurality of processing units. These processing units may be physically located within the same device, or electronic circuitry **118** may represent processing functionality of a plurality of devices operating in coordination. The electronic circuitry **118** may be configured to execute components **120**, **122**, and/or other components. The electronic circuitry **118** may be configured to execute modules **120**, **122**, and/or other modules by software, hardware, firmware, some combination of software, hardware, and/or firmware, and/or other mechanisms for configuring processing capabilities on electronic circuitry **118**. As used herein, the term "component" may refer to any component or set of components that perform the functionality attributed to the module. This may include one or more physical processors during execution of processor readable instructions, the processor readable instructions, circuitry, hardware, storage media, or any other components.

It should be understood that, although modules **120** and **122** are illustrated in FIG. **1** as being implemented within a single processing unit, in implementations in which processor(s) **124** includes multiple processing units, one or more of modules **120** and/or **122** may be implemented remotely from the other modules. The description of the functionality provided by the different modules **120** and/or **122** described below is for illustrative purposes and is not intended to be limiting, as any of modules **120** and/or **122** may provide more or less functionality than is described. For example, one or more of modules **120** and/or **122** may be eliminated and some or all of its functionality may be provided by other ones of modules **120** and/or **122**. As another example, processor(s) **124** 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 **120** and/or **122**.

The signal component **120** may be configured to receive pressure signals provided by the pressure sensors and as well as signals provided by other sensors described above and herein if they are included in the pressure sensitive peripheral device **102**. To achieve this, the signal component **120** may include timing circuitry configured to poll the pressure signals and other signals (if provided) periodically. In some implementations, the signal component **120** may poll one or more registers for receiving the signals. By way of non-limiting example, a register may be provided within the electronic circuitry **118** such that the pressure sensor **106** may provide the pressure signals by storing data indicating the pressure signal in the register whenever the squeezing of the pressure sensitive peripheral device **102** is detected and measured by the pressure sensor **106**. In that example, the signal component **120** may poll the register for receiving the pressure signals from the pressure sensor **106** periodically (e.g., once every 1/10th of a second). In some other implementations, the signal component **120** may include circuitry that facilitates interrupts such that an interrupt may be generated when a pressure signal is provided by the pressure sensor **106**.

The signal component **120** may be configured to process the pressure signals and other signals (if provided). The signal processing by the signal component **120** may include modulation, amplification, decoding, encoding, noise cancelling, and/or any other types of signal processing operations that may be performed by the signal component **120**. By way of non-limiting example, in one implementation, the pressure signals provided by the pressure sensor **106** may be in an analog format (e.g., a voltage profile). In that implementation, the signal component **120** may modulate the signals and detect sudden increase of the voltage as indicated by the pressure signals provided by the pressure sensor **106** for determining corresponding compressive forces applied to the pressure sensitive peripheral device **102** (e.g., squeezing of the pressure sensitive peripheral device **102** by a user) that caused the voltage increase. In that example, a table of voltage and compressive force correlation may be stored within the electronic circuitry **118** (e.g., inside a memory chip); and during runtime of the pressure sensitive peripheral device **102**, the signal component **120** may consult such a table for determining an amount of pressure/force that caused the increase of the voltage as indicated by the pressure sensor **106**.

In some implementations, the pressures signals and other signals (if provided) may be digitally encoded to represent corresponding information conveying corresponding actions/changes to the pressure sensitive peripheral device **102** detected. In those implementations, the signal component **120** may be configured to decode the digitally encoded information. By way of non-limiting example, the pressure signals provided by the pressure sensor **106** may be digitally encoded to represent an amount of pressure/force detected or measured by the pressure sensor **106**. For instance, a "0010" may mean that 4 pounds of force was measured by the pressure sensor **106** as a result of squeezing of the pressure sensitive peripheral device **102** by a user; a "0011" may mean that 5 pounds of force was measured by the pressure sensor **106** as a result of squeezing of the pressure sensitive peripheral device **102** by a user; and so on. In those implementations, a table of digital code and amount of pressure/force correlation may be stored within the electronic circuitry **118** (e.g., inside a memory chip). During runtime of the pressure sensitive peripheral device **102**, the signal component **120** may consult such a table to decode pressure signals and as well as other signals (if provided).

In some implementations, the signal component **120** may be configured to receive multiple contemporaneous pressure signals provided by pressure sensor **106**. In those implementations, the signal component **120** may be configured to interpret the multiple contemporaneous pressure signals to control one or more aspects of operation of the computing platform **124**.

The input provision component **122** may be configured to provide an input to the computing platform **124** based on the received pressures signals for controlling one or more aspects of the computing platform **124**. The one or more aspects may be related a graphical user interface on a display associated with the computing platform **124** and/or operational aspects of the computing platform **124**. Providing inputs based on the received pressure signals may include generating the inputs as a function of the pressure/force detected or measured by the pressure sensor **106** as indicated by the received signals. By way of non-limiting example, the input provision component **122** may be configured to generate a binary signal for controlling a graphical user interface based on whether the pressure/force indicated by the received pressure signals has breached certain threshold value. For instance, the threshold value may be set as 5 pounds of force, and the control input provision component **122** may generate a signal (e.g., a signal indicating "trigger pressed" by a user for initiating a game action in a game running on the computing platform **124**) only if the user has squeezed the pressure sensitive peripheral device **120** (for example as illustrated in FIG. **3**) with compressive forces greater than 5 pounds.

It should be understood that an input provided by the input provision component **122** to the computing platform **124** based on the pressure signal may be an analog value or a digital value. Digital values having very fine granularity may be interpreted by a user as quasi-analog input. By way of non-limiting example, a user may squeeze the pressure sensitive peripheral device **102** with varying forces in order to enter a value on a quasi-analog meter presented on the display where smaller forces correspond to smaller values on the meter and larger forces correspond to larger values on the meter. In that example, the control input provision component **122** is configured to generate control input correlating the amount of pressure/force applied to the housing body **104** as a result of the squeezing of the pressure sensitive peripheral device **102** by the user. For instance, an input of "1" may be generated if one pound of force is detected, an input of "2" may be generated if two pounds of force is detected, an input of "3" may be generated if three pounds of force is detected and so on. As another example, a user may enter a height of the user in a text field presented on the display where smaller forces correspond to shorter heights and larger forces correspond to taller heights. However, in some examples, the control inputs provided to the computing platform **124** may be in analog format. For example, the input provision component **122** may provide continuous analog inputs corresponding to the varying forces applied to the housing body **104** by the user to computing platform **124**. Such analog inputs may be useful for interacting with a fitness program that instructs a user to perform isometric exercise routine.

In some implementations, the input provision component **122** may be configured to interpret the received pressure signal to control one or more aspects of operation of pressure sensitive peripheral device **102** based on a position on pressure sensitive peripheral device **102** on which the opposing forces were applied. By way of non-limiting example, squeezing front and rear surfaces of pressure sensitive peripheral device **102** may correspond to one input, while squeezing top and bottom surfaces of pressure sensitive peripheral device **102** may correspond to another input.

In some implementations, the control input provision component **122** may be configured to quantify the compressive pressure applied to housing body **104**. For example, the input provision component **122** may quantify the compressive pressure applied to housing body **104** on an arbitrary scale such as a scale between one and ten, a scale between one and five stars, and/or other arbitrary scale. As another example, the control input provision component **122** may quantify the compressive pressure or force (or other suitable metric) applied to housing body **104** in absolute units such as pounds (lb), kilograms (kg), Newtons (N), pounds per square inch (PSI), Pascals (Pa), Newtons per meters squared (N/m^2), and/or other absolute units.

As illustrated in FIG. **1**, the pressure sensitive peripheral device **102** may be configured to communication with one or more computing platforms **124** (e.g., one or more servers **116** and/or one or more computing platforms **118**) via any suitable wired or wireless communication medium, such as, but not limited to, universal serial bus (USB), coaxial cable, Bluetooth, near field radio frequency, or any other types of wired or wireless communication medium. As illustrated, the pressure sensitive peripheral device **102** may provide inputs and/or signals to the computing platform **124** for controlling one or more aspects of the computing platform **124**. As described above and herein, in some implementations, the pressure sensitive peripheral device **102** may include electronic circuitry, such as the electronic circuitry **118** described above and herein, configured to provide inputs to the computing platform **124** based on the pressure signals and any other signals (if provided). However, this is not necessarily the only case. In some implementations, some or all of the functionality attributed to the electronic circuitry **118** described above and herein may reside within the computing platform **124**. For example, in one implementation, one or more driver components may be included in the computing platform **124** for receiving and processing the control signals from the pressure sensitive peripheral device **102**. In that implementation, the pressure sensitive peripheral device **102** may be configured to transmit analog signals conveying magnitude of the compressive forces applied to the housing body **104** at any given point of time, and the driver component(s) on the computing platform **124** may be configured to receive and interpret the analog pressure signals and generate control inputs based on the received signals in the similarly way(s) to that described above for electronic circuitry **122**. FIG. **6** illustrates one example of such an implementation. As illustrated in FIG. **6**, one or more processors **602** of the computing platform **124** may comprise a signal component **608** with the similar or same functionalities to those attributed to signal component **122** (described above and herein), a input provision component **606** with the similar or same functionalities to those attributed to input provision component **120** (described above and herein), and/or any other driver components. As also shown in FIG. **6**, the processor(s) **602** may include a graphical user interface component that provides graphical user interface for a user to interact with the computing platform **124**.

Returning to FIG. **1**, the inputs to the computing platform **124** based on pressure signals provided by the pressure sensor **106** may be used to control one or more aspects of the computing platform **124**. The one or more aspects may include one or more aspects of a graphical user interface on a display associated with the computing platform **124**, one or more operational aspects associated of the computing platform **124**, and/or any other aspects of the computing platform **124**. By way of non-limiting example, the one or more aspects of the graphical user interface controlled by squeezing pressure sensitive peripheral device **102** may include one or more of input of a value, selection from a menu, manipulation of a virtual object, entry of a password or a code, scrolling, moving a pointer by the user in the graphical user interface, interaction with a fitness program, interaction with a rehabilitation program, interaction with a medical treatment program, interaction with a game by the user through the graphical user interface, and/or other aspects of the graphical user interface on the display associated with pressure sensitive peripheral device **102**. Some aspects of the graphical user interface that may be controlled by squeezing the pressure sensitive peripheral device **102** are described below. It should be understood that these descriptions are illustrative and thus not intended to be limiting or exhaustive. One skilled in the art will appreciate other input methods enabled by squeezing the pressure sensitive peripheral device **102** in accordance with the present disclosure.

Input of a value such as a password through the pressure sensitive peripheral device **102** may be achieved by a sequence of squeezes performed on pressure sensitive peripheral device **102**. For example, a user may perform different magnitudes and/or different durations of squeezes on pressure sensitive peripheral device **102**. For instance, a user may perform a specific combination of short and long squeezes on pressure sensitive peripheral device **102** as a password input to the computing platform **124** via the graphical user interface. Combinations of squeezes on different locations of pressure sensitive peripheral device **102** may be used as input of different values, according to some implementations.

Selection from a menu in the graphical user interface through the pressure sensitive peripheral device **102** may be achieved by a squeeze with compressive force within a range corresponding to a menu item in the menu. By way of non-limiting example, a user may be enabled to select different menu items from the menu by squeezing the pressure sensitive peripheral device **102** with varying compressive forces. For instance, a first menu item may be selected by the user by squeezing the pressure sensitive peripheral device **102** with a first range of compressive forces (e.g., 1-3 pounds), a second menu item may be selected by the user by squeezing the pressure sensitive peripheral device **102** with a second range of compressive forces (e.g., 3-5 pounds), a third menu item may be selected by the user by squeezing the pressure sensitive peripheral device **102** with a third range of compressive forces (e.g., 5-7 pounds), and so on. However, this is not intended to be limiting. In some implementations, selection of menu items may be achieved by squeezing the pressure sensitive peripheral device **102** at different surfaces or locations (if the surface of the pressure sensitive peripheral device is spherical).

Scrolling the graphical user interface on the display associated with the computing platform **124** may be achieved by squeezing the pressure sensitive peripheral device **102** with compressive forces intermittently with more or less a uniform cadence. By way of non-limiting example, a user may be enabled to scroll the graphical user interface by squeezing the pressure sensitive peripheral device **102** in an on-and-off manner repetitively. The direction of scrolling may be achieved by squeezing different parts of the pressure sensitive peripheral device **102**. For instance, squeezing front part of side surfaces of housing body **104** of a pressure sensitive mouse **102** may enable the user to scroll the graphical user interface up; and squeezing the rear part of the side surfaces of the pressure sensitive mouse **102** may enable the user to scroll the graphical user interface down.

Manipulation of a virtual object based on the pressure signal may be further based on an accelerometer signal conveying a position and/or a change in position of pressure sensitive peripheral device **102**. For example, a virtual object may be "grasped" by squeezing pressure sensitive peripheral device **102**. The position of the virtual object may be controlled through corresponding a position and/or a change in position of pressure sensitive peripheral device **102**. The accelerometer signal may be provided by an accelerometer (not depicted) and/or other position detection device included in pressure sensitive peripheral device **102**. In one implementation, exertion and release of pressure may respectively result in zoom-in and zoom-out of a three-dimensional virtual space.

Interaction with a fitness program through the graphical user interface by the user may include squeezing pressure sensitive peripheral device **102** by the user. The pressure signals provided by the pressure sensor **106** as a result of the user squeezing of the pressure sensitive peripheral device

102 may be used during isometric and/or dynamic exercise routines in the fitness program, such as those disclosed in U.S. patent application Ser. No. 13/527,465 filed on Jun. 19, 2012 and entitled "Personal Wellness Device," which is incorporated herein by reference. Such routines may be provided by the fitness program, which may involve user squeezing pressure sensitive peripheral device with a threshold force, for a threshold duration of time, for a number of repetitions, and/or other exercise metrics. According to some implementations, the fitness program may include squeezing pressure sensitive peripheral device **102** to achieve a variable target force over time. For example, a graphical indication and/or other indication may convey, via the graphical user interface, to a user when the force applied is above or below a target force. The target force may change over time, according to a fitness program. The target force may change responsive to the applied force equaling the target force.

By way of non-limiting example, the fitness program may include elements instructing or challenging a user to perform a isometric exercise routine, including but not limited to, squeezing the pressure sensitive peripheral device **102** using two hands for certain duration. In that example, the user may be enabled to perform such an isometric routine as illustrated by FIG. **5**. Upon successful performance of the isometric exercise routine by the user, the fitness program may reward the user with virtual points, currency, unlocking of virtual items, new exercise routine(s), and/or other types of rewards. In some instances, the fitness program may instruct the user to perform the isometric exercise route in a corrected form upon interpreting the squeezing motion conveyed by the pressure signals provided by the pressure sensor **106**. In those implementations, the fitness program may include analysis component that analyzes user performance of isometric exerciser routines facilitated by the fitness program. In some implementations, the fitness program may instruct, challenge or otherwise motivate a user to squeeze the pressure sensitive peripheral device **102** while moving the pressure sensitive peripheral device **102** along a predetermined curve line. In those implementations, the pressure sensitive peripheral device **102**, such as a pressure sensitive mouse **102**, may provide signals indicating pressure applied by the user on the housing body of the pressure sensitive mouse **102**, motion performed by the pressure sensitive mouse **102**, and any other information.

FIG. **7** illustrates one example of computing platform **124** for facilitating receiving user inputs from a pressure sensitive peripheral device **102**. It will be described with reference to FIG. **1**. In this example, the processor(s) **702** of the computing platform **124** is configured with a graphical user interface component **704**, a fitness program component **706**, an analysis component **708**, and other components. As shown, the computing platform **124** may receive user inputs from the pressure sensitive peripheral device **102**. The received user inputs may include information indicating performance of an isometric routine (e.g., squeezing the pressure sensitive peripheral device **102** with certain compressive forces for a certain duration). The analysis component **708** may be configured to analyze the performance of the isometric exercise by the user based on the received user inputs. The fitness program **706** may be configured to provide the user instructions, challenges, rewards, aids, and/or any other types of elements to engage the user to perform isometric exercise routines and/or any other types of exercise routines. The graphical user interface component **704** may be configured to provide graphical indications, visual cues, instructions, and/or any other types of feedbacks to the user regarding their performance of isometric exercises routines, instructions, challenges, and/or any other types of feedbacks.

Interaction with a game through the pressure sensitive peripheral device **102** may include user squeezing the pressure sensitive peripheral device **102** to initiate one or more game actions in the game. The game actions enabled by the pressure sensitive peripheral device **102** may include movement with a force (e.g., thrusting, dashing, turbo charge, etc.), combat action with a force (e.g., jabbing, heaving, waving with a corresponding force, etc.), firing a shot, changing camera angles, selecting next weapon, accelerating, looking around, changing virtual character/units/avatar under control, and/or any other game actions.

By way of non-limiting example, a user may be enabled to initiate a game action such as punching, thrusting, heaving, waving, or any other hand movements of a virtual character (e.g., an avatar representing the user) with varying forces. For instance, the user may be enabled to initiate such an action with little force by squeezing the pressure sensitive peripheral device **102** lightly, and to initiate such an action with much force by squeezing the pressure sensitive peripheral device **102** strongly. In one implementation, the pressure sensitive peripheral device **102** is a pressure sensitive mouse; and in that implementation, the user is enabled to initiate n combat action with varying forces by controlling the compressive forces applied to the housing body **104** of the pressure sensitive mouse **102**. In another example, the pressure sensitive peripheral device **102** is a pressure sensitive joystick; and in that implementation, the user is enabled to initiate a movement in the game with varying forces by squeezing the pressure sensitive joystick **102** with varying compressive forces while moving the pressure sensitive joystick **102** directionally.

By way of another non-limiting example, the user may be enabled to initiate an aim and shoot action in the game by squeezing the pressure sensitive peripheral device **102** with compressive forces above certain threshold value. This may simulate a trigger action. In some examples, the user may be enabled to select next weapon in the game by repetitively squeeze the pressure sensitive peripheral device **102** until a desired weapon is selected by the user. Still in another example, the user may be enabled to accelerate a virtual vehicle under control of the user in the game by squeezing the pressure sensitive peripheral device **102** suddenly. It should be understood these are just some of the game controls that may be achieved by squeezing the pressure sensitive peripheral device **102** for illustration purpose. Accordingly, these examples are not intended to be limiting or exhaustive. One skilled in the art will appreciate other examples of game controls enabled by squeezing the pressure sensitive peripheral device **102** in accordance with the disclosure.

FIG. **8** illustrates yet another example of computing platform **124** shown in FIG. **1** for facilitating receiving user inputs from a pressure sensitive peripheral device also shown in FIG. **1**. In this example, the processor(s) **802** of the computing platform **124** is configured with a graphical user interface component **804**, a game component **806**, a game action component **808**, and other components. As shown, the computing platform **124** may receive user inputs from the pressure sensitive peripheral device **102**. The received user inputs that initiate one or more game actions in the game provided by the game component **808** (e.g., by squeezing the pressure sensitive peripheral device **102** with certain compressive forces for a certain duration). The game action component **808** may be configured to interpret the user inputs received from the pressure sensitive peripheral device **102**. The game action component may translate the received user inputs into one or more corresponding game actions as predefined by a provider, administrator, moderator, and/or any other entities related to the game provided by the game component **806**. The fitness program **806** may be configured to provide the game by determining one or more states of the game at a given time point. Determining the game state(s) by the game component may include determining a result of the game action(s) initiated by the user through squeezing the pressure sensitive peripheral device **102**. The graphical user interface component **804** may be configured to provide an interface for user to interact with the game provided by the game component **806**. The interface provided by the graphical user interface component **804** may include views of the game to reflect the result of the game action(s) initiated by the user through squeezing the pressure sensitive peripheral device **102**.

FIG. **9** illustrates a method **900** of facilitating receipt of user input using a pressure sensitive peripheral device with a pressure sensor in accordance with the disclosure. The operations of method **900** presented below are intended to be illustrative. In some embodiments, method **900** 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 **900** are illustrated in FIG. **9** and described below is not intended to be limiting.

In some embodiments, method **900** 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 **900** 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 **900**.

At an operation **902**, compressive forces applied to a housing body or housing bodies of a pressure sensitive peripheral device may be received. In some implementations, the compressive forces received in operation **902** may be applied by a user to any opposing surfaces of housing body of pressure sensitive peripheral device, i.e. squeezing the pressure sensitive peripheral device. This does not include clicking, (e.g., clicking buttons disposed on the pressure sensitive peripheral device **102**), tapping and/or dragging on a surface of the pressure sensitive peripheral device **102**, or other input methods that merely require force in one direction instead of two opposing forces applied to two opposing surfaces. A user may squeeze pressure sensitive peripheral device using two opposing palms that cover entire opposing surfaces. As another example, a user may squeeze pressure sensitive peripheral device using a thumb and index finger that contact portions of opposing surfaces. In some implementations, multiple compressive forces applied to different surfaces or parts of the housing body of the pressure sensitive peripheral device may be received in operation **902**. In some implementations, operation **902** may be performed by one or more of a pressure sensor disposed within the housing body or bodies of the pressure sensitive peripheral device that is the same as or similar to the pressure sensor **106** described above and herein.

At an operation **904**, a pressure signal based on the compressive forces received in operation **902** may be provided. The pressure signal provided by operation **904** may convey information associated with the compressive forces received in operation **902**. The information may include a magnitude of a pressure or force, duration of a pressure or force, a pressure or force magnitude profile as a function of time, a quantity of compressive forces, and/or other information related to compressive force applied on the housing body or housing bodies of the pressure sensitive peripheral device. In some implementations, operation **904** may be performed by one or more of a pressure sensor disposed within the housing body or bodies of the pressure sensitive peripheral device that is the same as or similar to the pressure sensor **106** described above and herein.

In operation **906**, the signal provided in operation **904** may be processed. Processing the signal in operation **906** may involve modulation, amplification, decoding, encoding, noise cancelling, and/or any other types of signal processing operations that may be performed to process the signal from the pressure sensor. In some implementations processing the signal in operation **906** may include quantify a pressure or force indicated by the signal on an absolute and/or arbitrary scale. In some implementations, the signal from the pressure sensor may indicate multiple forces applied to different surfaces or parts of the pressure sensitive peripheral device contemporaneously or near contemporaneously. In those examples, operation **906** may interpret the multiple forces for providing inputs. In some implementations, operation **904** may be performed by a signal component that is the same as or similar to the signal component **120** described above and herein.

In operation **908**, an input to a computing platform may be provided based on the signal processing in operation **906**. The input provided in operation **908** may be used to control one or more aspects of the computing platform, which may include one or more aspects of a graphical user interface on a display associated with the computing platform, one or more operational aspects of the computing platform, and/or any other aspects of the computing platform. By way of non-limiting example, the one or more aspects of the graphical user interface may include one or more of input of a value, selection from a menu, scrolling, moving a pointer, manipulation of a virtual object, entry of a password or a code by the user in the graphical user interface, interaction with a fitness program, interaction with a rehabilitation program, interaction with a medical treatment program, interaction with a game by the user through the graphical user interface, and/or other aspects of the graphical user interface. The one or more operational aspects of the computing platform may including volume a level of a sound output by the computing platform, powering on or off the computing platform, resolution of a video output by the computing platform, network mode (e.g., connected through Wi-Fi) or non-network mode (e.g., no network connections), brightness of a display coupled to the computing platform, and/or any other operational aspects of the computing platform. In some implementations, operation **908** may be performed by an input provision component that is the same as or similar to the input provision component **122** described above and herein.

Although the present technology has been described in detail for the purpose of illustration based on what is currently considered to be the most practical and preferred implementations, it is to be understood that such detail is solely for that purpose and that the technology is not limited to the disclosed implementations, 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 technology contemplates that, to the extent possible, one or more features of any implementation can be combined with one or more features of any other implementation.

What is claimed is:

1. A pressure sensitive peripheral device with one or more pressure sensors to facilitate receipt of user inputs to a computing platform, the pressure sensitive peripheral device comprising:

a housing body;

one or more pressure sensors disposed within and in contact with the housing body, the one or more pressure sensors being configured to provide a pressure signal conveying information from a compressive pressure applied to the housing body, the pressure signal being provided responsive a first set of two opposing forces applied to the housing body, wherein the first set of two opposing forces does not perform a clicking motion; and,

wherein the one or more pressure sensors are further configured to transmit the pressure signal to electronic circuitry configured to:

receive the pressure signal provided by the one or more pressure sensors, and

responsive to receiving the pressure signal provided by the one or more pressure sensors, provide an input to the computing platform based on the received the pressure signal which is constant or variable in time, the input being provided to facilitate controlling a graphical user interface presented on a display associated with the computing platform in accordance with a fitness exercise shown by the graphical user interface,

wherein providing the input to the computing platform based on the received pressure signal provided by the one or more pressure sensors comprises determining whether the compressive pressure applied to the housing body has reached a minimum magnitude that corresponds to a minimum physical exercise level, and only providing the input to the computing platform responsive to the compressive pressure reaching the minimum magnitude, wherein controlling the graphical user interface in accordance with the fitness exercise includes movement of an indicator shown by the graphical user interface by compressing the housing body of the pressure sensitive peripheral device such that the indicator moves along a curve line displayed by the graphical user interface for a time period.

2. The pressure sensitive peripheral device of claim **1**, wherein the one or more pressure sensors are further configured to provide a second pressure signal conveying information associated with a second compressive pressure applied to the housing body, the second pressure signal being provided responsive to a second set of two opposing forces applied to parts of the housing body, wherein the second set of two opposing forces are separate and discrete from the first set of two opposing forces.

3. The pressure sensitive peripheral device of claim **1**, wherein the electronic circuitry is further configured such that providing the input to the computing platform based on the received pressure signal provided by the one or more pressure sensors comprises determining whether the compressive pressure applied to the housing body has breached a threshold minimum magnitude level that corresponds to the minimum physical exercise level.

4. The pressure sensitive peripheral device of claim **1**, wherein controlling the graphical user interface presented on the display associated with the computing platform as facilitated by the provided input also includes one or more of:

input of a value in the graphical user interface;

selection from a menu in the graphical user interface;

scrolling the graphical user interface;

moving a pointer in the graphical user interface;

manipulation of a virtual object in the graphical user interface;

entry of a password or a code in the graphical user interface;

interaction with a rehabilitation program through the graphical user interface;

interaction with a medical treatment program through the graphical user interface; and

interaction with a game through the graphical user interface.

5. The pressure sensitive peripheral device of claim **1**, wherein the fitness exercise is an isometric exercise.

6. The pressure sensitive peripheral device of claim **1**, wherein controlling the graphical user interface in accordance with the fitness exercise includes compression of the pressure sensitive peripheral device with a threshold force, for a threshold duration of time, and/or for a number of repetitions.

7. The pressure sensitive position device of claim **4**, wherein interaction with the game includes performing one or more game actions through the pressure sensitive peripheral device.

8. The pressure sensitive peripheral device of claim **4**, wherein entry of the password or the code based on the pressure signal is achieved by a sequence of forces applied on the pressure sensitive peripheral device, a rotation of the pressure sensitive peripheral device, and/or one or more gestures input through display associated with the computing platform.

9. The pressure sensitive peripheral device of claim **1**, further comprising an accelerometer and/or a gyroscope configured to provide a position signal conveying a position and/or a change in position of the pressure sensitive peripheral device, and wherein the input to the computing platform is further based on the position signal provided by the accelerometer and/or the gyroscope.

10. The pressure sensitive peripheral device of claim **1**, wherein the electronic circuitry is further configured to receive multiple contemporaneous pressure signals provided by the one or more pressure sensors and to interpret the multiple contemporaneous pressure signals for providing the input to the computing platform.

11. The pressure sensitive peripheral device of claim **1**, wherein the electronic circuitry is further configured to quantify the compressive pressure applied to the housing body.

12. The pressure sensitive peripheral device of claim **1**, further comprising:

a heart rate sensor disposed within the housing body, the heart rate sensor being configured to provide a heart rate signal of a user of the pressure sensitive peripheral device;

a blood pressure sensor disposed with the housing body, the blood pressure sensor being configured to provide a signal measuring a blood pressure of the user of the pressure sensitive peripheral device; and/or a vibration sensor disposed within the housing body, the vibration sensor being configured to provide a vibrating signal conveying information indicating a vibration of the pressure sensitive peripheral device; and,

wherein the electronic circuitry is further configured to process the heart rate signal, the signal measuring the blood pressure of the user, and/or the vibration signal for generating the control input.

13. The pressure sensitive peripheral device of claim wherein the pressure sensitive peripheral device includes a computer mouse, a trackball, a joystick, a gamepad, a driving wheel, or a remote control.

14. The pressure sensitive peripheral device of claim **1**, wherein the electronic circuitry is disposed within the pressure sensitive peripheral device.

15. The pressure sensitive peripheral device of claim **1**, wherein the electronic circuitry is disposed within the computing platform.

16. A system for facilitating receipt of user inputs through a pressure sensitive peripheral device, the pressure sensitive peripheral device having a housing body with one or more pressure sensors disposed therein, the system comprising

one or more physical processors configured to execute computer program instructions to cause the one or more physical processors to:

receive, from the one or more pressure sensors, a pressure signal which is constant or variable in time conveying information associated with a compressive pressure applied to the housing body of the pressure sensitive peripheral device, the pressure signal being provided responsive to a first set of two opposing forces applied to the housing body, wherein the first set of two opposing forces does not perform a clicking motion; and

responsive to receiving the pressure signal provided by the one or more pressure sensors, provide an input to a computing platform based on the received pressure signal, the input being provided to facilitate controlling a graphical user interface presented on a display associated with the computing platform in accordance with a fitness exercise shown by the graphical user interface,

wherein providing the input to the computing platform based on the received pressure signal provided by the one or more pressure sensors comprises determining whether the compressive pressure applied to the housing body has reached a minimum magnitude that corresponds to a minimum physical exercise level, and only providing the input to the computing platform responsive to the compressive pressure reaching the minimum magnitude, wherein the fitness exercise is an isometric exercise performed through the pressure sensitive peripheral device by squeezing and/or moving the pressure sensitive peripheral device such that an indicator shown by the graphical user interface moves along a curve line displayed by the graphical user interface for a time period.

17. The system of claim **16**, wherein the one or more processors are further configured to execute computer program instructions to cause the one or more physical processors to provide a second pressure signal conveying information associated with a second compressive pressure applied to the housing body, the second pressure signal being provided responsive to a second set of two opposing forces applied to parts of the housing body, wherein the second set of two opposing forces are separate and discrete from the first set of two opposing forces.

18. The system of claim **16**, wherein providing the input to the computing platform based on the received pressure signal provided by the one or more pressure sensors comprises determining whether the compressive pressure applied to the housing body has breached a threshold minimum magnitude level that corresponds to the minimum physical exercise level.

19. The system of claim **16**, wherein controlling the graphical user interface presented on the display associated with the computing platform as facilitated by the provided input also includes one or more of:

input of a value in the graphical user interface;

selection from a menu in the graphical user interface;

scrolling the graphical user interface;

moving a pointer in the graphical user interface;

manipulation of a virtual object in the graphical user interface;

entry of a password or a code in the graphical user interface;

interaction with a rehabilitation program through the graphical user interface;

interaction with a medical treatment program through the graphical user interface; and

interaction with a game through the graphical user interface.

20. The system of claim **19**, wherein interaction with the game includes performing one or more game actions through the pressure sensitive peripheral device.

21. The system of claim **16**, wherein the one or more processors are further configured to execute computer program instructions to cause the one or more physical processors to receive multiple contemporaneous pressure signals provided by the one or more pressure sensors and to interpret the multiple contemporaneous pressure signals for providing the input to the computing platform.

22. A method for facilitating receipt of user inputs through a pressure sensitive peripheral device, the pressure sensitive peripheral device having a housing body with one or more pressure sensors disposed therein, the method being implemented in one or more physical processors configured to execute computer instructions, the method comprising:

providing, with the one or more pressure sensors, a pressure signal which is constant or variable in time conveying information associated with a compressive pressure applied to the housing body of the pressure sensitive peripheral device, the pressure signal being provided responsive to the housing body being squeezed by a first set of two opposing forces applied to the housing body, wherein the first set of two opposing forces does not perform a clicking motion;

receiving, with the one or more physical processors, the pressure signal provided by the one or more pressure sensors in contact with the housing; and

responsive to receiving the pressure signal provided by the one or more pressure sensors, providing, with the one or more physical processors, a control input to a computing platform based on the received pressure signal, the input being provided to facilitate controlling a graphical user interface presented on a display associated with the computing platform in accordance with a fitness exercise shown by the graphical user interface,

wherein providing the input to the computing platform based on the received pressure signal provided by the one or more pressure sensors comprises determining whether the compressive pressure applied to the housing body has reached a minimum magnitude that corresponds to a minimum physical exercise level, and only providing the input to the computing platform responsive to the compressive pressure reaching the minimum magnitude, wherein interaction with the fitness exercise is an isometric exercise performed through the pressure sensitive peripheral device by squeezing and/or moving the pressure sensitive peripheral device such that an indicator displayed by the graphical user interface moves along a curve line displayed by the graphical user interface for a time period.

23. The method of claim **22**, further comprising providing a second pressure signal conveying information associated with a second compressive pressure applied to the housing body, the second pressure signal being provided responsive to a second set of two opposing forces applied to parts of the housing body, wherein the second set of two opposing forces are separate and discrete from the first set of two opposing forces.

24. The method of claim **22**, wherein providing the input to the computing platform based on the received pressure signal provided by the one or more pressure sensors comprises determining whether the compressive pressure applied to the housing body has breached a threshold minimum magnitude level that corresponds to the minimum physical exercise level.

25. The method of claim **22**, wherein controlling the graphical user interface presented on the display associated with the computing platform as facilitated by the provided input also includes one or more of:

input of a value in the graphical user interface;

selection from a menu in the graphical user interface;

scrolling the graphical user interface;

moving a pointer in the graphical user interface;

manipulation of a virtual object in the graphical user interface;

entry of a password or a code in the graphical user interface;

interaction with a rehabilitation program through the graphical user interface;

interaction with a medical treatment program through the graphical user interface; and

interaction with a game through the graphical user interface.

26. The method of claim **25**, wherein interaction with the game includes performing one or more game actions through the pressure sensitive peripheral device.

27. The method of claim **22**, further comprising receiving multiple contemporaneous pressure signals provided by the one or more pressure sensors and to interpret the multiple contemporaneous pressure signals for providing the input to the computing platform.

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专利名称(译)	压敏外围设备和相关的使用方法		
公开(公告)号	[US10124246](US10124246)	公开(公告)日	2018-11-13
申请号	US14/257868	申请日	2014-04-21
[标]申请(专利权)人(译)	EZ作为饮料PRODIONS		
申请(专利权)人(译)	EZ作为饮料PRODUCTIONS，INC.		
[标]发明人	YANEV KOSTADIN DIMITROV YANEV IVO KOSTADINOV KALAYDJIYSKI LUDMIL BORISSOV		
发明人	YANEV, KOSTADIN DIMITROV YANEV, IVO KOSTADINOV KALAYDJIYSKI, LUDMIL BORISSOV		
IPC分类号	A61B5/00 G06F3/041 G06F19/00 G06F3/038 A63F13/20 G06F3/0338 A61B5/021 A61B5/024 A63B21/02 A63B23/035 A63B23/16 A63B21/00 A63B71/06		
CPC分类号	A63F13/212 G16H20/30 G06F3/0338 G06F3/0383 G06F3/0414 G06F19/00 A61B5/6897 A61B5/021 A61B5/02438 A63B21/028 A63B21/4035 A63B23/03508 A63B23/16 A63B71/0622 A63B2220/51 A63B2220/56 A63B2225/50 A63F13/06 G06F19/3481		
代理机构(译)	皮尔斯伯里 - 温斯罗普肖 - 皮特曼律师事务所		
其他公开文献	US20150301613A1		
外部链接	Espacenet		

摘要(译)

公开了通过向压敏外围设备上的一个或多个外部点施加变化的压力来促进用户向计算平台提供输入。压敏外围设备可包括设置在压敏外围设备的壳体或壳体内的一个或多个压力传感器。压力传感器可以提供压力信号，该压力信号传递与施加到压敏外围设备的壳体或压缩力的压力相关的信息。可以基于压力信号提供控制耦合到压敏外围设备的计算平台的一个或多个方面的输入。计算平台的一个或多个方面可以包括与计算平台相关联的显示器上的图形用户界面的一个或多个方面，计算平台的操作方面和/或计算平台的任何其他方面。