

DESCRIPTION

Title of Invention: MASSAGING APPARATUS

Technical Field

[0001] The present invention relates to a massaging apparatus operable by a mobile electronic information equipment. Moreover, the present invention relates to a technique for a massaging apparatus operable by a mobile electronic information equipment, for allowing a massager user wearing the mobile electronic information equipment around his or her eyes to operate the mobile electronic information equipment from a remote location.

Background Art

[0002] As disclosed in Patent Literature 1, etc., there is a heretofore known chair massager equipped with a remote-control operation terminal for its operation. The operation terminal and the chair massager are operatively connected together by wired system.

Patent Literature 2 discloses a relaxing and freshening-up system that utilizes moving images produced by computer-graphics process.

[0003] This chair massager user-targeted system allows a massager user wearing a display device in eyeglasses form to get message while enjoying on-display viewing of images in a relaxed state of mind. Thus, the system disclosed in Patent

Literature 2 necessitates an intricate mechanism to show images such as photographed images and virtual reality pictures on the eyeglasses-like display device.

[0004] Remarkable progress has recently been made in the development of mobile electronic information equipments typified by smartphones such as iPhone (registered trade mark). For example, in addition to serving as a telephone, the mobile electronic information equipment provides access to numerous websites on Internet, sends and receives e-mails, and runs various software programs such as game programs via applications. Besides, the mobile electronic information equipment is capable of display of various images, including photographed images and virtual reality pictures.

[0005] Patent Literature 3 discloses, as a device for viewing of images shown on a mobile electronic information equipment, a display in goggle form constructed of a box-shaped frame body capable of receiving a mobile electronic information equipment at its forward end, expressed differently, a head-mounted display designed for insertion of a mobile electronic information equipment. After wearing this display around his or her head, a user is able to view images shown on the mobile electronic information equipment from behind the rear end of the frame body with his or her hands free.

Citation List

Patent Literature

[0006] Patent Literature 1: Japanese Unexamined Patent
Publication JP-A 2012-90698

Patent Literature 2: Japanese Unexamined Patent
Publication JP-A 2001-9036

Patent Literature 3: Japanese Unexamined Patent
Publication JP-A 2015-106915

Summary of Invention

Technical Problem

[0007] Unfortunately, in such an operation terminal, there are definite limits on the performance capability of a built-in CPU and memory capacity. This imposes limitations on display of menu items for operation, etc.

Furthermore, one and common massaging apparatus may be used by a number of people. For example, in cases where the massaging apparatus is used by a family of five, massage modes desired by the individual family members normally differ from one another. For flexibility in meeting individual needs, the data of different massage modes for all the family members may be stored on an operation terminal in use. However, the limited performance capability of a built-in CPU and the limited memory capacity in the operation terminal as disclosed in Patent Literature 1 lead to difficulties in the storage of such a big data.

[0008] In this regard, remarkable progress has recently been made in the development of mobile electronic information

equipments typified by smartphones such as iPhone (registered trademark). For example, in addition to serving as a telephone, the mobile electronic information equipment provides access to numerous websites on Internet, sends and receives e-mails, and runs various software programs such as game programs via applications. To achieve such various capabilities, the mobile electronic information equipment incorporates, in addition to a high-performance CPU, a high-capacity memory.

[0009] This trend has created customer (user) requests asking the use of a mobile electronic information equipment as an operation terminal for operating a massaging apparatus.

An object of the present invention is to provide a massaging apparatus operable by a user-owned mobile electronic information equipment such as iPhone (registered trade mark).

Moreover, when it is desired to operate a chair massager to get massage while viewing favorite images as disclosed in Patent Literature 2, the use of the head-mounted display designed for insertion of a mobile electronic information equipment as disclosed in Patent Literature 3 (hereafter also referred to as "a virtual-reality goggle", or "VR goggle") allows the user to enjoy the massage in a relaxed state of mind.

[0010] Unfortunately, the following problems are encountered during the described massage time.

For example, let it be assumed that the phone equipped in the mobile electronic information equipment rings during the

time the user wearing the VR goggle carrying the mobile electronic information equipment is getting massage. To answer the phone call, the user has to take the VR goggle on his or her head off to remove the mobile electronic information equipment from the VR goggle. This is very troublesome.

[0011] Moreover, in keeping with progress in IoT technology, attempts to render a variety of things Internet-enabled are being pursued. As an example, efforts are being expended to make possible the use of a mobile electronic information equipment in place of an operation terminal of a massaging apparatus.

In the technique intended for this purpose, a predetermined application is used to permit display of menu items for operation of a chair massager on the display section of a mobile electronic information equipment owned by a user sitting in the chair massager. The user is able to control the working conditions of the chair massager (for example, to change the massage mode, adjust the massage intensity level, start massaging motion, and stop massaging motion) simply by manipulating the display section of the mobile electronic information equipment of his or her own.

[0012] Unfortunately, the use of such a technique may pose inconvenience, too.

For example, let it be assumed that the user has a thought of changing massage conditions or stopping massaging motion during the time he or she is getting massage while enjoying viewing

of images using the VR goggle.

However, the mobile electronic information equipment is carried by the VR goggle, which makes it difficult for the user to operate the mobile electronic information equipment by manipulating its display section with his or her fingers. To operate the mobile electronic information equipment, the user has to take the VR goggle on his or her head off to remove the mobile electronic information equipment from the VR goggle. This is very troublesome, too.

[0013] An object of the present invention is to provide a massaging apparatus in chair form that allows, under conditions where the massaging apparatus can be operated by a user-owned mobile electronic information equipment such as iPhone (registered trade mark), the user to change massaging operation conditions and receive a phone call even during the time he or she is getting massage while enjoying viewing of images using a VR goggle carrying the described mobile electronic information equipment.

Solution to Problem

[0014] For accomplishment of the described object, the following technical means is adopted in order that the present invention may be carried into effect.

The present invention provides a massaging apparatus for massaging massage target areas of user's body. The massaging apparatus is operable by a user-owned mobile electronic

information equipment.

It is preferable that the massaging apparatus has a massaging mechanism that massages the message target areas of user's body, and that the massaging mechanism can be operated by the mobile electronic information equipment.

[0015] It is preferable that the massaging apparatus has a position-changing mechanism that changes a position of the massaging apparatus, and that the position-changing mechanism can be operated by the mobile electronic information equipment.

It is preferable that the massaging apparatus has an additional mechanism for enhancing an effect of massage treatment given to a user, and that the additional mechanism can be operated by the mobile electronic information equipment.

[0016] It is preferable that, for operation of at least one or more mechanisms selected from among the massaging mechanism, the position-changing mechanism, the additional mechanism, and a control mechanism, changing of operation-related display items is effected by the mobile electronic information equipment.

It is preferable that a voice-recognition system available in the mobile electronic information equipment is utilized to operate at least one or more mechanisms selected from among the massaging mechanism, the position-changing mechanism, the additional mechanism, and the control mechanism, or to effect changing of operation-related display items.

[0017] It is preferable that the massaging apparatus has

a stress sensor that detects user's stress level, that an output from the stress sensor is transferred to the mobile electronic information equipment to enable the mobile electronic information equipment to estimate user's physical condition or psychological condition on the basis of a detected-value output from the stress sensor that has been transferred from the massaging apparatus, and that, in accordance with the estimated user's physical condition or psychological condition, at least one or more mechanisms selected from among the massaging mechanism, the position-changing mechanism, and the additional mechanism are actuated, or changing of operation-related display items is effected under the control of the mobile electronic information equipment.

[0018] It is preferable that a stress sensor installed in the mobile electronic information equipment is used to detect user's stress level, that user's physical condition or psychological condition is estimated on the basis of a value detected by the stress sensor by the mobile electronic information equipment, and that, in accordance with the estimated user's physical condition or psychological condition, at least one or more mechanisms selected from among the massaging mechanism, the position-changing mechanism, and the additional mechanism are actuated, or changing of operation-related display items is effected under the control of the mobile electronic information equipment.

[0019] It is preferable that, in accordance with user's personal information stored in the mobile electronic information equipment, at least one or more mechanisms selected from among the massaging mechanism, the position-changing mechanism, and the additional mechanism are actuated, or changing of operation-related display items is effected under the control of the mobile electronic information equipment.

It is preferable that, on the basis of external information obtained by the mobile electronic information equipment via Internet, at least one or more mechanisms selected from among the massaging mechanism, the position-changing mechanism, and the additional mechanism are actuated, or changing of operation-related display items is effected under the control of the mobile electronic information equipment.

[0020] It is preferable that weather information including one of weather, temperature, and humidity as of now is adopted as the external information available via Internet.

It is preferable that, during the time at least one or more mechanisms selected from among the massaging mechanism, the position-changing mechanism, the additional mechanism, and the control mechanism are being operated by the mobile electronic information equipment, an operation terminal mounted in a main body of the massaging apparatus is limited in its control function.

[0021] It is preferable that, even under conditions where

the operation terminal mounted in the main body of the massaging apparatus is limited in its control function, some actions of the massaging mechanism and/or the position-changing mechanism can be effected under the control of the operation terminal.

It is preferable that the main body of the massaging apparatus is provided with a placement area where the mobile electronic information equipment can be placed.

[0022] It is preferable that the placement area is disposed within a reach of the hand of a user sitting in the massaging apparatus.

Moreover, for accomplishment of the described object, the following technical means is adopted in order that the present invention may be carried into effect.

The present invention provides a massaging apparatus that is designed to permit display of menu items for operation of a massaging apparatus main body that massages message target areas of user's body and/or menu items for operation of an additional mechanism provided in the massaging apparatus main body on a display section of a mobile electronic information equipment owned by a user, and has an operation section, mounted in the massaging apparatus main body, for permitting manipulation of the display section of the mobile electronic information equipment from a remote location.

[0023] It is preferable that the massaging apparatus is equipped with a mounting body that accommodates the mobile

electronic information equipment, is worn on user's head, and allows a user to view a display section of the accommodated mobile electronic information equipment with his or her hands free.

It is preferable that the massaging apparatus main body includes a seat portion in which a user sits when taking massage, and armrest portions disposed one on each side of the seat portion, and that the operation section is disposed on the armrest portion.

[0024] It is preferable that the operation section has a system capable of effecting operation based on a "stop" menu item to stop operation of the massaging apparatus main body and/or the additional mechanism.

It is preferable that the operation section has a system capable of effecting operation based on a "forward-looking" menu item to display, on the display section, an image captured by a camera disposed at a back side of the mobile electronic information equipment.

[0025] It is preferable that an operation button is provided in the operation section to effect direct operation based on the "stop" menu item or the "forward-looking" menu item.

It is preferable that, under conditions where an indication of an incoming call is displayable on the display section of the mobile electronic information equipment, an incoming call can be handled by operating the operation section disposed on the armrest portion.

Advantageous Effects of Invention

[0026] The technique pursuant to the present invention enables a user-owned mobile electronic information equipment such as iPhone (registered trade mark) to operate the massaging apparatus.

Moreover, the technique pursuant to the present invention allows, under conditions where the massaging apparatus can be operated by a user-owned mobile electronic information equipment, the user to change massaging operation conditions and receive a phone call even during the time he or she is getting massage while enjoying viewing of images using a VR goggle (virtual reality goggle) carrying the described mobile electronic information equipment.

Brief Description of Drawings

[0027] [FIG. 1] is a drawing showing data exchange between a massaging apparatus pursuant to the present invention and a mobile electronic information equipment.

[FIG. 2] is a drawing showing data exchange between the massaging apparatus of the present invention and the mobile electronic information equipment (another embodiment).

[FIG. 3] is a drawing showing the massaging apparatus of the present invention in which is sitting a user wearing a VR goggle.

[FIG. 4] is a drawing showing an example of the VR goggle's appearance.

[FIG. 5] is a drawing showing an example of images shown

on the mobile electronic information equipment, which is projected by the VR goggle for on-display viewing for the user (free of display of menu items for operation of the massaging apparatus)

[FIG. 6A] is a drawing showing an example of an operation section for operation of the mobile electronic information equipment carried by the VR goggle.

[FIG. 6B] is a drawing showing an example of the operation section for operation of the mobile electronic information equipment carried by the VR goggle.

[FIG. 7] is a drawing showing how the operation section is to be manipulated to operate the mobile electronic information equipment carried by the VR goggle.

[FIG. 8A] is a drawing showing an example of images projected by the VR goggle for on-display viewing for the user (with display of menu items for operation of the massaging apparatus)

[FIG. 8B] is a drawing showing an example of images projected by the VR goggle for on-display viewing for the user (with display of incoming-call indication)

Description of Embodiments

[0028] The following describes an embodiment of the present invention with reference to drawings. In the following description, a chair massager exemplifies the massaging apparatus of the present invention.

The massaging apparatus 1 includes a seat portion 2 that supports user's buttocks from below, a backrest portion 3 disposed at the rear of the seat portion 2, and a footrest 4 disposed at the front of the seat portion 2.

[0029] Under the seat portion 2, there is provided a leg body for placement of the massaging apparatus 1 on a floor. The seat portion 2 is supportably positioned at a predetermined height by the leg body.

The backrest portion 3 has its lower end pivotally supported on the rear of the seat portion 2 or the rear of the leg body so as to be retained for free backward and forward rocking motion. The backrest portion 3 can be set in a reclined position with respect to the seat portion 2 by a position-changing mechanism such as a linear actuator disposed within the leg body.

[0030] The backrest portion 3 is internally provided with a vertically movable back-massaging mechanism 5 that produces massaging motion such as kneading motion, tapping motion, or vibratory motion.

Moreover, there are provided side-massaging mechanisms disposed one on each side of the backrest portion 3. Each side-massaging mechanism is designed to perform massage by applying pressure to the outer side of the arm or shoulder of a user sitting with his or her back resting on the backrest portion 3 while repeating inflation and deflation of an air bag in a predetermined rhythm, for example.

[0031] The footrest 4 is capable of supporting the legs of the user sitting in the seat portion 2 (a calf-to-foot range of each leg). The footrest 4 has formed at its face that supports user's legs (front face) paired right-hand and left-hand holding recesses, each receiving corresponding one of the legs of the user. The inward face of each of the right-hand and left-hand holding recesses has a built-in leg-massaging mechanism.

 The leg-massaging mechanism is constructed of paired right-hand and left-hand kneading plates that are moved close to and away from each other repeatedly in a predetermined rhythm to squeeze user's leg lying between the plates. Moreover, there are provided armrest portions disposed one on each side of the seat portion 2 in a horizontal direction. An arm-massaging mechanism is disposed within each armrest portion.

[0032] The massaging apparatus 1 according to this embodiment includes various additional mechanisms. As employed herein the additional mechanisms refer to those other than the massaging mechanisms that perform massage on the corresponding massage target areas of user's body, such as the position-changing mechanism that changes the position of the massaging apparatus 1.

 Examples of the additional mechanisms intended to enhance the effect of massage treatment given to the user include "an aromatherapeutic mechanism" that acts to give forth relaxation aroma in sync with the action of the massaging mechanism, "a

music playback mechanism" that plays music stored in the massaging apparatus 1 or externally introduced music (including environmental sound), "a music-assisted massage mechanism" that operates the massaging mechanism to perform massage in time to the music played by the music playback mechanism, and "an optical light mechanism (atmospheric light mechanism)" that applies light which works effectively for the user sitting in the massaging apparatus 1. As another additional mechanism, use can be made of a thermomassage mechanism (hyperthermic heater) that provides a hyperthermic effect to the user, or a cool and hot air blower mechanism. The hyperthermic heater may be embedded in the seat portion 2 or the backrest portion 3.

[0033] The massaging apparatus 1 according to this embodiment includes a stress sensor 6 as one of the additional mechanisms. The stress sensor 6 is a noteworthy additional mechanism, and its details will now be given accordingly.

The stress sensor 6 installed in the massaging apparatus 1 is a sensor that detects user's vital signals (biological information signals) for an understanding of the physical condition or psychological condition of the user sitting in the massaging apparatus 1.

[0034] As the stress sensor 6, use can be made of a variety of sensors, including a pulse sensor, a blood pressure sensor, a body temperature sensor, and a sweating amount sensor. The stress sensor 6 may be disposed at any location of the massaging

apparatus 1 without specific limitation. The essential is that the stress sensor 6 be positioned for proper vital-signal detection. For example, the stress sensor 6 may be disposed on the upper face of the armrest portion. In this case, the user is able to know his or her body temperature or the amount of sweating, which is one of vital signs, by touching the stress sensor 6 with his or her fingertip.

[0035] For example, when the body temperature was found to be above normal by the described stress sensor 6, it is determined that the user feels fatigued or that the user is subjected to high psychological stress.

In the massaging apparatus 1 thereby constructed, as is customary in the art, a cable is drawn out of the main body of the massaging apparatus 1, and, an operation terminal is connected to the tip of the cable to operate the massaging apparatus 1.

[0036] In this regard, the massaging apparatus 1 according to this embodiment is operable by, in addition to the described operation terminal, a user-owned mobile electronic information equipment 10 (typified by a smartphone such as iPhone (registered trade mark)).

The smartphone 10 incorporates a high-performance CPU and a high-capacity memory. The smartphone 10 has a large-sized touch screen (display section), and runs a plurality of programs (applications). In the smartphone 10, there are provided an input-output device for electric waves from mobile phones, an

input-output device for wireless LAN (Wi-Fi (registered trade mark)), and input-output devices for Bluetooth (registered trade mark) and infrared communication.

[0037] In this embodiment, screen-displayed images shown on the operation terminal are displayable on the screen of the smartphone 10 to enable the smartphone 10 to accept operation. Moreover, a high-performance CPU mounted in the smartphone 10 effects data processing that is effected by a CPU mounted in the operation terminal or the massaging apparatus 1 in itself. Furthermore, the data stored in a memory mounted in the operation terminal or the massaging apparatus 1 in itself is stored in whole or in part in a high-capacity memory mounted in the smartphone 10. In addition, without the wired system of the operation terminal, use is made of input-output devices mounted in the smartphone 10 such as wireless LAN.

[0038] In addition to a mobile phone typified by iPhone (registered trade mark), being called smartphone 10, various portable appliances, including a tablet PC typified by iPad (registered trade mark), may be used as the mobile electronic information equipment 10.

By way of example, how the massaging apparatus 1 is to be operated under the control of the smartphone 10 will be described with reference to FIG. 1.

[0039] This example is intended to control the massaging apparatus 1 on the basis of detected value data from the stress

sensor 6 installed in the massaging apparatus 1.

At the outset, a vital signal obtained by the stress sensor 6 installed in the massaging apparatus 1 is transmitted from the massaging apparatus 1 to the smartphone 10 owned by the user. The signal transmission is conducted by means of electric waves for mobile phone calls, wireless LAN, Bluetooth (registered trademark), or otherwise.

[0040] Upon receipt of the vital signal (detected value data from the stress sensor 6), the smartphone 10 estimates the physical condition or psychological condition of the user on the basis of the detected value data. For example, in the case of using a blood pressure sensor as the stress sensor 6, when user's blood pressure was found to be above normal by the stress sensor 6, it is determined that the user feels fatigued or that the user is subjected to high psychological stress.

After that, in accordance with the estimated physical condition or psychological condition of the user, the smartphone 10 displays a recommended massage mode on its screen, and thereafter actuates the massaging mechanism of the massaging apparatus 1 corresponding to the displayed massage mode (one or more massaging mechanisms selected from among the back-massaging mechanism 5, the side-massaging mechanism, and the leg-massaging mechanism).

[0041] Tasks such as the described data exchange and detected-value data processing are accomplished via a hardware

mounted in the smartphone 10 and a software which is run on the hardware. The software is implemented by downloading an application to the smartphone 10, followed by execution of the application.

Thus, the messaging apparatus 1 can be operated via the hardware and software (application) of the user-owned mobile electronic information equipment 10 such as iPhone (registered trade mark).

[0042] The way of operating the messaging apparatus 1 under the control of the smartphone 10 is not so limited. Listed below are some ways other than that described above (Examples (1) to (17)).

(1) The messaging mechanism is designed in advance to operate in a plurality of programmed modes. The smartphone 10 displays these modes on its screen to allow a user to make a choice. Thus, the user is free to operate the messaging apparatus 1 in a message mode of his or her own choice via the smartphone 10.

[0043] The data of the selected mode shown on the screen of the smartphone 10 is transferred to the messaging apparatus 1 over wireless LAN, for example. After the messaging apparatus 1 receives the transmitted signal, in accordance with the data carried by the signal, a suitable messaging mechanism is driven to operate.

(2) The smartphone 10 provides a screen display

indicating the actions of the massaging mechanisms, massage intensity levels, and the position of each massaging mechanism (for example, the vertical position) to allow the user to specify working conditions of the massaging mechanisms via the smartphone 10. As a matter of course, the data of selected conditions shown on the screen of the smartphone 10 is transferred to the massaging apparatus 1 over wireless LAN, for example. After the massaging apparatus 1 receives the transmitted signal, in accordance with the data carried by the signal, a suitable massaging mechanism is driven to operate under the selected conditions.

(3) An output from the stress sensor 6 is transferred to the smartphone 10, and, the output received by the smartphone 10 is processed by the CPU mounted in the smartphone 10 to determine user's stress level.

[0044] After that, a signal indicative of user's stress level determined via the smartphone 10 is transmitted to the massaging apparatus 1 over wireless LAN, for example, to actuate a suitable additional mechanism.

For example, when the user was found to be subjected to great stress, the smartphone 10 activates, as one of the additional mechanisms, the aromatherapeutic mechanism to give forth pleasing aroma, or the music playback mechanism to play relaxation music. Depending on the level of user's stress, the smartphone 10 activates the optical light mechanism. For example, the optical light mechanism is driven to apply light

while changing the intensity and color tone of the light illuminating an area around user' hand in a suitable manner.

(4) Depending on the level of user's stress determined on the basis of the output from the stress sensor 6, the smartphone 10 activates the music playback mechanism, which is one of the additional mechanisms. At this time, the smartphone 10 is capable of effecting control of the massaging mechanism in a manner to perform massage in time to the music played by the music playback mechanism.

[0045] A mechanical system or an air-bag system is typically adopted for the massaging mechanism. In this case, the time constant of mechanism operation is so large that it may be difficult to operate the massaging mechanism to perform massage in time to music. In this regard, it is effective to provide a predetermined delay period in the playing of music in time with the movement of the massaging mechanism (with large time constant). Such a delay process is effected via the smartphone 10 incorporating a high-performance CPU.

(5) The smartphone 10 identifies a person sitting in the massaging apparatus 1 as a specified user upon the entry of corresponding ID or password.

Preferably, the smartphone 10 stores therein the user's personal information (physical data such as sitting height and shoulder level). This enables the massaging mechanism to operate in accordance with the personal information. For

example, on the basis of the stored data about user's sitting height and shoulder level, the massaging mechanism is moved to an optimum position for performing massage suited to the user.

[0046] As shown in FIG. 2, a smartphone 10-mounted sensor, such as a face-recognition camera system or a fingerprint-recognition sensor, may be used for identification of users.

(6) The smartphone 10 identifies a person sitting in the massaging apparatus 1 as a specified user upon the entry of corresponding ID or password. The smartphone 10 stores therein the user's personal information such as his or her medical history. In accordance with the personal information, the massaging mechanism is moved to an optimum position for performing massage suited to the user.

[0047] For example, for a user who has previously suffered from neck injury or pain, the smartphone 10 restrains the massaging mechanism against movement toward user's neck, or drives the massaging mechanism to give gentle massage to the neck. Preferably, the smartphone 10 performs calculation operation for each and every driving command, and sends a command output to the massaging apparatus 1. This eliminates the need to mount a high-performance CPU in the main body of the massaging apparatus 1, with the consequent reduction of cost in the making of the massaging apparatus 1.

(7) The smartphone 10 is Internet-capable, and thus the

user checks weather information from Internet via the smartphone 10. For example, the weather information is available from the website of Meteorological Agency. Preferably, the smartphone 10 controls the operating state and message intensity level set for the massaging mechanism in accordance with weather information so obtained. For example, when outside air temperature was found to be below average, the smartphone 10 activates the hyperthermic heater, which is one of the additional mechanisms, and effects control of the heater in a manner to perform heating at a temperature which is slightly higher than the preset temperature.

(8) The massaging apparatus 1 has a CPU of its own. Preferably, the smartphone 10 effects downloading of a software for upgrading the CPU to a newer version, and transfers the downloaded software for version upgrade to the massaging apparatus 1 for program updates in the CPU of the massaging apparatus 1. The program updates in the CPU render the workings of the massaging apparatus 1 (for example, massage modes) up-to-date.

(9) In the event of a failure in the massaging apparatus 1, information about failed parts and failure conditions is transferred to the smartphone 10. The smartphone 10 provides a failure-indicating display based on the transferred data. The failure data can be transferred to a manufacturer or maintenance agency over a mobile-phone line or Internet.

(10) The smartphone 10 is capable of receiving an earthquake early warning. The smartphone 10 provides display of the earthquake early warning with an alarm sound a few tens of seconds before occurrence of an earthquake. This is useful in urging the user to take danger-avoiding actions against the earthquake early on such as evacuation or lockdown.

[0048] Upon receipt of the earthquake early warning, the smartphone 10 brings the massaging mechanism of the massaging apparatus 1 to a halt immediately in accordance with the received information, and returns the backrest portion in the reclined position to the original position. This allows the user to evacuate the place quickly in case of an earthquake.

(11) The smartphone 10 has a telephone function as a matter of course. Let it be assumed that the phone equipped in the smartphone 10 rings during the time the user is operating the massaging apparatus 1.

[0049] Upon receipt of a phone call, the smartphone 10 effects control of the massaging mechanism (the side-massaging mechanism and the arm-massaging mechanism for massaging user's arm, in particular) in a manner to stop its massaging motion. This allows the user to move his or her arms freely to answer the phone call.

As thus far described, the massaging apparatus 1 can be operated via the hardware and software (application) of the user-owned mobile electronic information equipment 10 such as

iPhone (registered trade mark).

(12) As described earlier, the massaging apparatus 1 includes the massaging mechanisms that perform massage on the corresponding massage target areas of user's body, namely the back-massaging mechanism 5, the side-massaging mechanism, the foot-massaging mechanism, and the arm-massaging mechanism, and further includes the position-changing mechanism that changes the position of the massaging apparatus, and the additional mechanisms intended to enhance the effect of massage treatment given to the user, namely the aromatherapeutic mechanism, the music playback mechanism, the music-assisted massage mechanism, the optical light mechanism, the thermomassage mechanism, the cool and hot air blower mechanism, etc. These mechanisms are controlled by a control mechanism mounted in the massaging apparatus.

[0050] The control mechanism includes a control section that exercises direct control over the back-massaging mechanism 5, the side-massaging mechanism, the foot-massaging mechanism, and the arm-massaging mechanism, and an operation terminal for specifying a mode of control effected by the control section.

The described embodiment discloses the technique that enables the mobile electronic information equipment 10 (smartphone) to accomplish some functions of the operation terminal and the control section.

[0051] As examples of operating conditions, when it is

determined that the user is subjected to great stress on the basis of user's stress level data from the stress sensor 6, "the operation of the massaging mechanism, etc. via the control section" is not performed. All that is to be done is "changing of display items shown on the display section of the smartphone 10". After that, the selection of operating conditions is left in the hands of the user.

For example, in accordance with the information from the stress sensor 6, a default massage intensity to be displayed on the screen of the smartphone 10 is automatically changed from "LOW" to "HIGH". Moreover, when the outside air temperature obtained from Internet via the smartphone 10 is below average, a default temperature set for the hyperthermic heater, which is one of the additional mechanisms, is adjusted to a higher level, and, the smartphone 10 displays the adjusted default temperature on its display section for user's check.

[0052] To sum up, in operating the control mechanism mounted in the massaging apparatus 1 via the smartphone 10, two ways will be considered, that is; effecting direct operation of the control mechanism for direct control over the massaging mechanism and the position-changing mechanism in accordance with the information from the smartphone 10; and changing display items or default values shown on the display section of the smartphone 10 in accordance with the information from the smartphone 10 (effecting automatic change from "LOW" set as a default to "HIGH").

The selection of specific operating conditions are left in the hands of the user.

(13) The recently-developed mobile electronic information equipment 10 for use in operation of the massaging apparatus 1 of the present invention, viz., the smartphone 10 is equipped with a voice-recognition system. For example, Siri (registered trade mark) installed in iPhone (registered trade mark) is capable of operation of iPhone (registered trade mark) and searching for information via iPhone (registered trademark).

[0053] Such a voice-recognition system may be utilized to operate at least one or more mechanisms selected from among the massaging mechanism, the position-changing mechanism, the additional mechanism, and the control mechanism. Upon talking to the smartphone 10, for example, saying "massage, harder", the smartphone 10 recognizes a massaging-mechanism operation command, and effects control of the control mechanism mounted in the massaging apparatus 1 in a manner to adjust the massage intensity level set for the massaging mechanism to "HIGH".

[0054] Thus, the voice-recognition system installed in the smartphone 10 allows the user to operate the massaging apparatus 1 with his or her hands free.

(14) The mobile electronic information equipment 10, viz., the smartphone 10 incorporates a variety of sensors. Examples of sensors mountable in the smartphone 10 include: a GPS sensor that provides the latitude, longitude, and altitude of a location

where the smartphone 10 is present on the basis of GPS data; an acceleration sensor that detects acceleration imparted to the smartphone 10; an illuminance sensor (luminance sensor) that detects the intensity of ambient light; and a proximity sensor that detects an approach of an object toward the smartphone 10. In addition, the smartphone 10 is equipped with a microphone that captures ambient sound, a camera that takes images (still images and moving images) of surroundings, a fingerprint sensor that is brought into contact with user's fingertip to read his or her fingerprint, etc.

[0055] As shown in FIG. 2, in the massaging apparatus 1 of the present invention, a sensor installed in the smartphone 10 in use (not limited to the aforementioned sensors) is used as the stress sensor 6 that detects the stress level of a user who is thinking of getting massage or already using the massaging apparatus 1.

The smartphone 10 estimates user's physical condition or psychological condition on the basis of the value detected by the stress sensor 6. In accordance with the estimated physical condition or psychological condition of the user, the smartphone 10 actuates at least one or more mechanisms selected from among the massaging mechanism, the position-changing mechanism, and the additional mechanism mounted in the massaging apparatus 1.

[0056] For example, let it be assumed that a camera installed in the smartphone 10 is used as the stress sensor 6. In this

case, the user takes an image of his or her fingertip with the camera. In addition to the surface of user's fingertip, the fingertip blood vessel shows up on the image. On the basis of the motion of the blood vessel which is visible on the image, the smartphone 10 measures user's pulse, etc., and detects whether the user under massage treatment is subjected to stress or stays relaxed. When it is determined that the user is not in a relaxed state of mind, for example, the massaging mechanism is automatically adjusted to produce greater massage effects, or various additional mechanisms are set in motion. Moreover, the smartphone 10 displays a message on its display section such as "DO YOU MAKE MASSAGE HARDER ?" to let the user proceed the manipulation.

[0057] Moreover, for example, let it be assumed that a microphone installed in the smartphone 10 is used as the stress sensor 6. In this case, the microphone captures user's breath or heartbeat sound. On the basis of the captured sound data, the smartphone 10 measures breaths or heart beats of the user under massage treatment per minute to detect whether he or she is subjected to stress or stays relaxed. When it is determined that the user is not in a relaxed state of mind, for example, as described above, the massaging mechanism is automatically adjusted to produce greater massage effects.

[0058] Moreover, for example, let it be assumed that an acceleration sensor installed in the smartphone 10 is used as

the stress sensor 6. The user may voluntarily set the massage intensity level at "HIGH" when he or she feels fatigued, or is under high stress. In this case, the level of vibration caused by massaging movement (the extent of user's swinging motion) is higher than the normal vibration level. The extent of user's swinging motion is detected by the acceleration sensor to estimate user's stress level. In accordance with the user's stress level so obtained, for example, the smartphone 10 provides a screen display to recommend the user to adjust the additional mechanism to produce greater effects, or to start operation of another additional mechanism.

[0059] The working conditions thus far described can be fulfilled not only by the sensor installed in the smartphone 10 but also by the sensor installed in the massaging apparatus 1.

That is, a device equivalent to the sensor installed in the smartphone 10 may be mounted in the massaging apparatus 1. In this case, the mounted device serves as the stress sensor 6 to detect the physiological response of the user under massage treatment (vital signals of user's action, blood pressure, pulse, etc.).

[0060] The detected signals indicative of user's physiological response are transmitted to the smartphone 10 by way of Wi-Fi (registered trade mark) or Bluetooth (registered trade mark), for example. On the basis of the signally

transferred data of the detected-value output from the stress sensor 6, the smartphone 10 estimates user's physical condition or psychological condition. After that, in accordance with the estimated physical condition or psychological condition of the user, for example, the smartphone 10 actuates at least one or more mechanisms selected from among the massaging mechanism, the position-changing mechanism, and the additional mechanism.

[0061] The described stress sensor 6 serves to obtain user's vital signals, and may thus be built as a vital sensor (vital signal-taking sensor) capable of obtaining each and every vital signal given off from user's body.

(15) As seen from the paragraph stating Example (14), by the action of the stress sensor 6 installed in the smartphone 10 or the main body of the massaging apparatus 1, user's physical condition or psychological condition can be estimated. In accordance with the estimated physical condition or psychological condition of the user, at least one or more mechanisms selected from among the massaging mechanism, the position-changing mechanism, and the additional mechanism are set in motion.

[0062] Then, the working conditions set for that one of the massaging mechanism, the position-changing mechanism, and the additional mechanism which is in operation (for example, the message intensity level set for the massaging mechanism) are varied to make adjustment to the behavior of the massaging

apparatus in a condition of performing massage on the user. This causes further change in user's physical condition or psychological condition. That is, the user comes to feel more relaxed or contrariwise feel a bit tense. Such a change in user's condition is immediately detected by the stress sensor 6. When the user was found to stay relaxed, the massage treatment is continued without further adjustment. On the other hand, when the user was found to be in a state of tension, for example, the massaging mechanism is adjusted so that the massage intensity level can be changed to "LOW", or, a screen display of a message such as "DO YOU MAKE MASSAGE SOFTER ?" is provided to leave the selection of operating conditions in the hands of the user.

[0063] That is, the output from the stress sensor 6 is fed back to the main body of the massaging apparatus 1 for the control of the working conditions of the massaging apparatus 1 (feedback control by the stress sensor 6).

(16) The main body of the massaging apparatus 1 is equipped with an operation terminal for the operation of the massaging apparatus 1. The operation terminal is of a remote-control type which is connectable to the main body by wired system, or a built-in type which is embedded in the front part of the armrest portion, for example.

[0064] Under normal circumstances, the operation terminal is used to control the massage intensity level, the massage position, and the massage mode set for the massaging mechanism,

to effect control of the position-changing mechanism in a manner to adjust the angle of tilt in the backrest portion 3 in the reclined position, and to activate the additional mechanism, for example.

As thus far described, according to the present invention, the massaging apparatus 1 is operated under the control of the mobile electronic information equipment, viz., the smartphone 10. In this case, to avoid competition between a control signal from the operation terminal and a signal from the smartphone 10, the signal from the smartphone 10 takes preference to the control signal. More specifically, under conditions where the massaging apparatus is operable by the smartphone 10, to disable the operation terminal, operation commands from the operation terminal are rejected (the operation terminal is limited in its control function) with some exceptions.

[0065] As the exceptions, even in the apparatus operation under the control of the smartphone 10, only a few commands from the operation terminal, such as a command to operate the position-changing mechanism and a command to stop the massaging mechanism, are accepted. Thus, even if the user becomes unable to operate the massaging apparatus 1 due to, for example, accidental fall of the smartphone 10 from his or her hand, the massaging mechanism can be brought to a halt, and the backrest portion 3 can be moved to the upright position by operating the operation terminal placed where it may be readily reached by

user's hand (within the reach of the user), such as the front part of the armrest portion. This allows the user to get away from the massaging apparatus 1.

[0066] That is, even under conditions where the operation terminal mounted in the main body of the massaging apparatus 1 is limited in its control function, some actions of the massaging mechanism and/or the position-changing mechanism can be effected by the operation terminal.

(17) Although the massaging apparatus 1 of the present invention has adaptability to varying situations the user finds himself or herself in, it is undesirable that the smartphone 10 have to be moved to a location out of reach of the user. With this in view, the massaging apparatus 1 is provided with a placement area 40 for placing the smartphone 10 within the reach of the user sitting in the massaging apparatus 1 (so as to be readily reached by user's hand).

[0067] Various forms may be adopted for the placement area 40. For example, as shown in FIG. 2, the placement area 40 may be made as a horizontally-disposed flat plate extending outwardly and sidewardly from an intermediate position of the armrest portion. The user is able to put the smartphone 10 on this horizontally-disposed flat plate to keep the smartphone 10 within reach for operation at anytime.

The way of operating the massaging apparatus 1 under the control of the mobile electronic information equipment 10

typified by the smartphone 10 is not limited to the described examples, and other various ways may be adopted. Although the foregoing description deals with the case where a chair massager exemplifies the massaging apparatus 1 operable by the mobile electronic information equipment 10, for example, a mountable massager such as a handheld massager is applicable to the massaging apparatus 1.

[0068] The following describes another embodiment of the present invention with reference to drawings. In the following description, a chair massager exemplifies a massaging apparatus 1.

 The massaging apparatus 1 shown in FIG. 3 includes a seat portion 2 that supports the buttocks of a user M from below, a backrest portion 3 disposed at the rear of the seat portion 2, and a footrest 4 disposed at the front of the seat portion 2.

[0069] Under the seat portion 2, there is provided a leg body for placement of the massaging apparatus 1 on a floor. The seat portion 2 is supportably positioned at a predetermined height by the leg body.

 The backrest portion 3 has its lower end pivotally supported on the rear of the seat portion 2 or the rear of the leg body so as to be retained for free backward and forward rocking motion. The backrest portion 3 can be set in a reclined position with respect to the seat portion 2 by a position-changing mechanism

such as a linear actuator disposed within the leg body.

[0070] The backrest portion 3 is internally provided with a vertically movable back-massaging mechanism that produces massaging motion such as kneading motion, tapping motion, or vibratory motion.

There are provided side-massaging mechanisms disposed one on each side of the backrest portion 3. Each side-massaging mechanism is designed to perform massage by applying pressure to the outer side of the arm or shoulder of the user M sitting with his or her back resting on the backrest portion 3 while repeating inflation and deflation of an air bag in a predetermined rhythm, for example.

[0071] The footrest 4 is capable of supporting the legs of the user M sitting in the seat portion 2 (a calf-to-foot range of each leg). The footrest 4 has formed at its face that supports the legs of the user M (front face) paired right-hand and left-hand holding recesses, each receiving corresponding one of the legs of the user M. The inward face of each of the right-hand and left-hand holding recesses has a built-in leg-massaging mechanism.

The leg-massaging mechanism is constructed of paired right-hand and left-hand kneading plates that are moved close to and away from each other repeatedly in a predetermined rhythm to squeeze the leg of the user M lying between the plates. Moreover, there are provided armrest portions 8 disposed one

on each side of the seat portion 2 in a horizontal direction. An arm-massaging mechanism is disposed within each of the armrest portions 8.

[0032] The massaging apparatus 1 according to this embodiment includes various additional mechanisms. As employed herein the additional mechanisms refer to those other than the massaging mechanisms that perform massage on the corresponding massage target areas of the body of the user M, such as the position-changing mechanism that changes the position of the massaging apparatus 1.

Examples of the additional mechanisms intended to enhance the effect of massage treatment given to the user M include "an aromatherapeutic mechanism" that acts to give forth relaxation aroma in sync with the action of the massaging mechanism, "a music playback mechanism" that plays music stored in the massaging apparatus 1 or externally introduced music (including environmental sound), "a music-assisted massage mechanism" that operates the massaging mechanism to perform massage in time to the music played by the music playback mechanism, and "an optical light mechanism (atmospheric light mechanism)" that applies light which works effectively for the user M sitting in the massaging apparatus 1.

[0073] As another additional mechanism, use can be made of a thermomassage mechanism (hyperthermic heater) that provides a hyperthermic effect to the user M, or a cool and hot air blower

mechanism. The hyperthermic heater is embedded in the seat portion 2 or the backrest portion 3. Moreover, the massaging apparatus 1 according to this embodiment may be provided with a stress sensor as one of the additional mechanisms. For example, the stress sensor is built as body temperature-measuring means, blood pressure-measuring means, or pulse-measuring means.

The massaging apparatus 1 may be designed so that, in accordance with the physical condition or psychological condition of the user M detected by the stress sensor, at least one or more mechanisms selected from among the massaging mechanism, the position-changing mechanism, and the additional mechanism can be operated, or display shown on a display section 11 of a smartphone 10 (menu items for operation of the chair massager, in particular) can be changed.

[0074] In the massaging apparatus 1 thereby constructed, as is customary in the art, a cable is drawn out of the main body of the massaging apparatus 1, and, an operation terminal is connected to the tip of the cable to operate the massaging apparatus 1.

In this regard, the massaging apparatus 1 according to this embodiment is operable by, in addition to the described operation terminal, a mobile electronic information equipment 10 (typified by the smartphone 10 such as iPhone (registered trade mark)) owned by the user M.

[0075] The smartphone 10 incorporates a high-performance

CPU and a high-capacity memory. The smartphone 10 has a large-sized touch screen (display section 11), and runs a plurality of programs (applications). In the smartphone 10, there are provided an input-output device for electric waves from mobile phones, an input-output device for wireless LAN (Wi-Fi (registered trademark)), and input-output devices for Bluetooth (registered trade mark) and infrared communication.

[0076] In this embodiment, screen-displayed images shown on the operation terminal are displayable on the display section 11 of the smartphone 10 to enable the smartphone 10 to accept operation. Moreover, a high-performance CPU mounted in the smartphone 10 effects data processing that is effected by a CPU mounted in the operation terminal or the massaging apparatus 1 in itself. Furthermore, the data stored in a memory mounted in the operation terminal or the massaging apparatus 1 in itself is stored in whole or in part in a high-capacity memory mounted in the smartphone 10. In addition, without the wired system of the operation terminal, use is made of input-output devices mounted in the smartphone 10 such as wireless LAN.

[0077] That is, for example, a predetermined application is used to permit display of menu items for operation of the massaging apparatus 1 in chair form (chair massager 1) on the display section 11 of the mobile electronic information equipment 10 owned by the user M sitting in the massaging apparatus 1, so that the user M is able to control the working conditions

of the chair massager 1 (such for example as to change the massage mode, adjust the massage intensity level, start massaging motion, and stop massaging motion) by manipulating the display section 11 of the mobile electronic information equipment 10 of his or her own.

[0078] In addition to a mobile phone typified by iPhone (registered trade mark), being called smartphone 10, various portable appliances, including a tablet PC typified by iPad (registered trade mark), may be used as the mobile electronic information equipment 10.

By way of example, how the massaging apparatus 1 is to be operated under the control of the smartphone 10 will be described with reference to FIG. 3.

[0079] This example is intended to control the massaging apparatus 1 on the basis of detected value data from the stress sensor installed in the massaging apparatus 1.

At the outset, a vital signal obtained by the stress sensor installed in the massaging apparatus 1 is transmitted from the massaging apparatus 1 to the smartphone 10 owned by the user M. The signal transmission is conducted by means of electric waves for mobile phone calls, wireless LAN, Bluetooth (registered trade mark), or otherwise.

[0080] Upon receipt of the vital signal (detected value data from the stress sensor), the smartphone 10 estimates the physical condition or psychological condition of the user M on

the basis of the detected value data. For example, in the case of using a blood pressure sensor as the stress sensor, when user's blood pressure was found to be above normal by the stress sensor, it is determined that the user M feels fatigued or that the user M is subjected to high psychological stress.

After that, in accordance with the estimated physical condition or psychological condition of the user M, the smartphone 10 displays a recommended massage mode on its screen, and thereafter actuates the massaging mechanism of the massaging apparatus 1 corresponding to the displayed massage mode (one or more massaging mechanisms selected from among the back-massaging mechanism, the side-massaging mechanism, and the leg-massaging mechanism).

[0081] Tasks such as the described data exchange and detected-value data processing are accomplished via a hardware mounted in the smartphone 10 and a software which is run on the hardware. The software is implemented by downloading an application to the smartphone 10, followed by execution of the application.

Thus, the massaging apparatus 1 can be operated via the hardware and software (application) of the mobile electronic information equipment 10 such as iPhone (registered trade mark) owned by the user M.

[0082] Moreover, it is well known that the smartphone 10 is capable of display of various images on its display section

11.

For example, the user is able to watch a movie stored in the smartphone 10 on the display section 11. The smartphone 10 having the function of receiving the airwaves of television broadcasting (one-segment broadcasting) is capable of display of a television program on the display section 11. At this time, voice and sound can be transferred to the music playback mechanism by way of Bluetooth (registered trade mark) mounted in the smartphone 10 to reproduce the voice and sound via the music playback mechanism.

[0083] Moreover, the smartphone 10 is capable of receiving video-sharing service provided by a video-sharing platform typified by YouTube (registered trade mark) via Internet connection. The user M is able to watch a video available from the video-sharing platform on the display section 11 of the smartphone 10.

YouTube (registered trade mark) provides user-viewable 360-degree images that are displayable around the user M with the concurrent use of data from a gyroscope sensor installed in the smartphone 10.

[0084] In addition, the user M is able to view three-dimensionally projected images that are reproducible via a certain application installed in the smartphone 10, and also able to view three-dimensional 360-degree images.

The user M usually holds the smartphone 10 with his or

her hand, or leaves the smartphone 10 on a table, to view various images provided by the smartphone 10.

[0085] Unfortunately, when getting message provided by the chair massager 1, the user M is not able to easily keep holding the smartphone 10 with his or her hand, let alone leave the smartphone 10 on a table.

 To avoid such an inconvenience, a mounting body, and more specifically a head-mounted display designed for insertion of a mobile electronic information equipment (VR goggle 20) has been developed to date.

[0086] FIG. 4 is an external view showing the VR goggle 20. While the VR goggle 20 may be made in various forms, in FIG. 4, the VR goggle 20 includes a box-shaped goggle main body 21 transversely elongated so as to cover human eyes, and a head band 22 for positioning the goggle main body 21 forward of the eyes of the user M.

 The goggle main body 21 is internally provided with two transversely-juxtaposed lenses, namely a lens for user's right eye and a lens for user's left eye. The rear end of the goggle main body 21 adjacent human face is made as an opening to allow the user M to see the described lenses.

[0087] The forward end of the goggle main body 21 is closed by a lid 23. The lid 23 is hingedly connected at its bottom to the goggle main body 21, so that the top edge of the lid 23 can fall forwardly at an angle of about 40 degrees to the goggle

main body 21, thus creating a free space at the upper part of the forward end of the goggle main body 21. After the described smartphone 10 is inserted through the free space into the goggle main body 21, the top edge of the lid 23 is moved toward the goggle main body 21 to close the forward end of the goggle main body 21.

[0088] As a matter of course, the smartphone 10 is set with its display section 11 (its face for image projection) opposed to the lenses. This allows the user M to view images (photographed images and virtual reality pictures) shown on the display section 11 through the lenses.

Moreover, the VR goggle 20 has the head band 22 for setting the VR goggle 20 at the head of the user M. The head band 22 allows the user M to wear the VR goggle 20 around his or her eyes, as well as to stay with his or her hands free.

[0089] While the head band 22 may be made in various forms, in FIG. 4, the head band 22 includes a horizontal band 24 which extends from the right edge of the goggle main body 21 to a point opposite the back side of the head of the user M and from there to the left edge of the goggle main body 21, and a vertical band 25 which extends from the central location of the top edge of the goggle main body 21 to a point opposite the top of the head of the user M, and further extends so as to be coupled to the horizontal midportion of the horizontal band 24.

As shown in FIG. 3, the user M sitting in the chair massager

1 enjoys massage with the VR goggle 20 on.

[0090] The following describes the basic usage of the massaging apparatus 1 of the present invention, or equivalently the chair massager 1 equipped with the VR goggle 20.

 The first step to be followed by the user M is to download applications, etc. to the smartphone 10 to bring the chair massager 1 into operative relation with the smartphone 10. Then, menu items for operation of the chair massager 1 become displayable on an operation section 30 of the smartphone 10 to allow the user M to make a choice among the menu items to operate the massaging mechanism or the additional mechanism.

[0091] For example, the massaging mechanism of the chair massager 1 is designed to operate in a plurality of programmed modes. The smartphone 10 displays these modes on its screen to allow the user M to make a choice. Thus, the user M is free to operate the massaging apparatus 1 in a message mode of his or her own choice via the smartphone 10.

 Then, the smartphone 10 is set to display user's favorite images or movies, or contents available from video distribution service (for example, a video of famous singer's concert) on the display section 11 by switching between installed applications. Moreover, the smartphone 10 may be set to provide display of an e-book application such as an application for Kindle (registered trade mark) to allow the user M to read electronic books. Following the completion of such a setting step, the

user M wears the VR goggle 20 carrying the smartphone 10 around his or her head.

[0092] Thus, the user M is able to view his or her favorite images or read his or her favorite electronic books while getting massage provided by the chair massager 1 (refer to FIG. 5).

For example, where the chair massager 1 is designed to operate in "Thai-massage mode", preferably, the smartphone 10 carried by the VR goggle 20 provides display of landscapes of Thai when the Thai-massage mode is selected. Moreover, as shown in FIG. 5, the smartphone 10 may be set to display an image that allows the user to come to feel more relaxed, depending on the output data from the stress sensor.

[0093] The thereby constructed massaging apparatus 1 according to the present application allows the user M to enjoy massage in a relaxed state of mind.

The described VR goggle 20 may be supplied with power from the main body of the chair massager 1. For example, a 5V-2A power-supply adapter may be used as a power source. The power source may be utilized to actuate or charge the smartphone 10 carried by the VR goggle 20.

[0094] Unfortunately, the use of the described technique may pose inconvenience.

That is, as described earlier, let it be assumed that the user M has a thought of changing massage conditions or stopping massaging motion during the time he or she is getting massage

while enjoying viewing of images using the VR goggle 20. However, the smartphone 10 is carried by the VR goggle 20, which makes it difficult for the user M to operate the smartphone 10 by manipulating the display section 11 with his or her fingers. To operate the smartphone 10, the user M has to take the VR goggle 20 on his or her head off to remove the smartphone 10 from the VR goggle 20. This is very troublesome.

[0095] With this in view, the chair massager 1 according to this embodiment is designed to enable display of menu items for operation of the massaging mechanisms, menu items for operation of the additional mechanisms, and other menu items on the display section 11 of the smartphone 10 owned by the user M. To permit manipulation of the display section 11 of the mobile electronic information equipment 10 from a remote location, an operation section 30 is disposed in the chair massager 1.

[0096] FIGs. 6A and 6B are drawings each showing an example of the operation section 30 that sends operation commands to the smartphone 10 carried by the VR goggle 20, in other words, the finger-sensitive operation section 30 that allows the user M to manipulate the display section 11 of the smartphone 10 from a remote location.

The operation section 30 should preferably be placed where it may be readily reached by the fingers of the user M sitting in the chair massager 1 (within the reach of the user M). For example, the operation section 30 should preferably be disposed

on that part of the top of the armrest portion 8 which extends from the front to the central location thereof. With this arrangement, even when the backrest portion 3 of the chair massager 1 is set in a reclined position, the user M is able to easily touch the operation section 30 with his or her hand (fingertip). This allows the user M to operate the smartphone 10 carried by the VR goggle 20 (refer to FIG. 7).

[0097] FIG. 6A is a drawing showing the operation section 30 employing a touchpad 31. In the touchpad 31 constructed of a flat plate-shaped sensor, upon stroking the sensor with user's finger, the movement is detected as variation in capacitance, and the detected movement is signally transferred to the smartphone 10 via, for example, Bluetooth (registered trademark), and converted into the movement of a pointer P in the display section 11 of the smartphone 10. This is achieved by the cooperative actions of the control program stored in the chair massager and the application installed in the smartphone 10.

[0098] FIG. 6B is a drawing showing the operation section 30 employing a trackball 32. In the trackball 32 constructed of a ball mounted with its upper half protruding from the operation section 30, upon rotating the ball with user's hand, reading on the direction of rotation, the rate of rotation, etc. are detected, and the detected movement is signally transferred to the smartphone 10 via, for example, Bluetooth (registered trademark), and converted into the movement of the pointer P in the

display section 11 of the smartphone 10. This is achieved by the cooperative actions of the control program stored in the chair massager and the application installed in the smartphone 10, too.

[0099] As an alternative, a cursor key or a joystick may be used for the operation section 30.

For example, the operation section 30 is disposed on that part of the upper face of the armrest portion 8 which lies toward the front thereof. Although the operation section 30 may be disposed on the upper face of the right-hand armrest portion 8 considering that a majority of massager users are right-handed, the position of the operation section 30 is not so limited. That is, the operation section 30 may be disposed on the upper face of the left-hand armrest portion 8, or on the upper face of each of the right-hand armrest portion 8 and the left-hand armrest portion 8.

The following describes how the chair massager 1 is to be operated via the described operation section 30 by way of example.

[0100] For example, as shown in FIG. 3, let it be assumed that the user M has a thought of changing massage conditions or stopping massaging motion during the time he or she is getting massage while enjoying viewing of images using the VR goggle 20. In this case, the user M touches the operation section 30 disposed on the armrest portion 8, or equivalently a touch screen

33 of the touchpad 31 with his or her fingertip, whereupon the image shown on the display surface of the smartphone 10 (the relaxation image as shown in FIG. 5) is changed to display of menu items as shown in FIG. 8A.

[0101] Then, in sync with the movement of the fingertip of the user M to stroke the touch screen 33 of the touchpad 31, the pointer P moves within the image seen through the VR goggle 20. After the pointer P is positioned at a desired menu item, the user M touches the touch screen 33 of the touchpad 31 with his or her fingertip once again, whereupon the selection of the menu item is completed on the smartphone 10.

That is, the movement of user's finger on the operation section 30 is virtually imaged on the display section 11 of the smartphone 10 carried by the VR goggle 20. This helps free the user M from troublesome hand work required to operate the smartphone 10, such as taking the VR goggle 20 on his or her head off and removing the smartphone 10 from the VR goggle 20.

[0102] The foregoing holds true for the case where other device than the touchpad 31, such as the trackball 32, is used for the operation section 30.

Thus, the main body of the massaging apparatus 1 is equipped with the operation section 30 that permits manipulation of the display section 11 of the smartphone 10 from a remote location. This allows the user M to change massaging operation conditions even during the time he or she is getting massage while enjoying

viewing of images using the VR goggle 20 carrying the smartphone 10.

[0103] The smartphone 10 should preferably be set to display an indication of "emergency stop" on the display section 11 at all times.

By manipulating the operation section 30 so as to select "emergency stop" from the menu items displayed on the display section 11 of the smartphone 10, it is possible to stop massaging operation immediately in any situation. In the operation section 30, a hardware such as a push button 34 may be used to implement the emergency-stop function. In this case, the intention of the user M can be instantaneously conveyed to the massaging apparatus 1 simply by pressing the push button 34.

[0104] By the same token, it is highly preferable to dispose a return button in the operation section 30 or in the vicinity of the operation section 30 to stop the movement of the backrest portion 3 toward the reclined position and return the backrest portion 3 inclined at an angle to the original position (upright position).

Moreover, the smartphone 10 should preferably be set to display an indication of "forward looking" on the display section 11 at all times.

[0105] Preferably, when the operation section 30 is manipulated so as to select "forward looking" from the menu items displayed on the display section 11 of the smartphone 10, the

smartphone 10 displays an image captured by a camera 12 disposed at the back side of the smartphone 10 on the display section 11 in any situation. The smartphone 10 is placed within the VR goggle 20, with its back side facing toward the front side of the VR goggle 20 (forward of the face of the user M). For example, where the lid 23 of the VR goggle 20 is made of a transparent plastic material, the back-side camera 12 of the smartphone 10 captures an image of an area ahead of the user M.

[0106] This allows the user M to understand the situation in front without fail simply by manipulating the operation section 30 so as to select "forward looking" from the menu items displayed on the display section 11 of the smartphone 10 without the necessity of taking the VR goggle 20 on his or her head off. Also in this case, a hardware such as a push button 34 may be used to implement the forward-looking function in the operation section 30. The movement of the user M can be instantaneously conveyed to the smartphone 10 simply by pressing the push button 34.

[0107] The smartphone 10 has a telephone function as a matter of course. There may be cases where the phone equipped in the smartphone 10 rings during the time the user M is operating the massaging apparatus 1.

Preferably, as shown in FIG. 8B, the smartphone 10 displays an indication of "incoming call" on the display section 11 at

all times or in response to a phone call.

[0108] By manipulating the operation section 30 so as to select "incoming call" from the menu items displayed on the display section 11 of the smartphone 10, it is possible to answer the phone call immediately in any situation. The voice of the user M talking on the telephone is transferred to a phone caller via the microphone of the smartphone 10, and, the user M listens to the voice of the phone caller via the speaker of the smartphone 10 or the music playback mechanism.

[0109] In the operation section 30, a hardware such as a pushbutton 34 may be used to implement the incoming-call function. The movement of the user M can be instantaneously conveyed to the smartphone 10 simply by pressing the push button 34.

It should be understood that the application of the present invention is not limited to the embodiments thus far described, and may be carried into effect in other various forms. That is, the embodiments as disclosed herein are considered in all respects as illustrative only and not restrictive. In particular, for such matters as not explicitly specified in the disclosure of the embodiments, for example, for working and operating conditions, various parameters, and the dimensions, weights, and volumes of constituent components, use has been made of the values adopted in the light of the common knowledge of those skilled in the art without departing from the practical ranges.

[0110] For example, although the foregoing description deals with the case where the chair massager 1 exemplifies the massaging apparatus operable by the mobile electronic information equipment 10, a mountable massager such as a handheld massager is applicable to the massaging apparatus 1.

Reference Signs List

[0111]	1	Massaging apparatus (Chair massager)
	2	Seat portion
	3	Backrest portion
	4	Footrest
	5	Back-massaging mechanism
	6	Stress sensor
	8	Armrest portion
	10	Mobile electronic information equipment
		(Smartphone)
	11	Display section
	12	Back-side camera
	20	VR goggle
	21	Goggle main body
	22	Head band
	23	Lid
	24	Horizontal band
	25	Vertical band
	30	Operation section
	31	Touchpad

32	Trackball
33	Touch screen
34	Push button
40	Placement area
M	User
P	Pointer

CLAIMS

1. A massaging apparatus for massaging message target areas of user's body designed as a massaging apparatus operable by a mobile electronic information equipment, which can be operated by a user-owned mobile electronic information equipment, the massaging apparatus being designed to permit display of menu items for operation of a massaging apparatus main body that massages message target areas of user's body and/or menu items for operation of an additional mechanism provided in the massaging apparatus main body on a display section of a mobile electronic information equipment owned by a user, the massaging apparatus having an operation section, mounted in the massaging apparatus main body, for permitting manipulation of the display section of the mobile electronic information equipment from a remote location.
2. The massaging apparatus operable by a mobile electronic information equipment according to claim 1,

wherein a massaging mechanism is provided to massage the message target areas of user's body,

and wherein the massaging mechanism can be operated by the mobile electronic information equipment.
3. The massaging apparatus operable by a mobile electronic information equipment according to claim 1,

wherein a position-changing mechanism is provided to change a position of the massaging apparatus,

and wherein the position-changing mechanism can be operated by the mobile electronic information equipment.
4. The massaging apparatus operable by a mobile electronic

information equipment according to claim 1,

wherein the additional mechanism is provided to enhance an effect of massage treatment given to a user,

and wherein the additional mechanism can be operated by the mobile electronic information equipment.

5. The massaging apparatus operable by a mobile electronic information equipment according to any one of claims 2 to 4,

wherein, for operation of at least one or more mechanisms selected from among the massaging mechanism, the position-changing mechanism, the additional mechanism, and a control mechanism, changing of operation-related display items is effected by the mobile electronic information equipment.

6. The massaging apparatus operable by a mobile electronic information equipment according to claim 5,

wherein a voice-recognition system available in the mobile electronic information equipment is utilized to operate at least one or more mechanisms selected from among the massaging mechanism, the position-changing mechanism, the additional mechanism, and the control mechanism, or to effect changing of operation -related display items.

7. The massaging apparatus operable by a mobile electronic information equipment according to claim 5,

wherein a stress sensor is provided to detect user's stress level,

wherein an output from the stress sensor is transferred to the mobile electronic information equipment to enable the mobile electronic information equipment to estimate user's physical condition or psychological condition on the basis of a detected-value output from the stress sensor that has been transferred from the massaging apparatus,

and wherein, in accordance with the estimated user's physical condition or psychological condition, at least one or more mechanisms selected from among the massaging mechanism, the position-changing mechanism, and the additional mechanism are actuated, or changing of operation-related display items is effected under the control of the mobile electronic information equipment.

8. The massaging apparatus operable by a mobile electronic information equipment according to claim 5,

wherein a stress sensor available in the mobile electronic information equipment is used to detect user's stress level,

wherein user's physical condition or psychological condition is estimated on the basis of a value detected by the stress sensor by the mobile electronic information equipment,

and wherein, in accordance with the estimated user's physical condition or psychological condition, at least one or more mechanisms selected from among the massaging mechanism, the position-changing mechanism, and the additional mechanism are actuated, or changing of operation-related display items is effected under the control of the mobile electronic information equipment.

9. The massaging apparatus operable by a mobile electronic information equipment according to claim 5,

wherein, in accordance with user's personal information stored in the mobile electronic information equipment, at least one or more mechanisms selected from among the massaging mechanism, the position-changing mechanism, and the additional mechanism are actuated, or changing of operation-related display items is effected under the control of the mobile electronic information equipment.

10. The massaging apparatus operable by a mobile electronic

information equipment according to claim 5,

wherein, on the basis of external information obtained by the mobile electronic information equipment via internet, at least one or more mechanisms selected from among the massaging mechanism, the position-changing mechanism, and the additional mechanism are actuated, or changing of operation-related display items is effected under the control of the mobile electronic information equipment.

11. The massaging apparatus operable by a mobile electronic information equipment according to claim 10, wherein weather information including one of weather, temperature, and humidity as of now is adopted as the external information available via internet.

12. The massaging apparatus operable by a mobile electronic information equipment according to claim 5,

wherein, during the time at least one or more mechanisms selected from among the massaging mechanism, the position-changing mechanism, the additional mechanism, and the control mechanism are being operated by the mobile electronic information equipment, an operation terminal mounted in a main body of the massaging apparatus is limited in its control function.

13. The massaging apparatus operable by a mobile electronic information equipment according to claim 12,

wherein, even under conditions where the operation terminal mounted in the main body of the massaging apparatus is limited in its control function, some actions of the massaging mechanism and/or the position-changing mechanism can be effected under the control of the operation terminal.

14. The massaging apparatus operable by a mobile electronic

information equipment according to claim 1,
wherein the main body of the massaging apparatus is provided with
a placement area where the mobile electronic information equipment
can be placed.

15. The massaging apparatus operable by a mobile electronic
information equipment according to claim 14,

wherein the placement area is disposed within a reach of the hand
of a user sitting in the massaging apparatus.

16. The massaging apparatus according to claim 1, wherein there is
provided a mounting body that accommodates the mobile electronic
information equipment, is worn on user's head, and allows a user
to view a display section of the accommodated mobile electronic
information equipment with his or her hands free.

17. The massaging apparatus according to claim 16, wherein the
massaging apparatus main body includes a seat portion in which a
user sits when taking massage, and armrest portions disposed one
on each side of the seat portion,

and wherein the operation section is disposed on the armrest
portion.

18. The massaging apparatus according to claim 17, wherein the
operation section has a system capable of effecting operation based

on a "stop" menu item to stop operation of the massaging apparatus main body and/or the additional mechanism.

19. The massaging apparatus according to claim 17, wherein the operation section has a system capable of effecting operation based on a "forward-looking" menu item to display, on the display section, an image captured by a camera disposed at a back side of the mobile electronic information equipment.
20. The massaging apparatus according to claim 18, wherein an operation button is provided in the operation section to effect direct operation based on the "stop" menu item or the "forward-looking" menu item.
21. The massaging apparatus according to claim 17, wherein, under conditions where an indication of an incoming call is displayable on the display section of the mobile electronic information equipment, an incoming call can be handled by operating the operation section disposed on the armrest portion.