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(71) Applicant: **Yang, Chang-Ming**
Miaoli County (TW)

(72) Inventor: **Yang, Chang-Ming**
Miaoli County (TW)

(74) Representative: **Wytenburg, Wilhelmus Johannes et al**
Mewburn Ellis LLP
York House
23 Kingsway
GB-London WC2B 6HP (GB)

(54) **AN ELECTRONIC DEVICE**

(57) An electronic device which includes a resilient piece, base plate and electronic source. The upper conductor is located on the resilient piece; the base plate is connected to the resilient piece, with a space between the two. The lower conductor is located on the base plate, and there is a crevice between the lower conductor and the upper conductor. The electronic source electrically connected to the upper conductor and the lower conductor. The sensor device is located on the base plate. Utilizing this structure, the electronic device can, based on the user's needs, perform testing of the subject's physiological status or test a specific site that is pressed, be used as assist for medical equipment, exercise equipment or communications facilities.

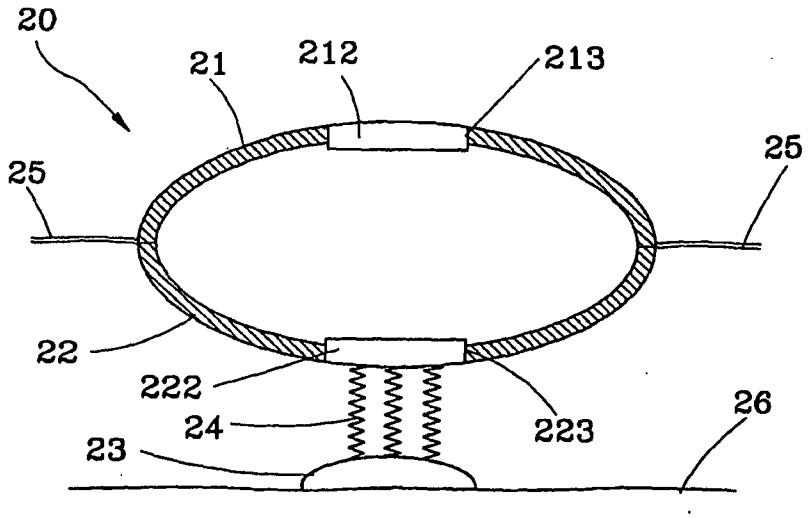

FIGURE 4

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Description

Technological aspect:

[0001] This invention involves a human body-testing installation, especially designed to be carried around, and can test any of the following: breath sounds, heart rate, EKG, body fat, sweat wetness, O_2 saturation, pulse rate, blood pressure, body temperature, urine sugar, or change in pressure at a point where pressure is applied.

Technological background:

[0002] Well-known electronic devices have been widely used for human body testing purposes, for example, electronic thermometers, electronic blood pressure monitors, lung sound-sensing and heart rhythm-sensing devices. Yet, the aforementioned devices have 3 common disadvantages, namely:

1. The aforementioned devices are all external devices that are inconvenient to be carried around.
2. The aforementioned devices are all operated by an on-off switch, to be switched on before use and turned off immediately after. When repetitive and short-time monitoring is needed, as in mountain-climbing, wherein what is actually needed is to take the heart rate every 5 minutes for a duration of 10 seconds, turning the switch on and off repetitively is cumbersome.
3. In the process of using the aforementioned devices, the user needs to turn on the switch, and then apply pressure on the devices so that it presses on the part to be monitored or tested. For a patient or a busy operator, this is very inconvenient.

Content of invention:

[0003] Facing the above-mentioned problems, this invention aims to provide an electronic device that can be fixed to a user's worn articles, for example clothes, pants, hats, gloves, ties, socks, scarves, etc., so it can be carried around conveniently.

[0004] This invention also aims to provide an electronic device with an on-off switch that is designed to be easy to use in repetitive, short-time monitoring or testing.

[0005] This invention also aims to provide an electronic device that integrates the actions of switching on and applying pressure on the part to be tested or monitored, into one single action, thereby providing ease of use.

[0006] To achieve the above-mentioned aims, one aspect of this invention provides an electronic device that include: a resilient piece, a base plate and an electronic source. The resilient piece has an upper conductor; the base plate is connected to the resilient piece, with a space between the resilient piece and the base plate. The base plate is designed with a lower conductor, which is separated from the upper conductor with a crevice. An electronic source connects each of the upper conductor and the lower conductor electrically.

Explanation of illustrations:

[0007] After going through the following detailed description by integrated illustrations of a first example embodiment, you will understand more accurately the make-up and special features of this electronic device, which includes:

Illustration 1 shows a cut-away view of a first example embodiment of an electronic device of the present invention;
Illustration 2 shows a schematic diagram of this first example embodiment in actual use;
Illustration 3 shows a schematic diagram of the electronic device in illustration 1 in actual use;
Illustration 4 shows a cut-away view of a second example embodiment of an electronic device of the present invention;
Illustration 5 shows a cut-away view of a third example embodiment of an electronic device of the present invention;
Illustration 6 shows a schematic diagram of the electronic device's third example embodiment in actual use on the finger;
Illustration 7 shows a schematic diagram of the electronic device's third example embodiment in actual use on the adhesive tape;
Illustration 8 shows a schematic diagram of the electronic device's third example embodiment in actual use on the clothing;
Illustration 9 shows a cut-away view of a fourth example embodiment of an electronic device of the present invention;
Illustration 10 shows a schematic diagram of the electronic device in illustration 9 in actual use;
Illustration 11 shows a cut-away view of a fifth example embodiment of an electronic device of the present invention;
Illustration 12 shows a cut-away view of a sixth example embodiment of an electronic device of the present invention;

Illustration 13 shows a cut-away view of a seventh example embodiment of an electronic device of the present invention;

Explanation of the main parts with labels in the illustrations:

[0008]

Electronic device 10	11	resilient piece	112	Upper conductor
	12	Base plate	122	Lower conductor
	13	Sensor device	14	Monitor
	15	Transmission interface	16	Tested subject's coat
	17	Illustration of functions	18	Microphone
	19	Processor		

Electronic device 20	21	Resilient piece	212	Upper conductor
	213	Hole	22	Base plate
	222	Lower conductor	223	Hole
	23	Sensor device	24	Spring
	25	Tested subject's shirt	26	Tested subject's skin

Electronic device 30	31	Upper conducting plate	32	Lower conducting plate
	33	Nonconductive material	34	Cover ring
	35	Finger	36	Clothes
	37	Adhesive tape		

Electronic device 40	41	Resilient piece	412	Upper conductor
	413	Hole	42	Base plate
	422	Lower conductor	423	Hole
	43	Blade	44	Sensor device

Electronic device 50	51	Resilient piece	512	Upper conductor
	513	Hole	52	Base plate
	522	Lower conductor	523	Hole
	53	Nonconductive material	54	Blade
	55	Sensor device		

Electronic device 60	61	Resilient piece	612	Upper conductor
	62	Base plate	622	Lower conductor
	63	Separated lamina	64	Sensor device

Electronic device 70	71	Upper conducting plate	72	Lower conducting plate
	73	Nonconductive material	74	Separated lamina
	75	Sensor device		

Specific implementing pattern:

[0009] In the following reference illustrations 1 through 3, this invention's first example embodiment of the electronic device 10 includes resilient piece 11, base plate 12, sensor device 13, processor 19, monitor 14, transmission interface 15 and an electronic source (not shown). Among which, the resilient piece 11 is like a dome shape, it is facing down, and is made of resilient, nonconductive material. Applying pressure downwards will cause the resilient piece 11 to deform. Removal of the applied force allows the resilient piece 11 to return to its prior shape. The upper conductor 112 is located on the central portion of the lower surface of the resilient piece 11. The base plate 12 is like a dome shape, and is made of nonconductive material. The dome shape base plate utilizes a disc-to-disc linkage located below the resilient piece 11. There is a space between the resilient piece 11 and the base plate 12. The lower conductor 122 is located on the central portion of the upper surface of the base plate. There is a gap between the lower conductor 122 and the upper conductor 112. The sensor device 13 is located at the lower surface of the base plate 12, and is electrically connected to the lower conductor 122.

[0010] Based on this example embodiment, the sensor device 13 is a heart rhythm sensor device which can be used to monitor heart rhythm and subsequently transmit the results to the processor 19. For example, the threshold value in the processor is set for 3 seconds. If the resilient piece 11 is pressed for only 2 seconds, then the processor will ignore and delete the results of this test since it is below the threshold value set in the processor. In other words, if the sensor device is pressed for more than 3 seconds, then the results of this test will be shown on the monitor 14; or the results can be send wirelessly via the transmission interface 15 to the outside world. From here, we can ignore the irrelevant data from tests that are done in too short a time, thereby preventing sensing by mistake. The electronic source provides the needed power to the sensor device 13, the monitor 14 and the transmission interface 15, and is electrically connected to the upper conductor 112 and the lower conductor 122.

[0011] As shown in illustration 2, the electronic device 10 is directly fixed to the subject's coat 16. As shown in illustration 1, the coat 16 is fixed between the base plate 12 and resilient piece 11, causing the sensor device 13 to come into direct contact with the part to be sensed, such as the subject's left chest which is closest to the heart. As shown in illustration 3, during sensing, the subject only needs to apply light pressure on the resilient piece 11, causing it to be deformed, which then causes the upper conductor 112 and the lower conductor 122 to come in direct contact with each other, completing the electrical circuit. When the sensor device 13 is activated, it starts to sense and monitor the subject's heart rhythm, and through the processor 19, decide whether sensing time reaches the threshold of 3 seconds or not. If it does, then the results are shown on the monitor 14, or be transmitted wirelessly to the outside world through the transmission interface 15. On the coat 16 is a functional diagram 17 which indicates the functions of the electronic device 10, and the functional diagram 17 can be dyed or stitched on the resilient piece 11. For example, in this applied example where the sensor device 13 is a heart rhythm sensor, the functional diagram 17 can be in the shape of a heart.

[0012] Since this electronic device 10 is directly set to the subject's coat 16, it does away with the inconvenience of carrying a sensor device. And during sensing, the subject needs only to press on the resilient piece with one hand, and turns the switch on and simultaneously causes the sensor device 13 to make contact with the site to be sensed. Because of this, even for repetitive and short-interval testing, it seems very convenient. Also, as the circuit is only powered on when resilient piece 11 is pressed, the circuit is otherwise always open. It decreases the energy consumption and is good for a green policy. Aside from this, this electronic device is also provided with an anti-false sensing feature. In addition, this invention's electronic device improves the disadvantages of similar devices in the market, thereby achieving its goal of our invention.

[0013] Moreover, there are several variations to this electronic device 10. For example, the locations of the resilient piece 11 and the base plate 12 can be interchanged. And the elastic base plate 12 is placed on top of the elastic piece 11. Or, both the resilient piece 11 and the base plate 12 use the same resilient material. All these changes give the same results. Secondly, a different thickness or different modulus of elasticity of the resilient piece can change the sensitivity of the electronic device 10. Because of this, during design, we can choose different sensitivity material to be used for the resilient piece based on the practical demands for the sensitivity of the electronic device 10. Several exemplary resilient piece materials include chloroprene rubber (CR) (such as in wetsuits and related water accessories); styrene butadiene rubber (SBR) (for cell phone cases, coolers and the like); a 30%:70% ratio of CR to SBR for sports suits, medical supports, and the like; silicone rubber; nylon; polyester; polypropylene; polyurethane; spandex; Lycra®; and sponge. However, any material suitable for providing a resilient and sufficiently elastic construction can be used.

[0014] Furthermore, we can use other types of sensor devices instead of the above-mentioned sensor device 13, for example, those used in sensing lung sound, pulse rate, blood pressure, body temperature, urine sugar, body fat, sweating, ECG, O_2 saturation, or pressure sensors. We can also vary the detect portion of the body, change the functional diagram 17 and reset the threshold value in the processor 19 based on the monitor factors. For example, we can use a body temperature sensor device 13 and place it under the armpit, set a longer threshold value of time (for example, 1 minute), for it to have enough time to achieve heat equilibrium. As regards the sensor device for urine sugar, we can place the sensor device near a perineum of a diaper, or dye or stitch a functional diagram thereon, or freely adjust any aspect

based on real demands.

[0015] In addition, the processor 19 can be equipped with a function to turn the sensor device on and off, change the sensor device's 13 sensing time, sensing frequency, and sensing mode, and/or other parameters based on the user's needs. Or these settings can be set to be activated based on the duration of time the user presses on the resilient piece 11, if it crosses the threshold value set in the processor 19, thereby preventing activation by accidental-touching. Moreover, the transmission interface 15 can be used to receive remote signals for the purpose of remote activation and inactivation of the sensor device, or to change the procedure of the test parameters. Regarding the monitor 14, it can be a cellular phone, PDA or a computer that shows the test results. Also, a light-emitting body can be used to emit a warning sign to the people around (such as in the form of a "red cross" or the number "119") whenever the sensor device 13 senses an abnormal result, such as an overly high blood pressure or sudden stop of the heartbeat. Or, signals can be sent via the transmission interface 15 to relatives far away, or directly call an ambulance. And also, the electronic device 10 can be equipped with a microphone 18 in the resilient piece 11 and connected electrically with the upper conductor 112, to allow the user to directly communicate with or seek help from the outside world via the transmission interface 15. The place where resilient piece 11 is located on the coat 16 can be printed with a functional diagram 17 to differentiate between emergency articles and communication articles. Included in the functional diagram 17 are illustrations of a red cross, ambulance and relatives.

[0016] Aside from these, when the electronic device 10 is designed to be an EKG or blood pressure sensor, the time needed for testing needs to be at least 1-2 minutes. Because of this, the subject's coat 16 can be equipped with a self-inflatable airbag. When the subject presses on the resilient piece 11, the upper conductor 112 comes into contact with the lower conductor 122, causing the inflatable bag to self-inflate thereby pressing the sensor device 13 against the skin of the part to be tested. Or the subject's shirt can be designed to be tight-fitting, which can lessen inconvenience on the subject who needs to maintain a proper position. This increases the ease of use.

[0017] As shown in illustration 4, this invention's second example embodiment of the electronic device 20 includes a resilient piece 21, base plate 22, sensor device 23, 3-row spring 24, monitor (not shown), and electronic source (not shown). Among which, the resilient piece 21 is like a dome shape and made of resilient, nonconductive material. In the disk center of the resilient piece 21, the upper conductor 212 and a hole 213 are located, where the upper conductor 212 is mounted. The base plate 22 is also like a dome shape, is made of resilient, nonconductive material, and is connected to the resilient piece between which there is a space. In the disk center of the base plate 22, the lower conductor 222 and an hole 223 are located, where the lower conductor 222 is mounted. There is a crevice between the lower conductor 222 and the upper conductor 212. The applied example of the sensor device 23 is a lung sound sensor, which is electrically connected to the lower conductor 222. This sensor device 23 is used to test human lung sound, and shows the test results on the monitor. The 3-combined spring 24 and the sensor device 23 and the base plate 22 are joined together. The electronic source provides the needed power to the sensor device 23 and the monitor, and is electrically connected to the upper conductor 212 and the lower conductor 222.

[0018] Fixing the electronic device 20 directly on the subject's shirt 25, makes it so that the sensor device 23 is pressing down directly on the part to be tested 26. During testing, pressing lightly on the resilient piece 21 promotes contact between the upper conductor 212 and the lower conductor 222, thereby turning the electrical circuit on. As the sensor device 23 is activated, it starts to test the subject's lung sound. Utilizing this type of structure, even if the subject performs extreme exercise, thereby deviating the position of the resilient piece 21 and the base plate 22 from the area to be tested, the sensor device 23 can still remain fixed to the site to be tested. For this reason, not only can the electronic device 20 maintain its active test status at all times, but also cannot be affected by the subject doing exercise and thereby moving the sensor device 23 from the tested site 26, causing error. The electronic device 20 can also be carried around conveniently, and be operated by one hand even during repetitive, short-interval testing. This is extremely convenient.

[0019] Referring to illustrations 5 through 8, this invention's third example embodiment of the electronic device 30 includes an upper conducting plate 31, lower conducting plate 32, nonconductive material 33, processor (not shown), monitor (not shown), and electronic source (not shown). Among which, the upper conducting plate 31 and the lower conducting plate 32 is like a dome shape and are made of resilient conductive material. The nonconductive material 33 is ring-shaped. The edges of the disks of the upper conducting plate 31 and the lower conducting plate 32 are fixed separately to the upper and lower edges of the nonconductive material 33. The upper conducting plate 31 and lower conducting plate 32 are separated from the nonconductive material to form a space. The processor is electrically connected to the upper conducting plate 31 and the lower conducting plate 32 separately. It can distinguish whether the circuit is on or off between the upper conducting plate 31 and the lower conducting plate 32, and can process this mutual electrical conductance signal and show it on the monitor. The electronic source provides the power needed for the processor and the monitor, and is electrically connected to the upper conducting plate 31 and the lower conducting plate 32.

[0020] The electronic device 30 is installed to the ring 34 to be put on the subject's finger 35 near the joint. This can be used in deaf-mute persons as a means of communicating with each other, and similarly among medical personnel in the operating room. If the subject wishes to express a personal opinion, he only needs to bend his finger, forcing the

upper conducting plate 31 and the lower conducting plate 32 to change shape, thereby coming into contact with each other, completing an electrical circuit. Afterwards, when the processor receives this electrical conducted signal, it processes it and shows it on the monitor. For example, it can be designed in such a way that bending the finger once means "Yes", and twice means "No", or three times or more or at different intervals to mean other different words, based on the needs of the user. Moreover, the monitor can be equipped with speakers, which can directly broadcast the user's opinion in spoken language for others to hear. Another thing is, as shown in illustration 7, we can use the adhesive tape 37 to fix the electronic device 30 on the eyelids, hence allowing a special group of patients (quadriplegics) to express their thoughts through blinking.

[0021] Besides, this invention's third example embodiment of the electronic device 30 can have other uses. For example, we can have several electronic devices 30 placed near the wrist joints, elbow joints, or the knee joints, and share a common processor to process different signals as a whole. Utilizing this arrangement, the electronic device 30 can be used as an exercise-assist equipment, helping beginners learn essential actions, just like learning to play golf, where the different electronic devices 30 on the different joints will help us determine if the user's posture is correct, and show it on the monitor. It can even show clearly the position of an incorrect posture, hence improving the user's learning results.

[0022] Again as shown in illustration 8, we can use several electronic devices 30 and arrange them in matrix array form, and place them between the fibers of the clothes 36, which critically ill, vegetative and chronically bed-ridden patients can wear. With the help of the test results, we can promptly know the condition of body areas that are subjected to pressure under prolonged time in these patients, and can alert nurses in advance to help the patients, thereby preventing bedsores or eczema. Moreover, we can install the electronic device 30 to a ring placed on a steering wheel as a tool to assist drivers. In this case, the electronic device will be used to test if the driver is grasping the steering wheel correctly. If not, the monitor will immediately show a warning signal to alert the driver, thereby preventing accidents.

[0023] As shown in illustrations 9 through 10, this invention's fourth example embodiment of the electronic device 40 includes a resilient piece 41, base plate 42, two blades 43, sensor device 44, monitor (not shown), and electronic source (not shown). Among which, the resilient piece 41 forms a dome shape and is made of resilient, nonconductive material. In the disk center of the resilient piece 41, the upper conductor 412 and an hole 413 are located, where the upper conductor 412 is mounted. The base plate 42 is also dome-shaped, is made of resilient, nonconductive material, and is connected to the resilient piece 41, between which there is a space. In the disk center of the base plate 42, the lower conductor 422 and a hole 423 are located, where the lower conductor 422 is mounted. The two blades 43 are each rectangular, board-like plates, and are made of flexible, nonconductive material. Its fixed end is fixed on the spot where the elastic piece 41 and the base plate 42 are joined, while its free end is located between the upper conductor 412 and the lower conductor 422. The distance between the two blades 43 and the upper conductor 412 is smaller than the distance between the two blades 43 and the lower conductor 422. The sensor device 44 is located on the lower surface of the base plate 42, and is electrically connected to the lower conductor 422. The sensor device is used to test the subject's physiological status, and the results are shown on the monitor. The electronic source provides the needed power to the sensor device 44 and the monitor, and is electrically connected to the upper conductor 412 and the lower conductor 422.

[0024] When the electronic device 40 is fixed to the subject's garment, he only needs to press lightly on the resilient piece 41, causing it to deform and change shape, leading to the upper conductor 412 to push apart the two blades 43 and coming into contact with the lower conductor 422, completing the electrical circuit on, as shown in illustration 10. When the sensor device 44 is activated, it starts to test. If the subject is in the process of moving, and unintentionally pulls tightly his shirt where the electronic device 40 is located, this will impel the base plate 42 to change shape. The lower conductor 422 will not be able to come into contact with the upper conductor 412 because it is separated by the two blades 43. Hence, this will prevent testing by mistake and power wastage. Based on this, the electronic device 40 not only allows the subject to be tested at any time based on his needs, but also can prevent testing by mistake due to the subject's exaggerated movements.

[0025] As shown in illustration 11, this invention's fifth example embodiment is electronic device 50, which includes a resilient piece 51, base plate 52, nonconductive material 53, two blades 54, sensor device 55, monitor (not shown), and electronic source(not shown). Among which, the resilient piece 51 is round, lamina-shaped and made of resilient nonconductive material. In the center of the resilient piece 51 are the upper conductor 512 and an opening 513 where the upper conductor 512 is mounted. The base plate 52 is like a dome shape and is made of resilient nonconductive material. In the disk center are located the lower conductor 522 and an hole 523 where the lower conductor 522 is mounted. The nonconductive material 53 is ring-shaped. The resilient piece 51 and the base plate 52 are fixed on the upper and lower edges of the nonconductive material 53 respectively. There is a space between the upper conductor 512, the lower conductor 522 and the nonconductive material 53. The two blades 54 are each rectangular, board-like plates, and are flexible, nonconductive material. Its fixed end is fixed on the nonconductive material 53, while its free end is located between the upper conductor 512 and the lower conductor 522. The distance between the two blades 54 and the upper conductor 512 is smaller than the distance between the two blades 54 and the lower conductor 522. The

sensor device 55 is located on the lower surface of the base plate 52, and is electrically connected to the lower conductor 522. The sensor device is used to test the subject's physiological status, and the results are shown on the monitor. The electronic source provides the needed power to the sensor device 55 and the monitor, and is electrically connected to the upper conductor 512 and the lower conductor 522.

[0026] This application example has a similar effect as the fourth application example. The user simply has to press on the resilient piece 51, causing the upper conductor 512 to change the shape of the two blades 54, thereby coming into contact to the lower conductor 522 it is on. On the other hand, if the user mistakenly presses on the base plate 52, the lower conductor 522 will be obstructed by the two blades 54, preventing electrical connection with the upper conductor 512.

[0027] Referring to illustration 12, this invention's sixth example embodiment of the electronic device 60 includes an resilient piece 61, base plate 62, separated lamina 63, sensor device 64, monitor (not shown), processor (not shown) and electronic source (not shown). Among which, the resilient piece 61 is like a dome shape and is made of resilient, nonconductive material. In the center portion of the underside of the resilient piece 61 is the upper conductor 612. The base plate 62 is like a dome shape and is made of resilient nonconductive material. In the disk center are located the lower conductor 622. The separated lamina 63 is designed to include conductible material, so it can be conductive at a fixed on the spot where the resilient piece 61 and the base plate 62 are joined. There is a crevice between the separator board 63 and both the upper conductor 612 and the lower conductor 622. The sensor device 64 is fixed on the lower surface of the base plate 62, and is electrically connected with the lower conductor 622. It is used to test the subject's physiological status and shows the results on the monitor. The processor is electrically connected to each of the following: upper conductor 612, the lower conductor 622, separated lamina 63 and sensor device 64, and is pre-installed with a deciding program. The contents of the program are as follows:

1. When the separated lamina 63 contacts first with the upper conductor 612, followed by the lower conductor 622, the sensor device 64 is activated, and starts to test;
2. When the separated lamina 63 contacts first with the lower conductor 622, followed by the upper conductor 612, no action is taken;
3. Under other circumstances, no action is taken without exception.

[0028] The electronic source provides the needed power to the sensor device 64, monitor and processor.

[0029] The electronic device 60 can be installed in the user's clothes. When the user lightly presses the resilient piece 61, it and the base plate 62 will change shape, causing the upper conductor 612 to come into contact first with the separated lamina 63, followed by the lower conductor 622. When the processor receives this information, it commands the sensor device 64 to start testing. On the contrary, when there is exaggerated movement from the user, causing the electronic device 60 to rub against the skin, there is an upward push from the skin, causing the lower conductor 622 to come into contact first with the separated lamina 63, followed by the upper conductor 612 contacted with the separated lamina 63. The processor will ignore this signal, thereby preventing the electronic device 30 to test by mistake.

[0030] Comparing illustration 13, this invention's seventh example embodiment of the electronic device 70 includes the upper conducting plate 71, the lower conducting plate 72, nonconductive material 73, separated lamina 74, sensor device 75, processor (not shown), output device (not shown), and a electronic source (not shown). Among which, the upper conducting plate 71 and the lower conducting plate 72 are dome-shaped, and are made of resilient, conductive material. The nonconductive material 73 forms a ring shape, and the upper conducting plate 71 and lower conducting plate 72 are fixed to the upper and lower edges of the nonconductive material 73 respectively. The separated lamina 74 is located inside the nonconductive material 73, and is separated from the upper conducting plate 71 and lower conducting plate 72 by a crevice. The sensor device 75 is fixed on the lower surface of the lower conducting plate 72, and is electrically connected to the lower conducting plate 72. The sensor device is used to test the subject's physiological status. The processor is electrically connected to each of the following: upper conducting plate 71, the lower conducting plate 72, separated lamina 74 and sensor device 75, and is pre-installed with a deciding program. The contents of the program are as follows:

1. When the separated lamina 74 contacts first with the upper conducting plate 71, followed by the lower conducting plate 72, the sensor device 75 is activated, and starts to test;
2. When the separated lamina 74 contacts first with the lower conducting plate 72, followed by the upper conducting plate 71, no action is taken;
3. Under other circumstances, no action is taken without exception. The electronic source provides the needed power to the sensor device 75, monitor and processor.

[0031] Based on the above, this application example has the same effect as the sixth application example. If the user presses on the upper conducting plate 71, causing it to come into contact first with the separated lamina 74, followed

by the lower conducting plate 72 coming into contact with the separated lamina 74, the processor will receive this signal and activate the sensor device 75 to start testing. On the contrary, if the signal is first due to the lower conducting plate 72 pressed by mistake, the processor will ignore this signal. Hence, the electronic device 70 has both the advantageous features of testing at anytime and preventing testing by mistake.

Claims

1. An electronic device comprising:

an elastic piece, made of insulated material, an upper conductor is provided on the elastic piece;
a base plate, made of insulated material, which is connected with the elastic piece, and a space is provided between the elastic piece and the base plate; a lower conductor is provided on the base plate, and a gap is provided between the lower conductor and the upper conductor;
a power source, which is electronically connected with the upper conductor and the lower conductor.

2. The electronic device as described in patent request 1, which also includes a sensor device, which is located on the base plate, and connected to the lower conductor; this sensor device is used to test breathing sounds, heart rhythms, EKG, body fat, perspiration, oxygen saturation, pulse rate, blood pressure, body temperature, pressure, and blood sugar in urine.

3. The electronic device as described in patent request 2, in which an elastic piece is joined between the sensor device and the base plate.

4. The electronic device as described in patent request 2, which includes a transmission interface which is electrically connected with the sensor device; it can transmit wirelessly to the outside world the test results of the sensor device, and can also receive information from the outside world.

5. The electronic device as described in patent request 2, which also includes a monitor which is electrically connected to the sensor device; it displays the test results or warning information from the sensor device.

6. The electronic device as described in patent request 2, which also includes a processor which is electrically connected to the sensor device; it is used to process the test results from the sensor device; it also turns on or shuts down the sensor device.

7. The electronic device as described in patent request 1, which also includes at least one includes at least one flexible blade which is located on the insulator, where its fixed end is located on the insulator, and its free end is located between the upper conducting plate and the lower conducting plate; the so-called flexible blade is made of nonconductive material; the distance between the two blades and the end part of the upper conductor is smaller than the span between the two blades and the lower conductor.

8. The electronic device as described in patent request 1, which also includes a separator board, which is located on the insulator; and is separated from the upper and lower conducting plates by a crevice; this separator board can be conductive and connect with the electronic source.

9. The electronic device as described in patent request 1, which also includes a microphone which is located on the elastic piece and is electrically connected with the power source and the upper conductor.

10. The electronic device as described in patent request 1, which also includes a ring which is located on the base plate; it is designed to be worn on a joint or set on a vehicle's steering wheel.

11. The electronic device as described in patent request 1 which also includes a garment where the base plate is fixed.

12. The electronic device as described in patent request 1 in which, the area on the garment where the elastic piece is located contains at least a type of functional diagram.

13. The electronic device as described in patent request 1 which also includes an adhesive tape which is located on the base plate; this is used to stick on a body joint or around the eyes.

14. An electronic device comprising:

a plate-shaped upper conducting plate;
a plate-shaped lower conducting plate, a space is provided between the upper conducting plate and the lower conducting plate;
an insulator, located between the upper conducting plate and the lower conducting plate; and
a power source, which is electronically connected with upper conductor and lower conductor.

15. The electronic device as described in patent request 14, which also includes a sensor device, which is located on the so-called lower conducting plate and is electrically connected to it; this sensor device is used to test breathing sounds, heart rhythms, EKG, body fat, perspiration, oxygen saturation, pulse rate, blood pressure, body temperature, pressure, and blood sugar in urine.

16. The electronic device as described in patent request 15 in which an elastic piece is joined between the sensor device and the lower conducting plate.

17. The electronic device as described in patent request 15 which also includes a transmission interface which is electrically connected with the sensor device; it can transmit wirelessly to the outside world the test results of the sensor device, and can also receive information from the outside world.

18. The electronic device as described in patent request 15 which also includes a monitor which is electrically connected to the sensor device; it displays the test results or warning information from the sensor device.

19. The electronic device as described in patent request 15, among which, also includes a processor which is electrically connected to the sensor device; it is used to process the test results from the sensor device; it also turns on or shuts down the sensor device.

20. The electronic device as described in patent request 14, which includes at least one flexible blade which is located on the insulator, where its fixed end is located on the insulator, and its free end is located between the upper conducting plate and the lower conducting plate; the so-called flexible blade is made of nonconductive material; the distance between the two blades and the end part of the upper conductor is smaller than the span between the two blades and the lower conductor.

21. The electronic device as described in patent request 14, which also includes a separator board, which is located on the insulator; and is separated from the upper and lower conducting plates by a crevice; this separator board can be conductive and connect with the electronic source.

22. The electronic device as described in patent request 14 which also includes a microphone which is located on the upper conductor and is electrically connected with the power source and the upper conductor.

23. The electronic device as described in patent request 14, which also includes a ring which is located on the lower conductor; it is designed to be worn on a joint or set on a vehicle's steering wheel.

24. The electronic device as described in patent request 14 among which, also includes garment where the base plate is fixed.

25. The electronic device as described in patent request 14 in which the area on the garment where the base plate is located contains at least a type of functional diagram.

26. The electronic device as described in patent request 14 which also includes an adhesive tape which is located on the base plate; this is used to stick on a body joint or around the eyes.

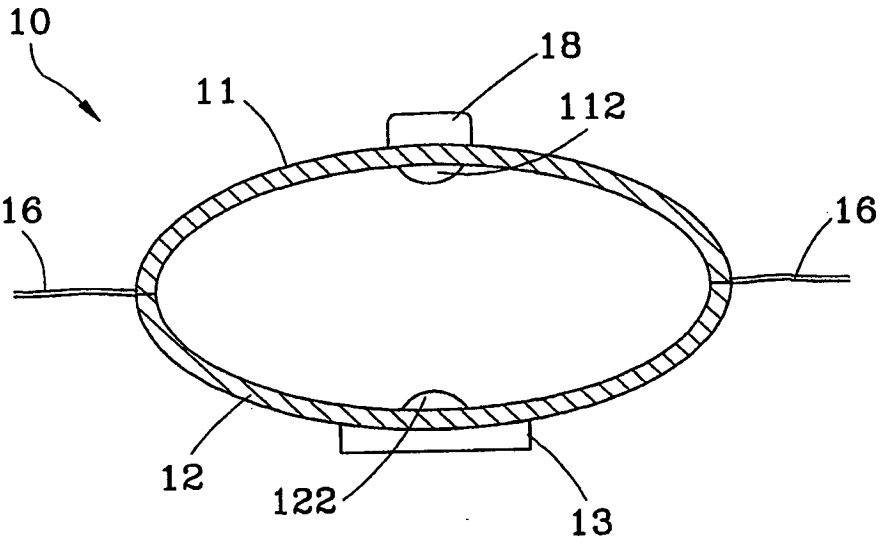


FIGURE 1

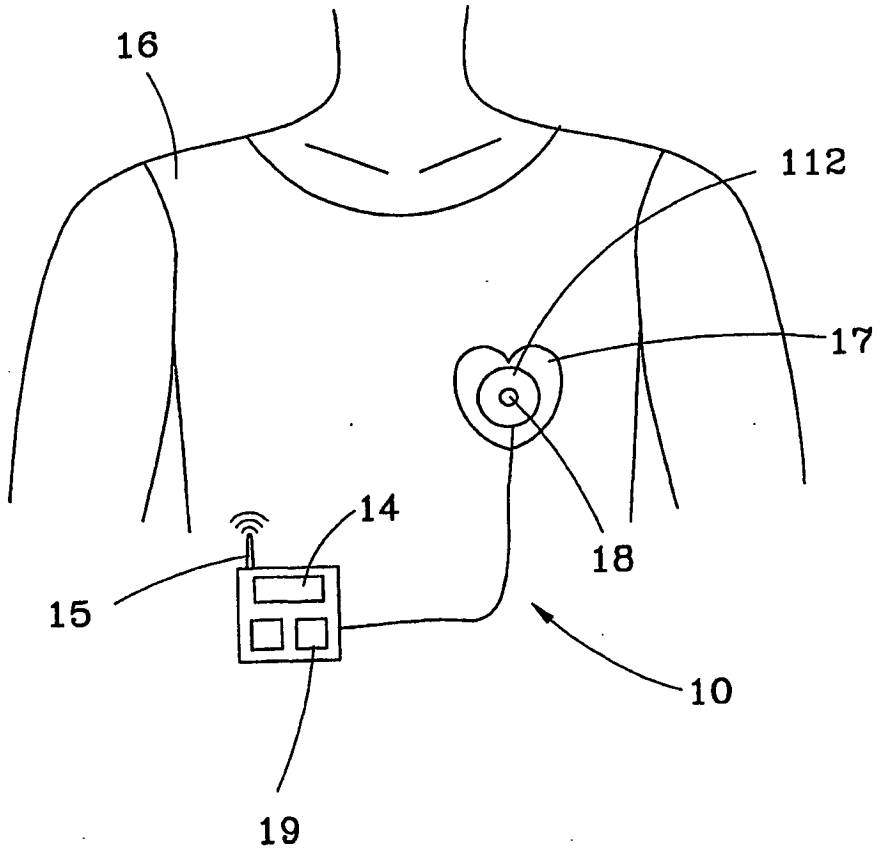


FIGURE 2

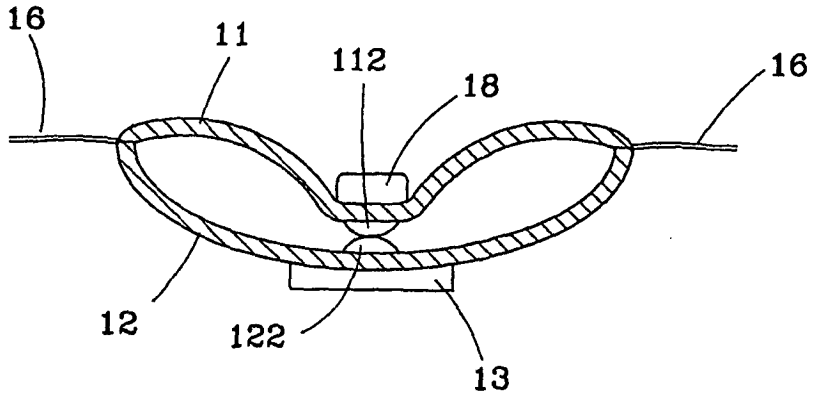


FIGURE 3

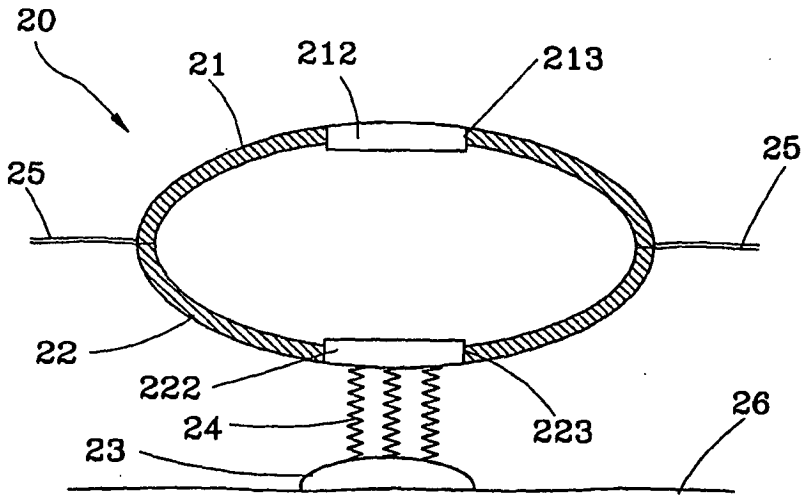
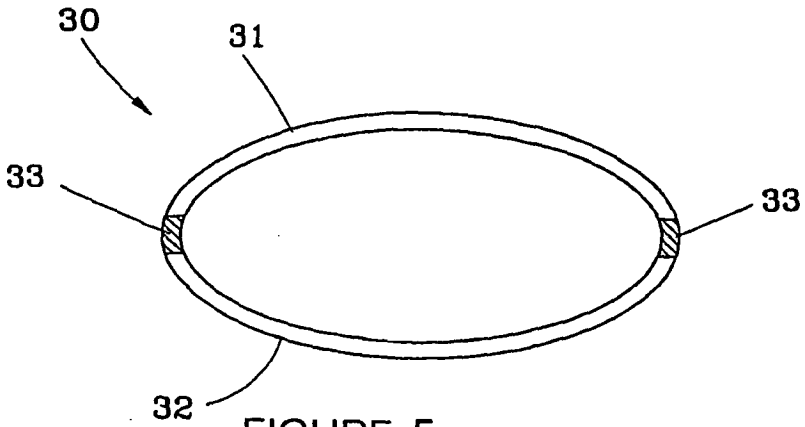


FIGURE 4



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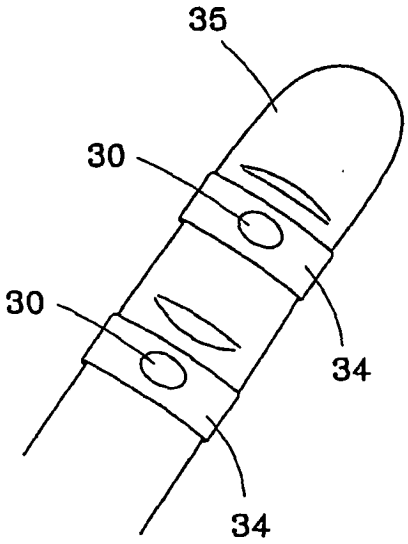

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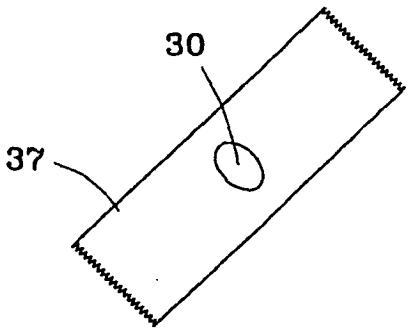

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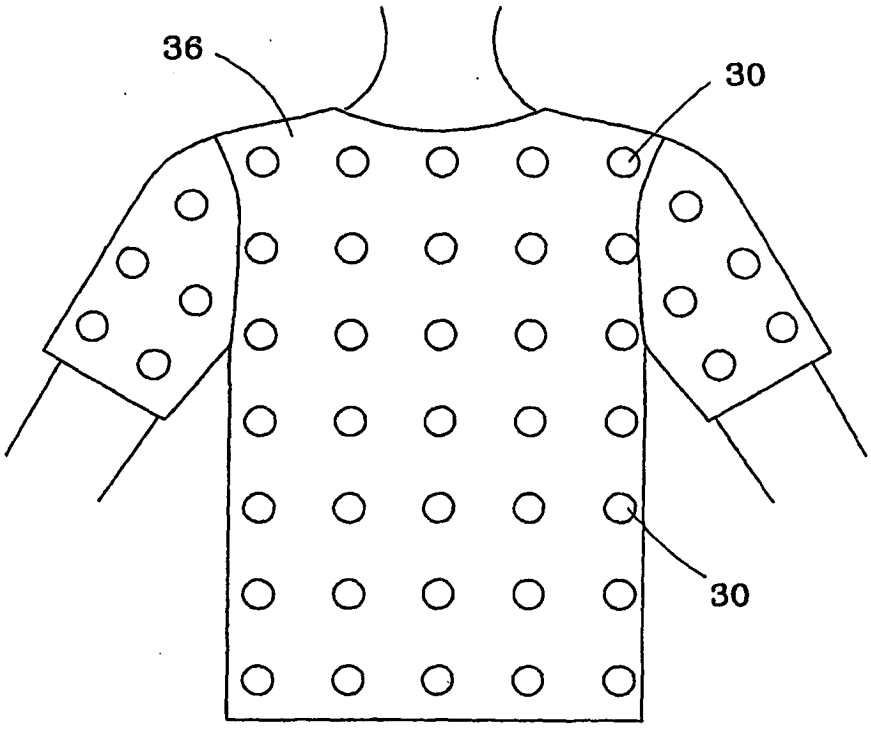

FIGURE 8

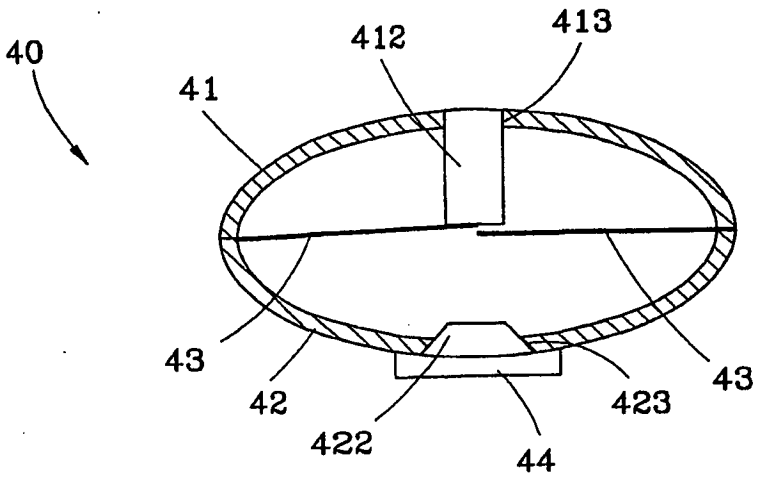

FIGURE 9

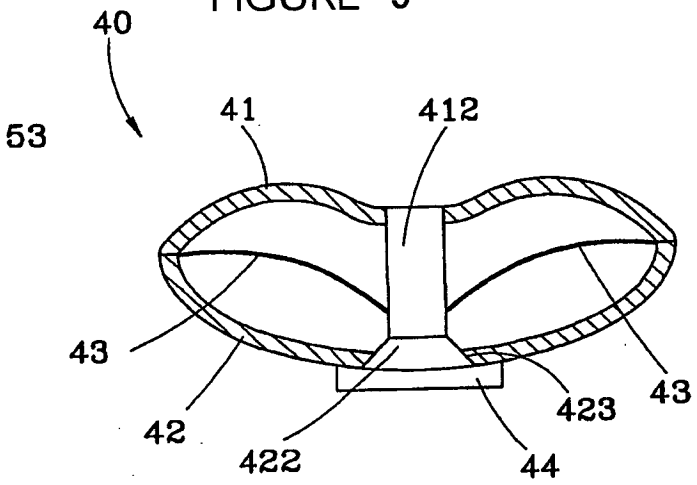

FIGURE 10

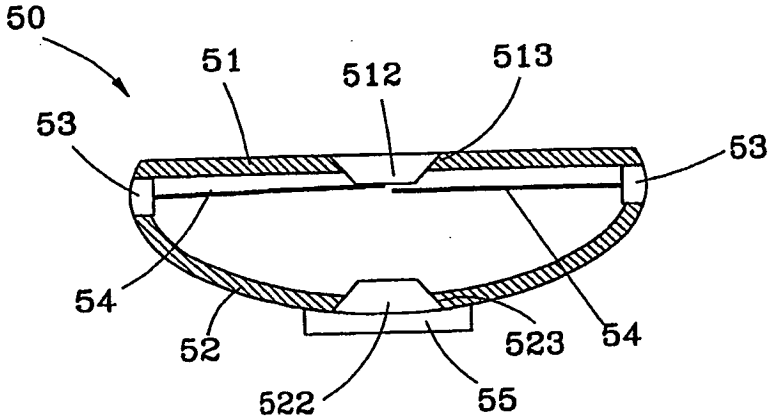

FIGURE 11

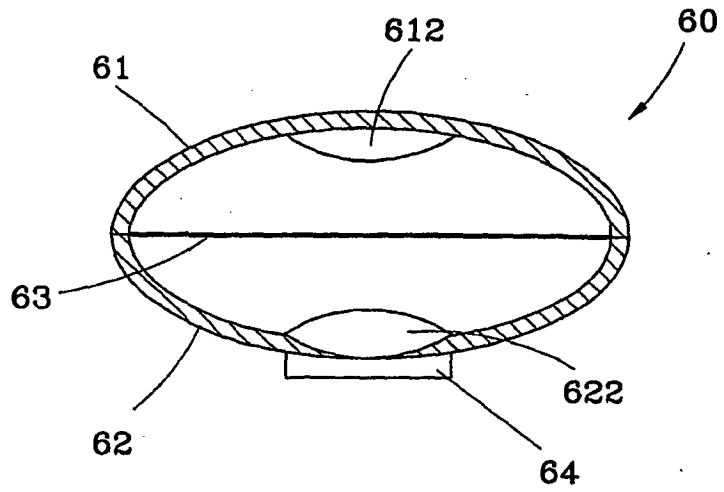

FIGURE 12

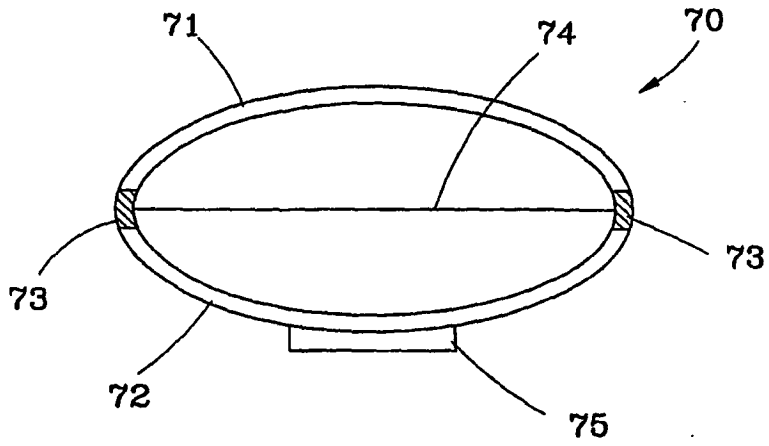

FIGURE 13

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2005/001520

A. CLASSIFICATION OF SUBJECT MATTER

See extra sheet

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC[8] A61B5,H01H13/00,13/50,13/52

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

Chinese patent document (1985-2005)

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

WPI,EPODOC,PAJ,CNPAT, elasticity piece, base plate, switch, portable

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN, A, 1366308 (Koninklijke Philips Electronics N.V.) 7 Sep.2005 (07.09.2005), the whole specification ,figures 2-3	1
A		2-26
A	CN, A, 1618395 (YANG,Zhang-Ming) 25 May.2005 (25.05.2005) ,the whole document	1-26
A	DE, U1, 29717348 (Sziczkus H) 12 Feb.1998 (12.02.1998) ,the whole document	1-26

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

* Special categories of cited documents:

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

"E" earlier application or patent but published on or after the international filing date

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

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

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

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

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

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

"&"document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
19 Jun.2006(19.06.2006)	13 · JUL 2006 (13 · 07 · 2006)
Name and mailing address of the ISA/CN The State Intellectual Property Office, the P.R.China 6 Xitucheng Rd., Jimen Bridge, Haidian District, Beijing, China 100088 Facsimile No. 86-10-62019451	Authorized officer SUN,Maoyu Telephone No. 86-10-62085796

Form PCT/ISA /210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2005/001520

Patent Documents refered in the Report	Publication Date	Patent Family	Publication Date
CN, A, 1666308	07.09.2005	US, B, 6600120	29.07.2003
		WO, A, 2004003952	08.01.2004
		AU, A, 2003237021	19.01.2004
		EP, A, 1520284	06.04.2005
		JP, T, 2005531895	20.10.2005
CN, A, 1618395	25.05.2005	none	
DE, U1, 29717348	12.02.1998	none	

Form PCT/ISA /210 (patent family annex) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2005/001520

CLASSIFICATION OF SUBJECT MATTER

A61B5/00 (2006.01) i

H01H13/52 (2006.01) i

Form PCT/ISA /210 (extra sheet) (April 2005)

专利名称(译)	电子设备		
公开(公告)号	EP1946696A1	公开(公告)日	2008-07-23
申请号	EP2005792188	申请日	2005-09-21
申请(专利权)人(译)	杨，长明		
当前申请(专利权)人(译)	杨，长明		
[标]发明人	YANG CHANG MING		
发明人	YANG, CHANG-MING		
IPC分类号	A61B5/00 H01H13/52		
CPC分类号	H01H3/14 A61B5/00 A61B5/0002 A61B5/024 A61B5/6804 A61B5/6805 H01H13/702 H01H2203/0085 H01H2205/004		
其他公开文献	EP1946696A4 EP1946696B1		
外部链接	Espacenet		

摘要(译)

一种电子设备，包括弹性件，底板和电子源。上导体位于弹性件上;底板连接到弹性件上，两者之间有一个空间。下导体位于基板上，下导体和上导体之间有缝隙。电子源电连接到上导体和下导体。传感器装置位于底板上。利用这种结构，电子设备可以根据用户的需要，对受试者的生理状态进行测试或测试被按压的特定部位，用作医疗设备，健身设备或通信设施的辅助。

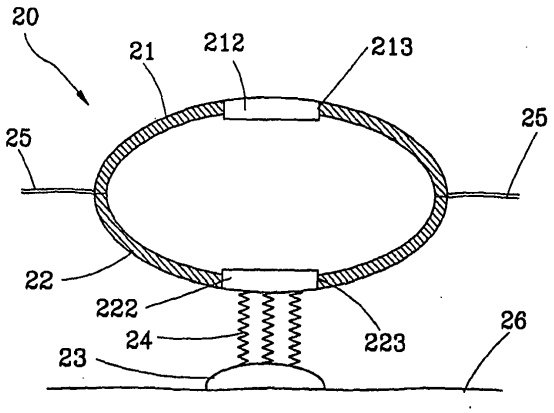

FIGURE 4