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(54) **Improved thermal apparatus and method of use**

(57) The present invention relates to a thermal apparatus, which comprises a power supply control unit and an operating unit, wherein the power supply control unit is electrically connectable on one side to an electrical supply network and on the other side to the operating unit which includes an enclosure and a heating element distributed within the enclosure, the thermal apparatus being characterized in that the control unit comprises at least one sensor able to detect vibrations or movements of said units control or, alternatively, able to detect the presence of a person in the surroundings of said control unit, and in that said control unit is connected to the thermal apparatus by means of a interconnection cable having such a physical structure and length such to create at least slight vibration to said control unit when the user uses the thermal apparatus.

The present invention further relates to a method to set up an appropriate temperature level for a continuous use of such a thermal apparatus or to set up the automatic switching off thereof.

In this way the thermal apparatus of the invention is able to ensure in an economic and efficient way the safety for any user of the thermal apparatus.

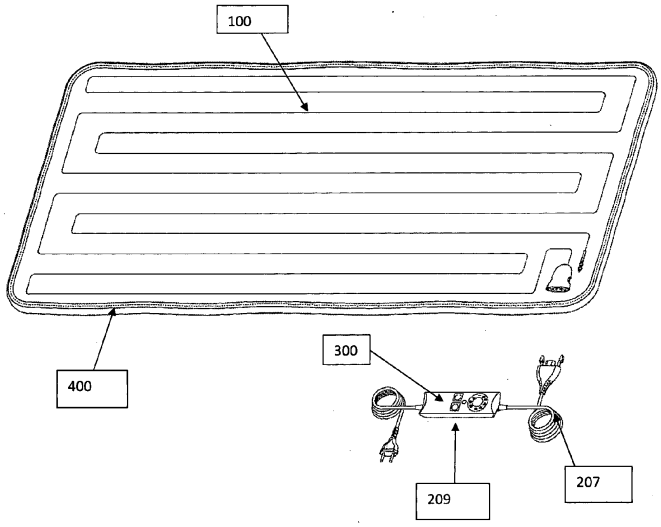

Figura 4

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Description

Field of the invention

[0001] The present invention relates to a thermal apparatus, such as a thermal blanket, a heating pad, and a heating carpet; in particular, the present invention relates to a thermal apparatus having a simplified electrical part and to a method for setting up the operating temperature for a continuous use of the apparatus.

State of the art.

[0002] Thermal blankets, heating pads, heating mats and similar products have long been known, and generally comprise a control unit power supply and an operating unit connected to it in electric mode; these two units can be connected together in a permanent way or can be separated and electrically connectable through an interconnection cable with eventual connector. The operating unit generally comprises a sheet consisting, for example, of textile material, and a linear heating element distributed inside the sheet and consisting of one or more conductors, mostly with a serpentine-like shape, having a path such as to favor, or better not to interfere too much, the sheet folding.

[0003] Normally, the heating element comprises first and second coaxial conductors, the first conductor being spirally disposed around an electrically insulating core, generally textile, while the second conductor being spirally wound around the first conductor, with the interposition of an electrically insulating material; an outer coating made in a further electrically insulating material encloses the whole. The heat is electrically produced by Joule effect inside the conductors, and from there it is distributed into all over the sheet.

[0004] It is immediately understandable and well-known in the industry that an apparatus of this type is often aimed at vulnerable users such as children and the elderly, so it has to be foreseen a careless use or even misuse by those kind of users.

[0005] It is also known at the regulatory level that the Technical Committees that deal with the upgrade of the household appliances safety standards, such as the CENELEC TC 61 European Technical Committee, are called to introduce changes in the household appliances safety standards which take into account of the fact that nowadays small children in the home are becoming more resourceful and seniors are living much longer, and therefore it is necessary to provide products that are easier and safer to use.

[0006] Thermal blankets and similar products enter even more in the apparatus categories that require continuous development to simplify their use while rendering them safer at the same time.

[0007] One of the main problems arising for these types of apparatus is to prevent a vulnerable user, which may have problems of conscious management appliance, to lie down into bed when the apparatus is set up to its maximum power and/or maximum temperature level.

[0008] Thermal blankets or similar products such as heating pads, heating mats or similar apparatus useful to heat the bed, the body, or the floor, provide a control unit which has several power or temperature use levels; one or some of these use levels are provided for use in a pre-heating phase and others are provided for a continuous use, the latter being designed for lower power/temperature levels. Obviously, in some cases, it is even preferred the appliance is allowed to switch off.

[0009] Even more sophisticated systems requiring the use of sensors adapted to detect the presence of the person in bed, as for example those described in U.S. Patents Nos. U.S. 5,948,303 and U.S. 6,513,164, or in Japanese patent application JP 2011-119791-A are also known in the art. However, such systems describe sensors placed within the sheet and this fact renders very complicated and expensive these product construction. The insertion of a sensor, of any known type, in the textile sheet, results in having a number of conductors which serve to connect said sensor to the control unit and this creates several constructive difficulties that render the machine quite complicated and expensive.

[0010] A first object of the present invention is to simplify the construction of a thermal apparatus, such as for example a thermal blanket or a similar apparatus, by minimizing the number of conductors of the interconnection cable that connects the power supply control unit and the operating unit one each other.

[0011] Another object of this invention is to provide a method which ensures effective management of the safety in a continuous use of the thermal apparatus, after it has been subjected to a pre-heating period of time.

Summary of the invention

[0012] In a first aspect the present invention relates to a thermal apparatus such as the one indicated in claim 1.

[0013] The Applicant of the present application has in fact surprisingly found that a thermal apparatus, comprising a power supply control unit and an operating unit, wherein said power supply control unit can be electrically connected on one side to an electrical supply network and on the other side to said operating unit which includes an enclosure and a heating element distributed within the enclosure, characterized by the fact that said control unit comprises at least a sensor able to detect vibrations or movements of said control unit or, alternatively, able to detect the presence of a person in the surroundings of said control unit, and wherein said control unit is connected to the thermal apparatus by means of an interconnection cable having such a physical structure and length to create at least slight vibrations to said control unit when the user uses said thermal apparatus,
is able to ensure safety for any thermal apparatus user in an economic and efficient way.

[0014] Indeed, thanks to the use of at least one sensor that is able to detect vibrations or movements of the control unit generally associated to the fact that a person touches said control unit, or is able to detect the presence of people in the surroundings of the unit control, it is possible to assemble the sensor directly on an electronic board contained in the control unit itself, thereby drastically reducing costs and constructive critical issues.

[0015] Moreover, thanks to the use of an interconnection cable - typically only used to electrically power the sheet - to connect said control unit to the thermal apparatus, being said sensor inserted into the control unit, an economically and safely device is obtained which is able to detect the moment at which the occupant lies down onto the bed or otherwise touches the control unit or moves elements such as said interconnection cable connected to it.

[0016] In this way, for example in the case where said thermal apparatus is a thermal blanket, when the user lies down onto the bed the movement of the bed generated by this action determines a vibration of said interconnection cable that, being connected to the thermal blanket, is detected by said sensor attached to the control unit of the thermal blanket itself. Obviously, an equivalent effect is obtained when the user simply touches the control unit with the intention of managing its adjustment, causing a vibration or movement of the control unit itself.

[0017] In this text and in the appended claims, the term "thermal apparatus" means an apparatus mainly, but not exclusively, intended to heating a bed or a person in bed, such as a thermal blanket, a heating pad, a thermal carpet or a similar thermal apparatus having substantially flat shape of any size, that is adapted to completely cover a bed or only a portion thereof or a part of the body or a part of the floor.

[0018] Preferably, the thermal apparatus is a thermal blanket, a heating pad, or a thermal carpet; more preferably, the thermal apparatus is a thermal blanket.

[0019] Preferably, said thermal apparatus is supplied with an alternating voltage having for example a frequency of 50 or 60 Hz; preferably, said alternated type electric network is managed by a power switch.

[0020] Preferably, said interconnection cable is dimensioned as by the 2x0,50 mm^2 H03VVF encoding type according to the international safety standards IEC and has a length of 60 cm.

[0021] Preferably, said sensor is an accelerometer, i.e. a sensor which converts the forces it is subjected to into accelerations along the three Cartesian axes in the three space dimensions. In the rest position it will be only subjected to the gravity force that will generate an acceleration configuration in all the three space directions.

[0022] Alternatively, preferably said sensor is a motion sensor including two or more conductive spheres that open and close an electrical contact.

[0023] More in general, according to the use mode envisaged for the thermal apparatus various other kinds of sensors can be used.

[0024] Preferably, said control unit comprises a programmable electronic circuit electrically connected to said sensor.

[0025] Preferably, on the outside of a plastic casing containing said control unit, at least one selector element is positioned in co-operation with said programmable electronic circuit; more preferably, on the outside of a plastic casing containing said control unit, an additional element is also positioned, such as a button or a switch of the mechanical type, to operate together with said selector element.

[0026] Preferably, through a management logic of the selector element and/or of said additional element, it will be possible to set up a temperature use level for a continuous use or the switch off of the thermal apparatus of the present invention, as it will be better detailed below.

[0027] Preferably, a software program installed in said electronic circuit co-operates with both said sensor element and said selector elements.

[0028] In this way, according to the responses provided by said sensor when it detects a movement, or the presence of a person in correspondence of the control unit, said software program is able to: a) switch off the thermal apparatus of the present invention, by selecting the Stand-by position, or b) select a proper temperature level for a subsequent continuous use thereof, for example for a night use, wherein the functional characteristic of being able to perform the above described action a) or action b) is herein defined as an ASF (Auto-Safety-Feature) function.

[0029] Preferably, a light signal on said outer part of the plastic casing of said control unit is also available to display the ON or OFF state according to said function ASF has been activated or disabled, respectively.

[0030] Preferably, said light signal is emitted by a LED.

[0031] Alternatively, or in addition, the activation of said function ASF can be signaled by means of an acoustic signal emission, type buzzer.

[0032] Preferably, said programmable electronic circuit also controls a disconnecting device, such as a TRIAC or a relay, which provides electrical energy to said operating unit. Preferably, said enclosure comprising said heating element at its inside is made from textile material; more preferably, said enclosure is a sheet made of textile material.

[0033] In a second aspect the present invention relates to a method to set up an appropriate temperature safety level for a continuous use or to set up the switch off of the thermal apparatus as the method specified in claim 8.

[0034] The Applicant of the present application has in fact surprisingly found that a method to set up an appropriate temperature safety level for a continuous use of a thermal apparatus or its switch off comprising the steps of:

a) switch on said thermal apparatus through a power switch;

b) set up the Stand-by level or a pre-heating temperature of the thermal apparatus;

c) detect the time at which the user intends to use the thermal apparatus by means of at least one sensor;

d) determine, according to said detection by said at least one sensor, the ASF (Auto-Safety-Feature) function, that is the automatic thermal apparatus switching off through the activation of the Stand-by level or, alternatively, the automatic thermal apparatus temperature reducing to a suitable temperature level pre-selectable by the user,

wherein said at least one sensor is fixed onto a control unit of said thermal apparatus which includes said control unit electrically connected to an operating unit which comprises an enclosure and a heating element distributed within the inner portion of the enclosure, and wherein said at least one sensor is able to detect vibrations or movements of said control unit or, alternatively, is able to detect the presence of a person in the surroundings of said control unit, and wherein said control unit is connected to the thermal apparatus by means of an interconnection cable having a physical structure and length such as to create at least slight vibrations to said control unit when the user uses said thermal apparatus,
is able to efficiently ensure the safety for any user of the thermal apparatus.

[0035] In this way, by switching off the thermal apparatus through the activation of the Stand-by level or by reducing the temperature to a suitable level for its continuous use after it has been subjected to a pre-heating phase, the method of the present invention allows to avoid the risk that the thermal apparatus temperature remains at a too high temperature level since it is being used and for a subsequent continuous use.

[0036] Preferably, the method of the present invention further comprises the step of programming said "ASF" function and storing it in a programmable electronic circuit associated with said sensor.

[0037] In this way, the activation of the ASF function associated with said sensor will then automatically allow the temperature level selection or the thermal apparatus switching off at each subsequent use of the thermal apparatus according to what has been programmed, as soon as said sensor detects the necessary conditions for such an activation.

[0038] In this way, the method of the present invention is such to allow also to a vulnerable user to use the thermal apparatus said method is applied thereto. In fact, once said ASF function has been programmed (e.g. from a not vulnerable person), said ASF function is stored by the programmable electronic circuit and then at each subsequent use and when the sensor detects such vibrations or movements of said control unit or, alternatively, detects the presence of a person in the surroundings of said control unit, the ASF function is automatically activated and the apparatus is switched off by activating the Stand-by level or automatically reaches a temperature suitable for its continuous use, without the need for any further manual intervention by the user.

[0039] This ensures greater safety to the vulnerable user of the thermal apparatus.

[0040] Preferably, said selection of a suitable temperature level for its continuous use is performed by means of an appropriate selector element present on the outside of the plastic casing of said control unit.

[0041] In particular, said ASF function programming, to be programmed when the thermal apparatus is used by a vulnerable user, is obtained through an operational sequence by means of one or more of said selector elements present on the outside of the plastic casing of said control unit.

[0042] In another way, the method of the present invention can be used by a not vulnerable user, that is by a person who is able to manage in a conscious way the thermal apparatus without the intervention of the thermal ASF function; in fact, said not vulnerable user is able to perform an operational sequence by using said selector element for selecting the temperature level in an appropriate manner.

[0043] In a preferred embodiment, the method of the present invention comprises the activation of an additional element, such as a button or a switch of a mechanical type, to operate together with said selection of the appropriate temperature level by means of said selector element in order to program said ASF function.

[0044] In this way, said additional element, if not activated at the appropriate time, prevents said temperature level selection for continuous use or for switching off said thermal apparatus.

[0045] Preferably, the effective programming of said "ASF" function of said sensor is checked through the lighting or less of a visual device, such as a LED; more preferably said visual device is placed on the exterior plastic casing of said control unit.

[0046] In this way, it is possible to easily check if said ASF function has been programmed or not.

[0047] Alternatively, or in addition, preferably, the effective programming of said "ASF" function of said sensor is checked through the emission of a sound signal, such as for example a "buzzer" type sound signal.

[0048] Preferably, when programmed, the ASF function is activated after a pre-defined period of time; for example, said ASF function is preferably activated 10 minutes after the thermal apparatus has been switched on through a power switch. This allows the user to remain in the surroundings of the thermal apparatus for other needs, without immediately activating the ASF function so as not to cancel the pre-heating function.

[0049] Preferably, the ASF function can be repeatedly activated or disabled by the user, through the programming of said programmable control circuit contained in said control unit, by means of said selector elements

present on the outside of said control unit plastic casing.

[0050] Preferably, the programmable electronic circuit stores the activation or deactivation of said ASF function, so that the control unit is already programmed for the desired use at each subsequent use of the thermal apparatus.

[0051] In this way, the thermal apparatus of the present invention is simple enough to be easily used by conscious and not vulnerable people, but on the other hand it not so easily and quickly usable by vulnerable people with some motor and/or cognitive limitation such as children and the elderly.

[0052] Preferably, in case the thermal apparatus is a thermal blanket, after having set up the pre-heating temperature of the thermal blanket, said method allows the set up of an appropriate temperature level for a continuous use of the thermal blanket, or alternatively for the switching off of said thermal blanket, when the vulnerable user intends to lay down onto the bed. The risk that said vulnerable user unknowingly imposes too high temperature levels or that lies down onto the bed leaving the thermal blanket set up at the pre-heating temperature, too high for the user safety, is thus reduced.

[0053] Further characteristics and advantages of the present invention will become more apparent from the examination of the following detailed description of a preferred embodiment, but not exclusive, illustrated by way of non-limiting example, with the support of the attached drawings, wherein:

- Figure 1 is a schematic view of one embodiment of an operating unit and of a control unit of the powering of a thermal blanket of the present invention and of the electrical circuit that connects said units one each other;

- Figure 2A is a front perspective view of one embodiment of a control device showing a selector element to set up the different temperature levels of the thermal blanket;

- Figure 2B is a rear perspective view of the control device of Figure 2A showing a power supply switch and a mechanical type selector element of the ASF function;

- Figure 3 is a front perspective view of one embodiment of a control device showing a selector element to set up different temperature levels of the thermal blanket and a selector element to set up the ASF function.

- Figure 4 is a perspective view of a thermal blanket of the invention wherein the heating element path, the power supply connecting cable, and the interconnection cable between the thermal blanket and the control apparatus are visible.

Detailed Description

[0054] The following detailed description refers to a particular embodiment of the thermal apparatus of the present invention. In particular it refers to a thermal blanket and to the method for setting up the temperature levels for a continuous use thereof in accordance with the aspects of the present invention, without limiting the content.

[0055] With reference to Figure 1, an electrical circuit connecting a power supply or temperature control unit 300 to an operating unit 400 of a thermal blanket of the present invention intended to be supplied at an AC voltage, for example with frequency of 50 Hz or 60 Hz, is described.

[0056] The operating unit 400 is formed by a textile material sheet and by a heating element 100 being arranged at its inside.

[0057] In Figure 1 is also shown a current fuse 204 positioned in the power supply control unit 300 which controls any anomalies for example related to over-currents.

[0058] As shown in Figure 4, an interconnection cable 207 conforms to electrical cable international code H03VV-F 2x0.50 mm^2, and having for example a length of 60 cm, connects the plastic casing 209 (which contains the control unit 300) to the sheet of the thermal blanket and is able to create at least slight vibrations or movements when the user lies down to bed. Such vibrations are detected by the sensor 208 (Figure 1), of the accelerometer type, directly fixed to the control unit 300, which is therefore able to detect when the control unit 300 has undergone a shift or a simple vibration.

[0059] Having placed the sensor 208 directly on the control unit 300 contained in the plastic casing 209 of the thermal blanket of the present invention, the construction complexity and, consequently, the costs of the thermal blanket itself have been reduced, with respect to what disclosed in the prior art documents wherein such sensors were placed inside the sheet whereby, with such a sensor positioning, the presence of a complex series of expensive conductors was needed.

[0060] The accelerometer type sensor 208 is electrically connected to the programmable electronic circuit 206, which is in turn connected both to a selector element 211, which allows the selection of one of the different 1-6 temperature levels or the Stand-by 0 level (visible in details in Figure 2A and Figure 3), and to and additional selector element of the mechanical switch type 205bis or of the button selector element type 205 (visible in details in Figure 2B and Figure 3, respectively). These selector elements 211 and additional selector elements 205 or 205bis are placed on the outside of the plastic casing 209 containing the control unit 300 (visible in Figure 3), and allow the user to select the ASF function managed by the accelerometer sensor type 208, through the software of the programmable electronic circuit 206, and thus to activate the automatic switching off of the thermal blan-

ket or, alternatively, to automatically activate operating temperature a reduction at a specified level for a continuous use, typically associated with a night-time use.

[0061] The programmable electronic circuit 206 contained in the control unit 300 also controls a switching element 203, such as a TRIAC or a relay, which provides the operating unit 400 with the electrical energy for heating.

[0062] Operationally, in one embodiment of the method of the present invention, in order to activate the ASF function of the control unit 300, first the power switch 301 that closes the circuit which allows the power supply of said control unit 300 is switched on and then the selector element 211, placed onto the plastic casing 209 which contains the control unit 300, is actuated so as to set up either a from 1 to 5 temperature level for a continuous use or the switch off by selecting the Stand-by 0 level. The ASF function is then activated by means of the button type selector 205 thus allowing the automatic thermal blanket switching off or the automatic temperature level reduction thereof for a continuous use. In an alternative embodiment, the ASF function is activated by means of the additional selector element of the mechanical switch type 205bis (rather than by means of the button type selector 205).

[0063] This programming is then stored by the programmable circuit 206 and then it will be applied whenever the vulnerable user will switch on the thermal blanket, without requiring any other additional programming. Obviously such an ASF function may be excluded or modified, by repeating the above steps through the combined management of the selector elements 211 and 205 (or 205bis).

[0064] In an alternative embodiment, the ASF function is activated with the aid of the selector element 211 only, which is first pressed for a short period of time, for example 0.5 seconds, in order to activate the selection of the from 0 to 5 temperature or switch off levels of the control unit 300, and then is pressed for a longer period of time, for example 3 seconds, in order to confirm the activation of the ASF function. An example of such a command is shown in Figure 2A.

[0065] The activation of the ASF function will be confirmed by a visual signal, for example a LED 210, placed onto the plastic casing 209 of the control unit 300 and/or by a sound signal.

[0066] The ASF function is therefore quite easy to be programmed by conscious people, which can be sure they have properly managed the programming through the switch off of the LED 210, but on the other hand it is not so easy and quick to use for people with some motor and/or cognitive limitations, such as children and the elderly. In this way, it is avoided the risk that the vulnerable user unknowingly impose too high temperature levels or that he/she lies down to bed leaving the thermal blanket set up at the pre-heating temperature level, that's too high for the user safety.

[0067] Of course, many modifications and variations of the above described preferred embodiments will be apparent to those skilled in the art, still remaining within the scope of the invention.

[0068] For example, the ASF function can be activated or deactivated at any time, or the 1-5 temperature levels setting up for the continuous use of the thermal blanket after the initial pre-heating phase can be varied, by means of the corresponding selector elements 211 and 205 or 205bis.

[0069] Also, for example, the ASF function, when programmed, can be activated after a pre-defined period of time; for example, the ASF function is activated after 10 minutes since the thermal apparatus has been switched on, so as to allow the user to remain in the thermal blanket surroundings for other needs, without immediately activating the ASF function, in such a way the pre-heating function is not cancelled.

[0070] Therefore, the present invention is not limited to the described preferred embodiments, illustrated only by way of example and not limitation, but it is defined by the following claims.

Claims

1. Thermal apparatus, comprising a power supply control unit (300) and an operating unit (400), wherein said power supply control unit (300) can be electrically connected on one side to an electrical supply network and on the other side to said operating unit (400) which includes an enclosure and a heating element (100) distributed within the enclosure, **characterized by** the fact that said control unit (300) comprises at least a sensor (208) able to detect vibrations or movements of said control unit (300) or, alternatively, able to detect the presence of a person in the surroundings of said control unit (300), and wherein said control unit (300) is connected to the thermal apparatus by means of an interconnection cable (207) having such a physical structure and length to create at least slight vibrations to said control unit (300) when the user uses said thermal apparatus.

2. Thermal apparatus according to claim 2, wherein said thermal apparatus is a thermal blanket, a heating pad, or a heating carpet.

3. Thermal apparatus according to claim 1 or 2, wherein said interconnection cable (207) is dimensioned as by the 2x0,50 mm^2 H03VVF encoding type according to the international safety standards IEC and has a length of 60 cm.

4. Thermal apparatus according to any one of claims 1-3, wherein said at least one sensor (208) is an accelerometer or a motion sensor that includes two or more conductive spheres that open and close an electrical contact.

5. Thermal apparatus according to any one of claims 1-4, wherein said control unit (300) comprises a programmable electronic circuit (206) electrically connected to said at least one sensor (208).

6. Thermal apparatus according to any one of claims 1-5, wherein on the outside of a plastic casing (209) containing said control unit (300), a selector element (211) and, possibly, an additional element (205) or (205bis), in co-operation with said programmable electronic circuit (206), is positioned.

7. Thermal apparatus according to any one of claims 1-6, wherein in said programmable electronic circuit (206) it is possible to set up an operating temperature level for a continuous use or for switching off the thermal apparatus, through a management logic of said selector element (211) and, optionally, of said additional element (205) or (205bis).

8. Method to set up an appropriate temperature safety level for a continuous use of a thermal apparatus or its switch off comprising the steps of:

a) switch on said thermal apparatus through a power switch;
b) set up the Stand-by level or a pre-heating temperature of the thermal apparatus;
c) detect the time at which the user intends to use the thermal apparatus by means of at least one sensor (208);
d) determine, according to said detection by said at least one sensor (208), the ASF (Auto-Safety-Feature) function, that is the automatic thermal apparatus switching off through the activation of the Stand-by level or, alternatively, the automatic thermal apparatus temperature reducing to a suitable temperature level pre-selectable by the user,
wherein said at least one sensor (208) is fixed onto a control unit (300) of said thermal apparatus which comprises said control unit (300) electrically connected to an operating unit (400) which comprises an enclosure and a heating element (100) distributed within the inner portion of the enclosure itself, and wherein said at least one sensor (208) is able to detect vibrations or movements of said control unit (300) or, alternatively, is able to detect the presence of a person in the surroundings of said control unit (300), and wherein said control unit (300) is connected to the thermal apparatus by means of an interconnection cable (207) having a physical structure and length such as to create at least slight vibrations to said control unit (300) when the user uses said thermal apparatus.

9. Method according to claim 8, wherein said method further comprises the step of programming said ASF function and stores it in a programmable electronic circuit (206) associated with said at least one sensor (208).

10. Method according to claim 8 or 9, wherein said pre-selection of a temperature level is performed by means of an appropriate selector element (211) present on the outside of the plastic casing (209) of said control unit (300).

11. Method according to any one of claims 8-10, wherein said method further comprises the activation of an additional element, such as a button (205) or a switch of a mechanical type (205bis), to operate together with said selector element (211).

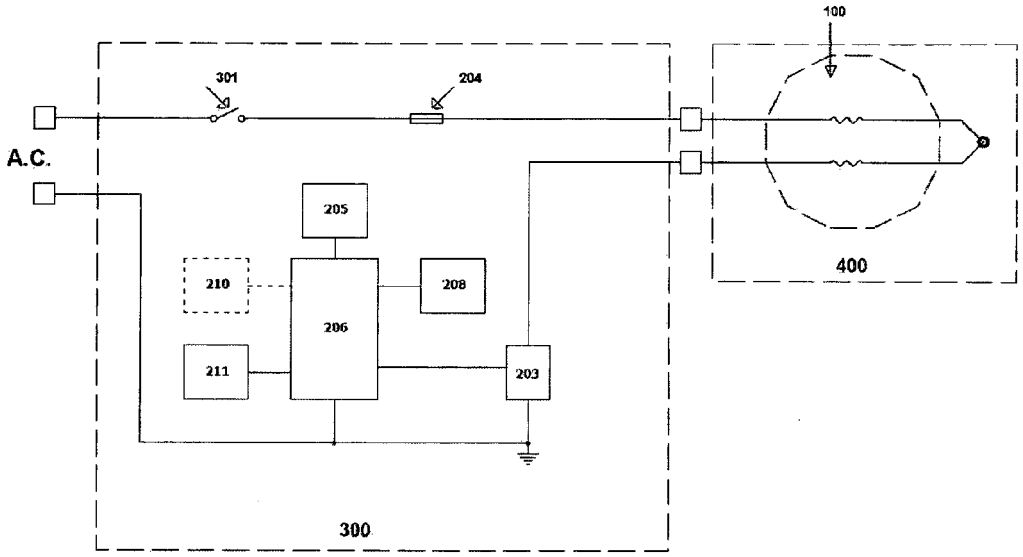
12. Method according to any one of claims 8-11, wherein the effective programming of said ASF function is checked through the lighting of a visual device (210), such as a LED.

13. Method according to any one of claims 8-12, wherein the effective programming of said ASF function is checked through the emission of a sound signal, such as a sound signal type "buzzer".

14. Method according to any one of claims 8-13, wherein said ASF function, when programmed, is activated after a pre-defined period of time.

15. Method according to any one of claims 8-14, wherein said ASF function of said at least one sensor (208) can be activated or disabled by the user by means of said selector elements (211).

FIG. 1



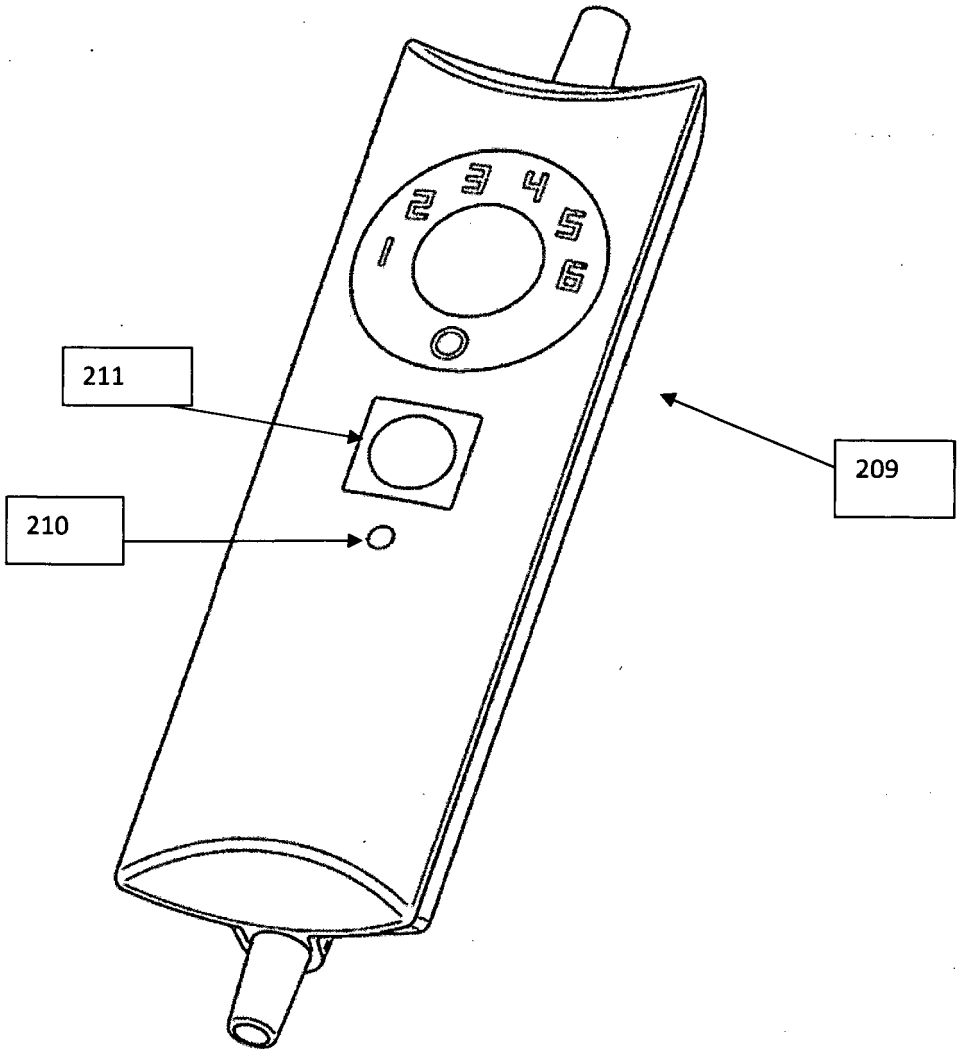


Figura 2A

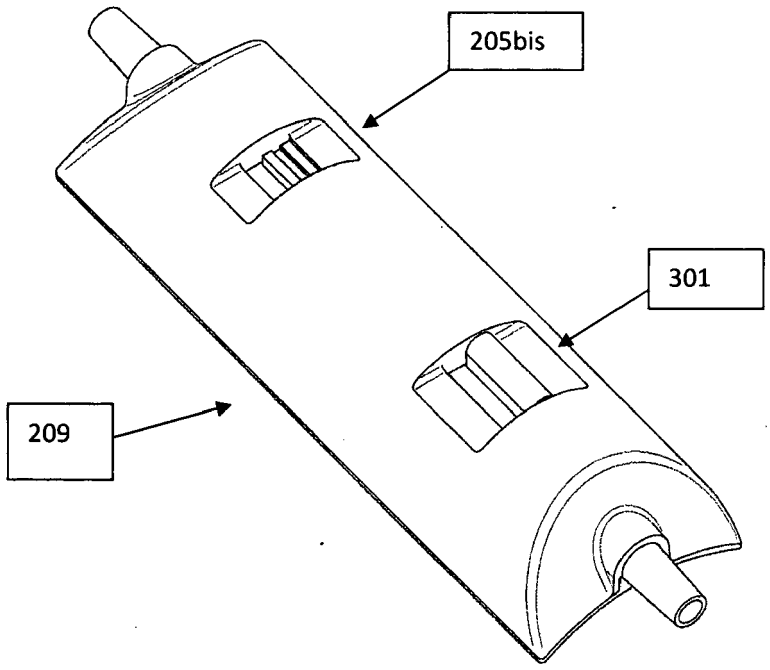


Figura 2b

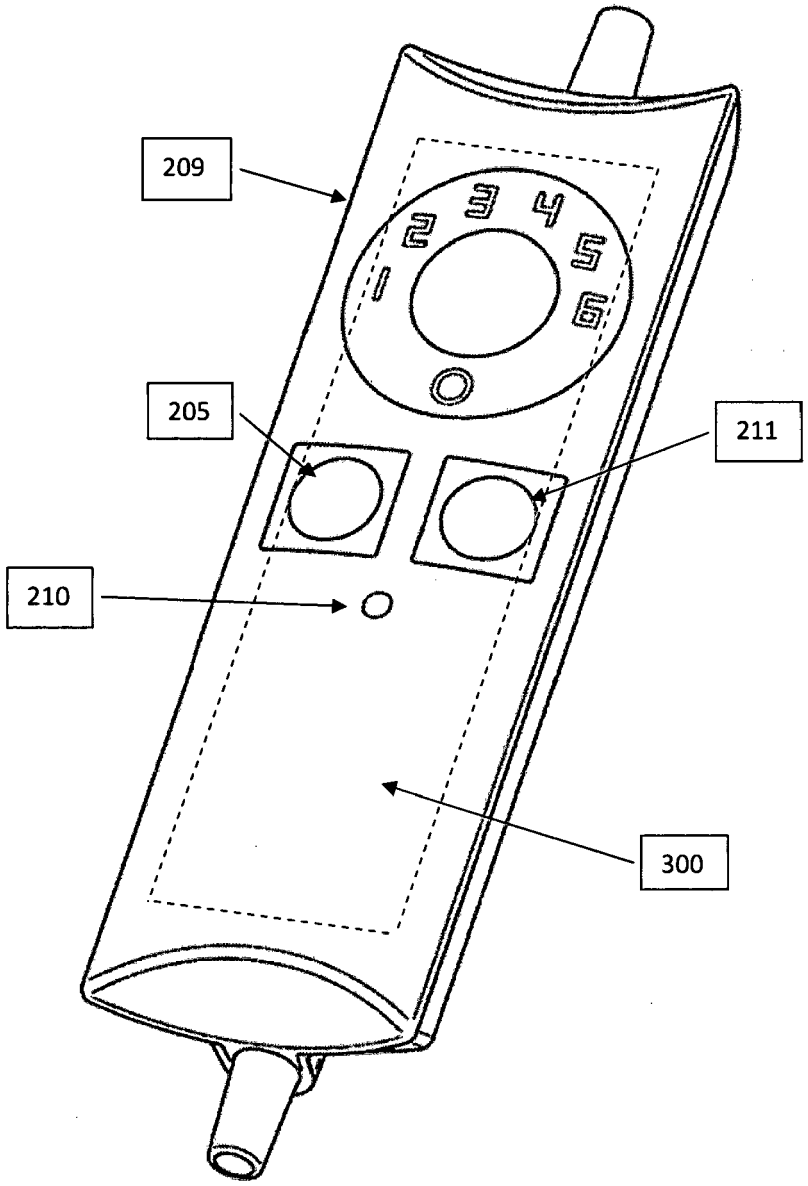


Figura 3

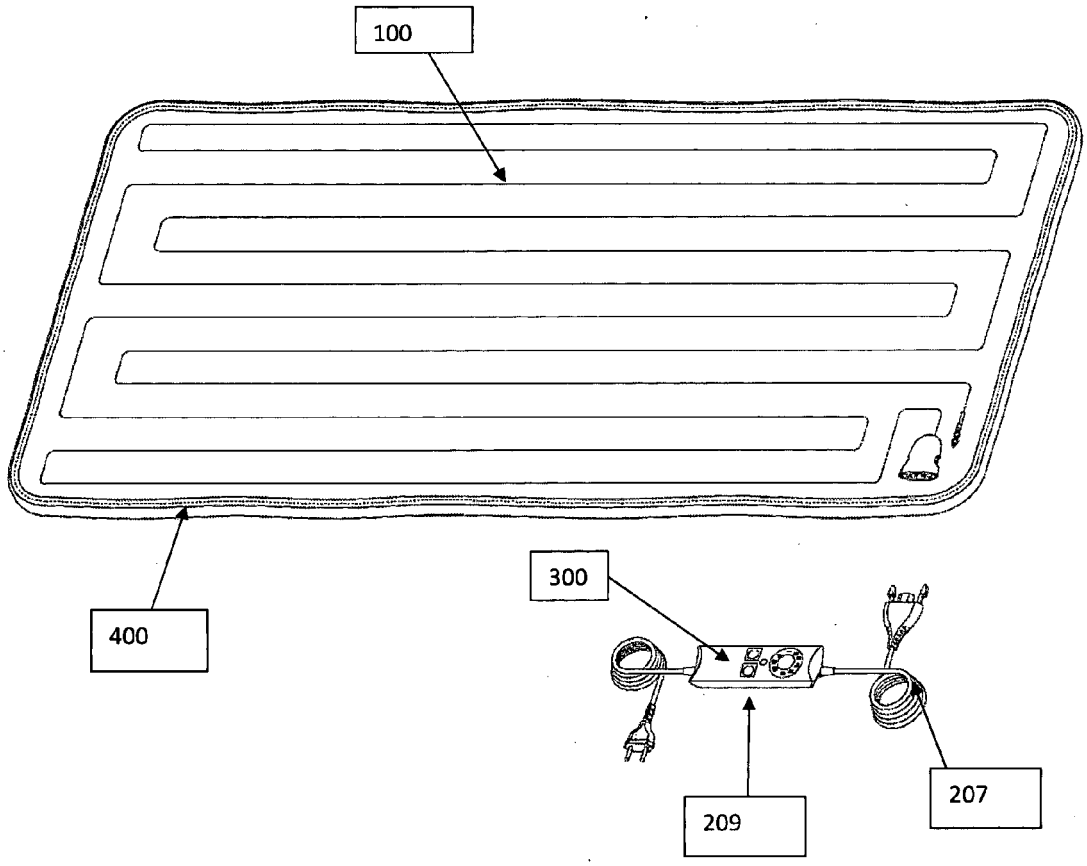


Figura 4

Europäisches Patentamt
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EUROPEAN SEARCH REPORT

Application Number
EP 13 00 3032

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	WO 00/62581 A1 (BAECKFORS STEFAN [SE]) 19 October 2000 (2000-10-19) * figures *	1,8	INV. A47G9/00 H05B3/00 H05B1/02
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A47G
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	10 October 2013	Maicas, Jesús

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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