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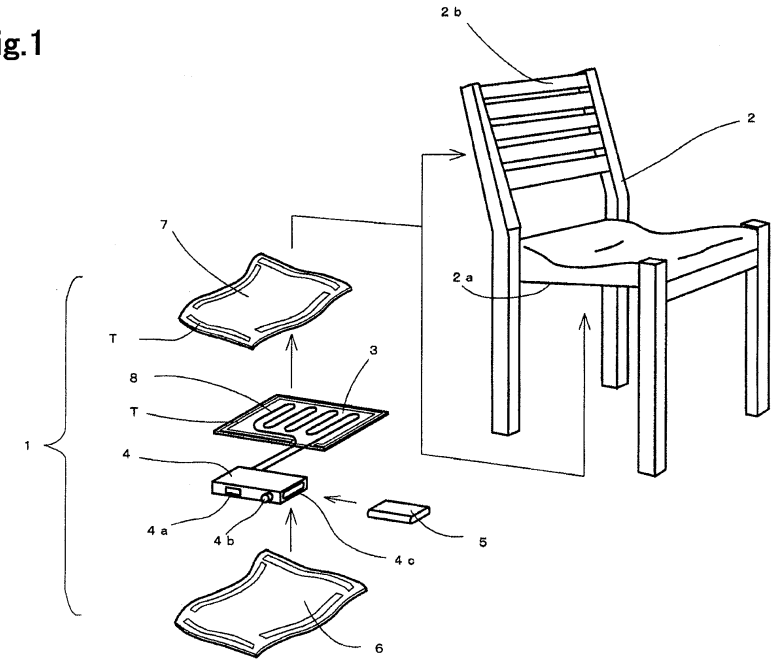
(54) BATTERY CHARGING CHAIR HEATING METHOD AND BATTERY CHARGING CHAIR HEATING DEVICE AND CHARGING BATTERY TYPE HEATING CHAIR

(57) [Subject] To provide a rechargeable battery type chair warming method, a rechargeable battery type chair warming device and a rechargeable battery type heatable chair that enables warming of chairs and wheelchairs used at schools, arenas, or camping sites by attaching a rechargeable battery by individuals who use the chairs, respectively. [Resolution Means] A heat generating unit is placed in a seat and/or back seat rest of a chair, and if an individual who uses the chair attaches a rechargeable battery to a power supply unit, power is supplied from the rechargeable battery, and the heat generating unit can be warmed up. The heat generating unit is structured by covering a heating element with a thermal conduction material, and the heat generating unit is attached to an existing chair or is originally incorporated into a seat or a back seat rest of a chair. The power supply can include a power switch and a volume control for temperature control in addition to a socket for attaching a rechargeable battery.

Fig.1



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Description

FIELD OF THE INVENTION

[0001] For chairs to be used at a gathering, such as schools, concert venues or arenas, the present invention relates to a rechargeable battery type chair warming method, a rechargeable battery type chair warming device and a rechargeable battery type heatable chair, which are warmed by setting a rechargeable battery by the individuals who respectively use the chairs.

BACKGROUND OF THE INVENTION

[0002] Recently, chairs having a heater mechanism have become used for car seats and theater seats, and a warm feeling during sitting can be experienced even in winter. These technologies are produced by a technology of highly efficient heating element. However, the power needs to be supplied from a car battery or a house hold wall socket, so they cannot be used outside. Further, for movable chairs or foldable chairs used at a gathering, such as schools, gymnasiums or public halls, if power is supplied from outer supply by connecting wires to the chairs, heatable chairs would not exist due to being cumbersome and difficulty in finding storage space. Therefore, it is a current situation that people have to suffer from coldness at a gathering in winter. In addition, when power is used for that purpose at a facility, because power consumption varies depending upon the number of people gathered, we will have difficulty in estimating the maximum power consumption and cost in advance.

[0003] Then, in order to solve these problems, various technologies have been proposed. For example, a seat warming device where heating is conducted per seat by individual warming seats at a pavilion of a facility is proposed, and a heater unit of each seat is connected to a power supply using power cables in parallel, and the setting of each seat temperature of heat generation is operated by a facility manager (see Patent Literature 1). However, because power is supplied through connected cables, the problem due to cable connection and the problem regarding the estimation of the power to be used cannot be solved. Further, a warming device for seat where a flexible electric heater is intensively arranged to a portion that makes contact with a human body on a chair or a vehicle seat is also proposed (Patent Literature 2). However, since said technology is also to utilize a car battery or a motorcycle battery, this is inappropriate for a use outside. Therefore, any technologies have not accomplished the elimination of the problems.

[0004]

Patent Literature 1: Japanese Patent Publication No. 3525263

Patent Literature 2: Japanese Patent Application Laid-Open No. 2000-210159

SUMMARY OF THE INVENTION

Problem to be Solved by the Invention

[0005] Taking the above-mentioned problems into consideration, an object of the present invention is to provide a rechargeable battery type chair warming method, a rechargeable battery type chair warming device, and a rechargeable battery type heatable chair that enable warming chairs to be used at schools, hospitals, concert venues, arenas and camping sites by setting a rechargeable battery by each individual who uses a chair.

Means for solving the Problems

[0006] In order to accomplish the object, the present invention is a rechargeable battery type chair warming method for warming a seating surface, and a method where a heat generating unit is established in a seat or/and a seat back rest; concurrently, power is supplied from a rechargeable battery to the heat generating unit by attaching the rechargeable battery to the power supply unit by an individual who uses the chair is adopted.

[0007] Further, the present invention is a rechargeable battery type chair warming device, and is comprised of a heat generating unit and a power supply unit, and the heat generating unit is structured such that a heating element is covered with a thermal conduction member, and a mounting mechanism to a chair is established in a predetermined place(s), and the power supply unit is configured such that a socket for attaching a rechargeable battery and power is supplied to the heat generating unit from a rechargeable battery and the heat generating unit is heated.

[0008] In addition, the present invention is a heatable rechargeable battery type heatable chair, and it is configured such that a heat generating unit formed by covering a heating element with a thermal conduction member in a seat or/and a seat back rest; concurrently, a power supply unit equipped with a socket for inserting a rechargeable battery in the power supply unit, and power is supplied from the rechargeable battery to the heat generating unit and the chair is warmed up.

[0009] Further, in the rechargeable battery type chair warming device and the rechargeable battery type heatable chair, for the present invention, a configuration comprising a controller that enables adjustment of warming temperature by controlling voltage for supplying power to the heat generating unit can be adopted.

[0010] Then, in the rechargeable battery type chair warming device and the rechargeable heatable chair, for the present invention, a configuration where a silicon rubber heater or a silicon cord heater is adopted as a heating element can be adopted.

Efficacy of the Invention

[0011] According to the rechargeable battery type

chair warming method and the rechargeable battery type chair warming device relating to the present invention, it becomes possible to change a chair to a heatable chair by merely placing a heat generating unit on a seat and/or a seat back rest of existing chairs, and it becomes possible to efficiently use existing equipment and an effect of contributing to an economic effect is produced.

[0012] Further, according to the rechargeable battery type chair warming method, the rechargeable battery type chair warming device and the rechargeable battery type heatable chair relating to the present invention, the power supply is a rechargeable battery carried by individuals, and it is unnecessary to furnish power from an outlet through a cable, it becomes possible to utilize the chair at a location without any power supply, such as outdoors. Consequently, the facility does not have to forcibly receive a burden of power charges, and since only a person who desires to have a chair warmed can pay the power charges, fairness according to self-pay burden can be maintained, and in addition, another advantageous effect where a facility manager can estimate maximum electric current to be used and power consumption can be estimated in advance is also produced.

[0013] In addition, according to the rechargeable battery type chair warming method, the rechargeable battery type chair warming device and the rechargeable battery type heatable chair, since a power supply is a rechargeable battery carried by individuals, even if a person has forgot to turn off the power, the power will be automatically turned off when the power in the rechargeable battery is out, and even if a person has forgot to turn off the power for a long time, an economic effect where unnecessary power usage can be minimized is produced. Further, another advantageous effect of the present invention is to reduce causes of electrical fire, electrical fire extinguishing difficulties, and electric shock accidents.

[0014] In addition, in the rechargeable battery type chair warming device and the rechargeable battery type heatable chair relating to the present invention, since the upper limit of the setting temperature can be determined per individual if the configuration having a controller is adopted, another effect where dissatisfaction caused by a difference in feeling temperature by individuals will never be provided is also produced.

DETAILED DESCRIPTION OF THE PREFFERED EMBODIMENTS

[0015] Hereafter, embodiments of the rechargeable battery type chair warming method, a rechargeable battery type chair warming device 1 and a rechargeable battery type heatable chair 10 relating to the present invention will be described based on drawings.

[0016] Fig. 1 is an explanatory drawing showing an embodiment of the rechargeable battery type chair warming device 1 relating to the present invention. The rechargeable battery type chair warming device 1 is comprised of a heat generating unit 3 arranged in a seat 2a of a chair 2 and a power supply unit 4. Further, as a portion to be warmed, even if the seat 2a or a seat back rest 2b of the chair may be warmed up, since the structure and the mounting method may not be different, only an embodiment to warming the seat 2a is shown in the figure.

[0017] The heat generating unit 3 has a function to generate heat by electrical resistance of a heating element 8 due to the supply from the power supply, and it is structured such that the heating element 8 is covered with a thermal conduction member 9 and a mounting mechanism T is established at a predetermined section, and a structure where general silicon rubber heater, silicon cord heater or other metal fiber to be described later is covered with the thermal conduction member 9 may be adopted. As a material of the heating element 8, copper alloy, nickel alloy and nichrome wire can be considered, and as a material of the thermal conduction member 9, general glass fibers can be considered; however, it is not limited to this and two or more types of materials of combination can be considered. Furthermore, as the silicon rubber heater or the silicon cord heater, if silicon rubber 9a is used as a material of the thermal conduction member 9, an effect where far infrared rays are efficiently emitted can be obtained, and, since the silicon rubber 9a is flexible, when the seat is curved or a fabric, this can be attached, as well.

[0018] The mounting mechanism T established to the heat generating unit 3 is for mounting the rechargeable battery type chair warming device 1 to the chair 2, and as long as the function is fulfilled, there is no special limitation; however, it is desirable to use wood screws, pressure-sensitive adhesive double coated tape with heat resistance, or detachable Velcro fastening.

[0019] Furthermore, in the heat generating unit 3, it is desirable to place an aluminum foil 7 for equally transmitting the heat generated from the heating element 8 to the entire seat 2a or seat back rest 2b. The aluminum foil 7 is molded along the shape of the seat 2a, the seat back rest 2b and the heating element 8. Further, it is desirable to equip a heat insulator 6 outside of the heat generating unit 3 for keeping the heat generated by the heating element 8 and for preventing the heat from emitting to the outside. As the heat insulator 6, glass fibers that have a configuration to cover the entire outside of the heat generating unit 3, and that have good insulation can be considered.

[0020] The detailed embodiment of the heat generating unit 3 is shown in Fig. 2. In other words, Fig. 2 is a structural cross sectional view showing embodiments of the heat generating unit 3 to be used in the present invention.

[0021] Fig. 2 (a) is a structural cross sectional view showing an embodiment in the case of adopting a silicon rubber heater to the heat generating unit 3. The silicon rubber heater is a sheet heating element having a structure where the heating element 8 is covered with the silicon rubber 9a, which is a thermal conduction member

9. Furthermore, in the figure, a embodiment where the aluminum foil 7 is attached to the mounting surface side of the heat generating unit 3 to the chair 2; concurrently, a sheet adhesive member, such as an adhesive tape, is equipped as the mounting mechanism T is shown, and the aluminum foil 7 fulfills the role to uniformly transmit the heat generated by the heating element 8 to the entire seat 2a or seat back rest 2b of the chair 2. Further, the entire rear side of the heat generating unit 3 is covered with the heat insulator 6 and the efficacy not to emit the heat generated by the heating element 8 to the outside is enhanced.

[0022] Fig. 2 (b) is a structural cross sectional view showing an embodiment in the case of adopting a silicon cord heater to the heat generating unit 3. The silicon cord heater is a sheet heating element with a structure where the heating element 8 is a cord-like linear heating element covered with the silicon rubber 9a, which is the thermal conduction member 9, and its periphery is further covered with the aluminum foil 7. The aluminum foil 7 fulfills a role to uniformly transmit the heat generated by the heating element 8 to the entire seat 2a or back seat rest 2b of the chair 2. Further, in the figure, an embodiment equipped with a sheet adhesive member, such as an adhesive tape, as the mounting mechanism T to the mounting surface side of the heat generating unit 3 to the chair 2. Then, the entire rear side of the heat generating unit 3 is covered with the heat insulator 6 and the efficacy not to emit the heat generated by the heating element 8 to the outside is enhanced.

[0023] Fig. 2 (c) is a structural cross sectional view showing an embodiment in the case of adopting the heating element 8 where a heat generating material, such as a metal wire, is made of fibers, to the heat generating unit 3. In other words, a heat generating material, such as extremely thin metal fibers, is used as the heating element 8, and a sheet heating element with a structure where fiber orientation or uniform dispersion of fibers for uniforming the resistance is noted and a pattern is sewn. Then, as shown in the figure, it is structured such that the heat generating unit 8 is insulated by the heat insulator 6, such as glass fibers with good insulation, and this is covered with a flexible urethane material 9b. Further, in the figure, an embodiment equipped with a sheet adhesive member, such as an adhesive tape, as the mounting mechanism T to the mounting surface side of the heat generating unit 3 to the chair 2 is shown. Then, the entire rear side of the heat generating unit 3 is covered with the heat insulator 6 and the efficacy not to emit the heat generated by the heating element 8 to the outside is enhanced. Furthermore, as the material of the heating element 8, metal fibers, such as stainless fibers or copper alloy fibers, can be considered; however, in recent years, a sheet where carbon fibers and synthetic fibers are mainly used and electrical conductivity is controlled has been developed, and it is considered to be used.

[0024] The power supply unit 4 is for supplying power to the heat generating unit 3, and is structured to be equipped with a socket 4c for attaching a rechargeable battery 5. A shape of the power supply unit 4 is determined according to the rechargeable battery 5 to be used, and as a material, a lightweight resin can be considered, but it shall not be limited. Further, it is necessary to be equipped with a control unit for power control within the power supply unit 4, and in addition, it is also possible to establish a power switch 4a and a volume controller 4b for temperature adjustment outside the power supply unit 4. Furthermore, in the case of adopting the embodiment to establish the control unit, the control unit is comprised with a CPU, a memory, an I/O interface, and an A/D converter, power distribution is started to the heat generating unit 3 by turning on the power switch 4a, and the temperature is adjusted minutely to attain desired temperature by the volume controller 4b.

[0025] The rechargeable battery 5 is a power supply medium for supplying power to the heat generating unit 3 through the power supply unit 4, and the size and shape can be considered selecting from standardized articles, which are standardized for securing compatibility to articles, and in particular, a lightweight and compact battery with large capacity and portability is selected. Regarding the type of the rechargeable battery, as long as it is a secondary battery, it shall not be particularly limited. Further, even a primary battery can be used; however, since this battery will be disposed, it is not economical, and a secondary battery is desirable except for the time of emergency or disaster. Specifically, a secondary battery, such as nickel hydride batteries or nickelcadmium batteries or lithium-ion batteries, can be considered. However, from the viewpoints of heating value and power consumption, a lithium ion secondary battery having characteristics, which are lighter, having no memory effect, and less capacity reduction due to self-discharge, is desirable. Further, recently, a bendable ultra-thin secondary battery has been developed, and if the rechargeable battery 5 having this flexibility is introduced, it becomes possible to integrate components by superimposedly hierarchizing the heat generating unit 3 and the power supply unit 4, as well.

[0026] Furthermore, regarding the chair 2, which is a subject where the rechargeable battery type chair warming device 1 relating to the present invention is mounted, any types of chairs 2, such as wheelchair, in addition to chairs with ordinary configurations are usable, and the subjects shall not be limited. In other words, the present invention shall not to be limited to a fixed configuration chair as shown in Fig. 1. For example, a foldable chair as shown in Fig. 5 (a) is usable, and as long as chairs have a configuration and a structure having space where the heat generating unit 3 and the power supply unit 4 can be placed in the seat 2a or back seat rest 2b. Further, since it is possible to adopt a flexible silicon rubber heater to the heat generating unit 3, a foldable cloth chair as shown in Fig. 5 (b) is also usable, and in addition, even if the seat shape is circular as shown in Fig. 5 (c), this is usable.

[0027] Next, a rechargeable battery type heatable chair 10 relating to the present invention will be described. Fig. 3 is a partial cross sectional view showing an embodiment of the rechargeable battery type heatable chair 10 relating to the present invention. The rechargeable battery type heatable chair 10 is comprised of the heat generating unit 3 established in the seat 2a or/and the back seat rest of the chair 2 and the power supply unit 4 for supplying power to the heat generating unit 3.

[0028] The heat generating unit 3 is structured such that the heating element 8 is covered with the thermal conduction member 9; in other words, the structure is similar to that of the heat generating unit 3 used in the rechargeable battery type chair warming device 1 except for the mounting mechanism T. At this time, in the explanation of the heat generating unit 3 of the rechargeable battery type chair warming device 1, "mounting surface side to the chair 2" and "rear side" can be used as original language and meaning when the heat generating unit 3 of the rechargeable battery type heatable chair 10 is configured to be mounted outside the chair 2, and it shall be interpreted by substituting "human body side" and "rear side" (opposite side from the human body; these are the same hereafter) when the heat generating unit 3 is incorporated in the chair 2, respectively.

[0029] Regarding the place where the heat generating unit 3 is arranged, both the embodiment where the heat generating unit 3 is incorporated in the chair 2 (built-in type) as shown in Fig. 3, and the embodiment where the heat generating unit 3 is mounted outside the chair 2 (external type) as shown in Fig. 4 are applicable.

[0030] The power supply unit 4 is for supplying power to the heat generating unit 3, and the rechargeable battery 5 is a power supply medium for supplying a power to the heat generating unit 3 through the power supply unit 4, and both are similar to the power supply unit 4 and the rechargeable battery 5 used in the rechargeable chair heating device 1.

[0031] Furthermore, regarding the chair 2 used for the rechargeable battery type heatable chair 10 relating to the present invention, general configurations of chairs 2, such as wheelchair, are applicable, and the subjects shall not be limited as similar to the above-mentioned one. In other words, the present invention shall not to be limited to a fixed configuration chair as shown in Fig. 3 and Fig. 4, but for example, the present invention is applicable to various configurations of chairs 2 as shown in Fig. 5.

Embodiment 1

[0032] First, the mounting method of the rechargeable battery type chair warming device 1 relating to the present invention will be described. The heat generating unit 3 is mounted on the lower surface of the seat 2a or/and the rear side of the back seat rest 2b of the existing chair through the mounting mechanism T, such as pressure-sensitive adhesive double covered tape. At this time, the aluminum foil 7 is inserted between the lower surface of the seat 2a or the rear side of the back sear rest 2b and the heat generating unit 3 on an as-needed basis. Further, the heat insulator 6 is placed so as to cover the heat generating unit 3 according to the circumstances.

[0033] After that, the power supply unit 4 is mounted in the predetermined place of the chair 2, and the heating element 8 of the heat generating unit 3 is connected with the power supply unit 4 through a connector, and then, mounting of the rechargeable battery type chair warming device 1 relating to the present invention is completed.

Embodiment 2

[0034] Next, a warming method for the chair 2 where the rechargeable battery type chair warming device 1 relating to the present invention is mounted and the chair 2 using the rechargeable battery type heatable chair 10 will be described.

[0035] At first, the rechargeable battery 5 is attached to the socket 4c of the power supply unit 4. Next, the power is turned on using the power switch 4a of the power supply unit 4. Then, the volume controller 4b for temperature control is adjusted on an as-needed basis, and warming adjustment is conducted so as to be a preferred temperature.

[0036] Furthermore, when stopping warming the chair, the opposite process to the warming operation should be conducted. In other words, the operation is completed by turning the power switch 4a off and extracting the rechargeable battery 5 from the socket 4c of the power supply unit 4.

Industrial Applicability

[0037] According to the present invention, since a power supply, such as an electric outlet, is unnecessary, the present invention can be adopted to any type of chair 2 in any location regardless of inside or outside. As the situations where the adoption is especially expected, any and all aspects, such a wheelchair on the occasion of going out, the chair 2 at outside stadium to be used for watching winter sports, the chair 2 at a seminar or a portable mobile chair at a camping site, can be assumed, and users will be very pleased at all situations. In addition, since the method of warming by setting the rechargeable batteries 5 brought/purchased by individuals who use the chairs 2, respectively, is adopted, there is no concern for a facility to be responsible for any extra electric charge, and it is also possible to maintain the fairness among users of the facility from the point where a person who needs to warm the chair 2 warms the chair up at their own expense. Therefore, the industrial applicability is great.

BRIEF DESCRIPTION OF THE DRAWINGS

[0038]

Fig. 1 is an explanatory figure showing an embodiment of the rechargeable battery type chair warming device relating to the present invention.
Fig. 2 is a structural cross sectional view showing embodiments of the heat generating units used in the present invention.
Fig. 3 is a partial cross sectional view showing an embodiment of the rechargeable battery type heatable chair relating to the present invention.
Fig. 4 is a partial cross sectional view showing an embodiment of the rechargeable battery type heatable chair relating to the present invention.
Fig. 5 shows perspective views of the embodiments of chairs used for the rechargeable battery type chair warming device and the rechargeable battery type heatable chair relating to the present invention.

Description of Symbols

[0039]

1	rechargeable battery type chair warming device
2	chair
2a	seat
2b	back seat rest
3	heat generating unit
4	power supply
4a	power switch
4b	volume controller
4c	socket
5	rechargeable battery
6	heat insulator
7	aluminum foil
8	heating element
9	thermal conduction material
9a	silicon rubber
9b	urethane
10	rechargeable battery type heatable chair
T	mounting part

Claims

1. A rechargeable battery type chair warming method for warming a chair comprising:

placing a heat generating unit in a seat and/or a back seat rest of a chair; and
installing a power supply unit at a predetermined place, wherein a rechargeable battery is used as a power supply for supplying power to the heat generating unit to warm the chair.

2. A rechargeable battery type chair warming device for warming a chair, comprising a heat generating unit and a power supply unit, wherein
the heat generating unit is structured to be covered with a thermal conduction member and to build a mounting mechanism in a chair at predetermined places, and
wherein the power supply unit is equipped with a socket for attaching a rechargeable battery, and
wherein power is supplied from the rechargeable battery to the heat generating unit for warming the chair up.

3. The rechargeable battery type chair warming device according to claim 2, further comprising a controller which can freely control the warming temperature by controlling the voltage supplied to the heat generating unit.

4. The rechargeable battery type chair warming device according to claim 2 or 3, wherein the heat generating unit is a silicon rubber heater or a silicon cord heater.

5. A rechargeable battery type heatable chair, comprising:

a heat generating unit comprising a heating element covered with a thermal conduction member being placed in a seat and/or a back seat rest of a chair;
a power supply unit comprising a socket for attaching a rechargeable battery, wherein the chair is warmed up by supplying power from the rechargeable battery to the heat generating unit.

6. The rechargeable battery type heatable chair according to claim 5, further comprising a controller which can freely control the warming temperature by controlling the voltage supplied to the heat generating unit.

7. The rechargeable battery type heatable chair according to claim 5 or 6, wherein the heating element is a silicon rubber heater or a silicon cord heater.

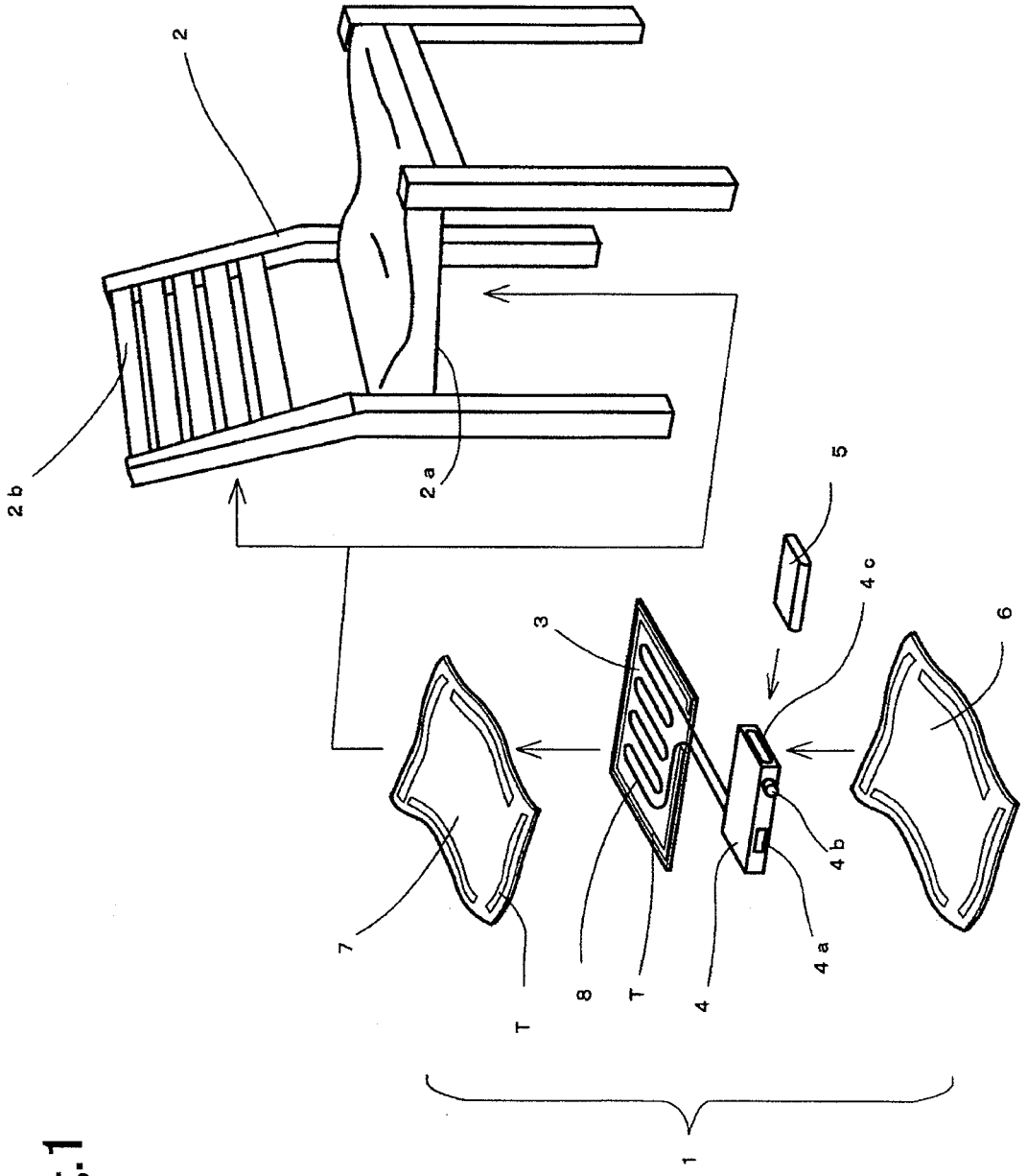
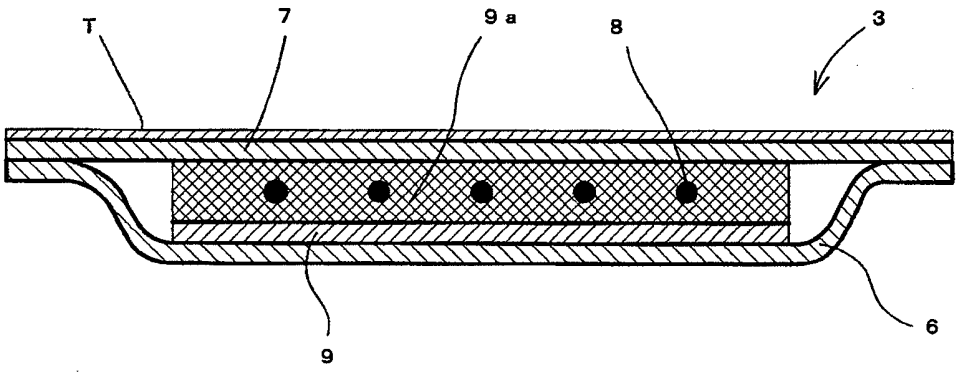


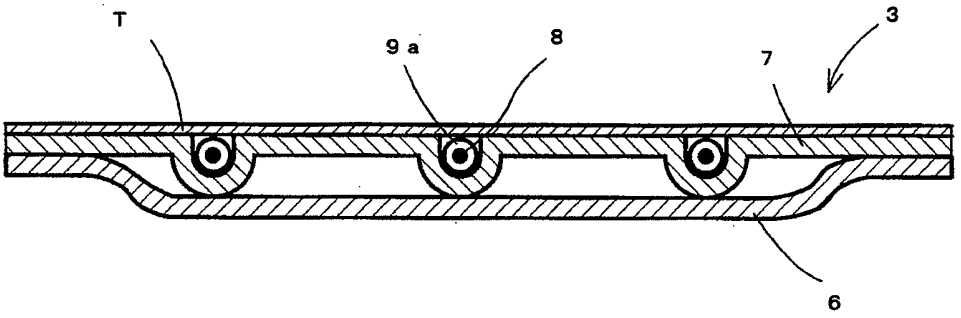
Fig.1

Fig.2

(a)



(b)



(c)

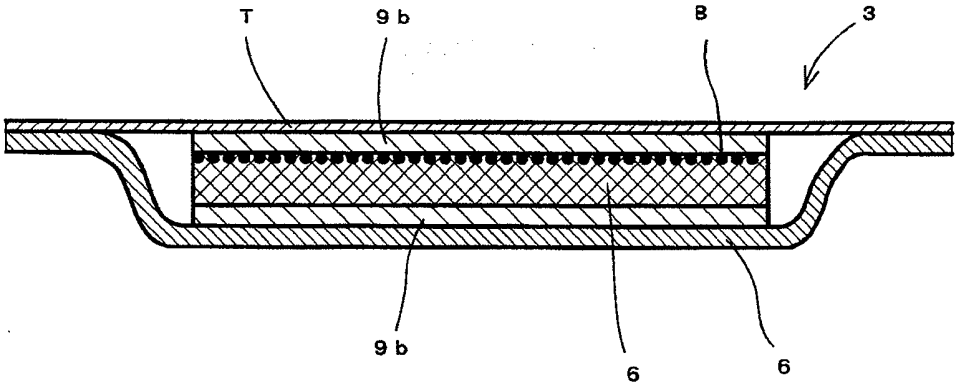


Fig.3

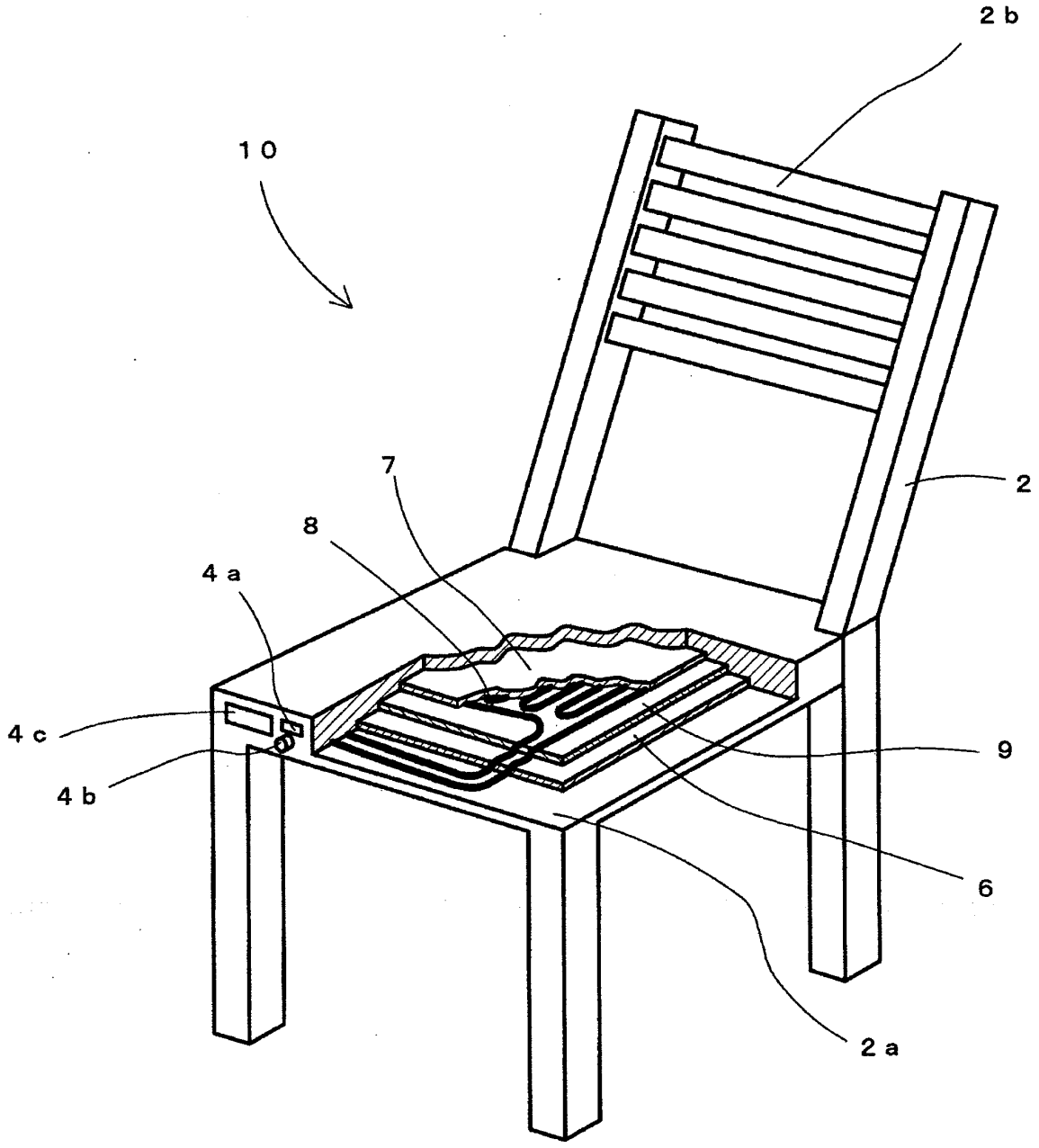


Fig.4

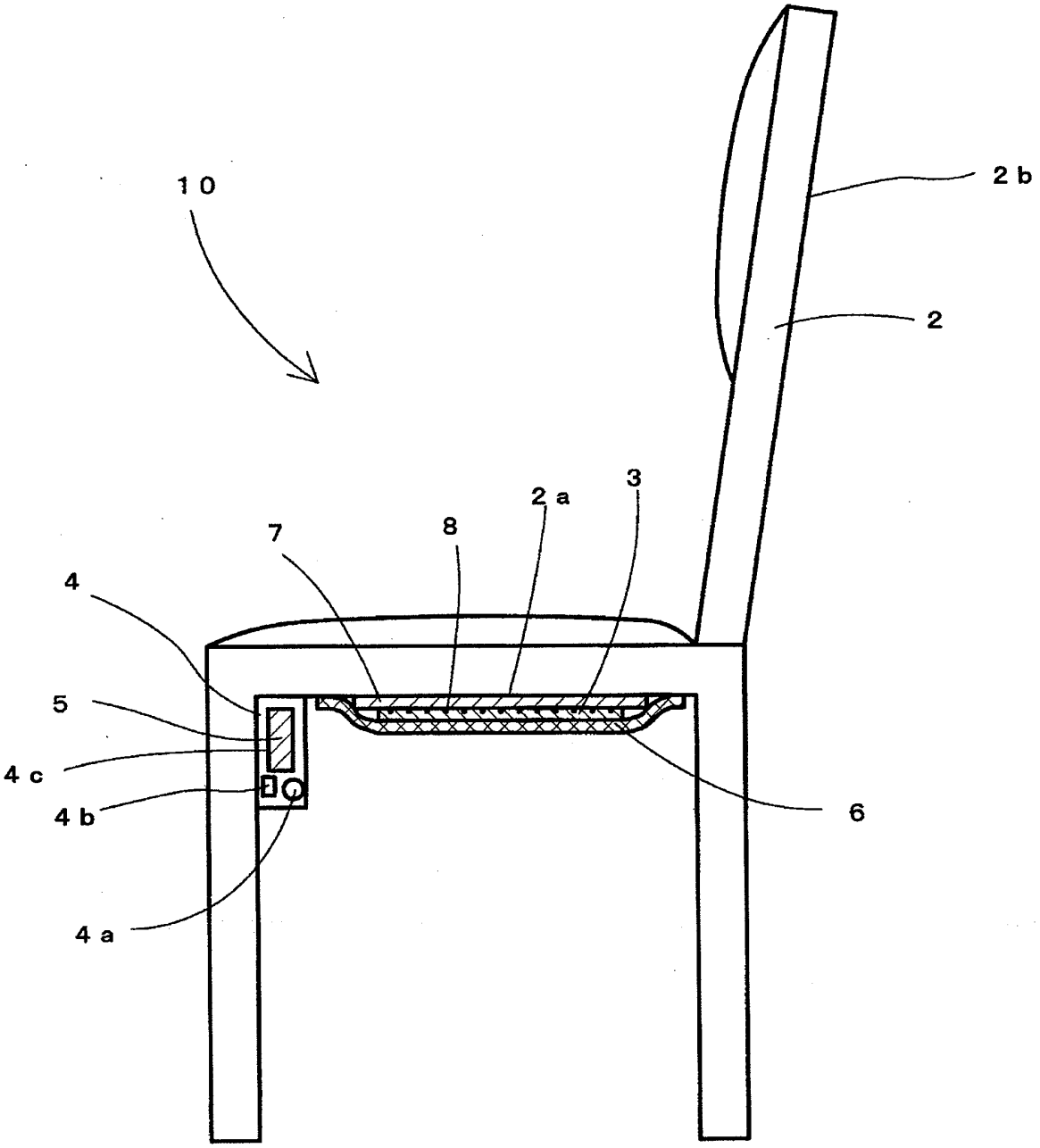
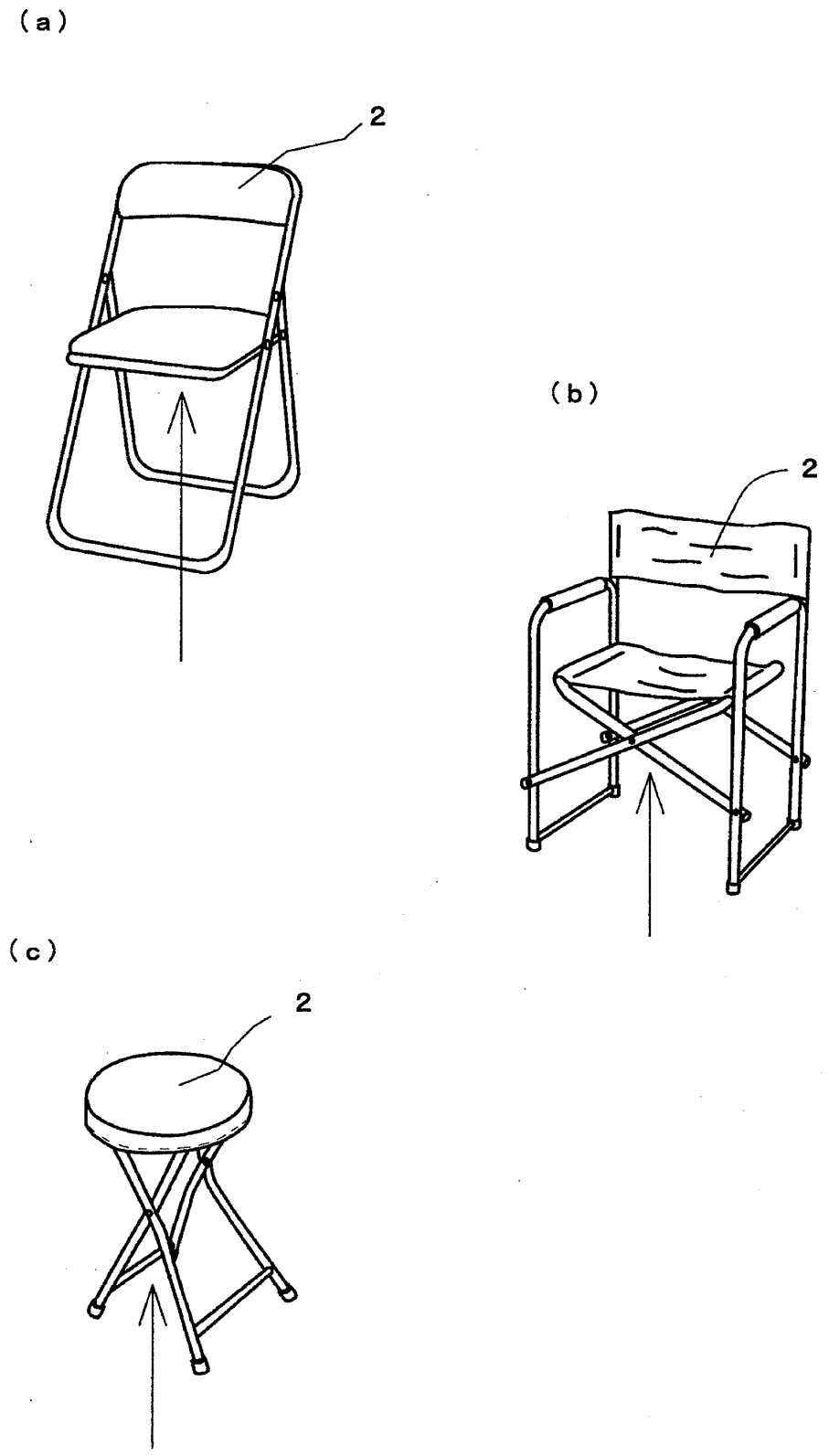


Fig.5



INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2006/303576

A. CLASSIFICATION OF SUBJECT MATTER
A47C7/74(2006.01)

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)
A47C7/74

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Jitsuyo Shinan Koho 1922-1996 Jitsuyo Shinan Toroku Koho 1996-2006
Kokai Jitsuyo Shinan Koho 1971-2006 Toroku Jitsuyo Shinan Koho 1994-2006

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	JP 05-220027 A (Matsushita Electric Industrial Co., Ltd.), 31 August, 1993 (31.08.93), Full text (Family: none)	1 2-7
Y	JP 09-28510 A (Tateyama Aluminium Industry Co., Ltd.), 04 February, 1997 (04.02.97), Full text; (particularly, column 12) (Family: none)	2-7
Y	JP 3101303 U (Chin Keisho), 12 February, 2004 (12.02.04), Full text (Family: none)	3,4,6,7

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

* Special categories of cited documents:
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Date of the actual completion of the international search	Date of mailing of the international search report
21 April, 2006 (21.04.06)	02 May, 2006 (02.05.06)
Name and mailing address of the ISA/ Japanese Patent Office Facsimile No.	Authorized officer Telephone No.

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

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 3525263 B **[0004]**
- JP 2000210159 A **[0004]**