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(54) COMPACT HEAT ACCUMULATOR

(57) The invention relates to a compact thermal accumulator formed by an electrical resistance element, a framework formed by two parallel metal plates with a specific gap in order to facilitate the passage of the convective currents, insulating partitions and two heat-accumulating panels made from a material with a high level of mechanical strength and great thermal accumulation power, in particular porcelain stoneware of very high quality, in addition to the corresponding temperature sensors and other electrical devices suitable for connection and disconnection of the electrical resistance element.

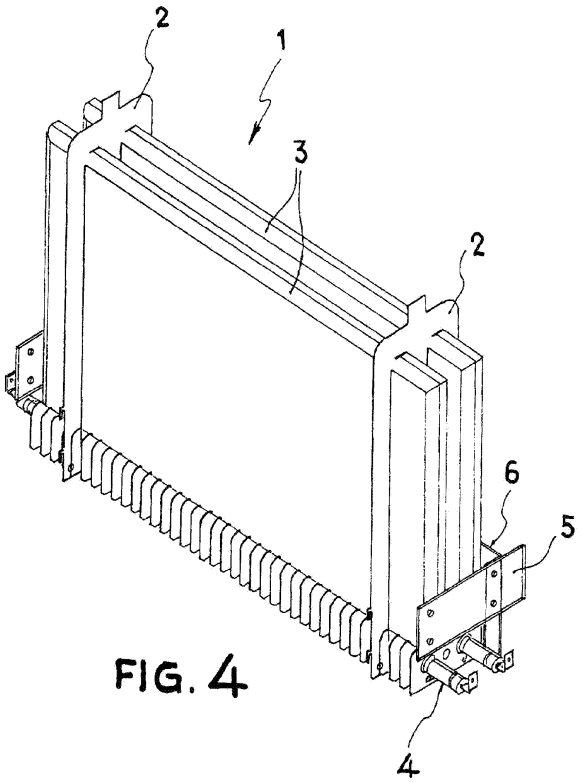

FIG. 4

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Description

Object of the Invention

[0001] The present specification is part of the application for a utility model relating to a compact thermal accumulator, the technical purpose of which is to form a heat-accumulating element to be placed inside fixed or portable radiators, formed by an internal electrical resistance element or other heat generating device assembled inside them, and by an outer enveloping casing.

[0002] It consists of two radiating panels, with high mechanical resistance and elevated thermal capacity, such as that offered by porcelain stoneware, which are placed parallel and separately, to facilitate the passage of the convective air currents circulating between them, being installed in a framework formed by two transverse plates, between which an electrical resistance element is assembled. The assembly is completed with a low front plate provided with two perpendicular partitions made from a suitable material.

[0003] The object of the invention consists of acting as a heat accumulator in the phase in which the radiator to which it is incorporated acts, electrically connected, as a convector, and that of returning the heat when said radiator is electrically disconnected, for which connection and disconnection purposes it has the appropriate temperature sensors and other suitable electrical devices (not depicted in the figures).

Background of the Invention

[0004] The applicant has knowledge of the existence of various accumulators which use water, oil or other materials for such purpose; he also has information about electric radiators working by convection, further knowing of the existence of radiators provided with heat accumulation means, and all with a view to desired savings in electric power consumption.

[0005] However, the applicant has no knowledge of the existence of an accumulator, formed by radiating porcelain stoneware panels, having the particularity of acting by absorbing heat when the corresponding radiator to which it is applied is connected to the electric system and acting as a convector, later returning the heat, when it is disconnected, in the form of heat radiation striking against another radiating panel, which is also made from porcelain stoneware, which together with the indicated casing, closes the corresponding radiator, inside of which the accumulator object of the present invention is located. And, of course, the applicant does not know of any thermal accumulator in which porcelain stoneware panels are integrated, in any technically feasible manner, in the way in which it is proposed by the present invention.

Description of the Invention

[0006] The thermal accumulator herein proposed is configured as a component of electric radiators formed by a radiating panel and a closure casing, in replacement of the simple electrical resistance elements assembled inside conventional radiators, to which accumulators using certain liquids or other materials, as previously indicated, can eventually be added internally.

[0007] The radiator in which the invention is incorporated starts up by means of the actuation of a simple switch, acting in a normal manner with an electrical connection until a sensor detects that the temperature of the environment is at a level which is preset as ideal, immediately being electrically disconnected, no longer acting as a convector and operating solely and exclusively by radiation of its inner and outer panels, all made from porcelain stoneware, being necessary to stress that the outer panel receives the radiations from the inner panels of the thermal accumulator object of this invention. This occurs until said sensor detects a preset drop in the ambient temperature, at which time the corresponding electrical connection is again re-established.

Description of the Drawings

[0008] To aid in better understanding what is being described, four sheets of drawings are attached in which the following figures have been depicted with an illustrative and non-limiting character with respect to the compact thermal accumulator object of the invention:

Figure 1 shows a plan view.
Figure 2 shows an elevation view.
Figure 3 shows a side view.
Figure 4 shows an axonometric perspective view.

Preferred Embodiment of the Invention

[0009] In view of such figures, the following can be contemplated:

[0010] How the thermal accumulator of reference (1) is formed by two transverse plates (2), by two porcelain stoneware panels (3), by an electrical resistance element (4) and by two insulating partitions (5) assembled on a front plate (6).

[0011] And how the transverse plates (2), the panels (3) between the former and the electrical resistance element (4) are arranged, and of how the partitions (5) are arranged on the front plate (6).

Claims

1. A compact thermal accumulator, of the type intended for retaining heat while the radiators to which they are applied are electrically connected, later returning the heat when such radiators are electrically disconnected, **characterized in that** it is formed by an electrical resistance element, a framework formed by metal plates, insulating partitions and at least one

heat-accumulating panel, in addition to the corresponding temperature sensors and other electrical devices suitable for connection and disconnection of said electrical resistance element.

2. The compact thermal accumulator according to claim 1, **characterized in that** it comprises two accumulating panels arranged in parallel and a specific gap is maintained between them to facilitate the passage of convective air currents which are generated in the electrical resistance element.

3. The compact thermal accumulator according to claims 1 and 2, **characterized in that** the two panels, responsible for retaining part of the heat generated by the electrical resistance element in its active phase and of later returning the heat in the passive phase of the same are formed by a material with a high level of mechanical strength and great thermal accumulation power.

4. The compact thermal accumulator according to claims 1, 2 and 3, **characterized in that** the material with a high level of mechanical strength and a great thermal accumulation power is porcelain stoneware of very high quality.

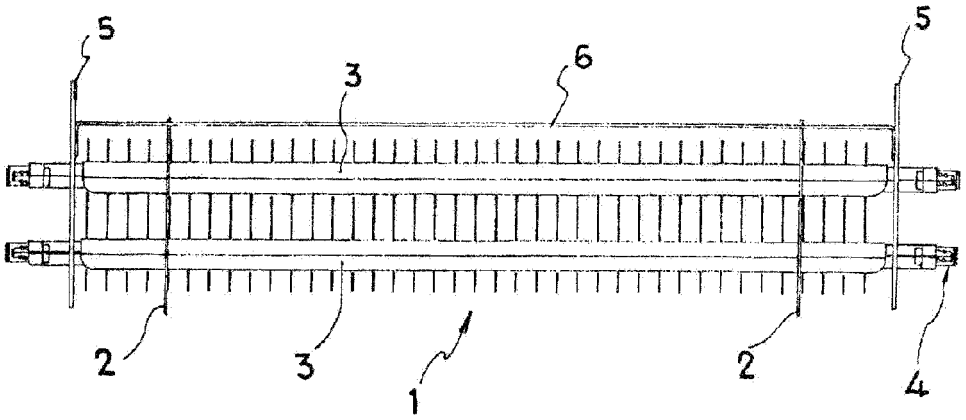

FIG. 1

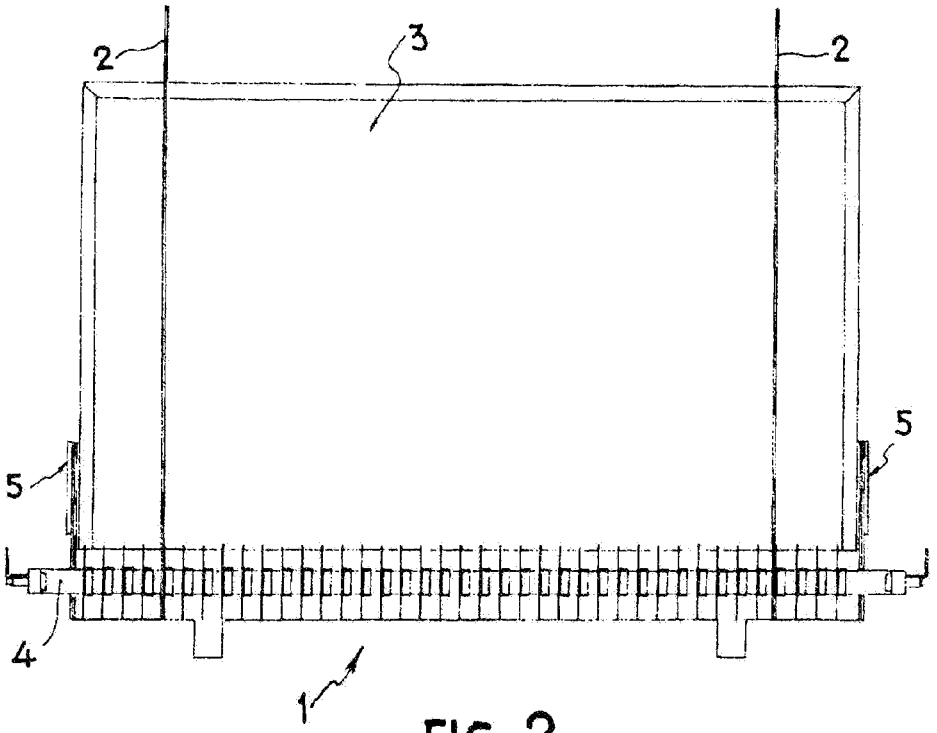

FIG. 2

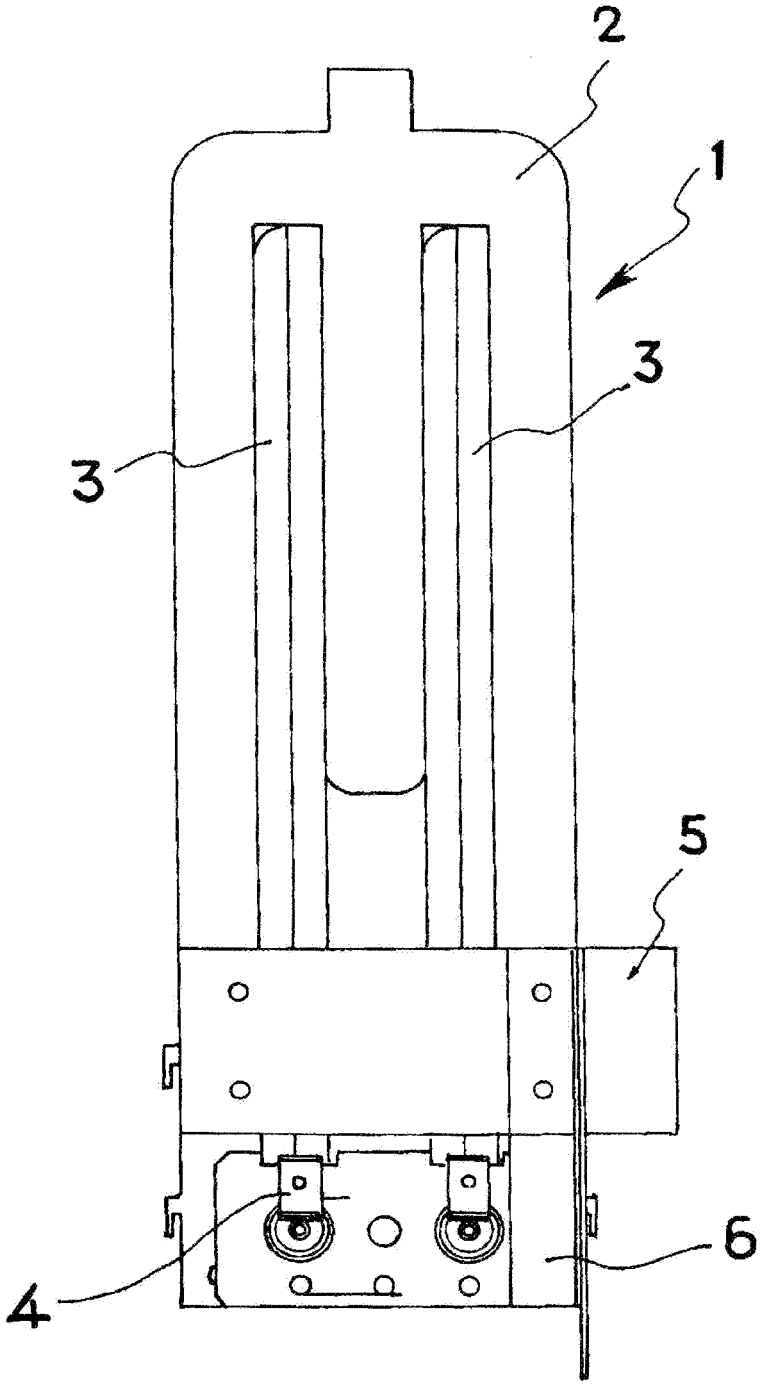

FIG. 3

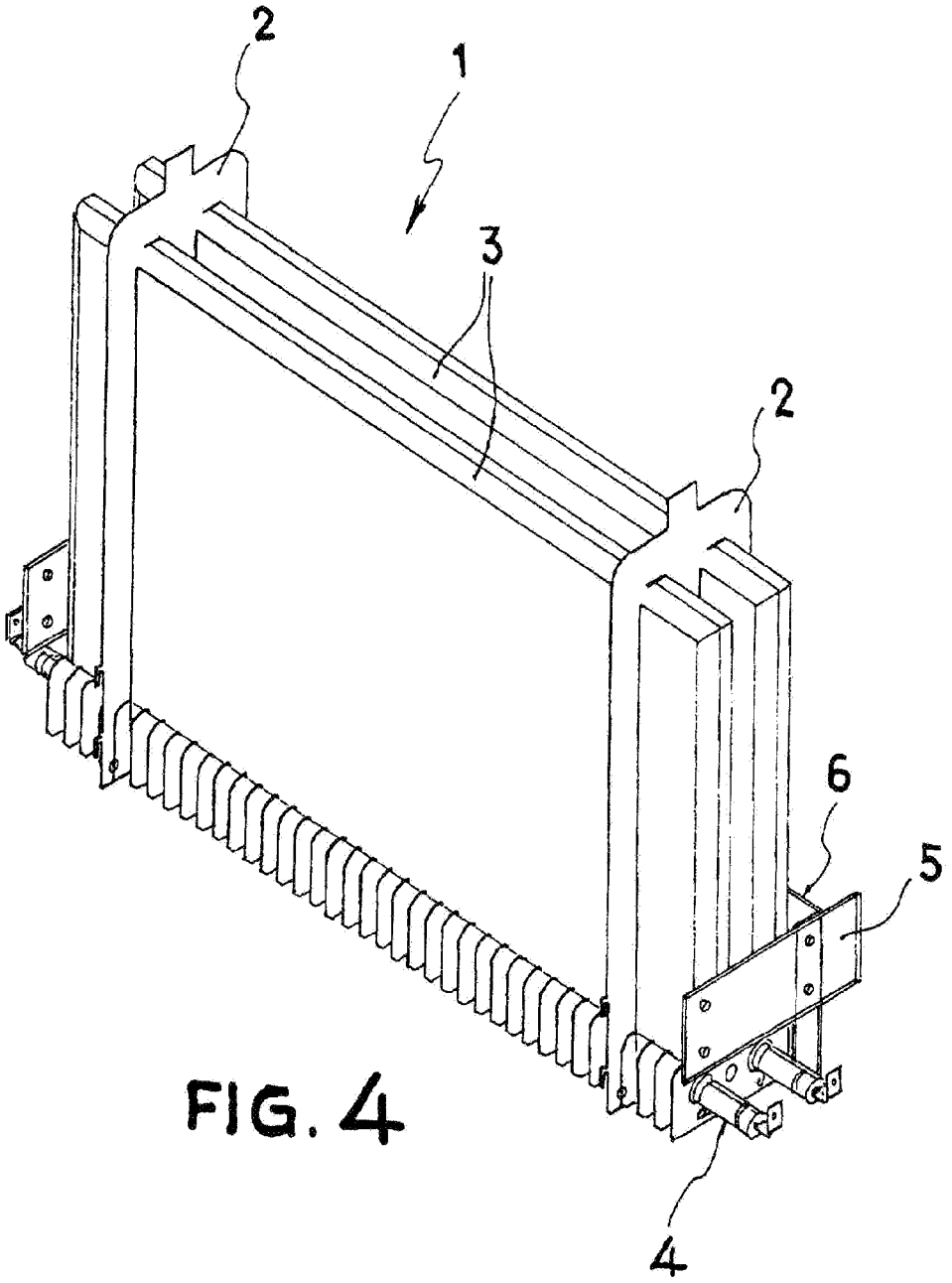

FIG. 4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ ES 2007/000646

A. CLASSIFICATION OF SUBJECT MATTER

F24H 7/02 (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)
F24H, F24C

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

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

CIBEPAT, EPODOC, WPI

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 2758875 A1 (FROGEAIS MICHEL) 31.07.1998, page 1, lines 1-15, 20-23; page 2, lines 6- 8.	1-4
X	FR 2874422 A1 (RIVET PIERRE) 24.02.2006, claim 1.	1-4
X	GB 1308369 A (HALLIWELL E F) 28.02.1973, page 2, lines 15-31.	1-4
P,X	ES 2265784 A1 (CLIMASTAR THERMOSTONE S L) 16.02.2007, claim 1.	1-4
X	GB 1591036 A (PRL SOC) 10.06.1981, claims 1,3.	1-4

☐ 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 document 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 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
07 March 2008 (07.03.2008)	(10/03/2008)
Name and mailing address of the ISA/ O.E.P.M. Paseo de la Castellana, 75 28071 Madrid, España. Facsimile No. 34 91 3495304	Authorized officer B. López de Quintana Palacios Telephone No. +34 91 349 30 40

Form PCT/ISA/210 (second sheet) (April 2007)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/ ES 2007/000646

Patent document cited in the search report	Publication date	Patent family member(s)	Publication date
FR 2758875 A B	31.07.1998	NONE	----------
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ES 2265784 AB	16.02.2007	WO 2007017545 A	15.02.2007
GB 1591036 A	10.06.1981	DE 2803388 AC FR 2379773 AB DE 7802324 U	10.08.1978 01.09.1978 10.04.1980

Form PCT/ISA/210 (patent family annex) (April 2007)