



(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
14.05.2008 Bulletin 2008/20

(51) Int Cl.:
F24C 15/34 (2006.01) F24H 7/00 (2006.01)

(21) Application number: **06819968.6**

(86) International application number:
PCT/ES2006/000464

(22) Date of filing: **04.08.2006**

(87) International publication number:
WO 2007/017545 (15.02.2007 Gazette 2007/07)

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI SK TR

(71) Applicant: **Climastar Thermostone, S.L.**
33192 Pruvia - Llanera (ES)

(72) Inventor: **LLANA GARCÍA, Pedro Luis**
E-33192 Pruvia - Llanera (ES)

(30) Priority: **05.08.2005 ES 200501988**
05.08.2005 ES 200501989

(74) Representative: **ABG Patentes, S.L.**
Orense 68, 7th floor
28020 Madrid (ES)

(54) **ARRANGEMENT OF PORCELANEOUS STONEWARE PLATES FOR USE AS AN ACCUMULATOR AND A RADIANT ELEMENT FOR HEATING**

(57) The invention relates to an arrangement for the heating of porcelainous stoneware plates for use as an accumulator and a radiant element for heating, comprising the use of porcelainous stoneware plates having a rear cover of synthetic metal (1), which enable a heating

element (3) to be joined to same in such a way as (i) to heat the stoneware plate through the incorporation of any type of electrical resistors (6) or the adjacent incorporation of a container for a fluid (4), such as water or oil, and (ii) to maintain heat irradiation once the actuation of the heater has been stopped.

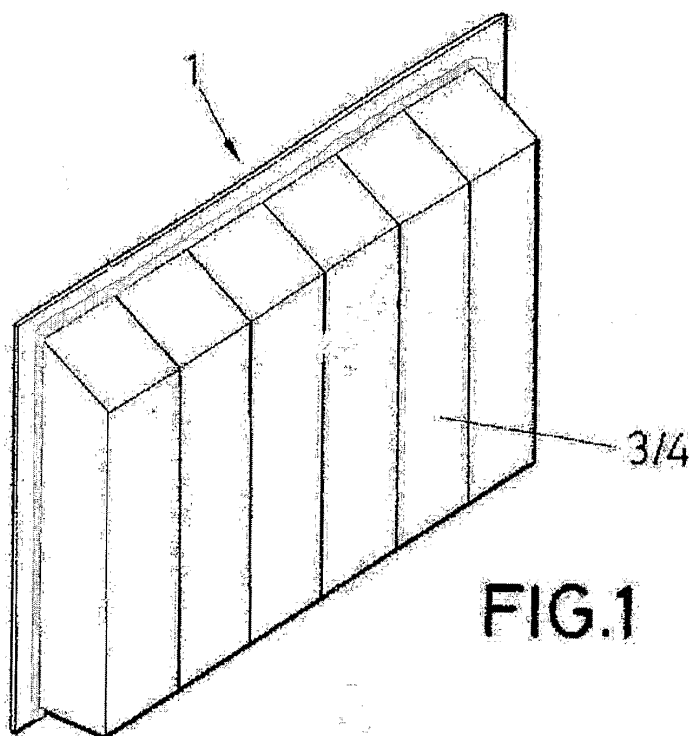
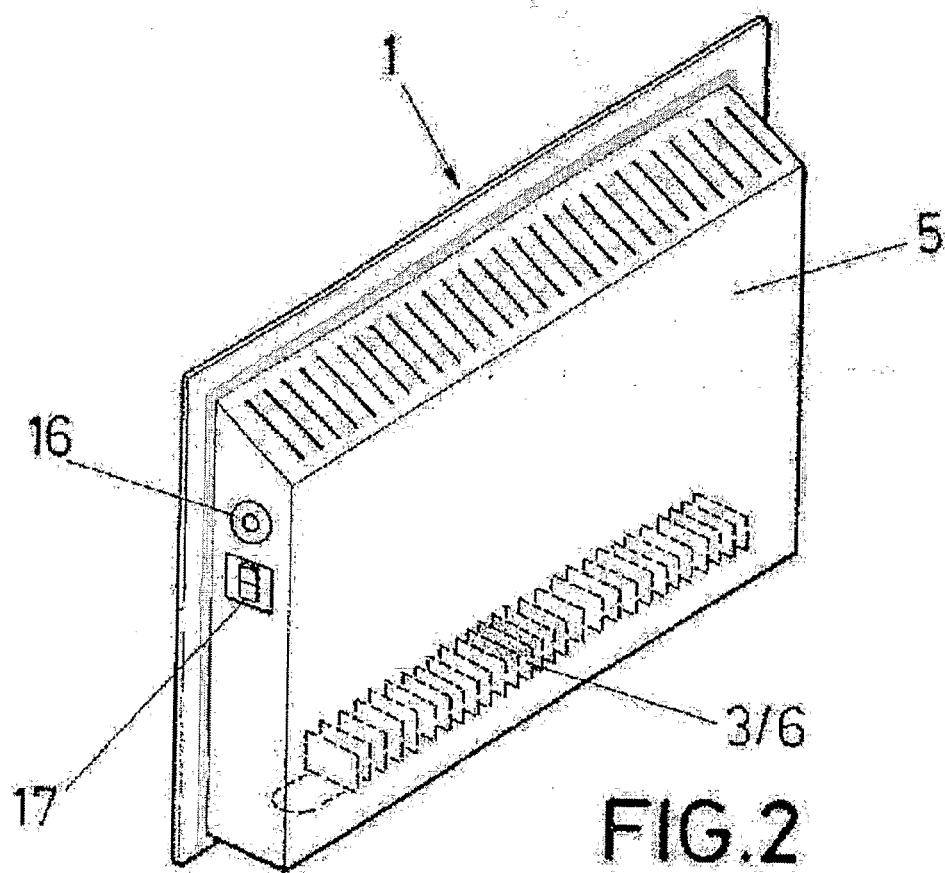


FIG.1



Description

[0001] The present invention relates to an arrangement for the heating of porcelainous stoneware plates for use as an accumulator and a radiant element for heating, using a new product formed by porcelainous stoneware joined to a synthetic metal providing important improvements in the impact resistance of the stoneware and in the integration and adherence of different elements in the synthetic metal.

Background

[0002] Patent document EP1455146 discloses an improved electric convector system consisting of a casing incorporating a filament, plate or piping resistor joined to a porcelainous stoneware plate. The drawback is that the stoneware plate has innumerable problems while fixing the different elements or components thereto due to its brittleness and rigidity. The mechanical securing means such as clamps, guides, screws, etc., often also cause its breaking or cracking due to the impact of the tool on the surface of the plate.

Description

[0003] An arrangement for heating has been designed with the present invention which allows applying a new product formed by porcelainous stoneware consisting of non-dry pressed, non-glazed ceramic tiles with very low water absorption, and therefore subjected to a single firing, joined to a synthetic metal in turn formed by a compound made from joining metal powder and a polymer. The arrangement for heating is based on joining the mentioned new product to any type of heating device or element, such that in addition to achieving its function by means of any type of electrical resistors it allows the adjacent incorporation of a container tank or radiator of fluid, such as water or oil, which once heated raises the temperature of the porcelainous stoneware, maintaining said temperature for a time greater than the fluid radiators known up until now.

[0004] As has been mentioned, the invention further incorporates the complementary and thermostatic regulation elements necessary for the maintenance of the room at the desired temperature, as well as suitable securing elements.

[0005] The invention is thus configured as an arrangement able to be generally used as an element generating heat to the exterior both by convection and by radiation, the porcelainous stoneware plate being the heat accumulator element, achieving the generation of gradual heating and the subsequent increase of its temperature in accordance with the existence of any heat generating system, such as any type of resistor, planar with an aluminum or filament circuit or a container tank for a fluid for example, and which, independently thereof, and once the actuation of said heat generating system or fluid has

been stopped, acts as a radiator generating its actuation in accordance with the heat accumulated on the porcelainous stoneware plate, such plate operating as a radiant and accumulator element for its use in heating.

[0006] The porcelainous stoneware plate is fixed to the different elements as a result of being joined in cold conditions to a synthetic metal formed by a compound made from joining metal powder and a polymer. This joining offers substantial improvements to the heater since:

- It increases the impact resistance of the stoneware.
- The application of the synthetic metal in a liquid state allows fixing metal supports on the stoneware plate, such as clamps, anchors or any type of fixing of the stoneware to the wall or to other elements.
- Since it is a joining in cold conditions, it allows the integration or adherence of different elements such as sensors, radiant elements, control and protective equipment in the synthetic metal.

[0007] In summary, the incorporation of the synthetic metal in the porcelainous stoneware acts as a glue which, upon being applied in the rear part of the plate, allows incorporating any anchoring means or component of the convector, which will be fixed when the product has dried.

Description of the Drawings

[0008] To complement the description and for the purpose of aiding to better understand the features of the invention, a set of drawings is attached to the present specification as an integral part thereof, in which the following is shown with an illustrative and non-limiting character:

Figure 1 shows a perspective view of the rear part of the arrangement for the heating of porcelainous stoneware plates for use as an accumulator and a radiant element for heating according to the invention, in which an embodiment thereof incorporating a radiator or container for a fluid as a heating element is shown.

Figure 2 also shows a perspective view of the rear part of an example of the arrangement for the heating of porcelainous stoneware plates with a rear cover of synthetic metal for use as an accumulator and a radiant element for heating according to the invention, in this case incorporating a resistor as a heating element.

Figure 3 shows an exploded view of the invention according to the example depicted in Figure 2, such that all the elements involved therein are shown, as well as its configuration and arrangement.

Figure 4 shows a longitudinal sectional view of the example depicted in Figures 1 and 2.

Preferred Embodiment of the Invention

[0009] In view of the mentioned figures and according to the adopted numbers, it can be observed therein how the arrangement for the heating of porcelainous stoneware plates with a rear cover of synthetic metal (1) for use as an accumulator and a radiant element for heating is formed from the adjacent incorporation thereto of a heating element (3) which can be of any type.

[0010] Said heating element (3) can be a radiator or container for a fluid (4) as can be observed in the example shown in Figure 1, or it can be incorporated inside an enveloping casing (5) in the event that it is a resistor (6), as observed in the example depicted in Figures 2 and 3.

[0011] In the first case, the mentioned radiator or container for a fluid (4), which can be of water or oil, will be fixed to the porcelainous stoneware plate with a rear cover of synthetic metal by means of the synthetic metal (2b) of said porcelainous stoneware plate (2a). The fluid, water or oil, contained in the radiator or container (4), which will be suitably heated by means of relevant conduits and boiler devices (not shown), having the thermostatic regulation elements, is configured as a heating element (3), transmitting said heat to the porcelainous stoneware plate with a rear cover of synthetic metal (1).

[0012] The arrangement further incorporates, in the second embodiment, a plurality of complementary and thermostatic regulation elements necessary for the functionality thereof, allowing the maintenance of the room at the desired temperature, such as a load thermostat (8) provided with a securing flange (9) for the securing to the bulb, flange located in the lower part of the enveloping casing (5), an air intake grate (10) also on said lower part, a control box (11) provided with a safety thermostat (12) and suitably protected by a protective plate with micanite (13), a deflector plate (14), a support (15) for the resistor (6), a load button (16) and a bipolar switch (17). The arrangement thus achieves, through the heat accumulated in the porcelainous stoneware plate (1) by means of a heating element (3), whether it is the radiator (4) or the resistor (6), gradually causing its heating and the subsequent increase in its temperature, that such plate continues maintaining and irradiating heat once the actuation of said heating element (3) has been stopped, such that said porcelainous stoneware plate (1) acts as an accumulator and a radiant element, which causes a considerable prolongation of temperature maintenance with the subsequent energy savings for heating any environment.

Claims

1. An arrangement for the heating of porcelainous stoneware plates for use as an accumulator and a radiant element for heating **characterized by** using porcelainous stoneware plates with a rear cover of synthetic metal which enable a heating element to

be joined to same such that in addition to achieving the heating of the stoneware plate by means of the incorporation of any type of electrical resistors or the adjacent incorporation of a container for a fluid, such as water or oil, it allows maintaining heat irradiation once the actuation of the heater has been stopped.

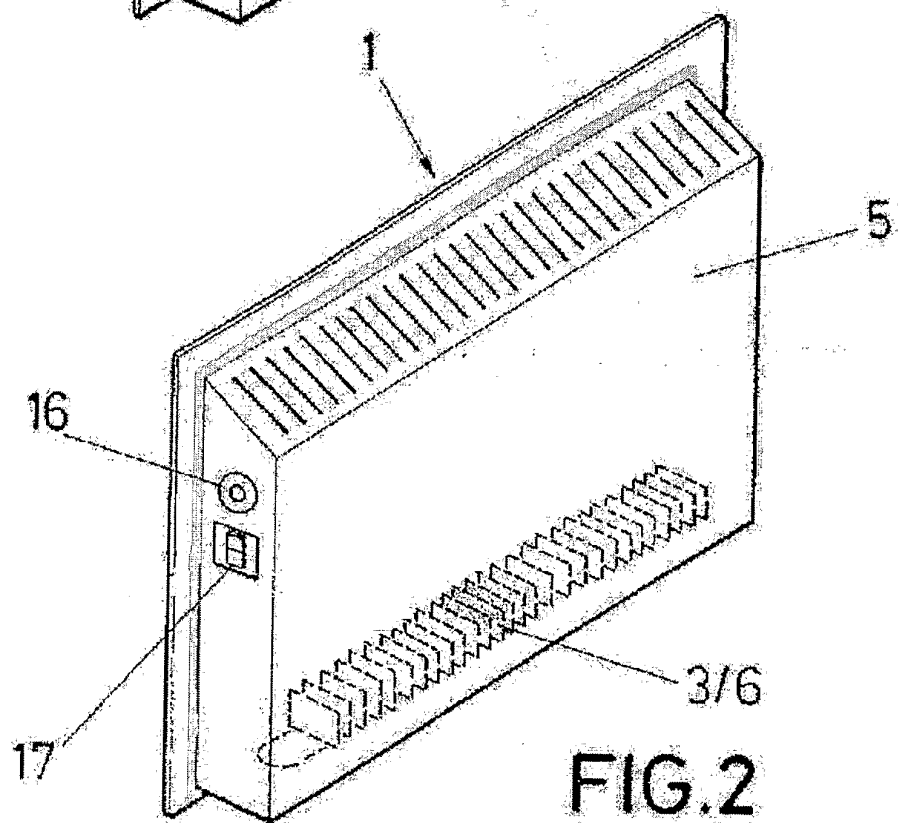
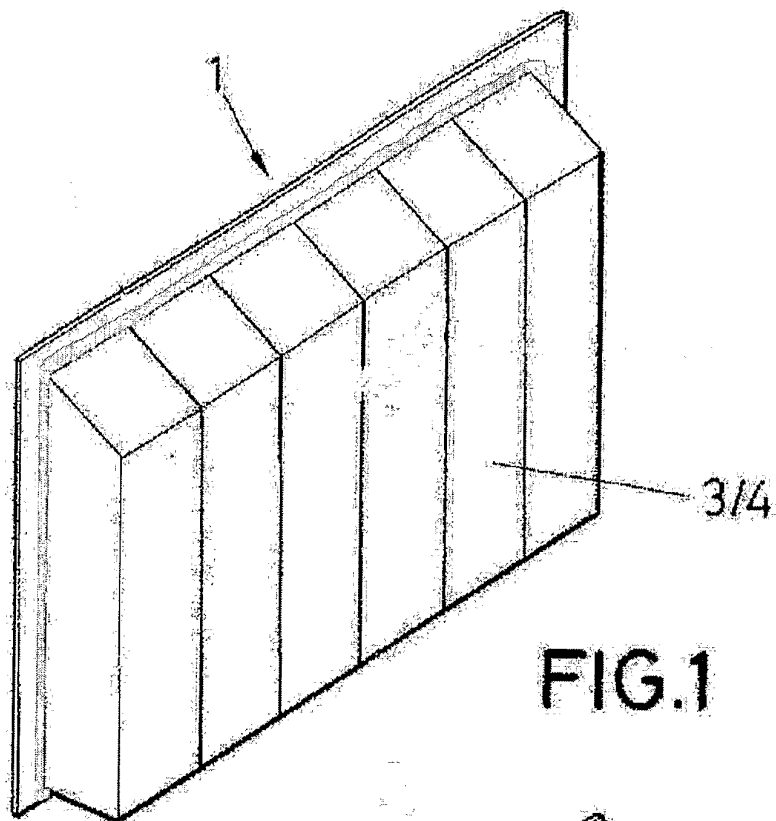
2. An arrangement for the heating of porcelainous stoneware plates for use as an accumulator and a radiant element for heating according to claim 1, **characterized in that** the stoneware plate with a rear cover of synthetic metal is formed by a tile adopting the preferably rectangular planar configuration, the rear surface of which incorporates, homogeneously covering said area, synthetic metal formed by joining metal powder and a polymer.

3. An arrangement for the heating of porcelainous stoneware plates for use as an accumulator and a radiant element for heating according to claims 1 and 2, **characterized in that** the heating element can be located directly in contact with the synthetic metal of the stoneware plate in the event that it is a radiator or a container for a fluid, or it can be incorporated inside an enveloping casing in the event that it is a resistor.

4. An arrangement for the heating of porcelainous stoneware plates for use as an accumulator and a radiant element for heating according to claims 1-3, **characterized by** the fact that the porcelainous stoneware plate is fixed to the heating element, whether it be the container for a fluid or an enveloping casing as well as to any other complementary or securing element, as a result of the rear cover of synthetic metal of the porcelainous stoneware plate to which the heating element is firmly adhered upon drying of said synthetic metal.

5. An arrangement for the heating of porcelainous stoneware plates for use as an accumulator and a radiant element for heating according to claims 1-4, **characterized by** the fact that the synthetic metal which has been joined to the rear part of the porcelainous stoneware plate does not lose its adherence properties when said plate is heated, and in that upon being heated it acts as an additional element transmitting the heat produced by the resistors, or heatings of any type adhered to the porcelainous stoneware plate.

6. An arrangement for the heating of porcelainous stoneware plates for use as an accumulator and a radiant element for heating according to claims 1-5, **characterized in that** the porcelainous stoneware is joined to the synthetic metal in cold conditions, which allows the integration or adherence of different elements in the synthetic metal.



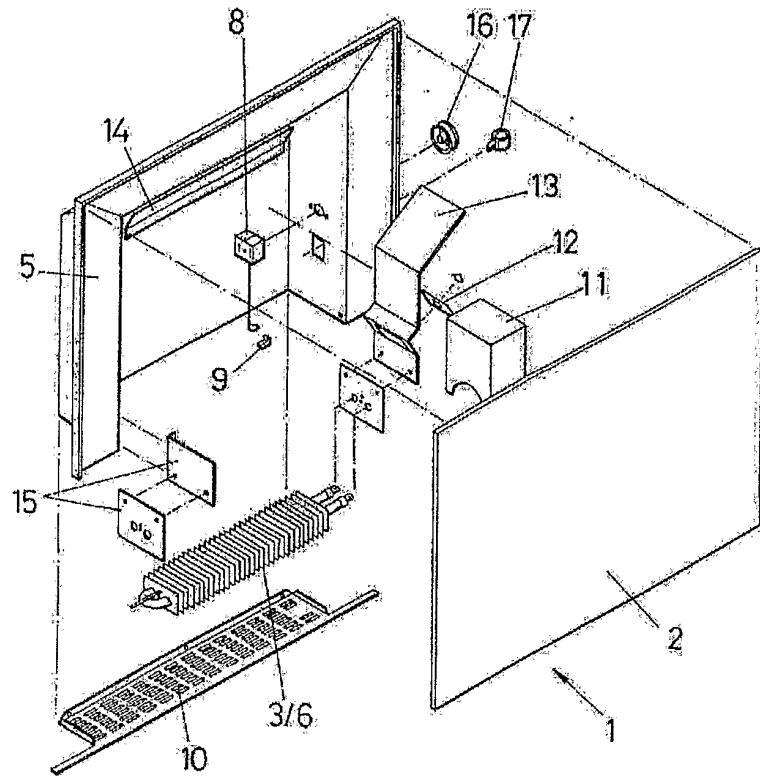


FIG. 3

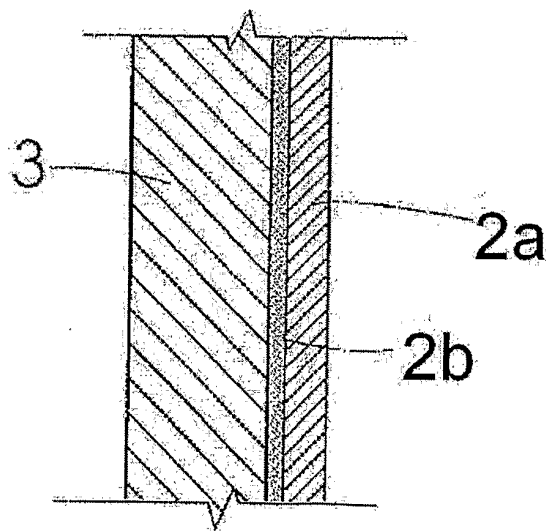


FIG. 4

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ ES 2006/000464

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)

F24C, F24H

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.
A	FR 2737833 A1 (OLIGER FRANCE) 14.02.1997, page 5, lines 17-34.	1-6
A	EP 0860666 A1 (ELECTRICITE DE FRANCE) 26.08.1998, column 3, line 25 - column 4, line 10.	1-6
A	EP 1080330 A1 (CUMBO TOUSSAINT) 07.03.2001, page 2, lines 21-26.	1-6
A	US 5454512 A (BERLAIMONT et al.) 03.10.1995, column 1, lines 34-54; column 2, lines 9-18.	1-6

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

* Special categories of cited documents:	"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
"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)	"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
"O" document referring to an oral disclosure use, exhibition, or other means	"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
"P" document published prior to the international filing date but later than the priority date claimed	
	"&" document member of the same patent family

Date of the actual completion of the international search

19.December.2006 (19.12.2006)

Date of mailing of the international search report

(28-12-2006)

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

J. A. Peces Aguado

Telephone No. +34 913496870

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

EP 1 921 388 A1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/ ES 2006/000464

Patent document cited in the search report	Publication date	Patent family member(s)	Publication date
FR 2737833 A	14.02.1997	CA 2228709 A WO 9707366 A AU 6823496 A EP 0843798 A AT 191081 T DE 69607357 D DE 69607357 T	27.02.1997 27.02.1997 12.03.1997 27.05.1998 15.04.2000 27.04.2000 07.12.2000
EP 0860666 A	26.08.1998	FR 2760073 A AT 212432 T DE 69803498 D ES 2170457 T DE 69803498 T	28.08.1998 15.02.2002 14.03.2002 01.08.2002 26.09.2002
EP 1080330 A	07.03.2001	FR 2778730 A WO 9960310 A AU 3713599 A AT 215682 T DE 69901174 D PT 1080330 T DE 69901174 T ES 2175967 T	19.11.1999 25.11.1999 06.12.1999 15.04.2002 08.05.2002 30.09.2002 31.10.2002 16.11.2002
US 5454512 A	03.10.1995	CA 2110701 A WO 9321481 A BE 1005729 A EP 0589012 A DE 69304476 D ES 2094535 T DE 69304476 T	28.10.1993 28.10.1993 28.12.1993 30.03.1994 10.10.1996 16.01.1997 03.04.1997

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

INTERNATIONAL SEARCH REPORT

International application No.

PCT/ ES 2006/000464

CLASSIFICATION OF SUBJECT MATTER

F24C 15/34 (2006.01)

F24H 7/00 (2006.01)

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- EP 1455146 A [0002]