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(54) **IMPROVED CONVECTION RADIATOR**

(57) Improved convection radiator having an internal coil (2), to which are attached metal parts (4) having tubular (6) and semitubular (7) conduits which are separated by longitudinal openings (8) with a width similar to that of the coil (2), in which there is a significantly elevated number of conduits (6) and (7) such that, in a reduced amount of space, each module (4) has an elevated number of conduits (6) and (7), thus increasing the metal surface area that is heated. The modules (4) are externally covered, on the flanges (5), by respective plastic covers (10), are fixed using conventional systems and have, on their upper part, metal grids (11) which are intended to prevent the accidental introduction of extraneous elements into the radiator and cover the openings which form the metal profiles constituting the tubular (6) and semitubular (7) conduits and through which the heat emanates.

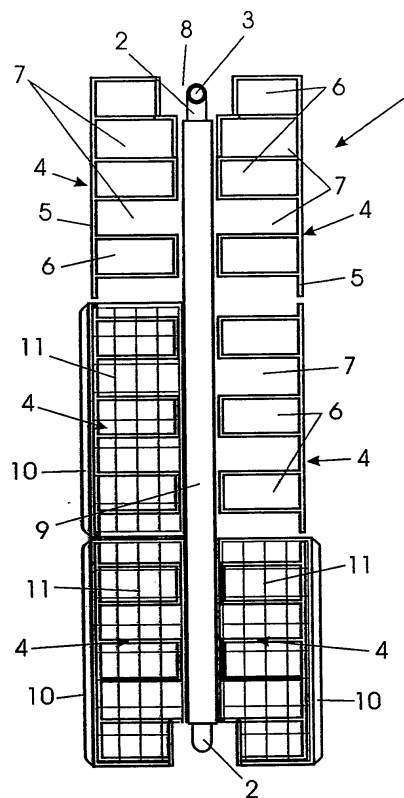


fig. 1

Description

Object of the Invention

[0001] As the title of the present specification states, the invention relates to an improved convection radiator providing to the function for which it is intended a series of advantages and innovative features, apart from others inherent in its organisation and makeup, which will be described in detail below, and which mean an improvement to what is already known in this field.

[0002] More specifically, the object of the invention consists of a radiator, intended for suitably heating the area or room in which it is located, which, being formed from an internal coil, suitably connected at its ends to a duct through which hot water will circulate, to which there are attached metal parts internally having tubular and semitubular conduits which are separated from one another on their upper faces by longitudinal openings with a width similar to the body of the coil, has a series of improvements in the structure and configuration of said metal parts significantly increasing its heating power, furthermore incorporating an outer plastic cover which adds important advantages both for optimizing its functionality and for reducing the cost of its industrial production.

Field of the Invention

[0003] The field of application of the present invention is within the industry dedicated to manufacturing heating apparatus, especially heating apparatus powered by any fuel or heating element using a water circuit as a heat-producing element.

Background of the Invention

[0004] As reference to the state of the art, it must be mentioned that multiple types of radiators of the type herein considered are currently known, the applicant being the proprietor of several Patents and Utility Models relating to elements related to the subject.

[0005] Specifically, the applicant is the proprietor of Utility Model no. 9003141, relating to a "Radiator applied to water-based heating systems", which describes and claims a radiator made up from a water circulation pipe on which there is arranged a plurality of flanges, between which there is a hollow pipe, having the purpose of producing a maximum contact between them and generating, since the pipes are hollow, the circulation of hot air or convection.

[0006] Likewise, the applicant is the proprietor of a Utility Model file, no. 9500186, relating to an "Improved radiator applicable to water-based heating systems", which describes a radiator intended to increase its performance, in which the contact pipe through the inside of which the water circulates, being in contact with the flanges and the hollow pipes, has at its ends a body or reducer element, for the purpose of reducing the internal diameter

of the pipe, furthermore incorporating in the areas adjacent to the hollow pipes and to the flanges a solid element likewise reducing its internal dimension, forcing the circulation of water to achieve greater friction and accordingly a substantial increase in the heating power of the water.

[0007] The applicant is also the proprietor of Utility Model no. 9500836, relating to an "Improved convector radiator", which describes a radiator having a hollow pipe connected to a water circuit, inside of which there is a resistor raising the temperature of the water, achieving transferring the heating effect to the outside enhanced by the adjacent parts forming fins.

[0008] Lastly the applicant is furthermore the proprietor of Utility Model no. 9802241, relating to an "Improved convection radiator", which describes a radiator made up from an internal coil, connected at its ends to a duct through which the hot water circulates, to which there are attached metal parts internally having tubular and semitubular conduits separated from one another on their upper faces by longitudinal openings with a width similar to that of the body of the coil, which, even being a radiator enhancing the expulsion of the heat by convection, its inner installation or water circuit being considerably simplified, and avoiding the installation of complex auxiliary elements substantially increasing its heating power with relation to conventional radiators, it can still be improved in several aspects, it being possible to increase its heating performance as well as reducing its production costs, which is the object provided in the invention herein proposed, and concerning which the applicant does not know of the existence of any other having similar technical, structural and constituent features.

Description of the Invention

[0009] Thus, and specifically, the radiator that the present invention proposes is configured from the incorporation therein of a coil acting as a circuit, being configured like a hollow pipe inside of which the hot water circulates, the heat being generated, enhanced by the elements attached to its structure acting as convectors, outwardly expelled through the upper openings that said elements have.

[0010] Logically, the coil has at its ends the suitable connections for the inlet and outlet of the hot water circulating therethrough, said water being heated by a conventional source producing the rise in the water temperature.

[0011] As has been mentioned, one or several elements are attached and fixed by conventional means to the mentioned coil on each of its larger sides or faces, which elements are configured by hollow metal profiles which hereinafter shall be called modules, the outer faces thereof being closed by way of flanges, and internally and longitudinally having a plurality of tubular and semitubular conduits, i.e., closed conduits complementary to respective adjacent open conduits, being separated from

one another by an opening with approximately the dimensions of the coil which is covered in its upper and lower area by respective U-shaped tubular bodies.

[0012] Advantageously, there is an elevated number of the mentioned tubular and semitubular conduits which the previously described metal bodies or modules have and which are attached to the coil, such that in a reduced amount of space, each module has an elevated number of conduits thus increasing the metal surface area that is heated, and accordingly increasing the heating power of each radiator.

[0013] It should be mentioned that in order to facilitate the connection of the ends of the coil to the water circuit, the tubular conduits existing at the ends of the side modules can be slightly shorter, thus leaving space for manipulating and suitably placing said connections.

[0014] It is thereby achieved that the radiator represents an important energy saving for the user or consumer, since more heat is obtained at the same water temperature, said heat being maintained for a longer time period.

[0015] In addition, and characterizing the invention, the metal modules which are fixed to the coil are covered by respective plastic covers, externally covering them on their entire surface, being fixed thereto by means of conventional systems, and having, on their upper part, metal grids which are intended to prevent the accidental introduction of extraneous elements into the radiator and cover the openings formed by the metal profiles constituting the tubular and semitubular conduits and through which the heat emanates.

[0016] Said covers advantageously allow the radiator and its inner elements to reach a higher temperature without being able to cause burns or undesired damaging effects externally upon contact, preventing, upon being open, having to paint said inner parts, which makes the product more expensive to produce and maintain, reducing the heat production of the metal conduits since paint is an insulating element.

[0017] The new improved convection radiator therefore represents an innovative structure with constituent and structural features unknown until now for such a purpose, reasons which, combined with its practical utility, provide it with sufficient foundations to obtain the privilege of exclusivity which is applied for.

Description of the Drawings

[0018] To complement the description which is being made 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 has been depicted with an illustrative and nonlimiting character:

Figure 1 shows a schematic plan view of the new improved convection radiator according to the invention, in which it has been depicted only partially cov-

ered by the plastic covers with grids in order to allow better observing all the elements that it comprises as well as the configuration and arrangement thereof.

Preferred Embodiment of the Invention

[0019] In view of the single described figure, and according to the numbers used therein, a preferred embodiment of the improved convection radiator can be observed, comprising the parts which are indicated and described below.

[0020] Thus, the radiator (1) in question is essentially made up from a coil (2) configured like a hollow pipe inside of which the hot water circulates, having at its ends (3) the suitable connections for the inlet and outlet of the hot water circulating therethrough, said water being heated by a conventional source producing the rise in the water temperature.

[0021] One or several elements are attached and fixed by conventional means to the mentioned coil (2) on each of its larger sides or faces, which elements are configured by hollow metal profiles or modules, which act as convectors upon being heated, generating the outward expulsion of the heat produced by the coil (2) with which it is in contact.

[0022] Said modules (4) have their outer faces closed by way of flanges (5), and they internally and longitudinally have a plurality of tubular or closed conduits (6) giving rise to semitubular or open conduits (7), complementary and adjacent to the former, said modules (4) being separated from one another by an opening (8) with approximately the dimensions of the coil (2), which is covered in its upper and lower areas by respective U-shaped tubular profiles (9) covering and protecting the upper and lower part of the coil (2).

[0023] As is seen in Figure 1, advantageously there is an elevated number of the mentioned tubular (6) and semitubular (7) conduits which the previously described metal bodies or modules (4) internally have and which are attached to the coil (2), such that in a reduced amount of space, each module (4) has an elevated number of conduits (6) and (7), thus increasing the metal surface area that is heated, and accordingly increasing the heating power of each radiator (1).

[0024] In addition, the modules (4) are externally covered on the flanges (5) by respective plastic covers (10), with dimensions suitable for covering them on the entire surface, being fixed thereto by means of conventional systems, and having, on their upper part, metal grids (11) which are intended to prevent the accidental introduction of extraneous elements into the radiator and cover the openings formed by the metal profiles constituting the tubular (6) and semitubular (7) conduits and through which the heat emanates.

[0025] Having sufficiently described the nature of the present invention, as well as the manner of putting it into practice, it is not considered necessary to explain it fur-

ther so that a person skilled in the art may understand its scope and the advantages which are derived from it, stating that, within its essentiality, it could be put into practice in other embodiments differing in detail from that indicated by way of example, and which will be equally covered by the protection which is claimed as long as its fundamental principle is not altered, changed or modified.

Claims

1. An improved convection radiator, of the type intended for heating the area or room in which it is located, is made up from an internal coil (2), connected at its ends (3) to a duct through which hot water will circulate, to which there are attached metal parts or modules (4) internally having tubular (6) and semitubular (7) conduits separated from one another on their upper faces by longitudinal openings (8) with a width similar to that of the body of the coil (2), **characterized by** the fact that there is a significantly elevated number of the tubular (6) and semitubular (7) conduits which the metal bodies or modules (4) have internally and which are attached to the coil (2), such that in a reduced amount of space, each module (4) has an elevated number of conduits (6) and (7), increasing the metal surface area that is heated; and in that the modules (4) are externally covered on the flanges (5) by respective plastic covers (10), with dimensions suitable for covering them on the entire surface, being fixed thereto by means of conventional systems, and having, on their upper part, metal grids (11) which are intended to prevent the accidental introduction of extraneous elements into the radiator and cover the openings formed by the metal profiles constituting the tubular (6) and semitubular (7) conduits and through which the heat emanates.

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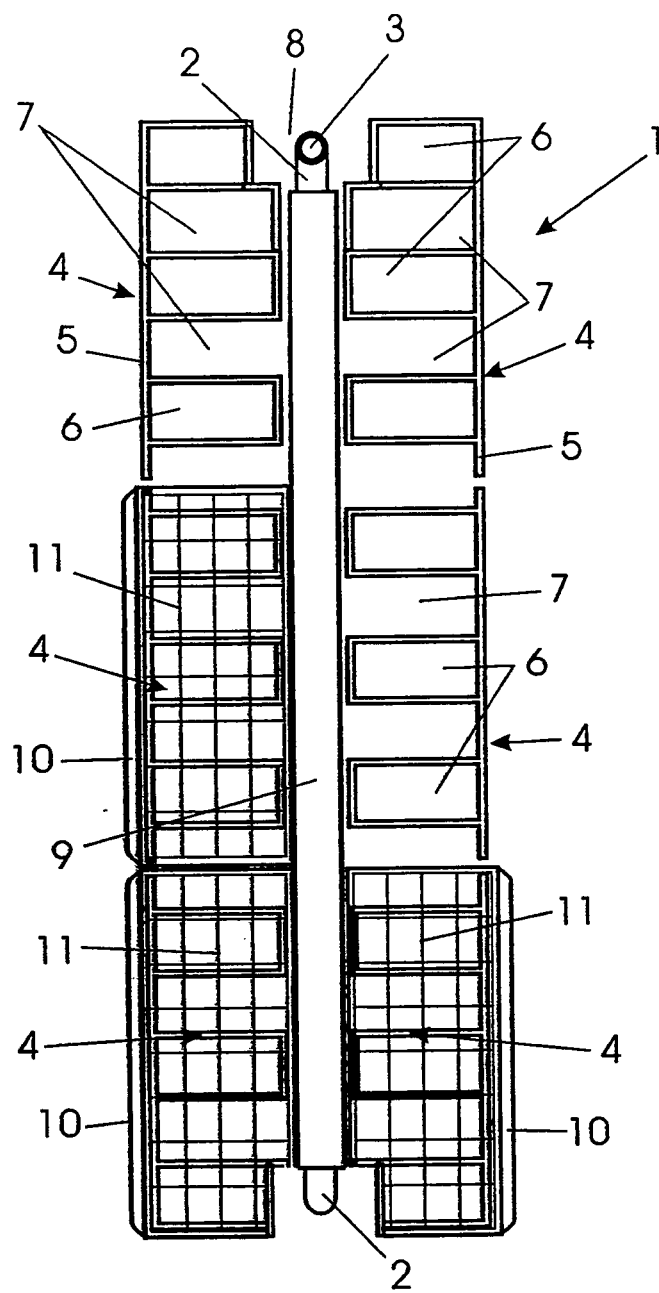


fig. 1

INTERNATIONAL SEARCH REPORT

International application No.

PCT/ ES 2007/000461

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)

F28D,F28F,F24D

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 1030152 A1 (ARANA URIARTE GENARO) 23.08.2000, the whole document.	1
Y	DE 3420258 A1 (HOLLAH ENGELBERT) 05.12.1985, the whole document.	1
A	GB 1572817 A (NU RAD LTD) 06.08.1980, the whole document.	1
A	FR 2319096 A2 (METALLIQUES ENTREPR CIE FSE) 18.02.1977, the whole document.	1
A	DE 29705079 U1 (CHEMISCHE IND ERLANGEN GMBH) 12.06.1997, the whole document.	1

☐ 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

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(18/12/2007)

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/ ES 2007/000461

Patent document cited in the search report	Publication date	Patent family member(s)	Publication date
EP 1030152 AB	23.08.2000	ES 1041067 U ES 1041067 Y WO 0012947 A EP 19980959912 AT 284013 T DE 69827970 D	16.06.1999 01.11.1999 09.03.2000 11.12.1998 15.12.2004 05.01.2005
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Form PCT/ISA/210 (patent family annex) (April 2007)

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International application No.

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