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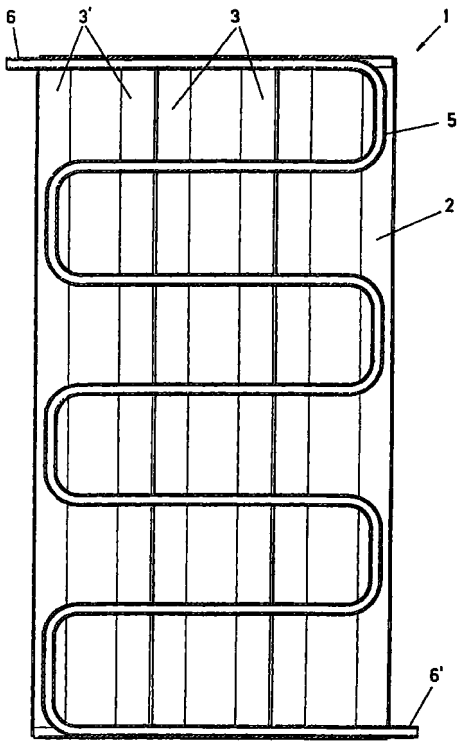
(54) IMPROVED CONVECTION RADIATOR

(57) Improved convection radiator consisting of a convection radiator (1) provided with a serpentine (5) with connections (6) and (6') to the general circuit, having metal parts (2) and (2') which can be optionally substituted by monoblock metal elements provided with tubular (3) and semi-tubular (3') conduits; the external zones (2) and (2') are separated from each other at their upper faces by longitudinal openings having a width which is similar to the width of the serpentine (5) to which the external parts (2) and (2') are secured.



G-H
FIG-7

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Description

PURPOSE

[0001] This descriptive report refers to an improved convection radiator, the purpose of which is to achieve suitable heating of the area in which it is found. It has an internal serpentine adapted in accordance with the pertinent harmonic deformation of a pipe to which profiles made up of parts are attached. These can be optionally formed by a monoblock body and are located on top of the surface of the tubular body forming the profile by means of their internal zone or hollow area. At the ends of the serpentine and joining the profiles attached to its two faces there are parts shaped also as profiles that have both on the upper and lower zones a longitudinal opening through which the calorific flow emerges to the exterior. The pertinent connections to the tubular body forming the serpentine, emerging in the ascending and descending vertical direction at opposite points are found on the ends of the radiator body.

SCOPE

[0002] This invention is applied in the industry dedicated to the manufacture of heating elements, especially heating devices supplied by any fuel or calorific element using a water circuit as a heat-producing element.

HISTORY

[0003] The applicant is the title holder of the Invention Patent requested with number 8803694 regarding to a WATER HEATING SYSTEM, in which a system that generates water heating by means of gas burners and especially intended for heating, including a fuel chamber of which full use is made and in which the calorific exchange to try and increase the performance is caused, is described and claimed.

[0004] The invention has two water circulation circuits, one of which is formed by two vertical and parallel pipes with one of these intended for water inlet and the other for water outlet. Said tubes are horizontally interconnected by means of tubular sections that have a diameter inferior to that of the tubes they communicate. There is a second water circulation circuit formed by an inlet tube rolled in a helicoidal way around the tubular set of the first circuit until it reaches the upper area where it continues in a corkscrew, subsequently descending in a vertical outlet section. The invention is complemented by the pertinent control means and accessories for lighting, gas circulation water circuit, valve parts, etc.

[0005] The applicant is also the title holder of the Utility Model file requested with number 9003141, regarding a RADIATOR APPLIED TO WATER HEATING SYSTEMS, that describes and claims a water circulation pipe on which a number of plates are arranged, one of these being a hollow pipe (3). The purpose of these elements is to cause maximum contact between the mentioned water circulation piping and the adjacent plates and, also, complete contact between the mentioned plates and the pipes which, on being hollow, generate the circulation of hot air or convection.

[0006] Likewise, the applicant is the title holder of a Utility Model file, requested with number 9500186, regarding an IMPROVED RADIATOR APPLICABLE TO WATER HEATING SYSTEMS, that describes and claims a radiator intended to provide a substantially higher performance as compared to conventional radiators. It is characterized by the fact that the contact tube, inside which the water circulates adjacent to the hollow pipes and some plates, has a body of reducing element on its ends in order to reduce the inside diameters of the pipe located in the heat-producing area. A solid element that also
reduces the sizes of the pipe on the inside is placed on the inside of the pipe with the larger diameter, coinciding with the areas adjacent to the hollow pipes and the plates, forcing the circulation of the water transported by the general pipe, thus obtaining a better friction and, consequently, a substantial increase in the calorific power of the water that passes through the internal area.

[0007] The applicant is also the owner of the Utility Model file number 9500836 regarding an IMPROVED CONVECTION RADIATOR that describes and claims a radiator with a hollow pipe connected to a water circuit, inside which, that is inside the hollow cylindrical body, there is an electric resistance that elevates the water temperature and succeeds in transferring the calorific effect to the outside increased by the adjacent parts in the form of fins.

[0008] Although in all the cases the production of calorific power has been verified, substantially increased as regards conventional radiators, it is seen in all cases that the radiator has a number of elements requiring its pertinent securing by different means and that marginal elements resulting in an increase of its costs and suitable maintenance of the installation are included.

[0009] The obvious solution to the problem existing at present in this matter would be to be able to count on a convection radiator using the calorific power of the water that passes through bodies formed by profiles and with their action increase the heat exhaust by convection, in which the internal installation or water circuit was appreciably simplified, removing the auxiliary element installation and acting solely and exclusively the circuit as a heat-producing element.

[0010] However, to date there is no knowledge of the existence at present of an invention provided with the characteristics mentioned above as ideal.

DESCRIPTION OF THE INVENTION

[0011] The improved convection radiator proposed by the invention is presented in itself as an obvious novelty within its specific field of application, as a serpentine is included inside the radiator and as a basic element on which the auxiliary elements are secured. This serpentine acts as a circuit shaped like a hollow pipe through the inside of which the hot water passes. The heat is increased by the elements attached to the structure of the serpentine that act as convectors, generating the discharge of heat to the outside caused by the serpentine in collaboration with a conventional installation that causes the temperature to rise, which is transmitted to the water included in the circuit. These elements forms a basic part of the different serpentines included in the radiators.

[0012] More specifically, the improved convection radiator purpose of the invention is formed by a hollow tubular body through the inside of which passes the water heated by a conventional source causing the water temperature to rise. This passes through a circuit to which and forming part of same the radiators including the tubular body in the interior are connected and adopt the shape of a serpentine. Their ends have the pertinent connections for the inlet and outlet of the hot water through the inside of the serpentine.

[0013] A monoblock body, or in substitution various bodies suitably attached and secured, are attached and secured by conventional means to the serpentine, shaped by hollow profiles of metallic material and with the external faces closed, Internally, they are shaped as a longitudinally situated hollow tubular body with the ends open and adjacent to the hollow zones situated longitudinally there are similar zones without the partition next to the serpentine, that is zones seen from the front that a U-shaped.

[0014] At the narrower ends of the serpentine are secured tubular bodies with a width narrower than the serpentine ends that have a general U-shape and an attachment the longitudinal opening of which coincides with the serpentine.

[0015] The profiles or adjacent monoblock body on the larger faces of the serpentine are separated by an opening with a width similar to the profile that acts as a sizing or remote body and obtains the air convection through the openings located in the upper or lower part.

[0016] The serpentine has ends for the corresponding connections located in the vertical position.

DESCRIPTION OF THE DRAWINGS

[0017] In order to complement this description and to help with a better understanding of the characteristics of the invention, attached to this descriptive report and as an integrating part are three sheets of drawings in which the following has been represented in an illustrative and non-limiting way:

Figure 1 corresponds to a side elevated view of the invention relating to an improved convection radiator.

Figure 2 shows a frontal view of the object represented in figure 1.

Figure 3 shows a floor view of the object represented in the above figures.

Figure 4 corresponds to an A-B view of the objected represented in figure 1.

Figure 5 shows a C-D view of the object represented in figure 1.

Figure 6 refers to an E-F view of the object represented in figure 1.

Figure 7 shows, lastly, a view similar to the one shown in figure 2, duly sectioned, in order to visualize the internal conduit shaped as a serpentine.

PREFERRED PERFORMANCE OF THE INVENTION

[0018] In view of these figures, it can be seen how the improved convection radiator (1) is formed by various similar bodies (2) and (2') next to a serpentine (5), that has connections (6) and (6') at its ends for the corresponding inclusion and securing
to the hot water transporting circuit produced by conventional means. The water, on passing through the inside of the serpentine (5), and in collaboration with the parts (2) and (2') that have internal tubular hollow zones (3) and semi-tubular hollow zones (3'), achieve that through the upper openings between the parts (2) and (2') positioned longitudinally on the upper and lower zone of the convection radiator (1) the hot air flow obtained through the serpentine, in collaboration with the parts (2) and (2') exits to the exterior, apart from shaping the parts (2) and (2') in accordance with their metallic nature as receivers of the heat produced by the serpentine (5) which also exits to the atmosphere of the zone where the radiator (1) is located.

[0019] As can be seen in the figures, the middle sides of the prism shaped by the radiator (1) have closing parts (4) and (4') formed by profiles that seen from the front adopt a U-shape and are attached to the surface of the serpentine (5) ends), specifically in the branches that have the connections (6) and (6') through which the hot water passes to the inside of the serpentine (5).

[0020] Consequently, the hot water causes the parts (2) and (2') to become heated and these, in accordance with their pertinent tubular (3) and semi-tubular shape (3') produce an air flow that exits to the exterior through the openings described above.

[0021] The water heat-producing source that

passes through the serpentine (3) can use any type of fuel and have any shape.

[0022] It should be indicated that the internal spaces of parts (2) and (2') next to the serpentine (5) can have similar dimensions or not.

Claims

1. Improved convection radiator of the type that uses a conventional heat-producing source to which a circuit is connected through the inside of which the hot water passes and which, in turn, tubular bodies shaped as internal circuits of a convection radiator are connected to the circuit. It is characterized by the fact that the convection radiator (1) has an internal serpentine (5) provided with connections to the general circuit (6) and (6') for the inlet and outlet of water to the serpentine (5). Arranged next to the surface of the serpentine (5) there are metallic parts (2) and (2') which can be optionally substituted by monoblock metal elements provided with tubular (3) and semi-tubular (3') conduits. Both external zones (2) and (2') are separated from each other at their upper faces by longitudinal openings having a width which is similar to the width of the serpentine (5) body to which the external parts (2) and (2') are secured by conventional means.

2. Improved convection radiator according to the first claim, characterized by the fact that the on middle or lateral faces of the radiator (1) there are profiles (4) and (4') that, seen from the front, adopt a U-shape, are located on the ends of the serpentine (5) and have connections (6) and (6').

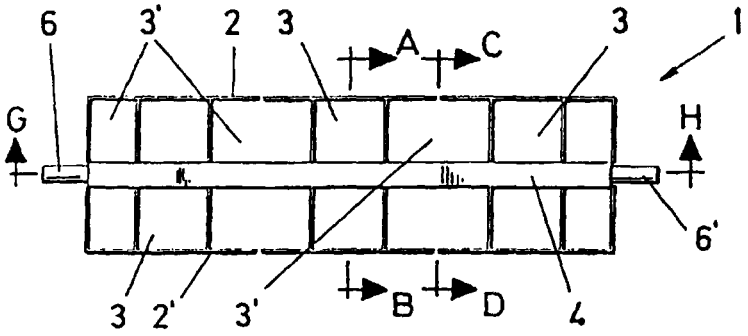


FIG -1

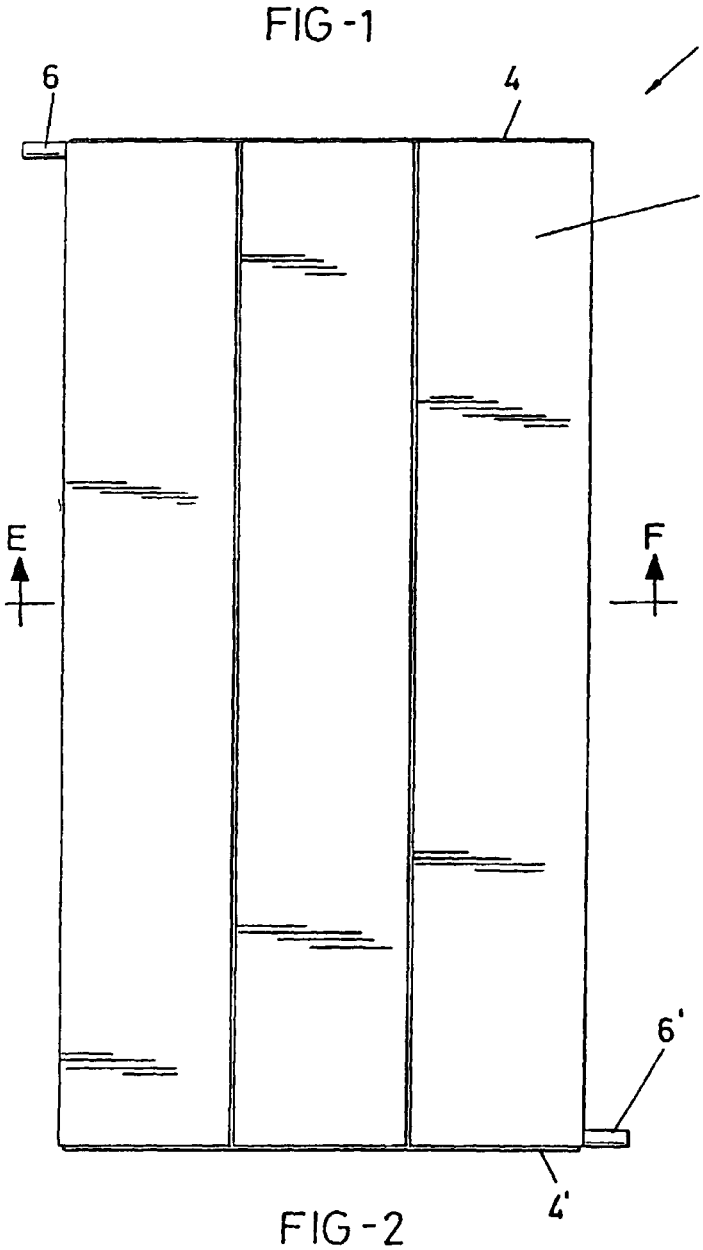


FIG -2

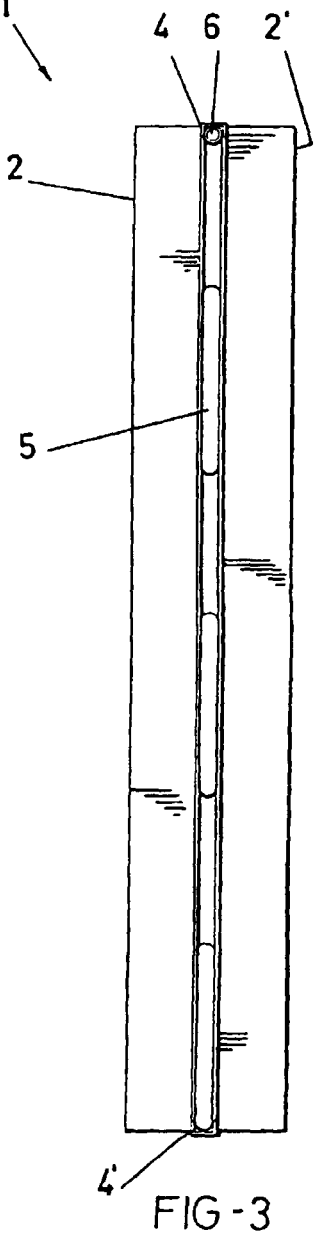
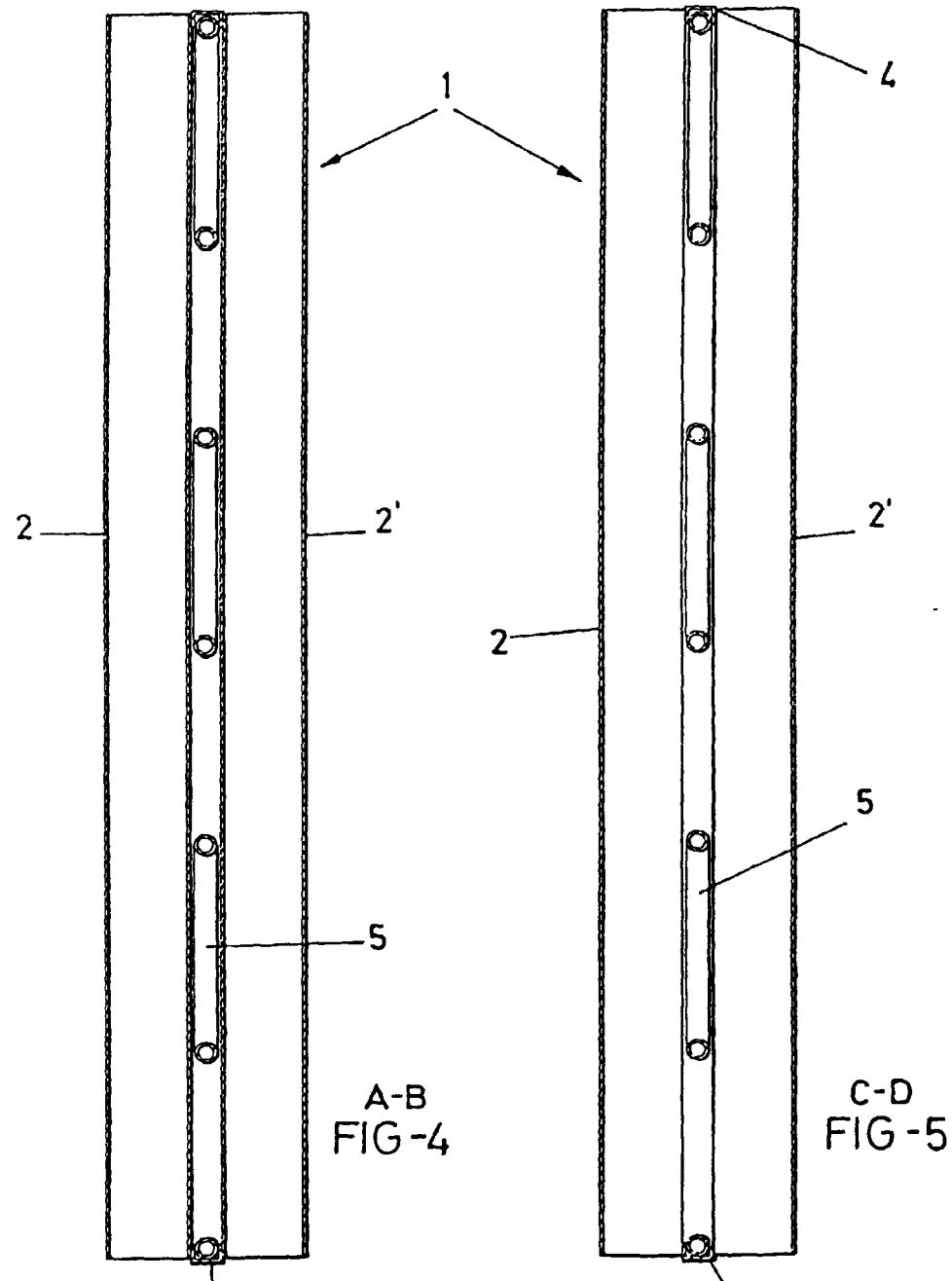
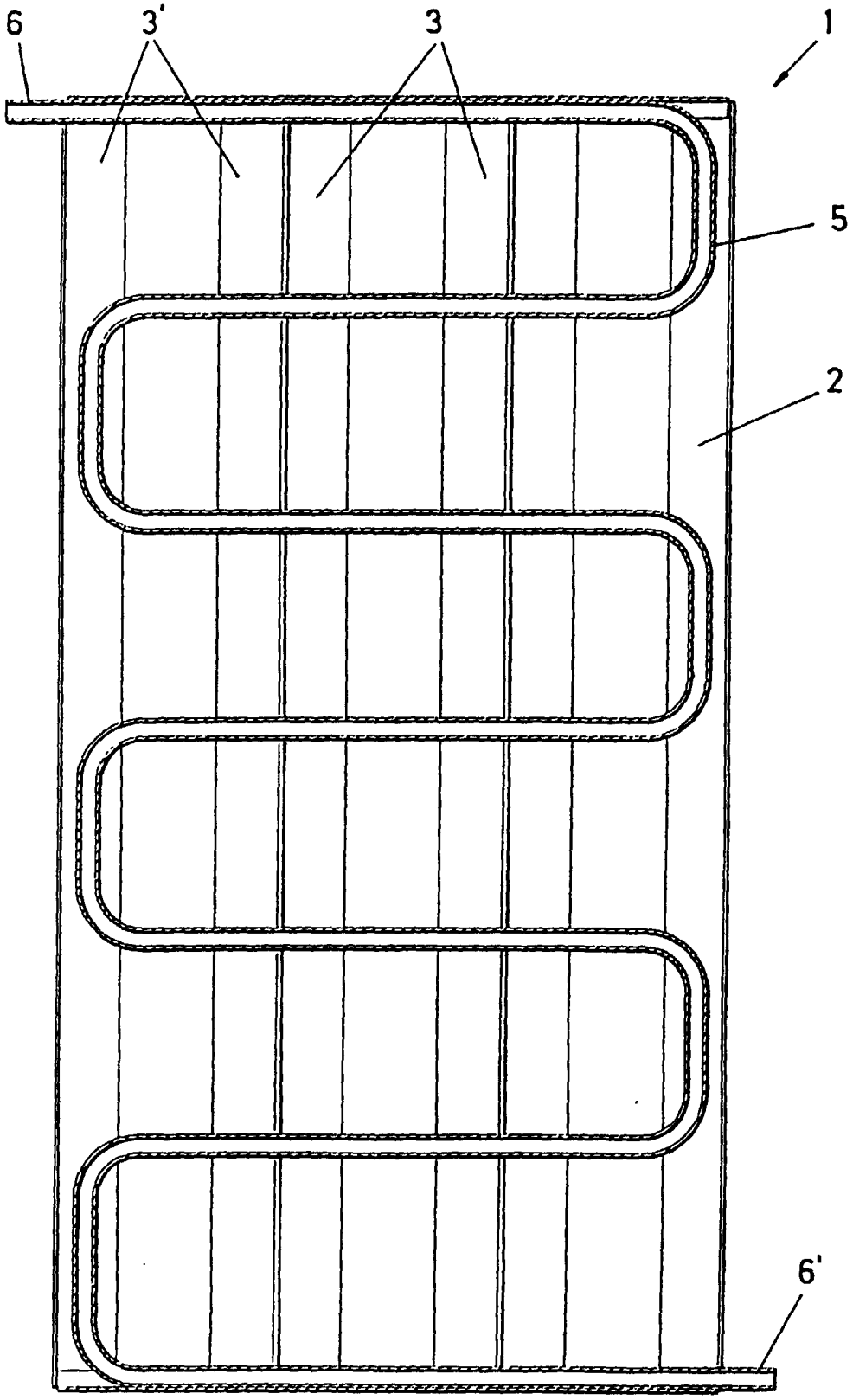


FIG -3


1
2
2'
5
4'
A-B
FIG-4
4
2
2'
5
4'
C-D
FIG-5
1
3'
4'
3'
3
5
2
6
6'
2'
E-F
FIG-6



G-H
FIG-7

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES 98/00339

A. CLASSIFICATION OF SUBJECT MATTER [6]:

IPC6: F28D 1/047, F28F 1/12
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)

IPC6: F28D, F28F

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, PAJ, 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 2045747 A (REINICHE, A.), 5 March 1971 (05.03.71), page 4, line 37 - page 5, line 10; figures 1-2.	1-2
X	GB 957567 A (F. H. BIDDLE LTD.), 6 May 1964 (06.05.64), page 1, line 79 - page 2, line 40; page 2, lines 72-73, 104-105; figures.	1-2
X	GB 1572817 A (NU-RAD LTD.), 6 August 1980 (06.08.80), page 2, lines 51-111 ; figures 1-3.	1-2
X	FR 2319096 A (COMPAGNIE FRANCAISE D'ENTREPRISES METALLIQUES), 18 February 1977 (18.02.77), page 3, lines 8-32; figures 1-2.	1
X	FR 1423528 A (GALLETTI UGO), 23 March 1966 (23.03.66), the whole document.	1

☐ 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
7 April 1999 (07.04.99)	9 April 1999 (09.04.99)
Name and mailing address of the ISA/	Authorized officer
Facsimile No. S.P.T.O.	Telephone No.

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International Application No
PCT/ ES 98 / 00339

Patent document cited in search report	Publication date	Patent familiy member(s)	Publication date
FR 2045747 A	05-03-1971		
GB 957567 A	06-05-1964		
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FR 2319096 AB	18-02-1977	DE 2628160 ABC	17-02-1977
FR 1423528 A	23-03-1966		

Form PCT/ISA/210 (patent family annex) (July 1992)