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(71) Applicant:
Itemar - Industria Termotecnica Marchigiana S.p.A.
63030 Monsampolo del Tronto (Ascoli Piceno) (IT)

(72) Inventor:
Biasi, Eugenio Giovanni
37128 Verona (IT)

(74) Representative: **Lanzoni, Luciano**
c/o BUGNION S.p.A.
Via G. Garibaldi n. 19
37121 Verona (IT)

(54) Hydraulic device for radiating plates

(57) The present invention relates to a hydraulic device for radiating plates, substantially comprising, as a single part, a delivery connecting pipe (2) and a return connecting pipe (3), which can be connected to the network supplying the heat-carrying fluid, by means of a first pair of connection couplings (8, 8'), and to the inlet duct (9) and outlet duct (10) of a radiating plate (11), by means of a second connection coupling (12, 12'). The device (1) is thus suitable for conveying the heat-carrying fluid from a standard position (13) for installation of the piping of the supply network, to a standard position (14) of the inlet duct (9) and outlet duct (10) of the radiating plate (11). In particular, the first connection couplings (8, 8') and the second connection couplings (12, 12') respectively consist of first and second cylindrical bushes provided with first holes (21) and second holes (22) communicating with the aforementioned connecting pipes (2, 3). The hydraulic device (1) also comprises means (15) suitable for connecting it to the radiating plate (11) and consisting of a substantially plate-like shaped element (16, 17) which can be fixed to the first connection couplings (8, 8') and rigidly anchored to a concealed side (18) of the radiating plate (11).

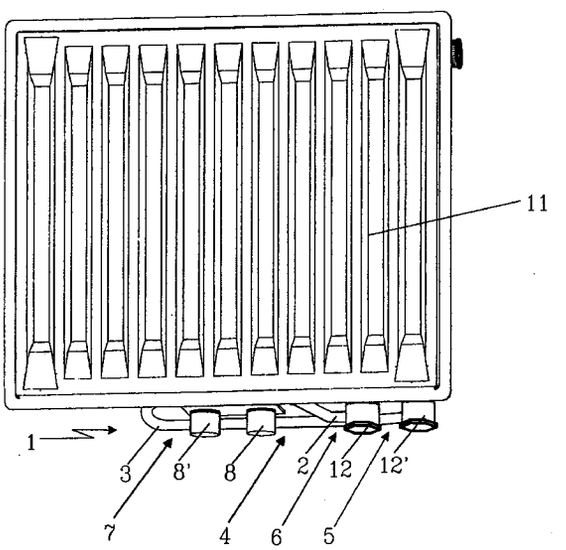

Fig. 5

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Description

The present invention relates to a hydraulic device for radiating plates (such as radiators, convector heaters, etc.) which use a heat-carrying fluid for conveying the heat.

The hydraulic device in question is intended to be used during the installation of radiating plates for connecting up in an easy manner the piping of the network supplying the heat-carrying fluid (normally consisting of water) to the inlet and outlet ducts of said radiating plates.

At present, in accordance with the known art, when installing radiating plates in buildings and in particular in domestic dwellings, it is required to overcome some difficulties of a practical nature which, as will be explained below, may involve delays in connecting up the plates to the network and an increase in the overall installation costs.

The installation, in buildings, of the fluid supply network is performed by preparing in the premises suitable locations for installation of the radiating plates. Each location therefore has associated with it two pipes, a delivery pipe and a return pipe, emerging from the masonrywork in the position where it is presumed that the connection to the ducts of the radiating plate is to be performed. This position is somewhat difficult to determine precisely, since it depends on the models and the dimensions of the radiating plates which are to be used.

It often happens that connection of the radiating plates to the supply network may require laborious work for joining up the various piping.

In order to overcome this drawback, at present efforts are being made to standardise both the position of the piping of the network at the connection locations and the position of the delivery and return ducts on the radiating plates.

Despite these efforts, for aesthetic and functional reasons (linked to the choice of type, size and position of the plates) or because different standards are adopted, it may still be necessary to make use of fittings for joining together (by means of welding and/or masonrywork) the piping of the supply network to the plate ducts.

In most countries, the piping of the supply network, at the locations for connection to the plates, are arranged laterally with respect to the areas assigned for installation of the plates.

However, in some countries (for example in Austria) the piping of the supply network is often made to emerge from the masonrywork or from the floor in central positions with respect to the areas assigned for installation of the plates, for example centrally underneath the windows.

In these countries, therefore, preference will be given to the use of radiating plates which have the delivery and return ducts in a central position with respect to their width and which thus allow more rapid and convenient installation compared to those plates (the majority of them) which have the ducts assembled in a lateral position.

The companies which manufacture radiating plates, in order to be competitive in these countries as well, must comply with the respective standards in each case and are obliged to make provision for a varied production of plate models with central outlet ducts, this being the case for their entire range of models of radiating plates.

Obviously this fact results in an increase in the production costs and in particular a marked increase in the warehouse costs due to the increased number of models which must be kept in stock.

If the standards are not complied with, the disadvantages which arise during installation of the plates are substantially of three types:

- an obvious disadvantage of a purely economic nature due to the use of specialised personnel for carrying out connection of the plates to the network;
- a disadvantage of a functional nature in that the quality of the connection operation depends entirely on the skill of the worker who will be called upon to adopt "remedial solutions", working in what are often not ideal conditions and having to presumably assemble fittings in positions which are as concealed as possible;
- a disadvantage in terms of time since the connection work may also require welding, modifications to the masonrywork (in order to arrange the piping in the exact position for connection) and resultant decoration work.

The main object of the present invention is therefore that of overcoming the abovementioned drawbacks relating to the known art by providing a hydraulic device for radiating plates which, in a practical, economic and functional manner, allows the heat-carrying fluid to be conveyed from a standard installation position of the supply network to a standard position for the inlet and outlet ducts of the radiating plates.

Another object of the present invention is that it should be easy to assemble on the radiating plates in a concealed position, as well as allow rapid, simple and safe connection of the radiating plates to the supply network.

A further object of the invention is that it should be adaptable in a flexible manner to the specific installation requirements of the plates, being able to be applied easily to different models of radiating plates and being provided in different sizes for connecting the plates to different standard positions of the supply network piping.

These and still further objects are all achieved by the hydraulic device in question, which comprises, as a single part, two connecting pipes which can be connected to the piping of the network supplying the heat-

carrying fluid, by means of a first connection coupling, and which can be connected to inlet and outlet ducts of a radiating plate by means of a second connection coupling. The aforementioned hydraulic device is thus suitable for conveying heat-carrying fluid from a standard installation position of the supply network to a standard position of the delivery and return ducts of the radiating plates.

In accordance with a further characteristic feature of the invention, the aforementioned connecting pipes are provided with means suitable for connecting the hydraulic device to the radiating plate.

The technical features of the invention, in accordance with the aforementioned objects, may be clearly understood from the contents of the claims indicated below and the advantages thereof will emerge clearly from the detailed description which follows, with reference to the accompanying drawings, which show an embodiment thereof purely by way of a non-limiting example, in which:

- Figure 1 shows, in diagrammatic form, a side view of the hydraulic device in question;
- Figure 2 shows, in diagrammatic form, a plan view of the device according to Fig. 1;
- Figure 3 shows, in diagrammatic form, a first rear perspective view of the device according to the present invention mounted on a radiating plate;
- Figure 4 shows, in diagrammatic form, a second rear perspective view of the device according to the present invention mounted on a radiating plate;
- Figure 5 shows, in diagrammatic form, a front perspective view of the device according to the present invention mounted on a radiating plate;
- Figure 6 shows, in diagrammatic form, a perspective bottom view of the device according to the present invention mounted on a radiating plate;
- Figure 7 shows, in diagrammatic form, a detail of a second connection coupling. With reference to the accompanying drawings, 1 denotes in its entirety the hydraulic device according to the present invention.

It consists of two connecting pipes, i.e. a delivery pipe 2 and a return pipe 3, each provided with an upstream end (respectively 4 and 5) and a downstream end (respectively 6 and 7) relative to the direction of forward movement of the heat-carrying fluid (indicated by arrows in the accompanying drawings).

Each connecting pipe 2 and 3 can be connected to the piping of the supply network (not shown in the Figures) by means of a first connection coupling 8, and to an inlet duct 9 and outlet duct 10 of a radiating plate 11, by means of a second connection coupling 12.

More precisely, the delivery connecting pipe 2 is connected, at its upstream end 4, to the first connection coupling 8 and at its downstream end 6, to the second connection coupling 12, while the return pipe 3 is connected at its upstream end 5 to the second connection coupling 12 and at its downstream end 7 to the first connection coupling 8.

As a result, the hydraulic device 1 is able to convey the heat-carrying fluid from a standard position 13 for installation of the piping of the supply network to a standard position 14 of the delivery and return ducts of the radiating plate 11.

In the case of the example considered, the piping of the supply network is arranged in a central position 13 with respect to the width of the radiating plate 11 (see Figs. 3,4,5,6), while the position 14 of the inlet duct 9 and outlet duct 10 of the radiating plate 11 is provided on one side of the plate 11.

The hydraulic device 1 in question is also provided with means 15 suitable for connecting it to the radiating plate 11.

These means 15 consist of a first plate-like element 16, fixed to said first connection couplings 8 (for example by means of welding), and a second plate-like element 17 rigidly anchored to a concealed side 18 of the radiating plate 11 (for example by means of screws).

The first connection coupling 8 consists of a first hollow cylindrical bush, which is internally threaded at a first end 19, closed at a second end 20 and laterally provided with a first hole 21 for connection with the downstream end 7 of the return connecting pipe 3 or with the upstream end 4 of the delivery connecting pipe 2.

The second connection coupling 12 consists of a second cylindrical bush provided with a second hole 22 for connection with the upstream end 5 of the return connecting pipe 3 or with the downstream end 6 of the delivery connecting pipe 2.

A first end 23 of the second bush is connected to one of the ducts of the radiating plate 11 (the inlet duct 9 or outlet duct 10), while a second end 24 of the second bush is closed by the head of a screw 25 designed to be inserted with its shank inside the second bush until it can be fixed onto one of the ducts 9, 10 of the plate 11. The shank of the screw 25 has a third hole 26 (see Fig. 7) for ensuring passage of the heat-carrying fluid from the connecting pipes 2, 3 to the ducts 9, 10 of the radiating plate 11. In the region of the third hole 26, the shank of the screw 25 has an annular depression for allowing the fluid arriving from the second hole 22 to enter inside it passing through the third hole 26 so as to then flow into the ducts 9 and 10 of the radiating plate 11.

The hydraulic device 1 provided in accordance with the above description may advantageously be formed as a single part and may be rigidly fixed onto the radiating plate 11 by means of the screws 25 associated with the second connection couplings 12 and by means of the second plate-like element 17.

Claims

1. Hydraulic device for radiating plates, characterized

in that it comprises at least two connecting pipes, i.e. at least one delivery pipe (2) and at least one return pipe (3), which are each provided with an upstream end (4, 5) and a downstream end (6, 7) relative to the direction of forward movement of the heat-carrying fluid, said connecting pipes (2, 3) being able to be connected to the piping of the network supplying said fluid, by means of a first pair of connection couplings (8, 8') respectively connected to the upstream end (4) of the delivery duct (2) and the downstream end (7) of the return pipe (3), and also being able to be connected to an inlet duct (9) and the outlet duct (10) of a radiating plate (11), by means of a second pair of connection couplings (12, 2') respectively connected to the downstream end (6) of the delivery pipe (2) and to the upstream end (5) of the return pipe (3), said hydraulic device (1) being designed to convey the heat-carrying fluid from a standard position (13) for installation of said piping of the supply network, to a standard position (14) of the inlet duct (9) and outlet duct (10) of the radiating plate (11).

2. Hydraulic device according to Claim 1, characterized in that said first connection coupling (8, 8') consists of a connecting element connected at a first end (19), by means of a screw/female-screw member, to a pipe of said supply network, and communicating with an end (4, 7) of one of said connecting pipes (2, 3).

3. Hydraulic device according to Claim 2, characterized in that said connecting element consists of a first hollow cylindrical bush which is internally threaded at said first end (19), closed at a second end (20) and laterally provided with a first hole (21) respectively for connection with the upstream end (4) of said delivery connecting pipe (2) and with the downstream end (7) of said return connecting pipe (3).

4. Hydraulic device according to Claim 1, characterized in that said second connection coupling (12, 12') consists of a second cylindrical bush.

5. Hydraulic device according to Claim 1, characterized in that said second cylindrical bush is provided with a second hole (22) communicating respectively with the upstream end(5) of the return connecting pipe (3) and with the downstream end (6) of the delivery connecting pipe (2), said second bush having a first end (23) connected to one of the ducts (9, 10) of the radiating plate (11) and a second end (24) closed by the head of a screw (25) designed to be inserted with its shank inside said second bush and to be fixed to one of the ducts (9, 10) of the radiating plate (11), the shank of said screw (25) having a third hole (26) for allowing the passage of the heat-carrying fluid from the connecting pipes (2, 3) to the ducts (9, 10) of the radiating plate (11).

6. Hydraulic device according to Claim 1, characterized in that it comprises means (15) suitable for connecting it to said radiating plate (11).

7. Hydraulic device according to Claims 1 and 6, characterized in that said means (15) suitable for connecting said hydraulic device (1) to said radiating plate (11) consist of a substantially plate-like shaped element (16, 17) which can be fixed to said first connection couplings (8, 8') and rigidly anchored to a concealed side (18) of the radiating plate (11).

8. Hydraulic device according to Claims 1 and 6, characterized in that said means (15) suitable for connecting said hydraulic device (1) to said radiating plate (11) consist of a plate-like element folded at about 90° so as to have a first side (16) which can be fixed to said first connection couplings (8, 8') and a second side (17) which can be anchored to said concealed side (18) of said radiating plate (11).

9. Hydraulic device according to Claims 1 and 6, characterized in that said means (15) suitable for connecting said hydraulic device (1) to said radiating plate (11) consist of two substantially plate-like elements, a first one (16) of which is shaped and can be fixed to said first connection couplings (8, 8'), and a second one (17) of which can be rigidly anchored to a concealed side (18) of the radiating plate (11).

10. Hydraulic device according to Claim 1, characterized in that it consists of a single body.

11. Hydraulic device according to Claims 1, 5 and 6, characterized in that said connecting pipes (2, 3), said first connection couplings (8) and said second connection coupling (12) and said means (15) suitable for connecting said hydraulic device (1) to said radiating plate (11) form a single body rigidly connected to said radiating plate (11) via said means (15) and said screws (25) associated with said second connection couplings (12).

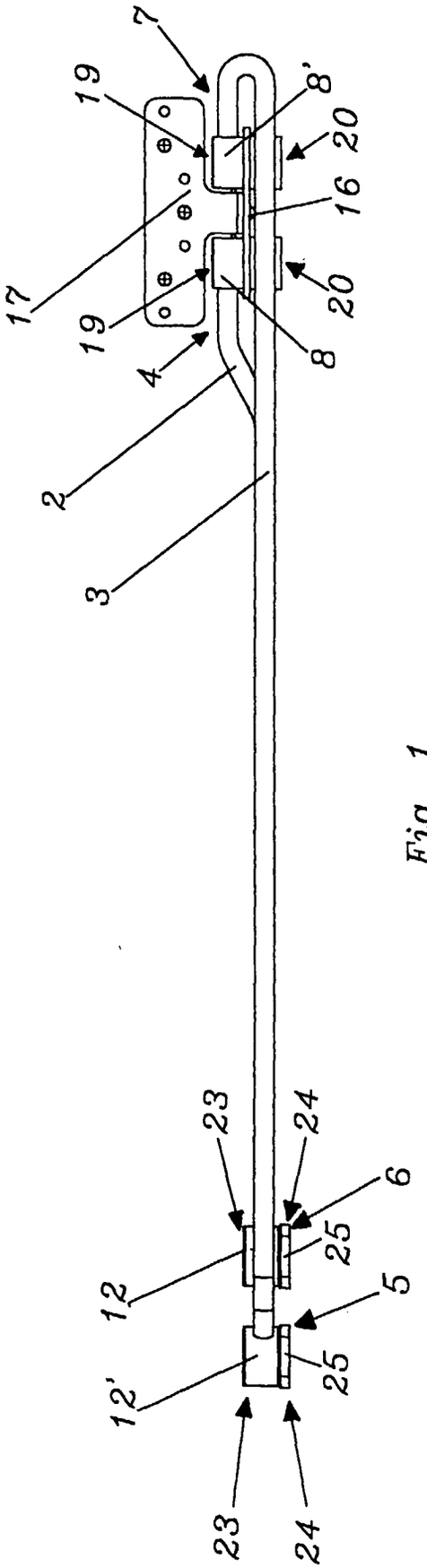
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Fig. 1

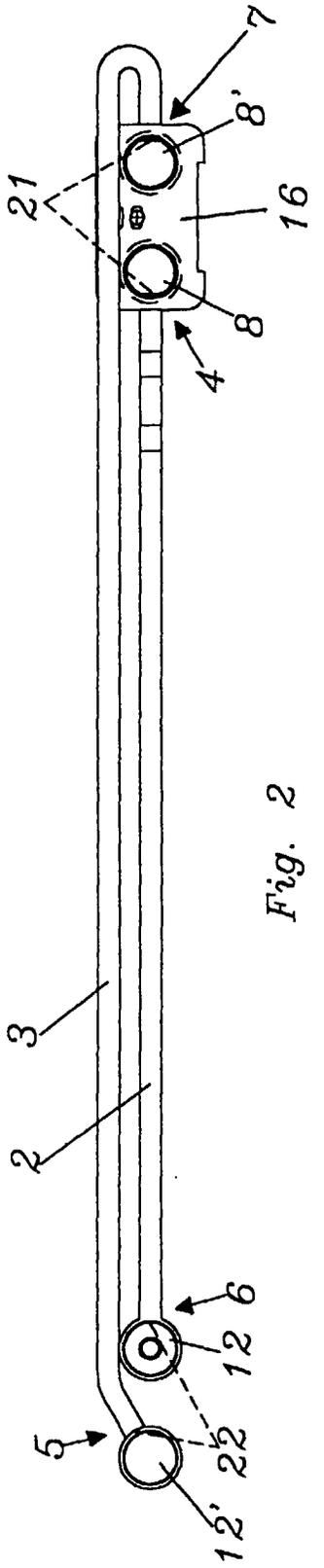
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Fig. 2

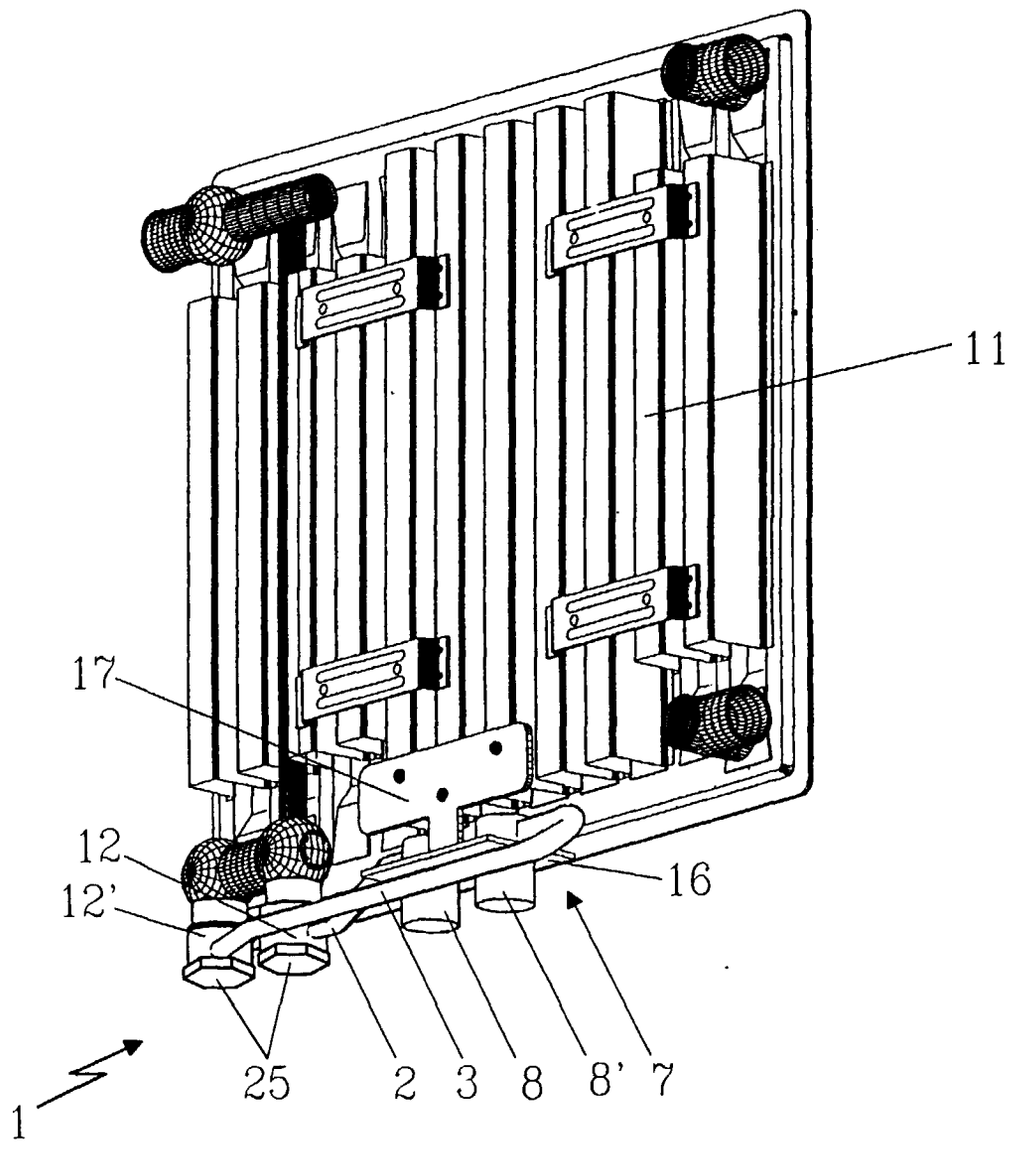

Fig. 3

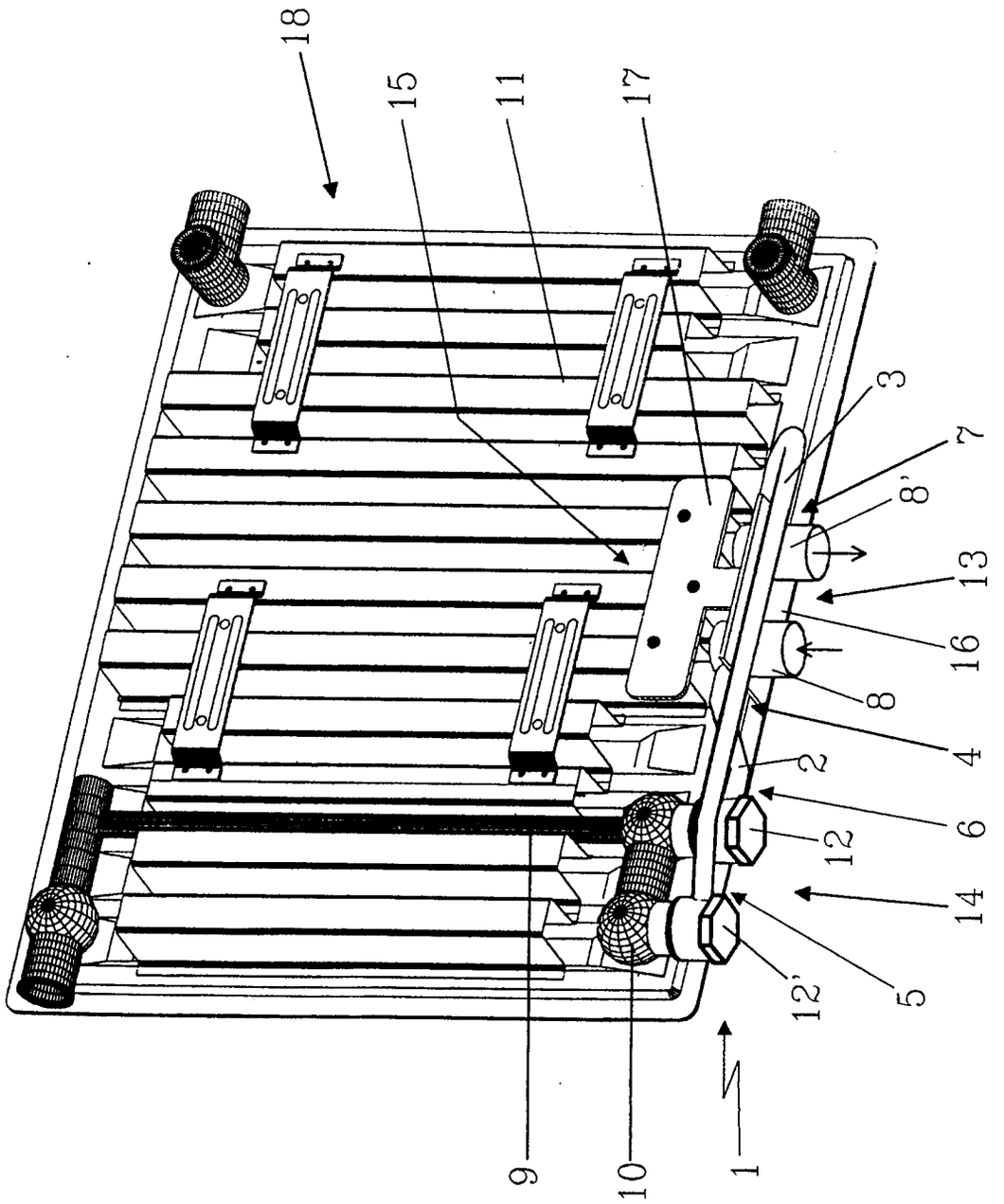

Fig. 4

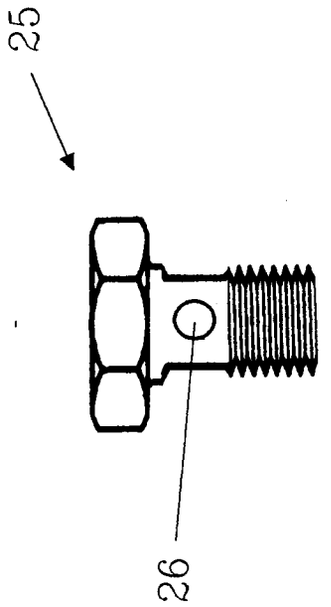

Fig. 7

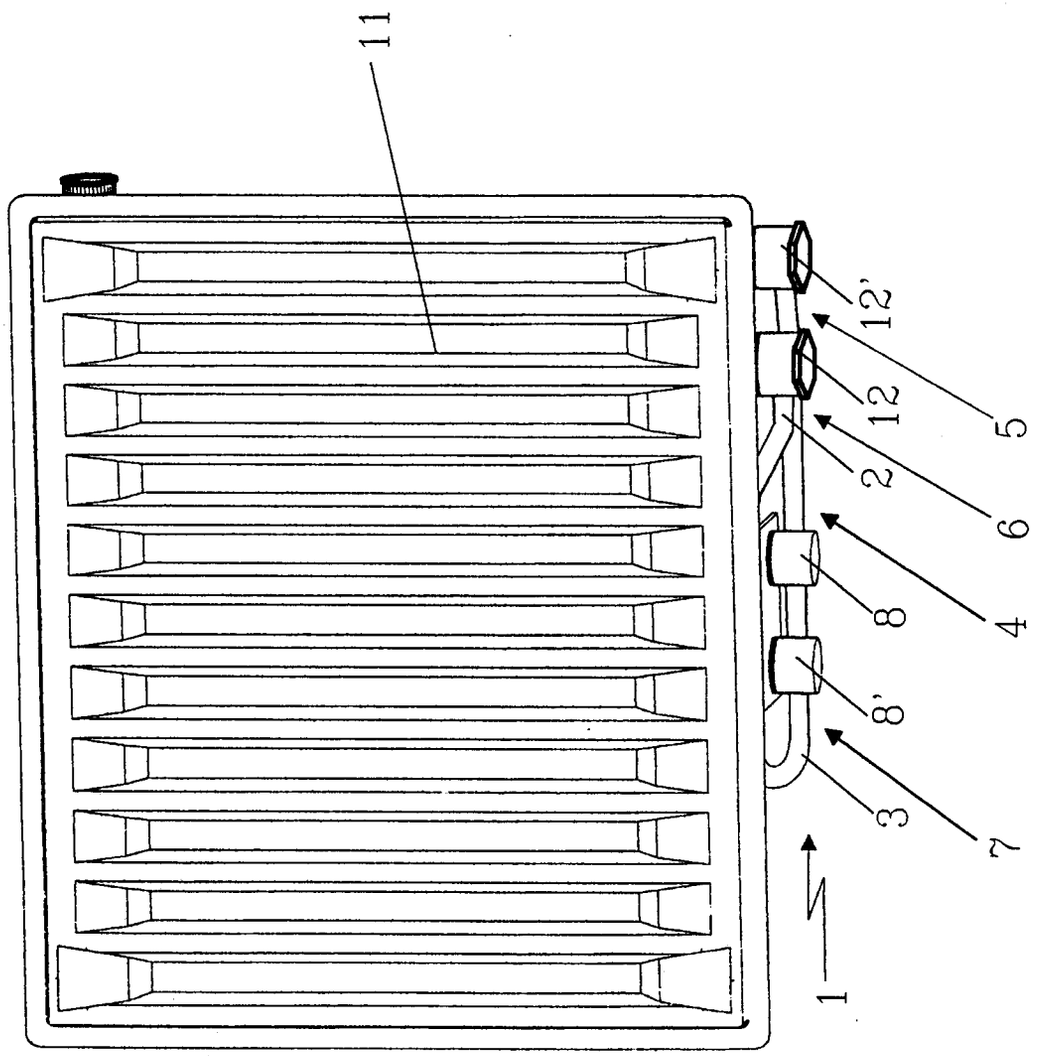

Fig. 5

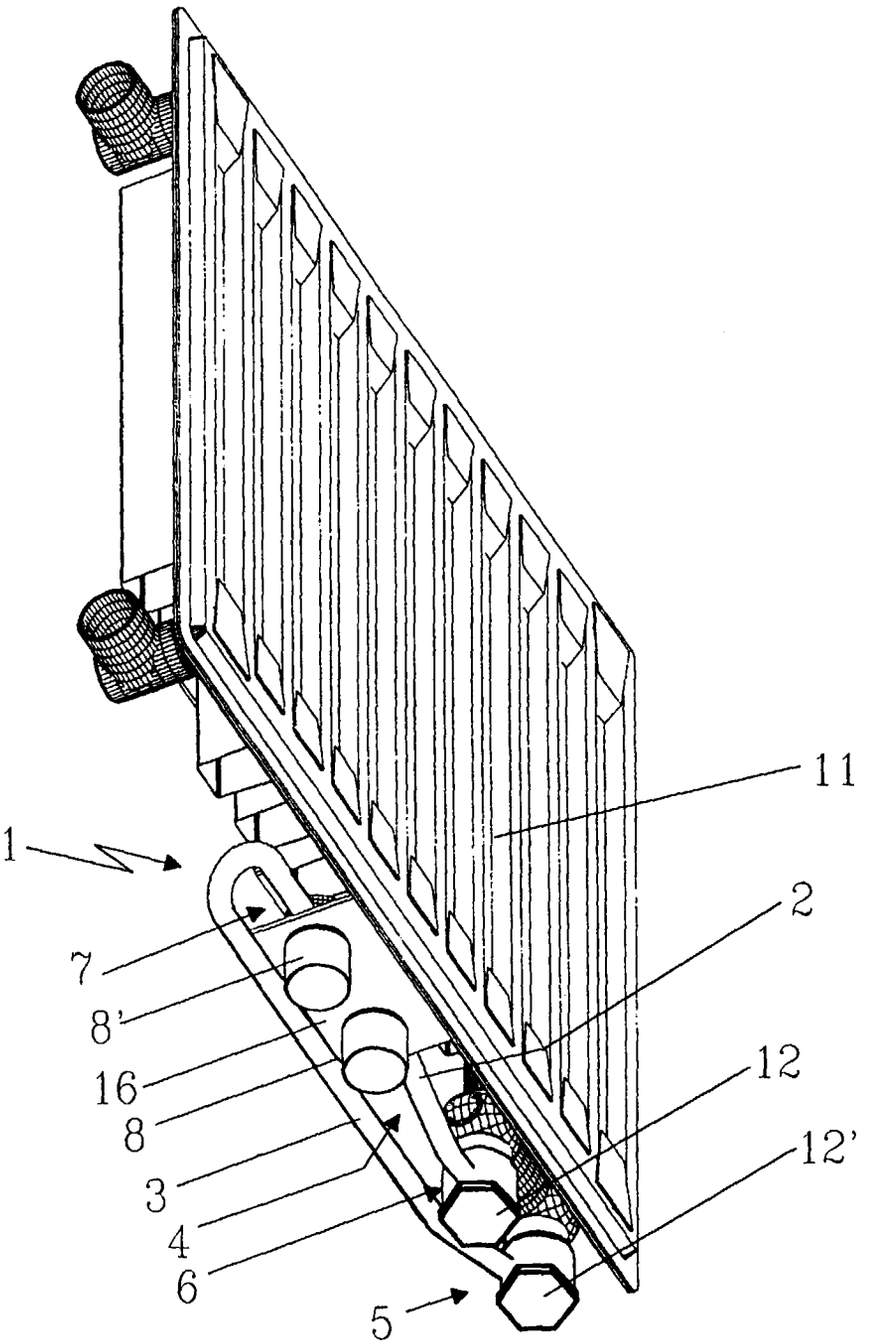

Fig. 6

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 97 83 0063

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	DE 86 04 649 U (F.W. OVENTROP ARN. SOHN KG) 19 June 1987 * claim 1; figures *	1	F24H9/12
A	DE 89 07 652 U (THYSSEN POLYMER GMBH) 17 August 1989 * claim; figures *	1	
A	WO 95 16889 A (STELRAD RADIATOREN GES MBH) 22 June 1995		

TECHNICAL FIELDS SEARCHED (Int.Cl.6)

F24H

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	9 June 1997	VAN GESTEL, H

CATEGORY OF CITED DOCUMENTS

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