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(54) Aluminium alloy heating body.

(57) A heating body to be used as a towel heater/drier and/or as a heating and decorating radiator comprising modular manifold segments (13, 15) aligned and fixed to one another by means of threaded fittings, and pipes fixed between each couple of manifold segments. The manifold segments (13, 15) are made in die-cast aluminium alloy, whereas the pipes or columns (12) are in extruded aluminium alloy, said pipes or columns (12) being fixed to the manifold segments (13, 15) before the in-line connection thereof, so as to form the composite heating body.

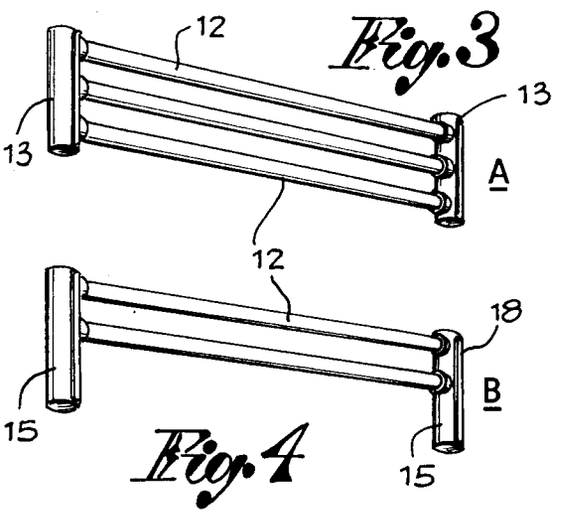

Fig. 3

Fig. 4

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The present invention relates to a heating body suitable for the realization of decorating radiators fitted with horizontal or vertical manifolds, as well as for being used as a towel heater/drier.

At present, heating bodies or radiators are known which comprise tubular elements, more precisely two parallel manifolds and a multiplicity of pipes or columns extending and fixed between the said manifolds. In these known heating bodies, manifolds and pipes are made in steel and connected to one another by welding. More particularly, each manifold, though variable in section, comprises one piece only, whose length is chosen initially, according to the dimensions of the heating body or radiator to be realized. Once the manifolds and the plurality of pipes have been assembled and welded, they form an only integral unit which can not be modified in capacity and shape. Such a construction also involves a certain complexity in managing the manufacturing procedure of heating bodies or radiators, since it requires preparation and use of manifolds in different lengths for each particular need or requirement; moreover, the plurality of pipes or columns must be welded between said manifolds in uncomfortable and inconvenient conditions.

The present invention seeks to provide a heating body comprising tubular components but conceived in a modular constructive structure which permits to change the configuration and embodiment thereof at any time.

In fact, it is an object of by the present invention to provide at least two basic modular elements, more precisely at least two different manifold segments, which may be coupled and assembled on each occasion and in different number and configurations, thereby permitting easy and comfortable composition of a wide choice of heating bodies, which may function as towel heaters/driers or as decorating radiators.

Another object of the present invention is to provide a heating body including aluminium-alloy components such as die-cast manifold segments and extruded pipes or columns to be fixed between the manifolds.

A further object of the present invention is to provide a fluid-circulation heating body which allows easier and more convenient assembly thereof, in which the manifolds, comprising several elements, do not require any welding but are coupled by screwing, like traditional modular-element radiators.

Another object of this invention is to provide a heating body in the form of a towel heater/drier or radiator which may be enlarged or reduced even after installation and use thereof, by adding or removing elements respectively, according to any specific requirements.

The heating body proposed by the present invention is substantially as claimed in claim 1. The invention will be further described with reference to the accompanying drawings, illustrated only by way of non-limitative example, in which:

Figure 1 shows a first manifold segment, with three side branches;

Figure 2 shows a second manifold segment, with two side branches;

Figures 3 and 4 show two heating body elements obtained by using manifold segments as shown in Figures 1 and 2 respectively;

Figure 5 shows an example of a composite heating body obtained by assembling several elements as shown in Figures 3 and 4; and

Figure 6 shows a sectional view of a pipe or column coupled to a manifold-segment branch.

According to the present invention, a heating body 10 including tubular elements comprises two composite manifolds 11 and a plurality of pipes or columns 12 having their ends fixed to said two manifolds.

Each manifold 11 is realized starting with modular manifold segments, precisely with a first tubular segment 13 having a number x of side branches 14, and at least another tubular segment 15 having a number y - different from x - of side branches 16. Both manifold segments 13, 15 may be made in die-cast aluminium alloy. The number x of branches provided in the first manifold segment 13 may be - for instance - three; the number y of branches provided in the second manifold segment 15 may be, for instance, two.

The branches 14,16 of the two manifold segments 13, 15 are preferably - but not necessarily - equidistant from one another; the branches provided in the first segment are distributed on the whole length thereof - see Fig. 1 - while the branches provided in the second segment cover only a part of its length - see Fig. 2.

Both manifold segments 13,15 are provided with internal threaded portions 17 for in-line coupling thereof by means of threaded fittings (nipples) in the usual form, and with one or more external reference ribs 18, which permit alignment of the segments to be fixed to one another, and only one orientation of their branches 14, 16.

On a level with each side branch 14, 16 of the manifold segments 13,15, a neck 14a, 16a is provided respectively, and a pipe or column 12 is mounted and fixed to each couple of coplanar necks provided in two segments equal and opposite to each other. As shown in Figure 6, one end of the pipe or column 12 is inserted in a neck 19, where it will be solidly fixed in a watertight manner, for example by using thermosetting epoxy resin.

With two first opposite manifold segments 13 and a number x (three) of pipes or columns 12 fixed between the said two segments, it is therefore possible to obtain an element of heating body A as shown in Figure 3. Likewise, with two second opposite manifold segments 15 and a number y (two) of pipes or columns it is possible to obtain another element of heating body B as shown in Figure 4. Said two elements of heating body A and B constitute the basic modular elements for the construction of composite heating bodies according to the present invention. In fact, by simply connecting the manifold segments 13, 15 of a number of elements A, or of a number of elements B or of a number of elements A and B by means of threaded fittings (nipples), it will be possible to obtain a composite heating body 10 in any size and configuration according to requirements, which may be installed and employed as a towel heater/drier as well as a heating and decorating radiator.

Claims

1. A heating body to be used as a towel heater/drier and/or as a heating and decorating radiator which comprises two tubular manifolds (11) and a plurality of pipes or columns (12) having their ends fixed to said manifolds, characterized in that each manifold (11) includes modular manifold segments (13, 15) aligned and fixed to one another by means of threaded fittings, and in that each manifold segment is fixed to the ends of two or more pipes or columns (12), the manifold segments (13, 15) being made in die-cast aluminium alloy, whereas the pipes or columns (12) are in extruded aluminium alloy, the pipes or columns (12) being fixed to the manifold segments (13, 15) before the in-line connection of said manifold segments so as to form a composite heating body.

2. A heating body as claimed in claim 1., wherein each manifold comprises at least one first tubular segment (13) having a first number of side branches (14) and/or one second tubular segment (15) having a second number of side branches (16) different from the number of side branches in the first tubular segment, each of said segments (13, 15) being provided with internal threaded portions for being connected in line with other tubular segments by means of threaded fittings and external reference marks for the alignment thereof.

3. A heating body as claimed in claim 2, wherein the first manifold segment (13) comprises preferably three side branches (14) distributed on the whole length thereof, and wherein the second manifold segment (15) comprises preferably two side branches (16) distributed on only a part of its length.

4. A heating body as claimed in the previous claims, wherein a neck (19) is provided on a level with each branch (14, 16) of each manifold segment (13, 15) which receives the end of a pipe or column (12) fixed therein by means of thermosetting epoxy resin.

5. A heating body as claimed in the previous claims, which comprises one or more elements (A) assembled including two first opposite manifold segments and a number - preferably three - of pipes or columns fixed thereto and/or one or more elements (B) including two second opposite manifold segments and a number - preferably two - of pipes or columns fixed thereto.

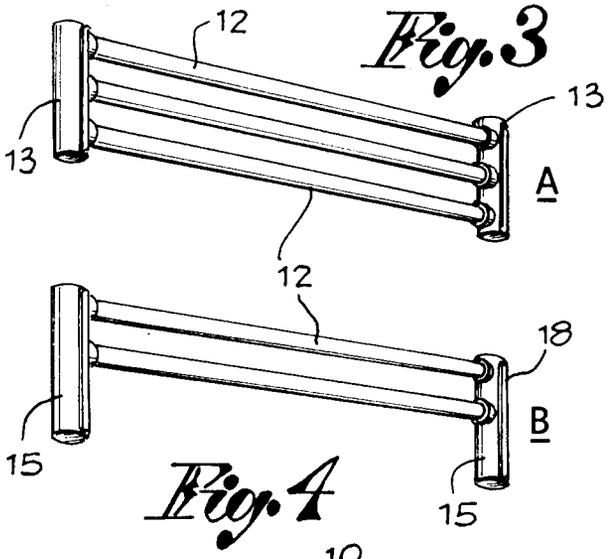

Fig.3

Fig.4

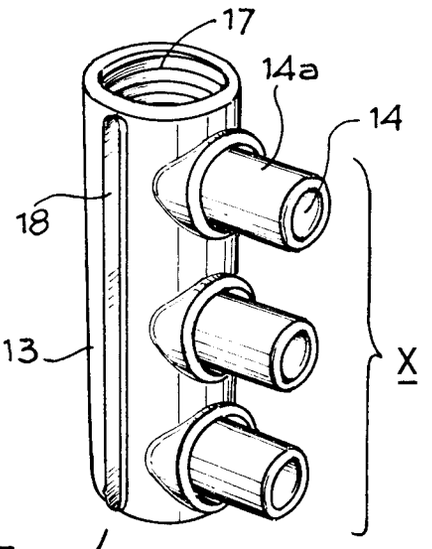

Fig.1

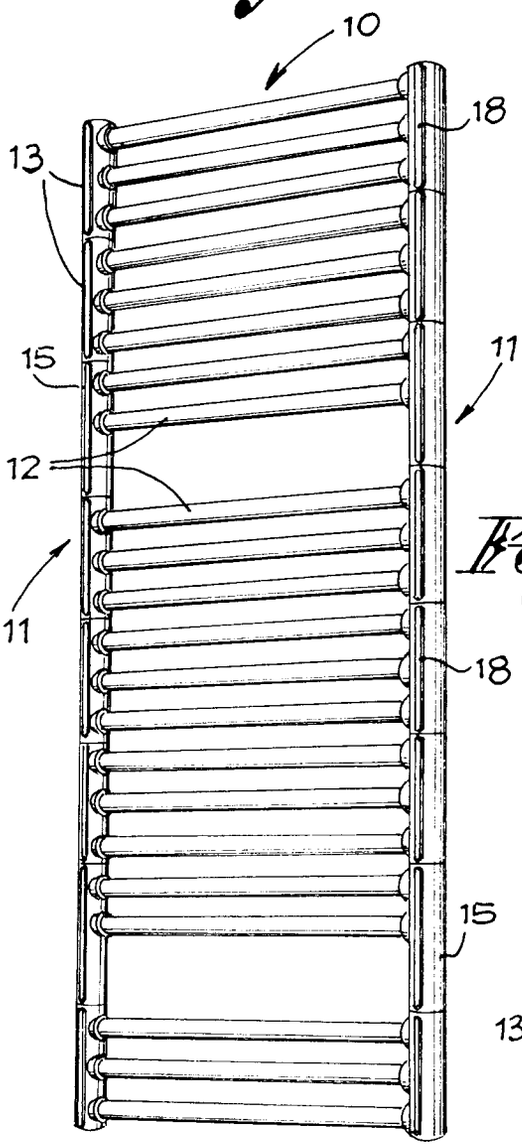

Fig.5

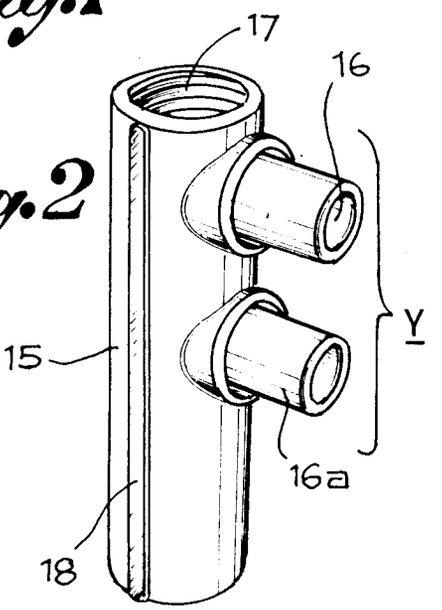

Fig.2

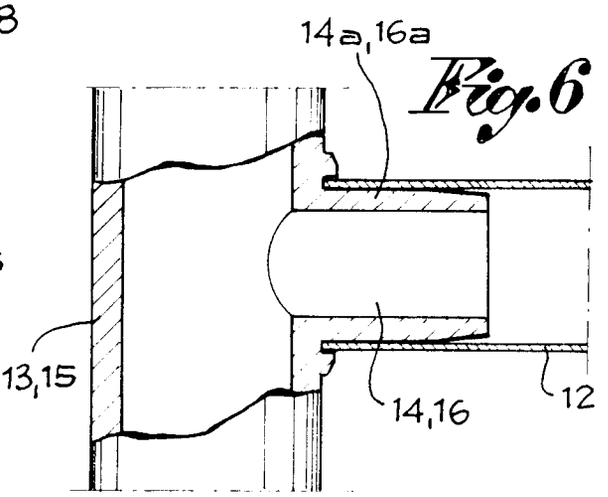

Fig.6

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EUROPEAN SEARCH REPORT

Application Number

EP 93 83 0135

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.5)
Y	US-A-1 797 636 (BUTLER) * the whole document *	1,2	F28D1/053
Y	WO-A-8 801 039 (SANTORO) * the whole document *	1,2	
A	DE-A-2 441 990 (ERBSLÖH) * the whole document *	1	
A	FR-A-2 452 690 (RUNTAL HOLDING COMPANY SA) * the whole document *	1	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

F28D
A47K
F28F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	08 JULY 1993	SMETS E.D.C.

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