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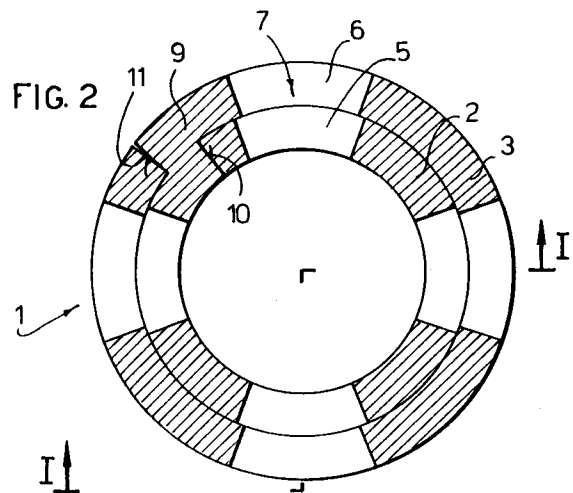
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Spacer ring for heating radiators.

A spacer and support ring for heating radiator plates, comprising a number of radial holes (7) for the passage of the heating fluid, composed of at least two concentric rings (2, 3) obtained from a single flat metallic ribbon (4).



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The present invention refers to a spacer and support ring for heating radiator plates.

Rings of the above mentioned type are obviously already known and are welded, with their respective faces opposite to perforated plates of the radiator. The ring must be of a certain inner diameter and of a certain outer diameter, and must have radial holes for the passage of the heating fluid.

In the majority of cases, such rings, which are made of metallic material, are obtained by turning, or at any rate by laborious mechanical working processes, starting from a single piece of material. The ring obtained in this way is obviously not very economical.

A different solution was proposed in E P - A number 0 397 223 and consists in starting from two different ribbons of metallic material for making two perforated rings of different thickness, which are pressure inserted one inside the other, in such a way as to obtain the desired thickness.

This solution requires a rather laborious process and an extremely complicated mold in order to obtain the final ring, which will also have a high cost. In addition, the two concentric rings which make up the final ring, can, in some cases, slip into each other, causing the closure of the holes for the passage of the water.

The aim of the invention is to provide a ring for radiators which will be simple to realize, safe and at moderate cost, obtained with a very easy and rapid process.

The ring for radiators according to the invention consists of at least two concentric rings, obtained from a single ribbon of metallic material.

The process for the production of the ring for radiators according to the invention consists in starting from a flat ribbon of metallic material and making appropriately spaced out holes in it, which will make up the radial holes of the final ring, in cutting the ribbon to a determined length, in bending it into a step in one of its intermediate sections, in winding one of the two sections of ribbon delimited by the said step in one direction, to form the inner ring, and winding the other section in the opposite direction, to form the outer ring.

On the inside surface of the inner ring a pair of V-shaped circumferential grooves can be made, to allow the ring to be locked on the drawn holes made on the radiator plates, before carrying out welding.

The invention will now be described in greater detail according to one of its preferred but not restrictive embodiments, with reference to the appended drawings, wherein:

figure 1 is a semi-sectional view of the ring according to the invention, taken along the line I-I in figure 2;

figure 2 is a section taken along the plane II-II in figure 1;

figure 3 is a plan view of a portion of flat metallic ribbon from which the ring according to the invention is obtained;

figures 4, 5 and 6 are side profile views, illustrating the successive phases for obtaining the ring according to the invention.

With reference to such figures, the ring for radiators according to the invention is shown as a whole with reference number 1. It comprises an inner ring 2 and an outer ring 3, obtained from a single flat ribbon of metallic material 4. The rings 2 and 3 have holes 5 and 6 respectively, which are positioned in alignment in the ring 1, in such a way as to form radial holes 7 for the passage of the fluid. In the example shown, the holes 5 and 6 have the same diameter, but different respective centre distances a and b . Obviously the dimensions of the holes 6 can be greater than those of the holes 5.

In addition, on the inside surface of the inner ring 2, two V-shaped circumferential grooves 8 (figure 1) are made, which serve to position the ring 1 correctly on the edges of the drawn holes made on the opposed plates of the radiator, before carrying out welding.

The extremely simple and rapid process for realizing the ring 1 will now be illustrated, with reference to the figures from 3 to 6.

Starting with a flat ribbon 4 of metallic material, in particular steel, the holes 5 and 6, with the respective centre distances a and b , are made by means of punching. The ribbon 4 is then cut to the desired length, corresponding to the total development of the ring 1, and bent into a step in one of its intermediate parts 9, in such a way as to determine two opposed shoulders at different levels 10 and 11. The bend 9 divides the ribbon 4 into two sections 2', 3', whose lengths correspond respectively to the development of the rings 2 and 3.

The section 2' is then wound in an anti-clockwise direction (with reference to figure 5), bringing its free end to a stop against the shoulder 10, in order to form the inner ring 2, while the section 3' is wound in a clockwise direction (figure 6), until its free end is brought to a stop against the shoulder 11, in order to form the outer ring 3.

In such way, there is no danger of circumferential slipping between the rings 2 and 3.

Before winding the section 2', the V-shaped grooves 8, as shown in figure 4, are made on the inner face, which will make up the inside surface of the inner ring 2.

Obviously some phases of the process illustrated can be inverted with each other without this affecting the structure of the final ring 1.

Claims

1. A ring for radiators, comprising radial holes (7) for the passage of the heating fluid, characterized in that it is made up of at least two perforated concentric rings (2, 3), obtained from a single flat metallic ribbon (4). 5

2. A ring according to claim 1, characterized in that the free ends of the said rings (2, 3) come to a stop against the respective opposed shoulders (10, 11) offset from each other, of a stepped bend (9) of the said single metallic ribbon (4). 10
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3. A ring according to claim 1 or 2, characterized in that the said radial holes (7) are determined by the alignment of respective holes (5, 6), with different centre distances (\underline{a} , \underline{b}), made in the said concentric rings (2, 3). 20

4. A ring according to any one of the previous claims, characterized in that on the inner surface of the inner ring (2) two circumferential grooves (8) are foreseen for positioning the ring (1) on the edges of drawn holes of the opposed plates of the radiator. 25

5. A process for the realization of a ring for radiators according to any one of the claims from 1 to 4, consisting in starting from a single flat ribbon (4) of metallic material, in punching on the latter a series of holes (5, 6), with respective centre distances (\underline{a} , \underline{b}), in cutting the ribbon (4) to the length corresponding to the development of the ring (1), in carrying out an intermediate stepped bend (9), in such a way as to determine two sections (2', 3') whose lengths correspond respectively to the developments of the concentric rings (2, 3) of the ring (1), in winding the section (2') in one direction for forming the inner ring (2), and the section (3') in the opposite direction for forming the outer ring (3). 30
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6. A process according to claim 5, characterized in that two longitudinal grooves (8) are made on the inner side of the said section (2') before it is wound to form the ring (2). 50

7. A process according to claim 5 or 6, characterized in that the free ends of the said sections (2', 3'), after the respective windings for forming the concentric rings (2, 3), are brought to a stop against respective opposed shoulders (10, 11) offset from each other, determined by the said stepped bend (9). 55

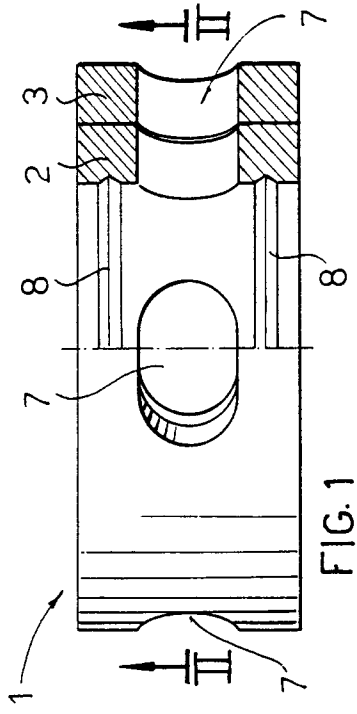


FIG. 1

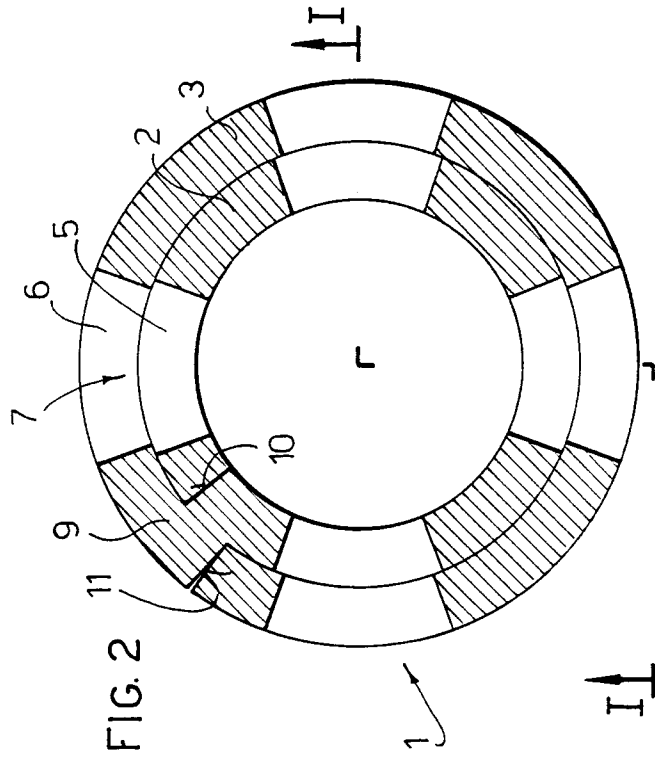


FIG. 2

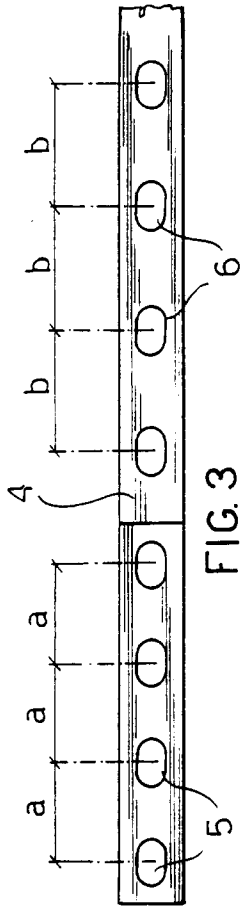


FIG. 3

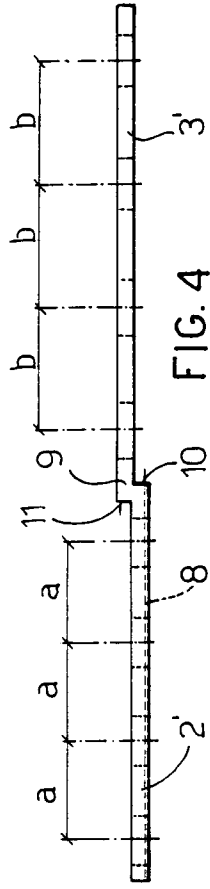


FIG. 4

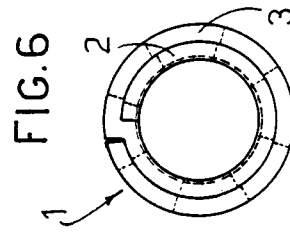


FIG. 5

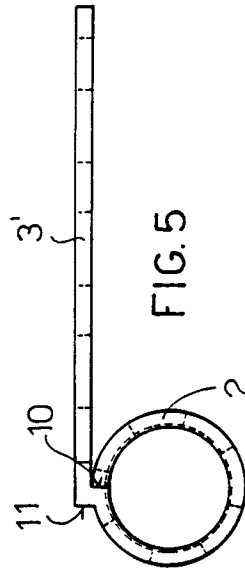


FIG. 6



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)
D,A	EP-A-0 397 223 (ROFIX N.V.) * column 1, line 1 - column 2, line 27; figures 1,2 * ---	1,5	F28F9/26 B21D53/16 B21D53/02
A	DE-A-3 838 245 (BERG GMBH & CO KG) * column 4, line 24 - column 5, line 11; figures 1-4 * ---	1,5	
A	US-A-2 968 088 (HAUTAU) * column 1, line 61 - column 2, line 62; figures 1-4 * ---	1,5	
A	DE-A-2 506 778 (BERG KG) ---		
A	DE-A-3 102 188 (KERMI GMBH & CO KG) -----		
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			F28F B21D
Place of search	Date of completion of the search	Examiner	
THE HAGUE	27 APRIL 1993	BELTZUNG F.C.	
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X : particularly relevant if taken alone		E : earlier patent document, but published on, or	
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