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(54) **Interior radiator**

(57) An interior radiator, warming-towel radiator or similar (1) is proposed, comprising a radiator body (2) having an inlet end (3) and an outlet end (4) for the vector fluid which radiator (1) has a tubular body (2) formed by a plurality of curved or profiled segments (5) which are

connected to each other by means of a respective pipe union (6) adapted to provide an axial stiffness and a reciprocal rotation between the two segments (5) tightly connected to said pipe union (6), wherein means (27A) for the mechanical fixing of the radiator shape chosen by the final user are provided.

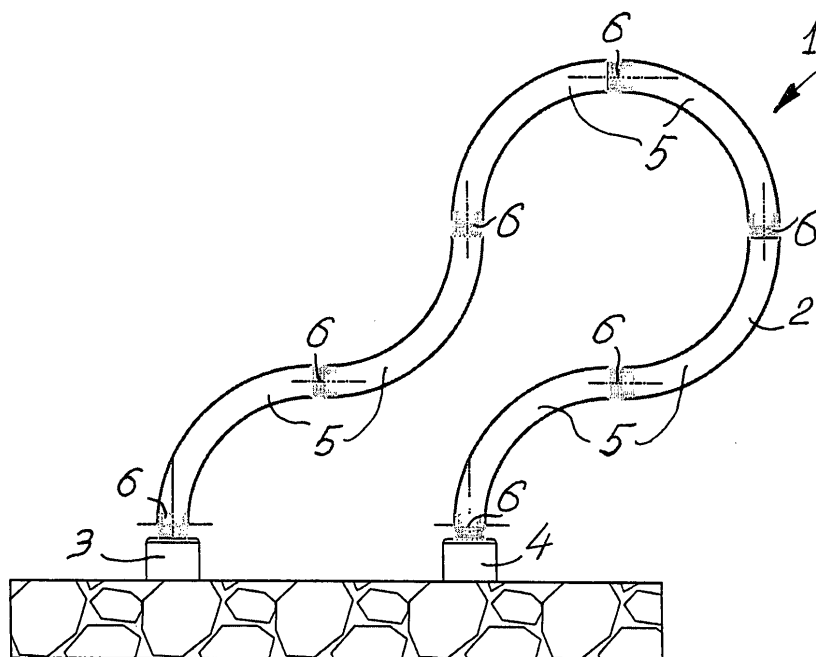


Fig. 5

Description

Description of the invention

Field of the invention

[0001] The present invention relates to an interior radiator, for example to a warming-towel radiator, according to the preamble of claim 1.

Background of the invention

[0002] Interior radiators and warming-towel radiators for heating plants are known in several embodiments. In general they are made by a plurality of tubular segments which are stiffly connected at one end to a manifold delivering pipe and, at the other end, to a manifold return pipe of the carrier fluid. Therefore, the known interior radiators and warming-towel radiators have a geometrical rigid conformation which, after the production of the radiators, is no more changeable.

[0003] Generally speaking, this is also true for other heating radiators apart from the conformation thereof.

[0004] Therefore, the geometrical shape of the known radiators is fixed, that is not variable, as could sometimes be desirable, in particular not only at the end of the users but also at the end of interior decorators and architects.

Summary of the invention

[0005] Therefore, the aim of the present invention is that of showing an interior radiator or warming-towel radiator which allows the final user to choose and carry out the tridimensional shape of the radiator and to fix then mechanically said shape.

[0006] According to the present invention this aim is obtained with a radiator having the features of claim 1.

[0007] Further developments are set forth in the dependent claims.

[0008] With the radiators according to the invention several advantages are obtained.

[0009] First of all the user before to install the radiator can choose which tridimensional shape to give to the radiator within the range of a plurality of possible shapes, and then can mechanically secure said shape by means of simple fixing means, for example threaded dowels.

[0010] By providing radiators having curvilinear segments which are reciprocally movable it is possible to obtain tridimensional shapes which are among one another very different, and among which the user will choose the most desired shape.

[0011] The change of the shapes can be obtained in a simple and easy manner due to the use of pipe unions between the single radiator segments which pipe unions allow a simple reciprocal rotation between two respective adjacent segments.

[0012] Beside warming-towel radiators the proposed radiators represent real interior radiators in which a spe-

cial attention is given to the desired tridimensional radiator shape and allow a great design freedom for interior decorators and architects. By using a different surface finishing, different metals like stainless steel, carbon steel, brass, copper and so on, as well as combinations thereof, it is possible to obtain many aesthetic effects which also contribute to provide a greater creative freedom for interior decorators and architects.

[0013] The proposed pipe unions requires a simple manufacturing and allow an easy assembling, wherein they assure a reliable stiffness in the axial direction and a reliable rotation around the longitudinal axis of said unions as well as an unexceptionable hydraulic tightness.

[0014] According to the teachings of the present invention the proposed radiators can be used both as common radiators, that is radiators connected with the household heating plant, as well as as electric radiators, that is radiators which can be singularly connected to the household electric network because the hollow proposed pipe unions besides the throughgoing of the fluid vector also allow, alternatively, the throughgoing of electric heating resistors, for example of the dry kind, having a specific control circuit with switch, thermostat and similar devices.

[0015] The obtainable tridimensional conformations also provide an heating improvement in environment due to a spatial greater thermal exchange.

[0016] In consequence of the use of single components having small dimensions it is practically possible to carry out all kinds of surface finishes as, for example, a galvanic finish, a liquid coating, a cataphoresis eposydic coating, and so on.

Brief description of the drawings

[0017] Additional features, advantages and details of the articulated interior radiators or warming-towel radiators according to the present invention will be further apparent from the following description of some exemplary embodiments of articulated radiators which are shown in the accompanying drawings in which:

Figures 1 to 4 show four perspective views of four exemplary embodiments of articulated radiators according to the invention,

Figures 5 and 5A show a top view of an articulated radiator according to the invention in the assembled condition and, in the installed condition, connected to unions of a traditional heating plants which unions project,

for example, from a wall, respectively,

Figures 6 and 6A, 7 and 7A, 8 and 8A, 9 and 9A show in a middle axial sectional view, in the exploded and in the assembled state, respectively, an exemplary embodiment of pipe unions for connecting adjacent segments of an articulated radiator according to the invention.

Description of the preferred embodiment

[0018] In the different Figures equal or equivalent parts are provided with equal reference numbers.

[0019] Reference is first made to Figures 1 to 4 in which the different interior radiators 1, which may be used as warming-towel radiators, have a tubular radiator body 2 having an inlet end 3 and an outlet end 4 for the vector fluid, wherein said ends 3 and 4 are connected in a known manner to a traditional heating plant.

[0020] The radiator body 2 according to the invention is formed by a plurality of curvilinear segments 5 which are connected to each other by means of a respective pipe union 6, wherein said unions 6 functionally allow an axial stiffness and a free rotation between two respective curvilinear segments 5 which are tightly connected by a pipe union 6.

[0021] In the shown case the single curvilinear segments 6 are circular segments having a common circumference, as inferable from Figure 5A, wherein the radiator shown in Figure 5 is formed by six circular segments 6 which are rotated to each other, for example as shown in Figure 5, in a tridimensional coplanar arrangement. At any case this arrangement could be modified by the user just before the installation of the radiator, wherein the choice of the chosen conformation determines the distance between the ends 3 and 4 which distance is to be considered by the pipe fitter.

[0022] The mentioned axial stiffness and rotational mobility under condition of an unexceptionable hydraulic tightness between two adjacent segments 6 are obtained, according to the invention, for example, with the pipe unions 6 shown and described in the following.

[0023] Therefore, reference is first made to the Figures 6 and 6A which illustrate the pipe union 6 in three pieces. In more details said pipe union 6 is formed by a central body or hollow shaft 7 and two end caps 8 which, in the illustrated example, have an equal conformation and, constructionally, provide the correspondent advantages.

[0024] As inferable from the Figures 6 and 6A, the shaft 7 has front ends 9, which in the shown example are chamfered, and two annular grooves 10 as seats for retaining rings 11. Each end cap 8 has a cup-like conformation with a chamber 12 housing one half of said shaft 7, with a collar 13, a bottom 14 and a conical jacket 15 which connects said bottom 14 and said collar 13 by forming a stop step 16 for stopping an end of a segment 5 which can be inserted into said jacket part 15 for a fixing, for example by means of a welding 17. From the Figures 6 and 6A is also inferable that inside said bottom 14 is provided a seat 18 for housing a stopping O-ring 18 for a shaft end 9, and that inside said jacket part 15 are present a first groove 20 as a seat for housing a flat guiding ring 21 for said shaft 7, and a second groove 22 as a seat for a rotational O-ring 23. With the reference number 24 is further denoted a flat guiding ring made of Teflon which is to be inserted onto the central part of the shaft 7 and to be housed, when said pipe union 6 is as-

sembled, into correspondent half seats 25 provided in said collars 13.

[0025] According to a teaching of the invention a such conformation of a pipe union 6 assures the necessary axial stiffness and free rotation of both end caps 8, that is of the two segments 5 secured on said end caps.

[0026] In order to mechanically fixing the shape of the radiator 1 chosen by the final user said two end caps 8 could be provided for example with fixing means formed, for example, by threaded dowels 27A, as illustrated in more details in the following.

[0027] The embodiment of the pipe union 6 shown in the Figures 7 and 7A distinguishes itself from the pipe union of Figures 6 and 6A substantially by the fact that a half shaft of the shaft 7A is formed in one piece with an end cap 8A, wherein the latter (8A) is therefore carried out as a male-cap and makes superfluous the several machining phases and the several components provided for the above illustrated female-caps 8. The reference number 27 denotes a seat for a threaded dowel 27A. Therefore said pipe unions are cheaper than the unions of the embodiments of the Figures 6 and 6A.

[0028] The function of said threaded dowel 27A is that of mechanically fixing the shape of the radiator 1 chosen by the final user.

[0029] The embodiment of the pipe unions 6 according to Figures 8 and 8A is, in principle, a "merger" of the embodiments shown in the Figures 6, 6A and 7, 7A. In fact are provided a female-cap and a male-cap, wherein in the male-cap 8A are provided grooves 28, 29, 30, 31 and 32 for, respectively, a flat guiding ring 33 made of Teflon, the retaining ring 11 for the shaft, two sealing O-rings 34, and for a profiled guiding ring made of Teflon for the frontal housing of a sealing O-ring 36, and a stopping O-ring 37.

[0030] The pipe union 6 illustrated in the Figures 9 and 9A is a modification of the pipe union 6 shown in the Figures 8 and 8A from which it differs for a different conformation of the caps 8 and 8A such that the pipe union 6 is housed inside the curvilinear segments and, consequently, said pipe unions 6, when the radiator 1 is assembled, are not visible, as may be seen from the Figures from 1 to 4.

[0031] An example of a radiator 1 provided with pipe unions 6 of the type "visible" in the Figures 6 to 8 is instead inferable from the Figure 5, wherein these "visible" pipe unions also allow the achievement of radiators having particular chromatic contrasts.

[0032] Therefore, with the above described structures of pipe unions 6 after the fixing of said caps 8 with the segments 5, by means of welding, warm shrinking, press-coupling, or the like, said two caps are connected by means of one or more retaining rings to said shaft 7, so that a mechanical axially rigid connection is obtained which allows a sealed rotation.

[0033] From the above structural and functional description it is readily apparent that with the interior radiators, warming-towel radiators and similar provided with

pipe unions for connecting the curved segments as illustrated, the indicated aim is effectively accomplished and the aforementioned advantages are obtained.

[0034] It lies within the teachings of the present invention to provide said curved segments both with curves like circumferential segments as well as with other curvilinear profiles, and with rectilinear segments or with curvilinear segments having other profiles so that the designer has the possibility to conform the interior radiator according to a configuration or shape at will, and also for specific purposes of heating of rooms and objects, in the last case in particular with an electric heating. As an example the proposed radiator can form a part of a structure of a bed for children or babies, for example in the mattress supporting parts, in order to assure a determined local chosen temperature which latter can also be temporary adjustable.

[0035] It also lies within the scope of the invention the use of profiled segments and the relative pipe unions for producing interior items for houses, for example for bath rooms, without specific heating purposes but allowing the final user to chose and mechanically fixing the desired shape.

[0036] In practicing the invention those skilled in the art may introduce different modifications and variants and substitute single components of the pipe unions and the unions themselves with other functionally equivalent components and unions without thereby departing from the scope of the present invention as disclosed and claimed.

Claims

1. Interior radiator, warming-towel radiator or the like, comprising a radiator body having an inlet end and an outlet end for the vector fluid, **characterized in that** the radiator body is tubular and formed by a plurality of profiled segments which are connected to each other by means of a respective pipe union which is able to allow an axial stiffness and a reciprocal rotation between the respective two segments which are tightly connected with said pipe union, wherein a means allowing a mechanical fixing of the shape chosen by the final user is provided.
2. Radiator according to claim 1, **characterized in that** said profiled segments are curvilinear segments having a bending radius or a curve or a shaping with a development at will.
3. Radiator according to claim 2, **characterized in that** it is formed by a plurality of curved segments having a length which substantially corresponds to one fourth of a circle.
4. Radiator according to claim 2, **characterized in that** it is formed by a plurality of profiled mixed segments,

for example curvilinear segments, and/or rectilinear segments, and/or segments shaped at will.

5. Radiator according to claim 1, **characterized in that** said pipe unions are substantially formed by two caps with an intermediate shaft which is distinct or integral with a cap, wherein housing seats for tightening elements like O-rings, and guiding elements like flat rings made of Teflon or the like are provided in said caps and shaft, wherein further the axial stiffness is obtained with at least a retaining ring or similar housed in grooves in said cap/caps and in said shaft.
6. Radiator according to claim 1, **characterized in that** said means allowing a mechanical fixing of the radiator shape chosen by the final user is formed, for example, by a threaded dowel which is housed in a threaded seat provided in said cap/caps and acting on said shaft.
7. Radiator according to claim 1, **characterized in that** the single profiled radiator segments are made of equal or different metals having equal or different colors.
8. Radiator according to one or more of the preceding claims, **characterized in that** it houses dry heating resistors having an own electric circuit with switch, rheostat, and the like, for the connection with the electrical network.
9. Radiator according to one or more of the preceding claims, **characterized in that** it forms at least one part of a framework of a bed for babies or children, of a baby incubator, and so on.
10. Tubular interior item for houses and flats, for example for bathrooms, **characterized in that** it is formed by a plurality of profiled segments connected to each other by means of a respective pipe union which is able to provide an axial stiffness and a relative rotation between the two segments which are tightly connected with said pipe union, wherein a mechanical means for fixing the shape of said interior item chosen by the final user are provided, as set forth in one or more of the claims 1 to 8.

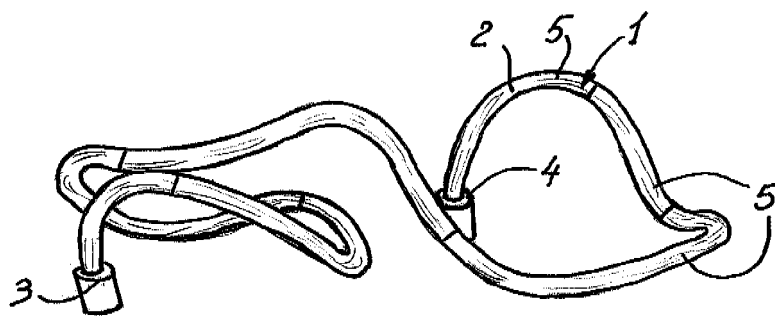


Fig. 1

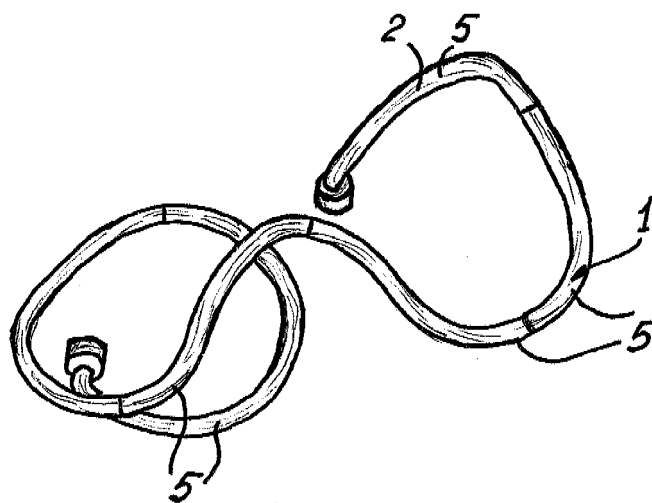
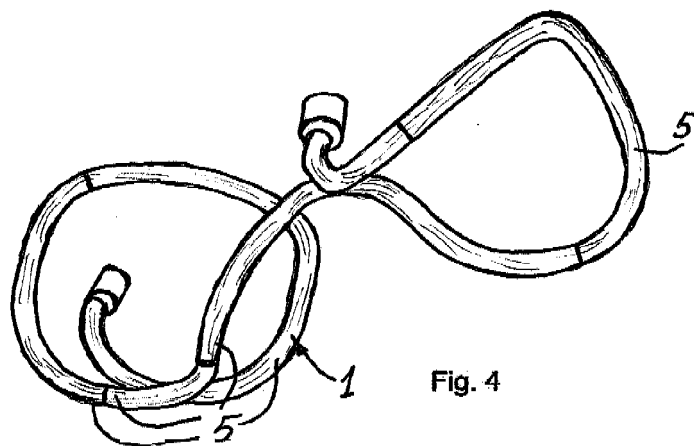
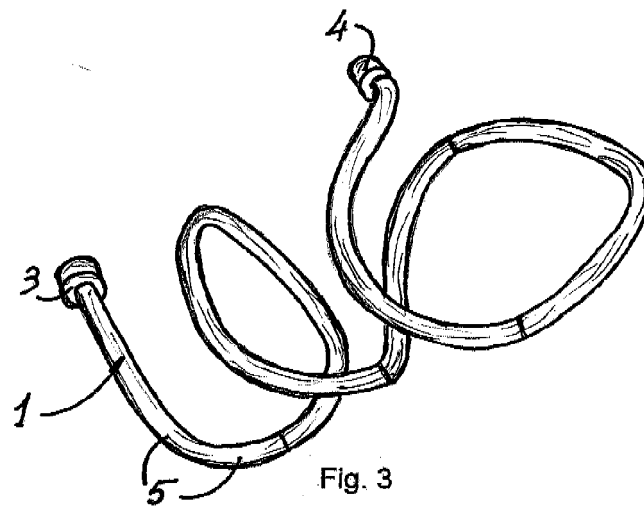


Fig. 2



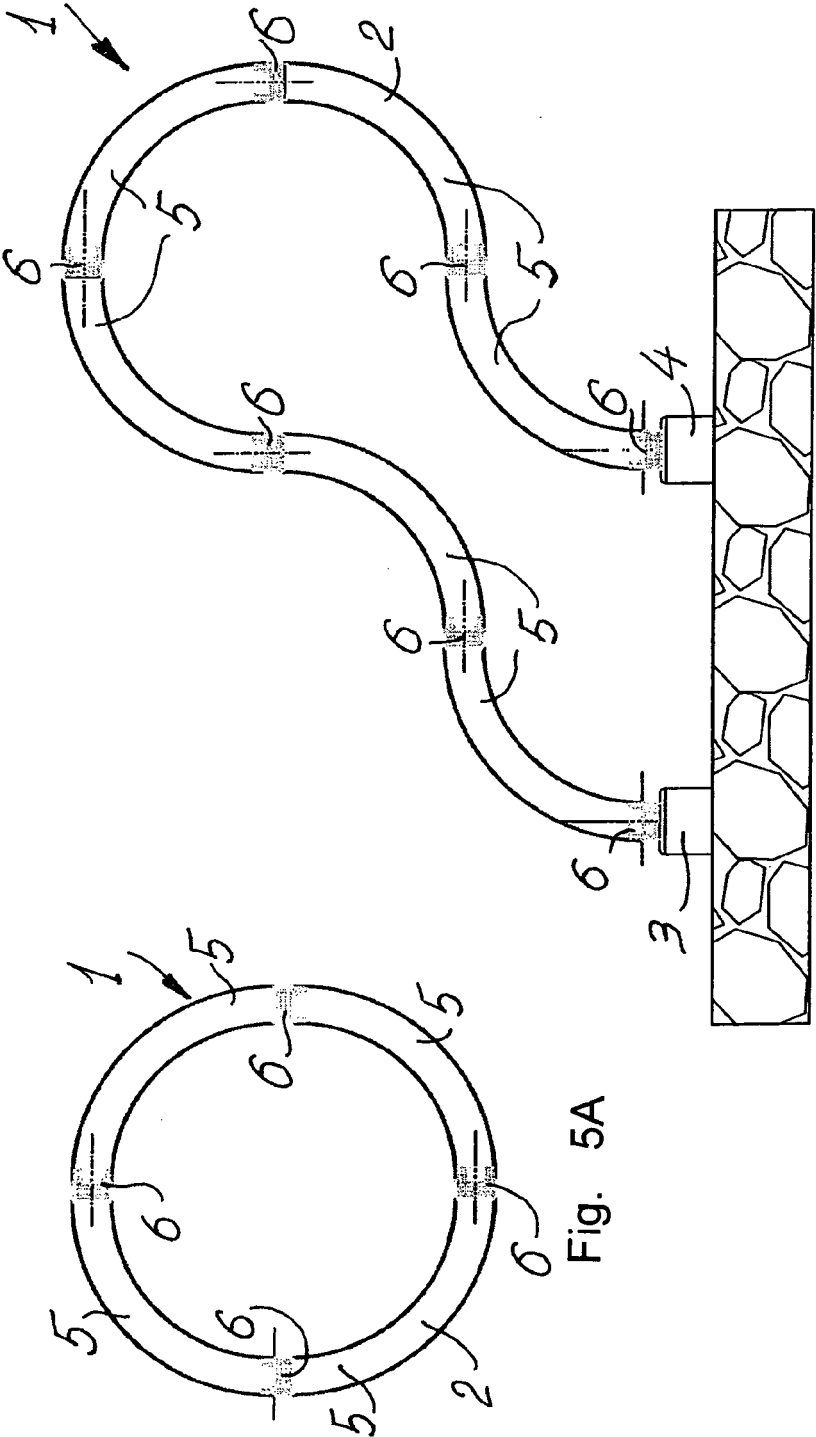


Fig. 5A

Fig. 5

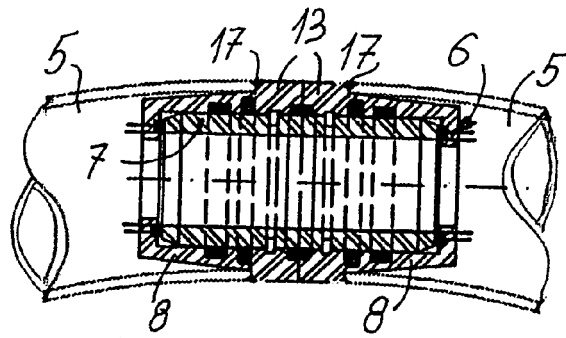


Fig. 6A

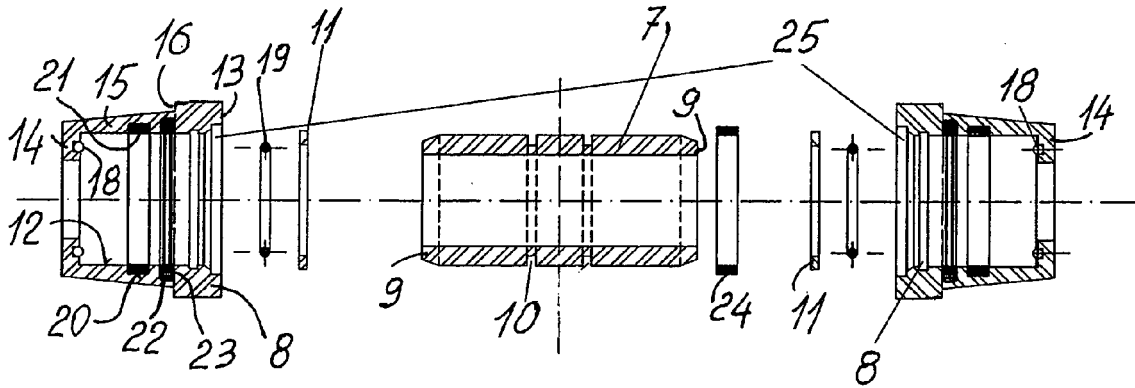


Fig. 6

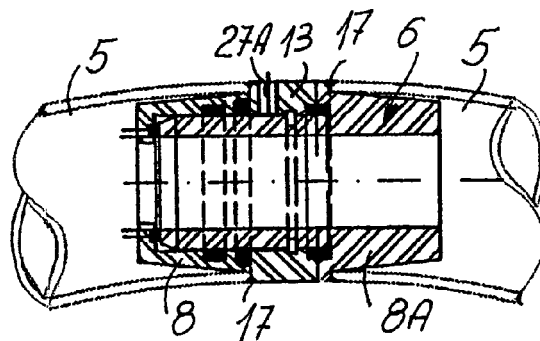


Fig. 7A

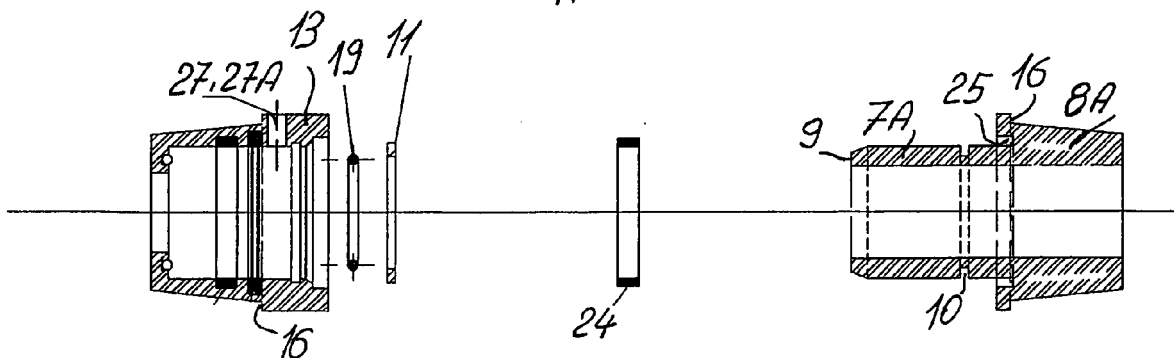


Fig. 7

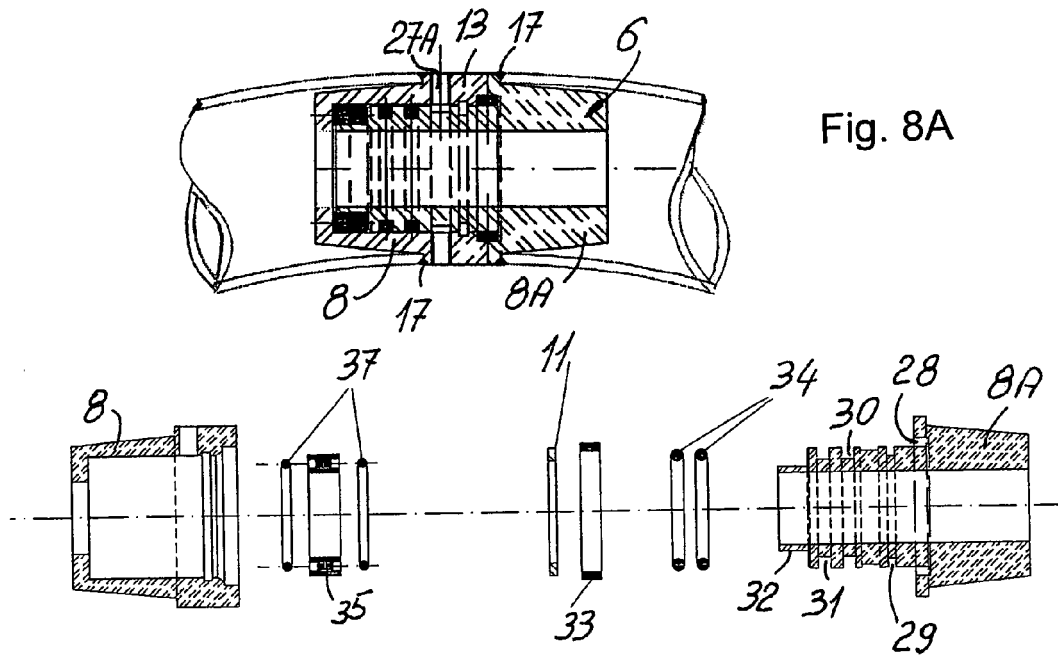


Fig. 8

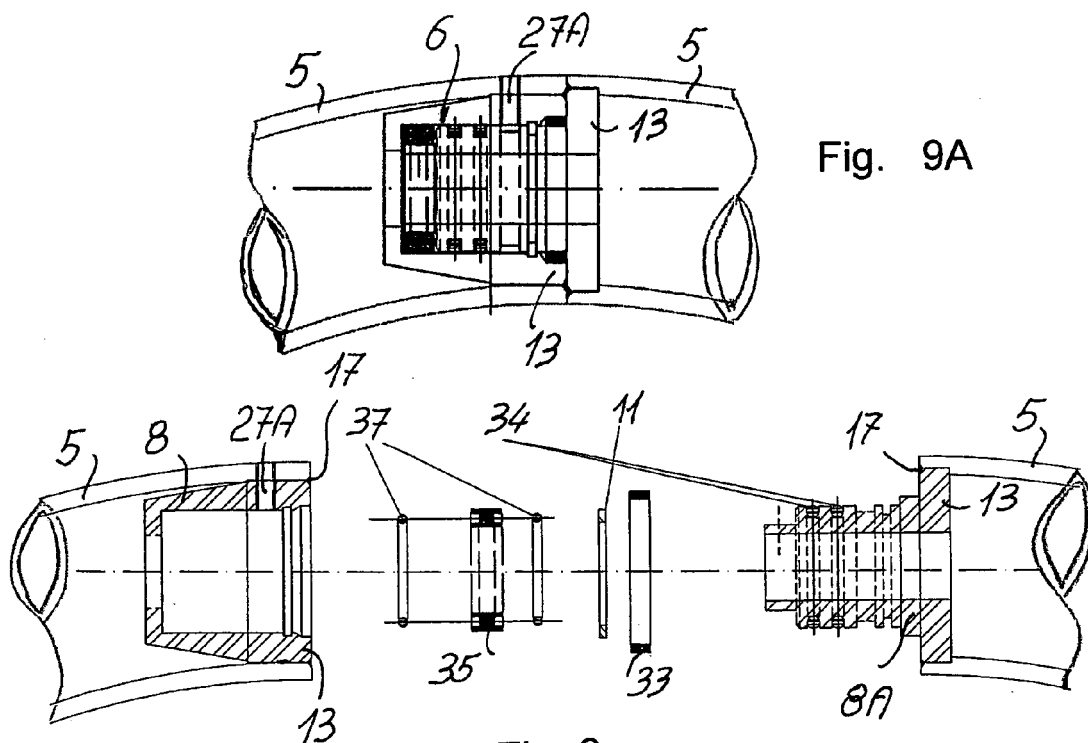


Fig. 9



EUROPEAN SEARCH REPORT

 Application Number
 EP 10 00 2225

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	DE 39 27 066 A1 (SCHWITTERS HENRY [DE]) 21 February 1991 (1991-02-21) * column 1, line 38 - line 50; figures * -----	1,2,4,6, 7,10	INV. F28F9/26 A47K10/06
X	GB 1 044 051 A (ANTHONY BIKKER) 28 September 1966 (1966-09-28) * page 2, line 95 - line 111; figure 1 * -----	1,2,4,7, 8,10	
X	CH 449 890 A (BENTELER WERKE AG [DE]) 15 January 1968 (1968-01-15) * column 3, line 53 - column 4, line 13; claims 1,5,6,; figures *	1,2,4-7, 10 8	
Y	EP 1 179 723 A2 (DELTACALOR S R L [IT]) 13 February 2002 (2002-02-13) * paragraph [0014] * -----	8	
A	US 5 829 161 A (HUNG CHICHUAN [TW] ET AL) 3 November 1998 (1998-11-03) * figures 3-8 *	1-10	
A	US 4 037 861 A (MEDNEY JONAS) 26 July 1977 (1977-07-26) * abstract; figures * -----	1-10	TECHNICAL FIELDS SEARCHED (IPC) F28F A47K
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 2 August 2010	Examiner Mootz, Frank
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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 EPO FORM 1503 03/82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 10 00 2225

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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02-08-2010

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
DE 3927066	A1	21-02-1991	NONE	
GB 1044051	A	28-09-1966	NONE	
CH 449890	A	15-01-1968	AT 275099 B	10-10-1969
			NL 6600560 A	31-01-1967
			SE 325119 B	22-06-1970
EP 1179723	A2	13-02-2002	IT MI20001862 A1	11-02-2002
US 5829161	A	03-11-1998	CN 2253951 Y	14-05-1997
US 4037861	A	26-07-1977	NONE	