



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
13.11.2002 Bulletin 2002/46

(51) Int Cl.7: **F24D 19/06**

(21) Application number: **02076703.4**

(22) Date of filing: **30.04.2002**

(84) Designated Contracting States:
**AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU
MC NL PT SE TR**
Designated Extension States:
AL LT LV MK RO SI

(72) Inventor: **Nilsson, Kenneth**
330 33 Hillerstorp (SE)

(74) Representative: **Wallengren, Yngvar**
Patentbyrå Y Wallengren AB
Box 116
331 21 Värnamo (SE)

(30) Priority: **09.05.2001 SE 0101627**

(71) Applicant: **Sigarth AB**
330 33 Hillerstorp (SE)

(54) **Anchorage for side plate**

(57) A radiator (10) is provided with a side plate (3) which has an over dimensioned aperture for passage of a connection pipe which is connected to a connecting member (12) located inside the side plate (3) and has a circumferential, radially projecting bead (13) or one or more projections. At the opening and on its inside, the side plate (3) has a snap device (14) with an aperture

for the connection pipe. The snap device (14) has a snap member (15) which may be snapped inside the bead (13) / the projection and is restrictedly movably connected (18) to the side plate (3) for movements parallel with the plane thereof. The snap device (14) or its snap member (15) is spring pretensioned (17) in order to impart a downwardly directed force to the side plate (3).

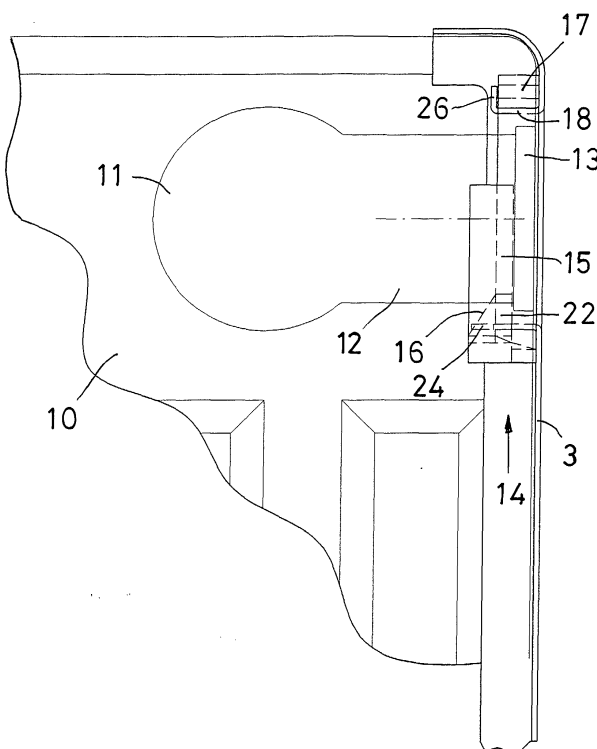


Fig 5

Description

TECHNICAL FIELD

[0001] The present invention relates to a device for securing a side plate on a radiator, at least one connection pipe to the radiator extending through an aperture in the side plate and being connected to a connection member on the radiator inside the side plate, and the connection member having a radially projecting bead or one or more projections.

BACKGROUND ART

[0002] Radiators for waterborne heat are often designed as duplex radiators and have a front and a rear radiator between which convector plates are disposed so that the heat-emitting surface of the radiators is considerably improved. Alternatives with single radiators and triple radiators also occur. The space above the radiator or radiators is closed by means of a grid so that air flowing in from beneath in the heated state may depart upwardly. Along opposing end sides, the radiator has cover plates, principally for aesthetic reasons, but also in order to realise a chimney effect through the radiator.

[0003] The radiator has connections for the supply and removal of water. As a rule, these inlets and outlets are placed over one another one on each end side. Connection to them is put into effect by means of pipes horizontally connecting to the radiator which, as a result, must be passed through at least one side plate, but possibly through both.

[0004] In a radiator which has both connections on one end side, the C-C distance between the connections according to valid standards may vary as much as ± 2 mm. The distance between the centre of the upper most connection and the upper side of the radiator may vary by ± 1 mm.

[0005] Designs and constructions are previously known in the art in which the side plates have, on the insides, upper and lower pairs of Ω shaped snap catches which grasp about the transverse connection pipes which extend between the front and rear radiator plate, i.e. the component radiators of which the radiator is constructed. Since these plastic clips localise the side plate in dependence upon the position of the transverse connecting pipes, and these in turn constitute an integral part of the connection member which, on the one hand, interconnects the component radiators with each other and, on the other hand, connects the external conduits, the side plates must have such large passage apertures for the external conduits that this solution will be aesthetically unacceptable. In addition, there will be poor precision in the connection of the side plates to the grid running along the upper side of the radiator.

[0006] A solution is also previously known in the art in which the side plates have, at their upper end, down-

wardly directed projections which are passed through corresponding apertures in the grid on the upper side of the radiator. At the lower end, the side plate has catches produced from flexible steel wire which are caused to grasp in under the transverse pipe placed under the connection and extending between the front and rear component radiators.

[0007] In this design and construction, the side plate is positioned in a vertical direction by the positioning of the upper grid.

[0008] This design and construction principally suffers from the major drawback that if attempts are made to lift the radiator in the side plates, these will, in all likelihood, give way because of the poor resilient force in the resilient catches.

[0009] In yet a further known construction, use is made of rotary washers which are placed in the side plates and which have somewhat oval apertures for the external connection conduits and which, along approximately a semicircular arc, have gripping members which are intended to grasp behind a bead on the connection of the radiator. Such a side plate is slid on the connections from above, whereafter the plastic washers are rotated a quarter of a turn or more.

[0010] A side plate of this type can not be lifted off the radiator because of the rotation of the plastic washers but positions the side plate in dependence on the position of the connections of the radiator. This implies that the side plate, above all in the vertical direction, may be positioned so high that a gap occurs towards the upper grid of the radiator.

PROBLEM STRUCTURE

[0011] The present invention has for its object to design the device intimated by way of introduction such that, regardless of the tolerances of the positions of the connections of the radiator, it is always capable of positioning the side plates in correct positions in relation to the radiator proper, in particular its upper grid. The present invention further has for its object to realise a device which is simple to mount and dismount and which does not run the risk of being released from the radiator if the radiator were to be lifted by gripping the side plates. Finally, the present invention has for its object to realise a device which is aesthetically appealing and which may be manufactured at low cost.

SOLUTION

[0012] The objects forming the bases of the present invention will be attained if the device intimated by way of introduction is characterised in that a snap device is disposed on the inside of the side plate and at the aperture therein, the snap device being movably connected to the side plate for limited movements approximately parallel with the plane of the side plate, the snap device having an aperture through which the connection pipe

extends, and the snap device having at least one snap member which is catchable inside the bead/projection/projections.

[0013] As a result of these characterising features, the major advantage will be afforded that the snap device may adjust itself in response to the tolerances which the connection member or connection members may have.

[0014] In one advantageous embodiment, the present invention is further characterised in that the snap device or its snap member is spring pretensioned in order to exercise a downwardly directed force against the side plate.

[0015] As a result of these features, the major advantage will be afforded that the side plates are always kept in close abutment against the grid on the upper side of the radiator.

BRIEF DESCRIPTION OF THE ACCOMPANYING DRAWINGS

[0016] The present invention will now be described in greater detail hereinbelow, with reference to the accompanying drawings. In the accompanying drawings:

- Fig. 1 shows a side plate seen from the inside;
- Fig. 2 is a section taken along the section line E-E in Fig. 1;
- Fig. 3 is a section taken along the section line A-A in Fig. 1;
- Fig. 4 is a section taken along the section line B-B in Fig. 1;
- Fig. 5 shows an upper corner portion of a radiator in the partly cut-away state and where the radiator is provided with a side plate according to the present invention;
- Fig. 6 shows a snap device according to the present invention, seen from the inside;
- Fig. 7 shows the snap device seen from beneath in Fig. 6;
- Fig. 8 shows the snap device seen from the left in Fig. 6;
- Fig. 9 is a section taken along the section line through the snap device according to Fig. 6;
- Fig. 10 is a view corresponding to Fig. 1 on a slightly larger scale and with the snap device according to Fig. 6 mounted in position; and
- Fig. 11 is a section taken along the section line D-D in Fig. 10.

DESCRIPTION OF PREFERRED EMBODIMENT

[0017] In the body of the description, expressions will be employed below such as upwards, downwards, upper, lower etc. These expressions relate to the state when the radiator is mounted in the normal position of use and in which its external connection pipes approach the radiator in horizontal directions from the side.

[0018] Further, expressions such as inwards and out-

wards will be employed by which is taken to signify inwards towards the radiator and outwards away from it, respectively.

[0019] Figs. 1-4 show a separate side plate according to the present invention. As will be apparent from the drawings, the side plate 1 is rectangular in configuration and has an upper edge portion 2 which is intended to rest on the upper side of a grid which covers the upper side of the radiator and which may substantially make a right angle with the side surface 3 of the side plate. Furthermore, the side plate 1 has a front edge portion 4 and a rear edge portion 5 which are formed to straddle the front and rear side of the radiator and possibly abut against them. The edge portions may be approximately parallel with each other and transversely directed, possibly at right angles to the plane of extent of the side plate. In this context, the term front relates to the side of the radiator facing towards the observer, while the rear relates to the opposite side, preferably the side facing towards a wall.

[0020] As a result of the above described forming of the side plate, it will be realised that this may be slid on a radiator from the side so that the upper edge portion 2 rests on the upper grid of the radiator while the front edge portion 4 and the rear edge portion 5 straddle the radiator and approach as closely as possible to the front side of the front radiator plate or the component radiator and to the rear side of the rear radiator plate or component radiator. Since no lower edge portion (would correspond to the upper edge portion 2) exists, the side plate is displaceable in relation to the radiator in the vertical direction. On the other hand, the two edge portions 4 and 5 guide the side plate transversely of the plane of extent of these edge portions, in certain cases with a minor clearance because of tolerances.

The side plate 1 has apertures 6 and 7 for passage of external connection pipes and the apertures have collars 8 and 9, respectively, which extend inwards in a direction in towards the radiator.

[0021] The two apertures 6 and 7 are of such over dimensioning in relation to the external connection conduits of the radiator that the tolerances disclosed by way of introduction for the C-C dimension of the connections and also the dimension from the upper connection conduit to the upper side of the grid of the radiator can reliably be encompassed.

[0022] Fig. 5 shows, in the cut-away state, an upper corner region of a radiator. In this figure, reference numeral 10 relates to a rear or inner component radiator, while reference numeral 11 relates to a transverse connecting pipe which connects the rear component radiator 10 with a front component radiator (not shown). The connection pipe 11 has a connection member 12 to which an external connection pipe is intended to be connected. The connection member is, in the illustrated embodiment, tubular and has, at its outer, free end, a number of radially projecting projections or a circumferential, annular bead 13.

[0023] A snap device 14 is fixed on the inside of the planar side surface 3 of the side plate in such a manner that it is positionally fixed to and from the side plate but so that it is restrictedly movable approximately parallel with the plane of the side plate. The snap device has at least one snap member 15 which, on mounting of the side plate 1, is intended to snap in behind the bead 13 and partly surround the tubular connection member 3. Further, the snap device 14 has, around the snap member or snap members, one or more entry surfaces 16 which, when they are pressed against the axial outer edge of the bead 13, are intended to displace the snap device so that a snapping-in of the snap members 15 behind the bead is facilitated. To this end, the entry surfaces form a space which is radially inwardly converging in a direction towards the planar side surface 3 and which, in a circumferential direction of the connection member 12, accommodates approximately a half turn. The snap device 14 further includes a spring member 17 which abuts against an abutment portion 18 on the inside of the planar side surface 3 of the side plate and is preferably formed as a part of the collar 8 or 9 or an extension thereof inwards towards the radiator. The spring member is designed so as to urge the snap members from beneath against the under side of the connection member 3, whereby, as a reaction hereto, a downward force may be imparted to the whole of the side plate 1 so that the upper edge portion 2 of the side plate always abuts against the upper surface of the radiator.

[0024] The snap device 14 is, with its snap members, entry surfaces and spring member, of one piece manufacture from a suitable plastic material.

[0025] Fig. 6 shows the snap device 6 seen from the inside, i.e. from the radiator and outwards towards the inside of the side plate 1. The entry surfaces 16 and the spring member 17 are clearly apparent. It will also be apparent that the snap device has a circumferential wall 20 which defines an aperture 19 through which the connection member 12 and the external connection pipe may be passed.

[0026] It will be apparent from Fig. 6 that the snap device has, in its lower end, a recess 21 which is laterally defined by two projecting heels 22. As is apparent from Figs. 1 and 3 taken together, the collars 8 and 9 have, in their lower region, a T-shaped projection 23 with a head 24 and a neck 25. The neck 25 is intended to be located in the recess 21 in the snap device 14 but is of lesser width than the recess 21, for which reason a certain freedom of movement occurs in the width direction of the recess 21 and also in its vertical direction. The head 24 is intended to be located over or inside the two heels 22 so that the snap device 14 is thereby prevented from moving transversely of the plane of extent of the side plate 1.

[0027] As will be apparent from Figs. 1 and 4 taken together, the collars 8 and 9 have, in their upper region, on the one hand the above-mentioned abutment details 18 and, on the other hand, upwardly bent projections 26

which are intended to rest against the edge of the spring member 17 facing towards the radiator in a recess 27 therein. In that the projection 26 abuts against the side of the spring member 17 facing away from the side plate 1, the snap device is prevented from moving transversely of the plane of extent of the side plate. In that the recess 27 is of greater width than the projection 26, the snap device can, on the other hand, move parallel with the plane of extent of the side plate.

[0028] Figs. 10 and 11 show the side plate with mounted snap devices 14, and, in Fig. 10, the bead 13 is further intimated on the connection portion.

[0029] It will be clearly apparent from Fig. 11 that the projection 26 on the two collars 8 and 9 is located in abutment against the inside of the spring member 17, i.e. its side facing towards the radiator. Correspondingly, it will be apparent that the head 24 on the lower regions of the collars 8 and 9 is located inside the two heels 22.

[0030] It will also be apparent from Fig. 10 that the snap members 15 have grasped in on the underside of the bead 13 and that the spring member 17 has raised the snap device 14 so that it is urged against the connection member 12 from beneath.

Claims

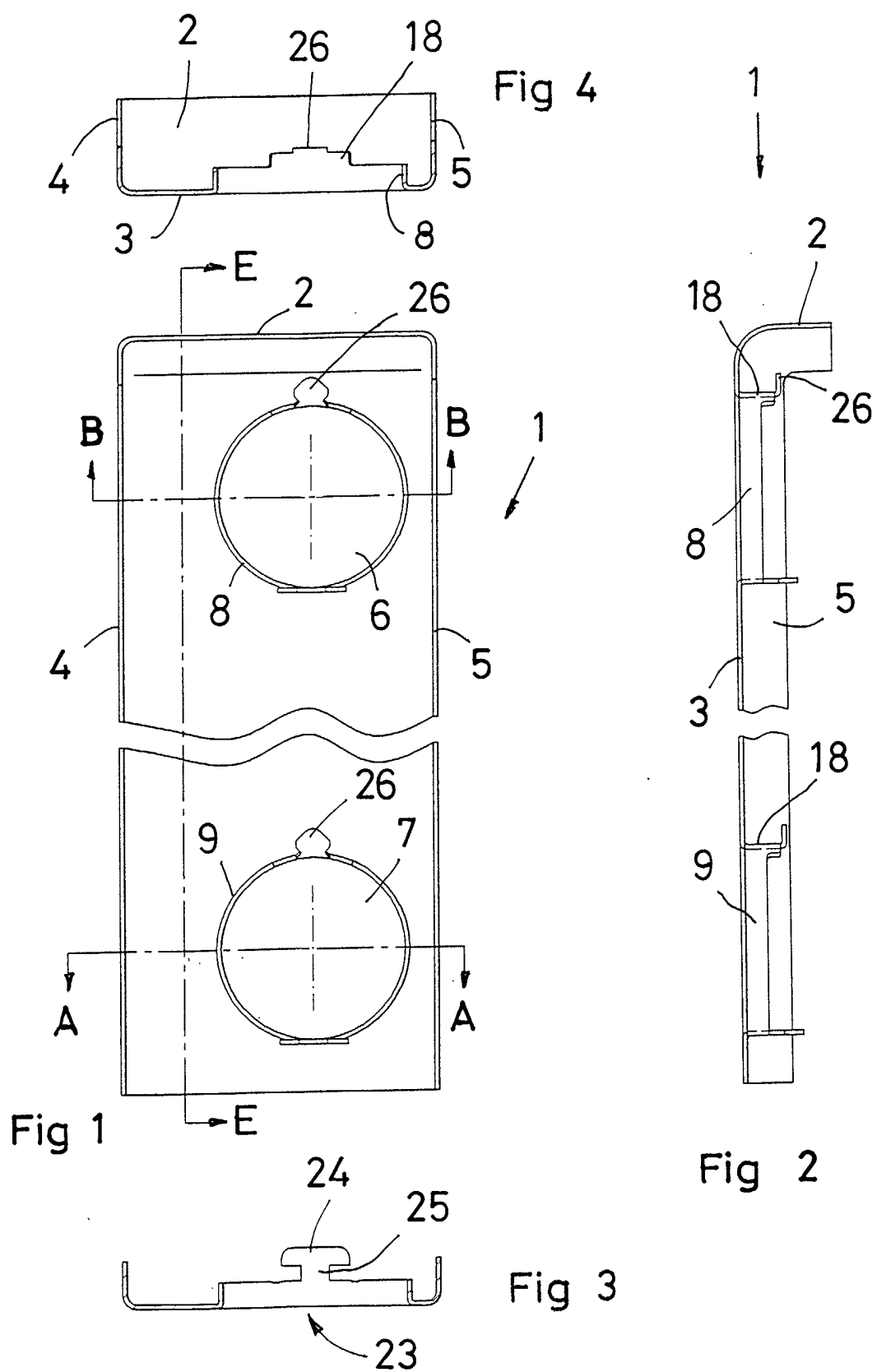
1. A device for securing a side plate (1) on a radiator, at least one connection pipe to the radiator extending through an aperture (6, 7) in the side plate (1) and being connected to a connection member (12) on the radiator inside the side plate, and the connection member having a radially projecting bead (13) or one or more projections, **characterised in that** there is disposed, on the inside of the side plate and at the aperture (6, 7) and on the inside, a snap device (14) which is movably connected to the side plate for limited movements approximately parallel with the plane of the side plate, the snap device having an aperture (19) through which the connection pipe extends, and the snap device having at least one snap member (15) which may be snapped in position inside the bead/the projection/the projections (13).
2. The device as claimed in claim 1, **characterised in that** the snap device (14) or its snap member (15) is spring pretensioned in order to exercise a downwardly directed force against the side plate (1).
3. The device as claimed in claim 1 or 2, **characterised in that** the aperture (6, 7) of the side plate (1) is over dimensioned in relation to the connection pipe, whereby the pipe can, in the mounted position of the side plate on the radiator, be permitted to assume different positions in the aperture determined by tolerances.

4. The device as claimed in any of claims 1-3, **characterised in that** the snap device (14) has a circumferential wall (20) around a central aperture (19) which, along a first portion, has the snap member (15) an axial distance inside the inside of the side plate (1) and which, in a counter positioned, second portion, has a spring member (17) in engagement with an abutment (18) on the side plate (1), the spring member (17) being disposed to urge the snap member (15) against the connection member (12). 5 10
5. The device as claimed in claim 4, **characterised in that** the first portion is an upper portion, while the second portion is a lower portion. 15
6. The device as claimed in any of claims 1-5, **characterised in that** the snap device (14) has an entry portion on its side facing away from the inside of the side plate (1), the entry portion having entry surfaces (16) which converge in towards an axial centre or midline through the snap device (14) in the axial direction towards the inside of the side plate. 20
7. The device as claimed in any of claims 1-6, **characterised in that** the snap device (14) is of one piece manufacture from plastic. 25
8. The device as claimed in any of claims 4-7, **characterised in that** the abutment member (18) is similarly manufactured as a first anchorage (26) for the snap device (14) and that a second anchorage (24) is disposed at an opposing portion of the snap device, both anchorages being designed for tolerance-absorbing limited movements of the snap device in relation to the side plate (1) approximately parallel with the plane thereof. 30 35
9. The device as claimed in any of claims 1-8, **characterised in that** the snap device (14) is non rotatably connected with the side plate (1). 40

45

50

55



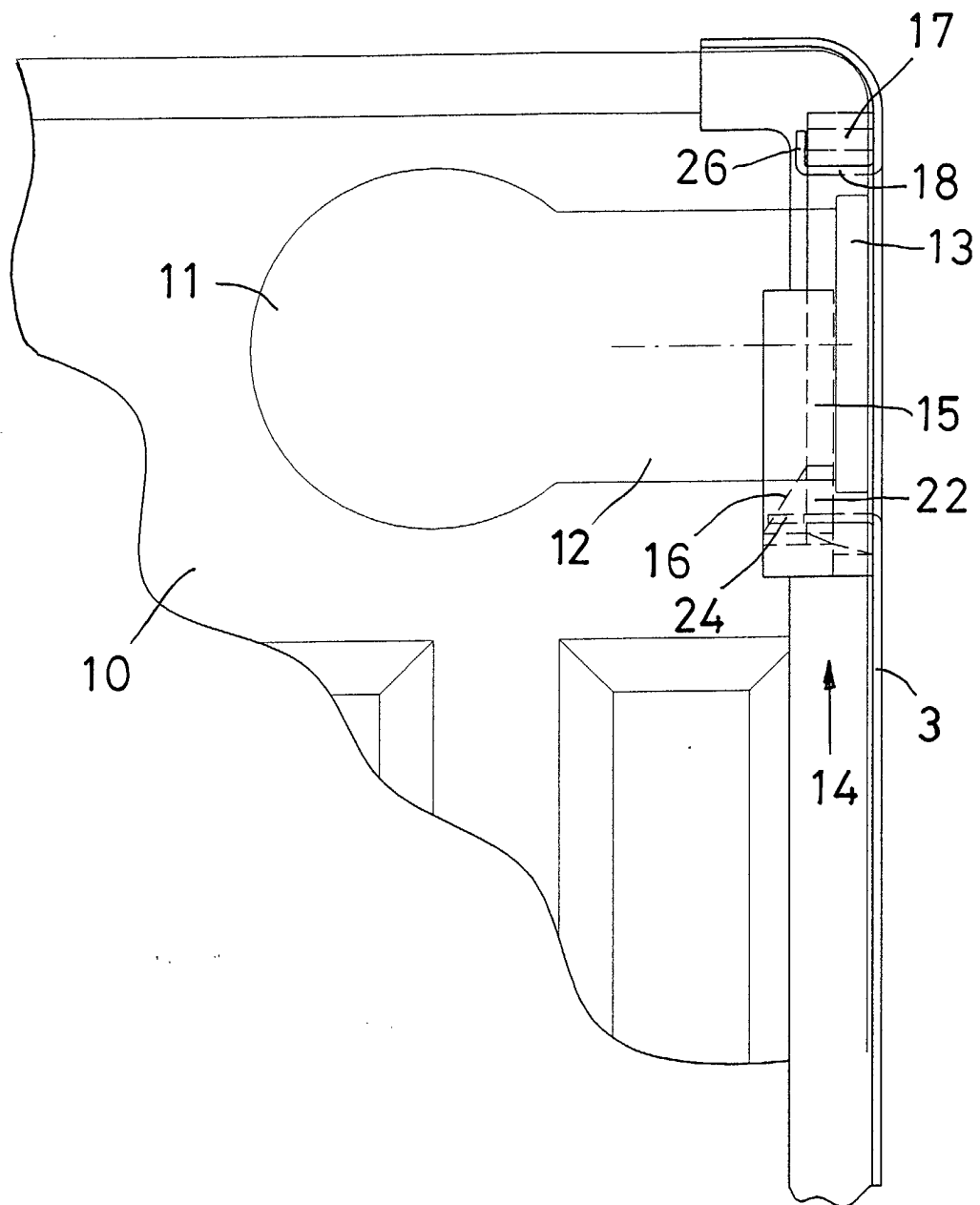


Fig 5

Fig 7

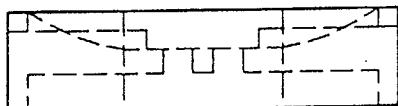


Fig 9

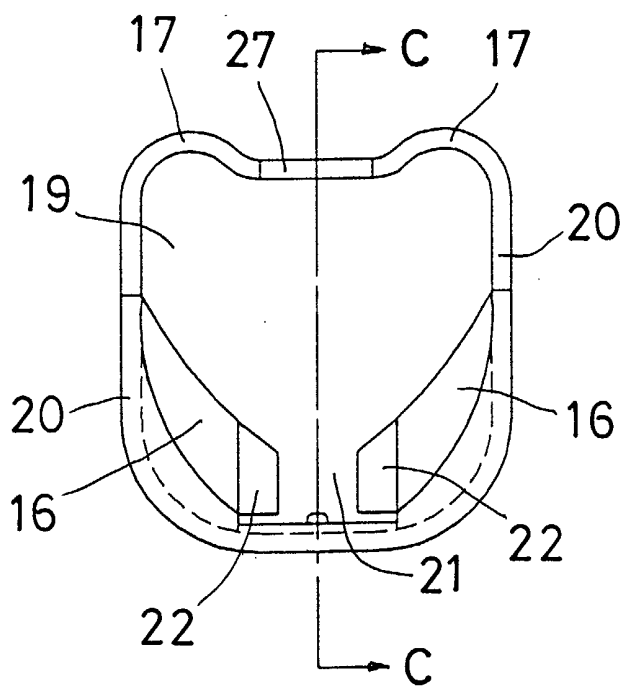
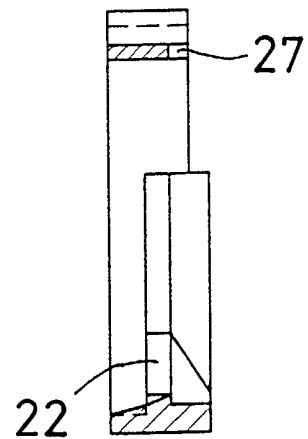


Fig 6

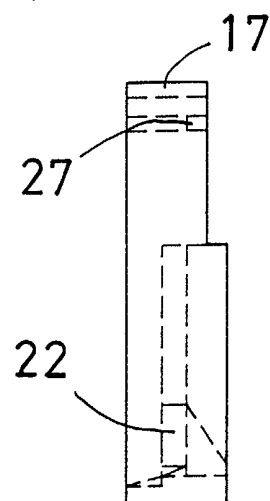


Fig 8

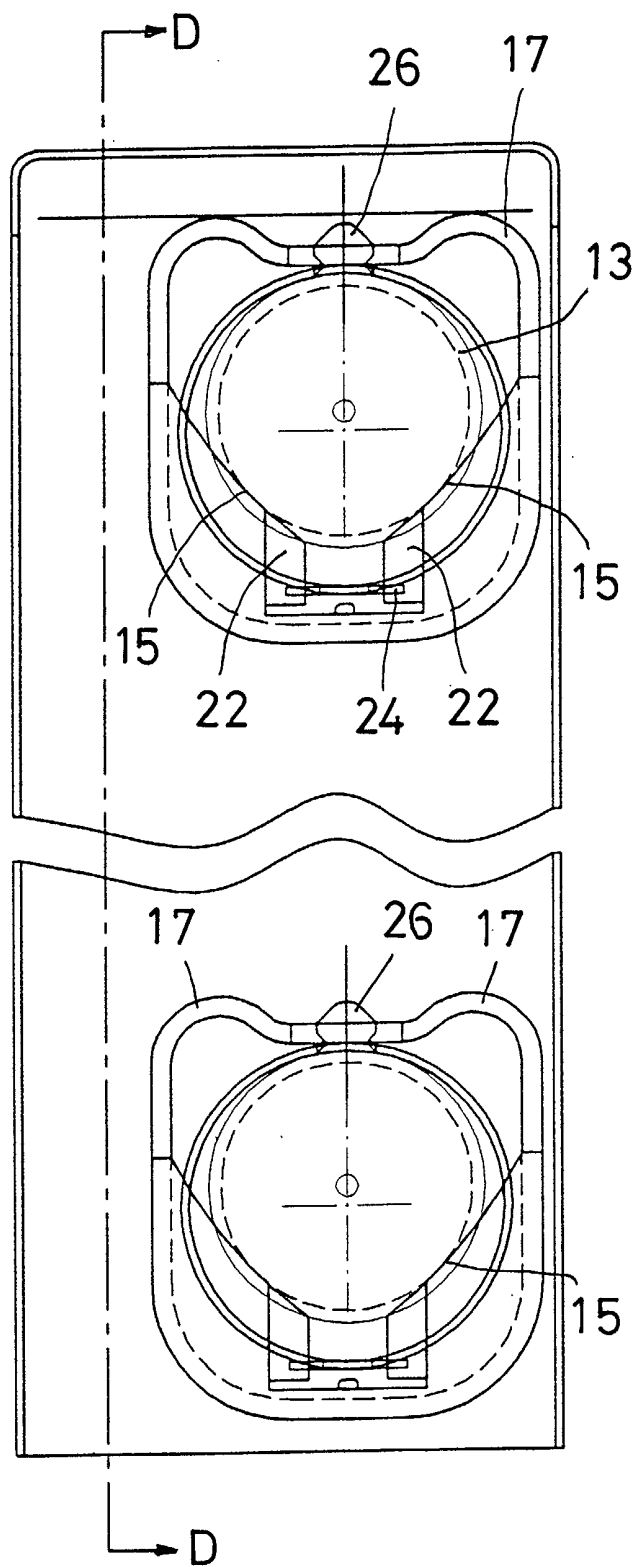


Fig 10

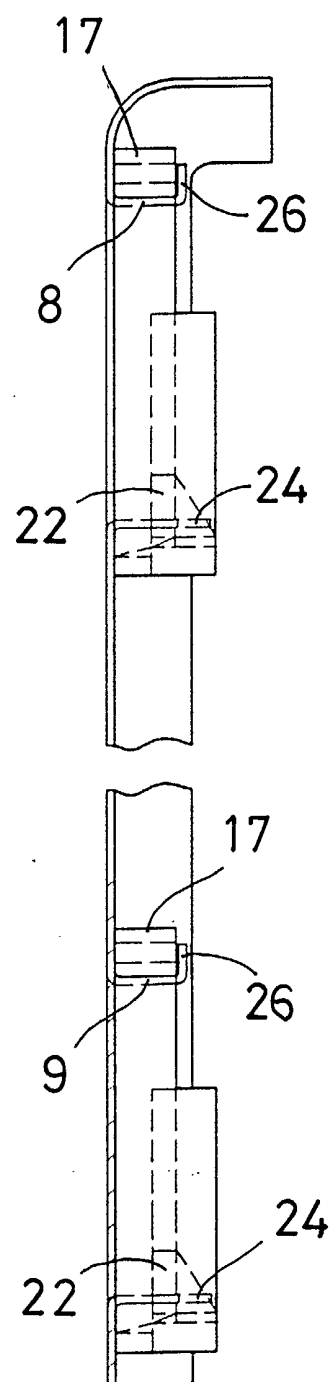


Fig 11