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(54) **PIPE CLOSURE APPARATUS**

ROHRABSPERREINRICHTUNG

APPAREIL D'OBTURATION D'UN TUYAU

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(56) References cited:  
**EP-A- 0 339 525**

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## Description

### Field of the Invention

**[0001]** The invention relates to a pipe closure apparatus for sealing a radiator tailpiece outlet. The invention further relates to a method of sealing a radiator tailpiece outlet.

### Background to the Invention

**[0002]** To remove an individual radiator from the wall to which it is attached, for example to decorate the wall behind, it is first necessary to close the valves at both ends of the radiator to isolate the radiator from its pipework, then undo the union nuts found between the radiator and the valve outlet of the pipework before moving the radiator. A problem associated with this method is that the water retained within the radiator tends to leak out of the bottom of the radiator through the pipe outlet at the tailpiece when the union nuts have been undone. Water in the radiator tends to be dirty and may cause damage to floor coverings surrounding the radiator.

**[0003]** To overcome the problem with water leakage, stoppers may be inserted in the radiator outlet between the valve outlet and the tailpiece outlet. However, before fitting of such stoppers into the radiator tailpiece outlet the radiator tailpiece outlet and valve outlet must first be moved far enough away from each other to allow room for the stopper to be inserted. During the relative movement water may leak out of the radiator outlet or the movement may damage the pipework. Similar problems arise when the radiator is to be replaced. Therefore, the problem associated with water leakage from the radiator tailpiece outlet is not overcome using such stoppers.

**[0004]** The same problem may occur in general plumbing situations when a pipe through which fluid is intended to flow is cut into two separate pipes. As soon as the pipe is cut, fluid will tend to leak out of the ends of the pipes. Movement of the pipes may generally be difficult due to the presence of related pipework, making it difficult to insert stoppers into the ends of the pipes.

**[0005]** It is an aim of the present invention to overcome the problems associated with the prior art represented by EP-A-0 339 525, which describes a pipe closure apparatus.

### Summary of the Invention

**[0006]** According to the present invention there is provided a pipe closure apparatus for sealing a radiator tailpiece outlet to prevent fluid flow therefrom, the pipe closure apparatus comprising the features of claim 1.

**[0007]** The pipe closure apparatus may have sealing means which is relatively thin and adapted to fit between the pipe outlet and an adjacent object the pipe closure apparatus may be used to seal pipe outlets to which access is awkward. In this situation the sealing means of

the closure apparatus may be inserted in a small gap formed between the pipe outlet to be sealed and another object and the sealing means biased into sealing engagement with the pipe outlet to prevent fluid flow therefrom. In the case of a radiator, the sealing means is inserted in the gap between the pipe outlet to be sealed (in this case the tailpiece) and the valve outlet to which it is normally attached.

**[0008]** Suitably, the sealing means is less than 10mm thick. More suitably, the sealing means is less than 5mm thick. Preferably, the sealing means is less than 2mm thick. Even more preferably, the sealing means is substantially 1 mm thick.

**[0009]** The relatively small thickness of the sealing means allows the sealing means to be fitted in relatively small gaps between the pipe outlet to be sealed and another object.

**[0010]** Suitably, the gap between the pipe outlet and the adjacent object is less than 10 mm wide. More suitably, the gap is less than 5 mm wide. Preferably, the gap is less than 2 mm wide. Even more preferably, the gap is substantially 1 mm wide.

**[0011]** The sealing means according to the invention is supported by an anchor, which anchor is preferably adjustable.

**[0012]** Suitably, the sealing means comprises an elastomeric band. Suitably, the elastomeric band may provide its own biasing means by stretching the elastomeric band.

**[0013]** Suitably, the sealing means comprises a lamellar structure. Preferably, the lamellar structure consists of a hard wearing, non porous material, preferably metal, more preferably aluminium or stainless steel. Suitably, the lamellar structure is rubber coated to provide a resilient seal.

**[0014]** Suitably, the biasing means is adjustable. This allows the amount of bias to be varied. Suitably, the biasing means comprises an adjustable threaded bolt, such that the lamellar structure may be moved along the threaded bolt to vary the position of the lamellar structure and thus the amount of bias provided. Suitably, the adjustable biasing means comprises one or more springs. Alternatively, the biasing means comprises one or more VELCRO (trade mark) strips. Furthermore, the biasing means comprises a belt like structure, whose girth may be adjusted to alter the amount of bias.

**[0015]** Suitably, the anchor comprises a clamp.

**[0016]** Suitably, the clamp comprises two side members.

**[0017]** Suitably, the anchor comprises a g-shaped clamp.

**[0018]** An advantage of a clamp is that it enables the user to quickly and easily insert the sealing means into the small gap that is created between the radiator tailpiece outlet and the valve outlet once disconnection has taken place. An advantage of using a clamp having a flat base, is that once a sealed pipe or radiator has been removed from its mounting, the clamp is less likely to

damage the floor upon which the sealed pipe or radiator is placed.

**[0019]** Suitably, the anchor further comprises a drip tray which may be releasably attached to the anchor.

**[0020]** Preferably, the drip tray is releasably attached to the anchor by one or more spring clips.

**[0021]** The drip tray may have the further function of bearing against the adjacent object to make the gap between the pipe outlet and the adjacent object bigger by forcing the pipe away from the adjacent object.

**[0022]** Suitably, the anchor further comprises resilient means along its base such that the base of the anchor does not mark the floor onto which the anchor is placed. Suitably, the anchor comprises a rubber covering or the like. Preferably, the anchor comprises rubber feet.

**[0023]** Suitably, the clamp is fitted to the radiator in close vicinity to the outlet, which outlet is usually at the bottom of the radiator.

**[0024]** Suitably, the clamp consists of a holding clamp which supports a slidably adjustable bar or rod. When fitted to the radiator, the bar or rod can slide from side to side within the clamp. Suitably, the bar or rod is arranged in a substantially horizontal direction.

**[0025]** Suitably, a fork-like fitting extends from the rod or bar of the clamp. Suitably, the fork-like fitting extends from one end of the rod or bar. The fork-like fitting suitably comprises two fingers. Suitably, the fork like fitting extends substantially perpendicular to the rod or bar.

**[0026]** Suitably, the fork-like fitting is arranged to support the sealing means. The sealing means is preferably provided by a flat band of rubber. The seal is stretched across the two fingers of the fork-like fitting to form a flat seal. Other types of seal can be used.

**[0027]** According to the present invention there is provided a method of sealing a radiator tailpiece outlet to prevent fluid flow therefrom using pipe closure apparatus according to the invention, the method comprising the steps of claim 5.

**[0028]** First, the radiator is isolated from the pipework by closing the control valves at either end. Once the clamp has been attached to the radiator, the union or captive nuts which connect the valve to the radiator tailpiece outlet should be unfastened. The valve can then be pulled away from the radiator with one hand to provide a gap between the tailpiece outlet and the valve. (There is usually enough flexibility to allow this). Then with the other hand, the sealing means can be adjusted sideways until it is directly aligned with the gap. The sealing means can then be inserted into the gap by rotating the rod about its longitudinal axis until the radiator tail piece outlet is covered by the seal. In other words, one of the fingers of the fork-like fitting is located below and the other is located above the opening.

**[0029]** To effect a water-tight seal the rod can be pushed through the clamp to cause the seal to stretch over the radiator tailpiece outlet to be sealed. The rod or bar and seal can be held in place by means of a small pinch bolt or retaining bolt which can be tightened

against the rod or bar.

**[0030]** This process can be repeated at the other radiator valve. The radiator can then be removed from the wall with the water still inside.

**[0031]** As the seals are relatively thin, the overall length of the radiator is only negligibly increased. Removal and replacement of the radiator is much easier due to the unobtrusiveness of the sealing means.

**[0032]** Alternatively, the rod or bar of the clamp may be attached to a spring at one end to provide biasing means of the seal. This would obviate the requirement for a pinch bolt.

**[0033]** The rod or bar may be located at any position of the clamp, including on an arm of the clamp such that it is located on the front of the radiator in use and on the bridge of the clamp, such that it is located underneath the radiator in use.

**[0034]** The reach of the fork-like fitting which supports the seal from the bar or rod of the clamp may be adjusted to fit the pipe closure apparatus to different types of radiator.

**[0035]** For example, spacing means may be provided. The spacing means may be fitted onto the holding clamp such that in use, the spacing means is located between the radiator and the clamp.

**[0036]** Suitably, the spacing means is provided by an elongate member. The elongate member suitably has a channel of substantially rectangular cross-section cut out of opposing longitudinally extending sides of the member. The width of each channel is suitably chosen such that the spacing means can be fitted onto an arm of the clamp by a push fit arrangement. The depth of each channel is preferably not equal, in order that the degree of spacing provided by the spacing means can be varied depending upon which side of the spacing means is fitted to the arm of the clamp.

**[0037]** The clamp maybe made of any suitable material, including metal, plastic or a combination thereof, for example.

**[0038]** It should be appreciated that references to a pipe outlet are intended to include all pipes from which fluid may flow, whether normally the pipe end functions as an outlet or an inlet. Furthermore, references to pipes are also intended to include valve inlets and outlets.

**[0039]** An advantage of pipe closure apparatus in accordance with the first or second aspect of the invention is that it allows the user to insert the sealing means into the gap between the radiator tailpiece valve and the valve outlet with one hand while holding the valve outlet away from the radiator with the other hand.

**[0040]** Sealing an outlet in accordance with the invention is much quicker and easier than previous methods. Time is an important factor in disconnected and reconnection of radiator valves, a method that saves time also reduces fluid loss and therefore mess.

### Brief Description of the Drawings

[0041] A pipe closure apparatus and method in accordance with the present invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 is a schematic perspective view of a pipe closure apparatus according to an embodiment of the present invention;

Figure 2 is a schematic side view of the pipe closure apparatus of figure 1;

Figure 3 is a schematic side view of a radiator showing how it attaches to its related pipework;

Figure 4 is a schematic side view of two of the pipe closure apparatus according to the present invention in use on a radiator;

Figure 5 is a schematic plan view of the arrangement shown in Figure 4;

Figure 6 is a schematic part side view of a pipe closure apparatus according to another embodiment of the present invention, in use;

Figure 7 is a schematic side view of pipe closure apparatus according to a further embodiment of the present invention, in use;

Figure 8 is a top view of pipe closure apparatus according to a yet further embodiment of the invention attached to a typical radiator with the seal held in the sealing position;

Figure 9 is a side view of the device as shown in figure 8;

Figure 10 is an end view of the device as shown in figure 8;

Figure 11 is a side view showing how two devices as shown in Figure 8 are attached to a typical radiator;

Figure 12 is an end view of an alternative embodiment of a pipe enclosure apparatus in accordance with the present invention;

Figure 13 is a part side view of the device of figure 12 attached to a typical radiator showing the seal positioned in the gap prior to sealing;

Figure 14 is a perspective view of a spacing means; and

Figure 15 is a side view of the spacing means of figure 14 in use with the apparatus of figure 8.

### Description of the Preferred Embodiments

[0042] A pipe closure apparatus according to an embodiment of the present invention is illustrated in Figures 1 and 2. The pipe closure apparatus 10 comprises what is known as a g-type clamp 12. The clamp 12 has two substantially identical parallel, planar side members 14, 16 in substantially face to face relationship with each other, separated by a base plate 18. Each of the side members 14, 16 is generally g-shaped, that is each side member 14, 16 is formed from a rectangle with a smaller rectangular notch removed to define on each side member 14, 16 a large leg 20, 22 and a small leg 24, 26. Secured to each small leg 24, 26 is each end of an elastomeric band 25, which will be described in more detail below. The clamp 12 has an inner face 28 and an outer face 30.

[0043] One side member 14 of the clamp 12 has an internally threaded aperture (not shown). Through this aperture is placed a correspondingly externally threaded bolt 32, such that one end 34 of the bolt 32 extends within the inner face 28 of the clamp 12 and the other end 36 of the bolt 32 extends from the outer face 30 of the clamp 12. At the inner end 34 of the bolt 32 is a planar stop member 38. At the outer end 36 of the bolt 32 is a bolt head 40. The bolt head 40 has a recess 42. The bolt 32 is adapted to be hand-tightened, although if necessary, a screwdriver can be used in recess 42.

[0044] Figure 3 shows a part side view of a radiator 44 showing how it attaches to its related pipework 46. The radiator 44 has a tailpiece outlet 48 around which is a union nut 50. The pipework 46 has a valve outlet 52 which is usually attached to the radiator tailpiece outlet 48 via the union nut 50 to allow fluid flow from the pipework 46 to the radiator 44. Fluid flow from the valve outlet 52 is controlled by rotating valve head 54.

[0045] Figures 3, 4 and 5 show how the pipe closure apparatus is used according to an embodiment of the present invention. Whilst the radiator tailpiece outlet 48 is still attached to its related pipework 46 via valve outlet 52, clamp 12 of the closure apparatus 10 is positioned at the bottom edge (56 in Figure 4) of the radiator 44, with the inner face 28 of the clamp 12 fitting around the bottom edge 56 of the radiator 44. The inner face of side member 16 is positioned to abut one side of the radiator 44. The stop member 38 of the threaded bolt 32 extending through side member 12 abuts the opposite side of radiator 44. When so positioned, the clamp 12 is held by its base plate 18 and the threaded bolt 32 rotated in the threaded aperture (not shown) by rotating threaded bolt 32 by hand or using a screw driver in recess 42. Rotating the bolt head 40 in a first direction moves the stop member 38 until it abuts the side of the radiator 44. Continued rotation of the bolt head 40 provides a secure fit of the clamp 12 on the radiator 44.

**[0046]** Once the clamp 12 is fitted to the bottom edge 56 of the radiator 44, the elastomeric band 25 attached to the clamp 12 is left slack. Each valve outlet 52 must then be shut off, stopping fluid flow through the radiator 44, by rotating the valve head 54. The unions between the tailpiece outlets 48 and valve outlets 52 are preferably dealt with one at a time. The union nut 50 may be loosened so that the tailpiece outlet 48 becomes separate from the valve outlet 52, leaving a small gap (indicated generally at 58 on Figure 3). The elastomeric band 25 is able to be positioned over the end of the tailpiece outlet 48, whilst still attached to each of the small legs 24, 26 of the clamp 12. The clamp 12 may then be slackened to allow it to move along the radiator 44 to be further from the tailpiece outlet 48, thus biasing the elastomeric band 25 against the tailpiece outlet 48 to provide a seal to prevent water retained within the radiator 44 from leaking out of the tailpiece outlet 48 when the radiator 44 is moved. Alternatively, the band may be stretched over the valve outlet to achieve closure.

**[0047]** On a standard radiator, two closure apparatus 10 are required, one at each end of the radiator. It is preferred that such closure apparatus 10 are mirror images of each other (as shown in Figure 4) so that the bolt heads 40 are both on an accessible side of the radiator when the closure apparatus 10 are attached thereto. The same process as about is repeated for the second closure apparatus.

**[0048]** The invention provides a closure apparatus for a radiator outlet, which allows a thin seal to be formed at the end of the outlet without the radiator being required to be moved. This reduces the likelihood of leakage of water from the radiator, the closure apparatus provide for quick and simple removal of the seal so that the outlet may be reattached to its related pipework without any further leakage.

**[0049]** When replacing the radiator 44, it is first placed in position. The elastomeric band 25 may then be pulled away from the tailpiece outlet 48, either by stretching the band 25 or by slackening the band 25 by moving the clamp 12 towards the outlet 48. The union nut 50 is then able to be reattached to the valve outlet 52.

**[0050]** The sealing means has been described, according to one embodiment of the present invention, as a elastomeric band which may provide its own biasing to make a seal and also which may be biased by moving the clamps to which it is attached. However, the sealing means may also comprise a thin, rigid lamellar structure adapted to fit between the valve outlet of the pipework and the radiator tailpiece outlet and be held by a clamp such that the lamellar structure tightly abuts the radiator tailpiece outlet and forms a watertight seal therewith. The sealing means provided by either the elastomeric band or the lamellar structure is thin enough to fit between the valve outlet of the pipework and the radiator tailpiece outlet when the radiator is held on the wall, allowing the radiator tailpiece outlet to be sealed before moving the radiator.

**[0051]** It should also be appreciated that the clamp need not necessarily be in the form of a g-shaped clamp and also that it need not necessarily be attached to the bottom of the radiator. A closure apparatus is envisaged comprising a clamp that attaches to a side of the radiator adjacent the tailpiece outlet, the clamp having a threaded fitting which allows a seal member to be positioned in the gap between the valve outlet of the pipework and the tailpiece outlet and securely biased towards the tailpiece outlet to provide a seal therewith.

**[0052]** Another preferred embodiment of the present invention is illustrated in Figure 6. Figure 6 shows a g-clamp 12 as described with reference to Figure 1, attached to the bottom edge 56 of the radiator 44, as described with reference to Figure 4. However, in Figure 6, the closure apparatus 10 (sealing means not shown) has the additional feature of a drip tray 60. The drip tray 60 extends below the radiator 44 between the radiator 44 and the floor (not shown). The drip tray is firmly but releasably attached to the clamp 12 by means of spring clips 62 or an adjuster. When in position below the radiator 44 the drip tray 60 is able to catch any drips which may leak out of the outlet 48 before the seal is formed. The drip tray 60 may have the further function of bearing against the pipework 46 to make the gap 56 bigger by forcing the radiator 44 to which the clamp 12 and hence the drip tray 60 are attached away from the pipework 46.

**[0053]** A further preferred embodiment of the present invention is illustrated in Figure 7. The clamp 12 is the same as that shown in Figure 4 but with the addition of rubber feet 64 at the base of the clamp 12. Once the radiator 44 with the clamps 12 attached is removed from the wall, the radiator 44 may be placed on the floor 66, supported by the rubber feet 64. The presence of the feet 64 reduces the damage to soft floor coverings caused by the sharp edges of the radiator digging into the floor, especially with larger radiators.

**[0054]** A pipe closure apparatus in accordance with a yet further embodiment of the invention is shown in Figures 8, 9, 10 and 11. The pipe closure apparatus 70 comprises a g-type clamp 12. The clamp has two parallel side members 72 and 74. Side member 72 is substantially planar and faces side member 74 which is provided by an upright rod. Side members 72 and 74 extend substantially perpendicular from the same face of base plate 76.

**[0055]** A screw fastening 78 comprising a threaded shank 80 and a knob 82 passes through side member 72 and is connected at the end thereof to supporting body 84.

**[0056]** Rod 86 passes through supporting body 84 and supports the sealing means 88. The sealing means 88 comprises a fork-like head 90 attached to the end of rod 86 by means of a screw 92. Rod 86 can slide through body 84 in the direction indicated by arrow A (Figure 9). Rod 86 and hence sealing means 90 is locked in a fixed position by means of a pinch bolt 94.

**[0057]** Sealing means 88 further comprises a band of

elastomeric material 96 (shown in dashed lines only in Figure 10) stretched over the fingers 98 of the fork-like head 90.

**[0058]** In use, the clamp is placed about the radiator 100 such that side member 74 is behind the radiator 100, side member 72 is in front of the radiator 100 and base plate 76 extends underneath the radiator. The screw fastening 78 is turned using knob 82 to move the supporting body 84 towards the front of the radiator 100. The knob 82 should be turned until the supporting body 84 is in contact with the radiator 100 and the radiator 100 is firmly gripped between the side members 72 and 74 of the clamp 70.

**[0059]** Moving the supporting body 84 causes movement of the rod 86 and sealing means 88. Whilst the clamp 70 is being put in place the fork-like head 90 should be arranged for instance in a substantially vertical position so as not to interfere with the undoing of the tailpiece, as shown by the dashed lines in Figure 10. Once the valve outlet 102 of the water pipe 104 (Figure 11) has been released from the radiator tailpiece outlet 106, the rod 86 can be rotated within the supporting body 84 such that the fork-like head 90 is arranged with a finger 98 thereof located either side of the tailpiece outlet 106. In this orientation the elastomeric band 96 extends across the tailpiece outlet 106.

**[0060]** The rod 86 can now be moved sideways such that the elastomeric material 96 contacts firmly the tailpiece outlet 106 and thereby seals the outlet 106. The rod 86 can then be fixed in position by means of the pinch bolt 94 and thereby maintain the seal.

**[0061]** Figures 12 and 13 illustrate an alternative embodiment of a pipe closure apparatus 110 in accordance with the invention.

**[0062]** The apparatus 110 comprises a clamp comprising a side member 112 which is substantially parallel to a side member 114, the side members being separated by a base plate 116 from which they extend substantially perpendicular thereto.

**[0063]** A clamping screw 118 extends through side member 112 and comprises a contact surface 120 on the end thereof.

**[0064]** The apparatus 110 further comprises sealing means 122 comprising a rod 124, a fork-like head 126 and a band of elastomeric material 128. The rod 124 passes through the base plate 116 and is arranged to be moveable in the direction illustrated by Arrow B. Pinch bolt 130 is provided to releasably fix rod 124 and hence sealing means 122 in a desired position relative to the clamp. The shank of pinch bolt 130 passes through side member 112 and base plate 116 to contact the rod 124.

**[0065]** In use, the clamp is placed around radiator 100 such that the side member 114 is located behind the radiator 100, side member 112 is located in front of the radiator 100 and base plate 116 extends underneath the radiator 100. The clamping screw 118 is turned until the contact surface 120 contacts the radiator 100 and the

apparatus 110 is firmly clamped to the radiator 100.

**[0066]** The rod 124 is then rotated about its longitudinal axis such that a finger 132 of the fork-like head 126 is located either side of the radiator tailpiece outlet 106. The rod is then moved longitudinally such that the elastomeric band 128 is firmly in contact with the outlet 106. The rod, and thereby the sealing means, is held in place by tightening the pinch bolt 130.

**[0067]** Figure 14 illustrates a spacing means 140 which can be used with some embodiments of a pipe closure apparatus in accordance with the present invention, in particular those embodiments disclosed in Figures 9-13.

**[0068]** The spacing means 140, comprises a body having a channel 142 of substantially rectangular cross-section cut in opposing sides of the body 140. The depths of the channels are not the same.

**[0069]** Figure 15 illustrates the spacing means 140 of Figure 14 in use on the apparatus 70 of Figure 8. The spacing means 140 is fitted onto the supporting body 84 to reduce the distance between the supporting body 84 and the side member 74. Because the channels 142 of the spacing member 140 are of different depths, the space between the supporting body 84 and the side member 74 can be varied by different amounts.

**[0070]** Use of the spacing member 140 with the apparatus 70 allows the apparatus to be used with radiators of various thickness and allow the radiator tailpiece outlet to be located substantially in the centre of the elastomeric band 96 of the sealing means 88 when in use.

**[0071]** The spacing means 140 is suitably comprised of a resilient material. Preferably an elastomeric material.

## Claims

1. A pipe closure apparatus (10) for sealing a radiator tailpiece outlet (48) adjacent an object (52) to prevent fluid flow from the radiator tailpiece outlet (48), the pipe closure apparatus (10) comprising sealing means (25, 122, 128) adapted to fit in the gap between the radiator tailpiece outlet (48) and the adjacent object to abut the radiator tailpiece outlet (48), and biasing means (12) adapted to hold the sealing means (25, 122, 128) in engaged sealing engagement with the radiator tailpiece outlet (48) wherein the sealing means (25, 122, 128) is supported by an anchor (12) for engaging a radiator.
2. Apparatus according to Claim 1, wherein the sealing means (25, 122, 128) is less than 10mm thick.
3. Apparatus according to Claim 1 or Claim 2, wherein the sealing means (25, 122, 128) comprises its own biasing means.
4. Apparatus in accordance with any one of the pre-

ceding claims, wherein the sealing means (122, 128) comprising a rod (124) having a fork-like head (126) attached to an end thereof, which fork-like head (126) comprises two fingers spaced apart from one another and an elastomeric band (128) stretched between the two fingers of the fork-like head (126).

5. A method of sealing an outlet of a radiator tailpiece outlet to prevent fluid flow therefrom using pipe closure apparatus in accordance with any preceding claim, the method comprising the steps of inserting the sealing means (25, 122, 128) into a gap between the radiator tailpipe outlet (48) and the another object (52) and biasing the sealing means (25, 122, 128) into sealing engagement with the radiator tailpipe outlet (48) to prevent fluid flow therefrom.

#### Patentansprüche

1. Rohrverschlussvorrichtung (10) zum Abdichten eines Radiator-Endstück-Auslasses (48) angrenzend an ein Objekt (52), um einen Fluidfluss von dem Radiator-Endstück-Auslass (48) zu verhindern, wobei die Rohrverschlussvorrichtung (10) eine Dichteinrichtung (25, 122, 128), angepasst so, um in den Spalt zwischen dem Radiator-Endstück-Auslass (48) und dem angrenzenden Objekt zu passen, um an den Radiator-Endstück-Auslass (48) anzustoßen, und eine Vorspanneinrichtung (12), angepasst so, um die Dichteinrichtung (25, 122, 128) in einen in Eingriff gebrachten, dichten den Eingriff mit dem Radiator-Endstück-Auslass (48) zu halten, aufweist, wobei die Dichteinrichtung (25, 122, 128) durch einen Anker (12) für ein Eingreifen in einen Radiator gehalten ist.
2. Vorrichtung nach Anspruch 1, wobei die Dichteinrichtung (25, 122, 128) weniger als 10 mm dick ist.
3. Vorrichtung nach Anspruch 1 oder Anspruch 2, wobei die Dichteinrichtung (25, 122, 128) deren eigene Vorspanneinrichtung aufweist.
4. Vorrichtung nach einem der vorhergehenden Ansprüche, wobei die Dichteinrichtung (122, 128) eine Stange (124) aufweist, die einen gabelähnlichen Kopf (126) besitzt, befestigt an einem Ende davon, wobei der gabelähnliche Kopf (126) zwei Finger, voneinander beabstandet, und ein elastomeres Band (128), gedehnt zwischen den zwei Fingern des gabelähnlichen Kopfs (126), aufweist.
5. Verfahren zum Dichten eines Auslasses eines Radiator-Endstück-Auslasses, um eine Fluidströmung davon unter Verwendung einer Rohrverschlussvor-

richtung zu verhindern, gemäß einem vorhergehenden Anspruch, wobei das Verfahren die Schritte eines Einsetzens der Dichteinrichtung (25, 122, 128) in einen Spalt zwischen dem Radiator-Endstück-Auslass (48) und dem anderen Objekt (52) und Vorspannen der Dichteinrichtung (25, 122, 128) in einen dichtenden Eingriff mit dem Radiator-Endstück-Auslass (48), um eine Fluidströmung davon zu verhindern, aufweist.

#### Revendications

1. Dispositif de fermeture de tuyau (10) pour obturer un about de sortie de radiateur (48) adjacent à un objet (52) afin d'empêcher un écoulement de fluide par l'about de sortie de radiateur (48), le dispositif de fermeture de tuyau (10) comprenant un moyen d'obturation (25, 122, 128) adapté pour se loger dans l'interstice entre l'about de sortie de radiateur (48) et l'objet adjacent en étant abouté contre l'about de sortie de radiateur (48), et un moyen de rappel (12) adapté pour tenir le moyen d'obturation (25, 122, 128) engagé en contact d'obturation avec l'about de sortie de radiateur (48), dans lequel le moyen d'obturation (25, 122, 128) est porté par une bride d'ancrage (12) pour être engagé avec un radiateur.
2. Dispositif selon la revendication 1, dans lequel le moyen d'obturation (25, 122, 128) a une épaisseur inférieure à 10 mm.
3. Dispositif selon la revendication 1 ou 2, dans lequel le moyen d'obturation (25, 122, 128) comprend son propre moyen de rappel.
4. Dispositif selon l'une quelconque des revendications précédentes, dans lequel le moyen d'obturation (122, 128) comprend une barre (124) ayant une tête fourchue (126) attachée à une de ses extrémités, laquelle tête fourchue (126) comprend deux doigts espacés l'un de l'autre et une bande élastomère (128) étirée entre les deux doigts de la tête fourchue (126).
5. Procédé d'obturation d'un about de sortie de radiateur pour empêcher un écoulement de fluide par celui-ci en utilisant un dispositif de fermeture de tuyau selon l'une quelconque des revendications précédentes, le procédé comprenant les étapes consistant à insérer le moyen d'obturation (25, 122, 128) dans un interstice entre l'about de sortie de radiateur (48) et l'objet (52) et à rappeler le moyen d'obturation (25, 122, 128) en contact d'obturation avec l'about de sortie de radiateur (48) afin d'empêcher un écoulement de fluide à ce niveau.

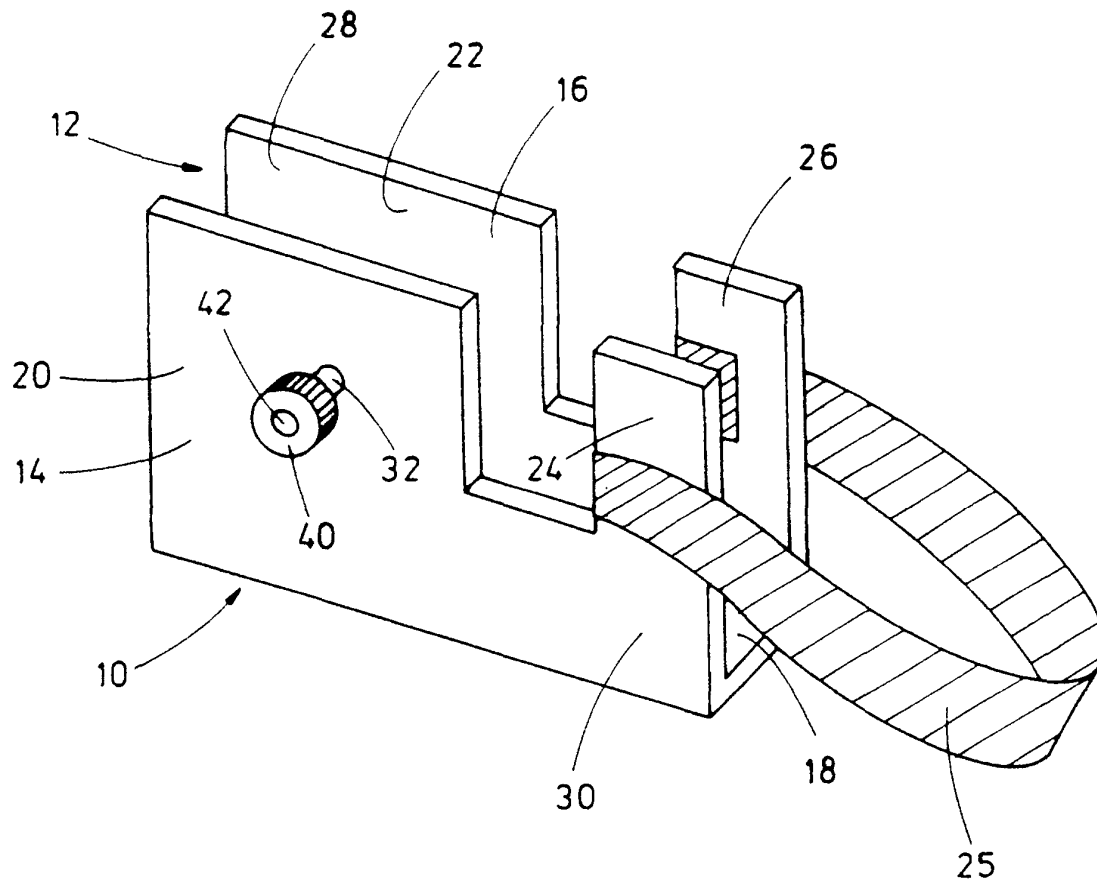


FIG. 1

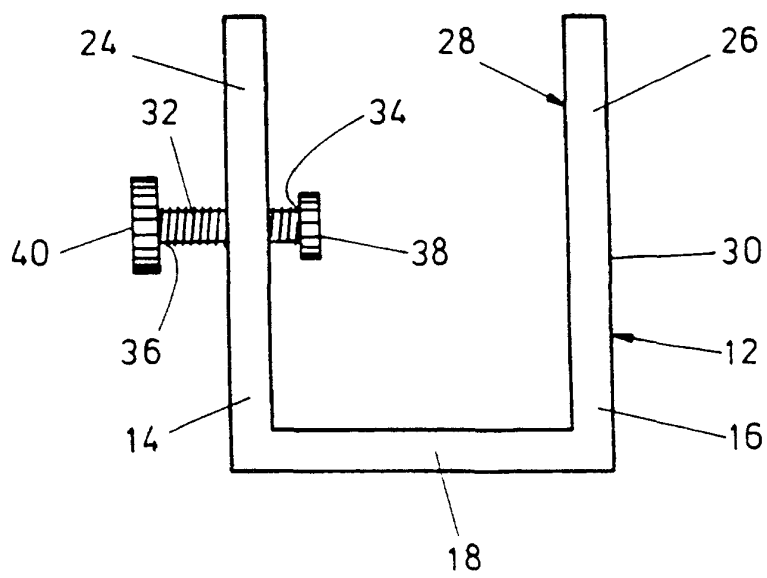


FIG. 2



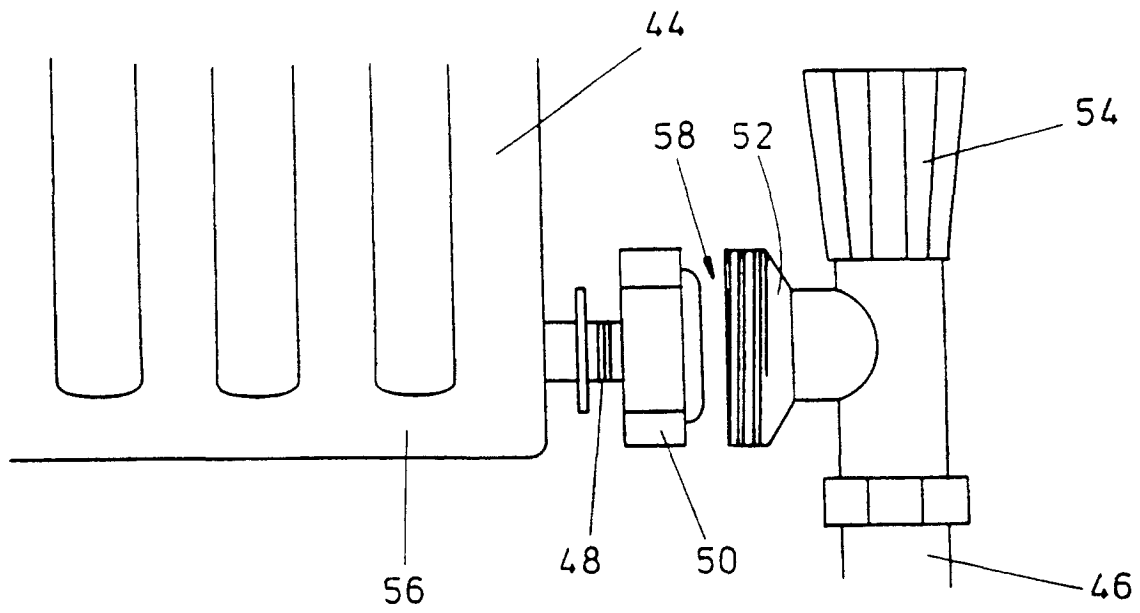


FIG. 3

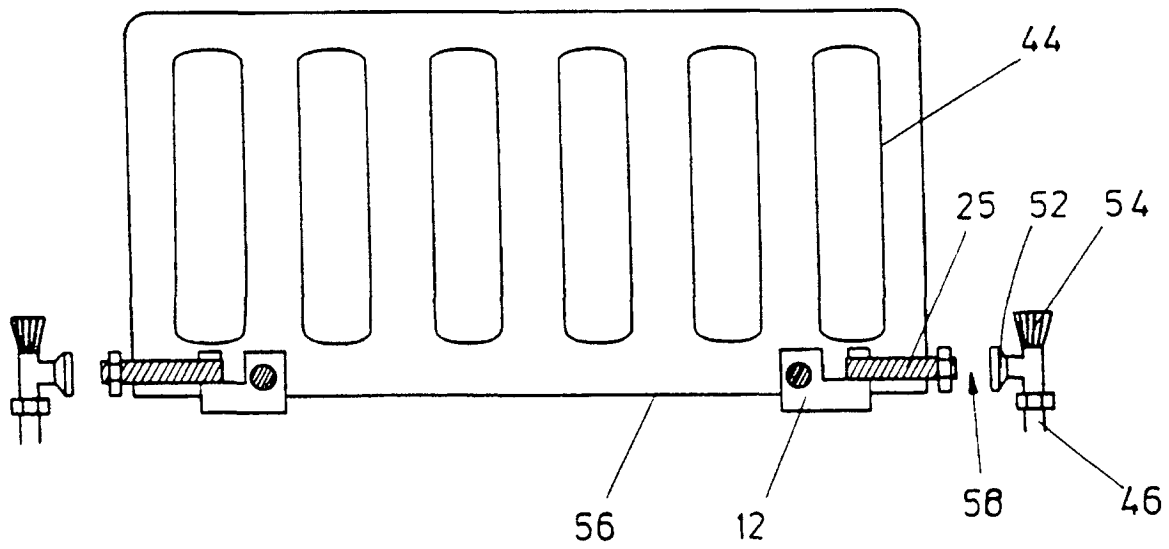


FIG. 4

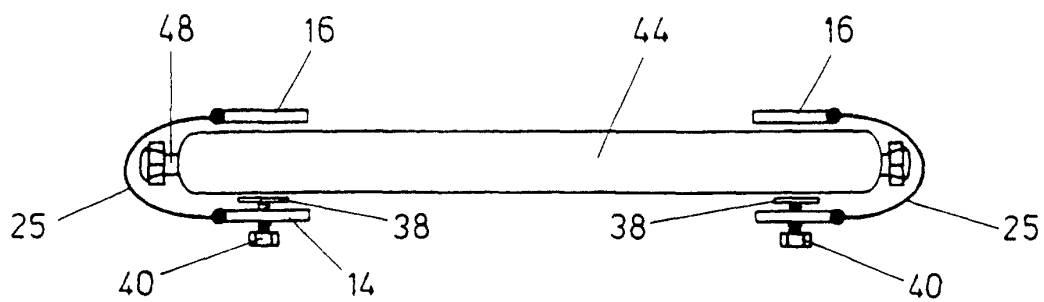


FIG. 5

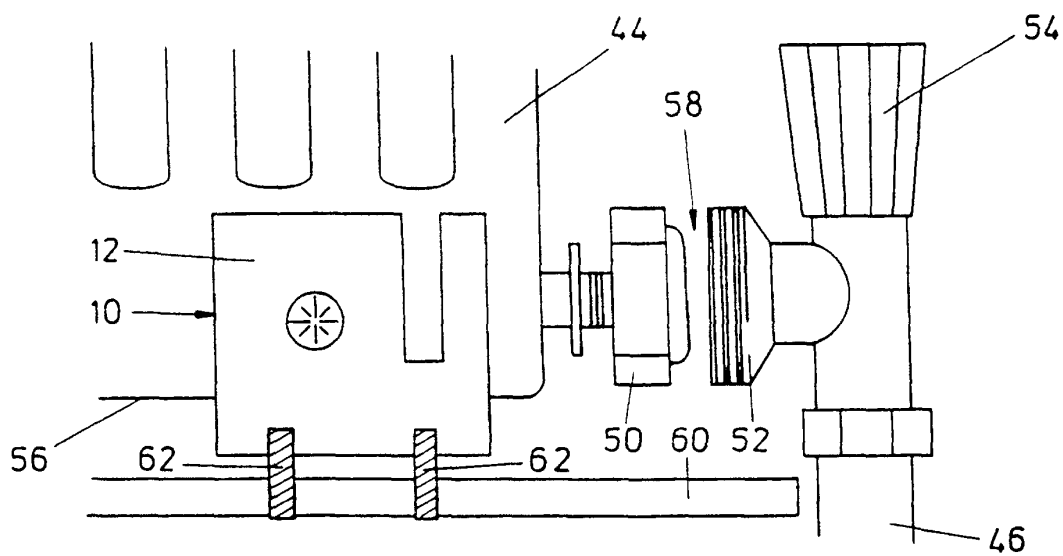


FIG. 6

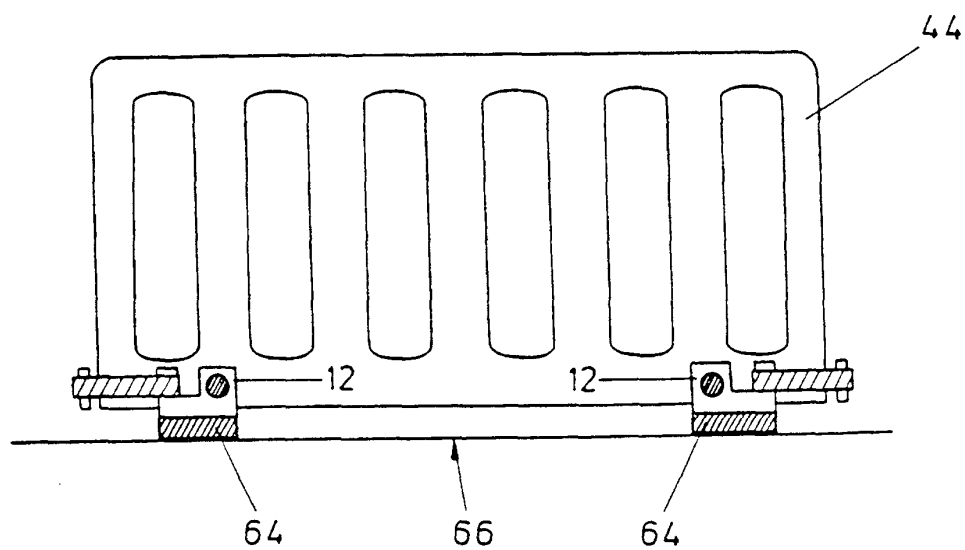
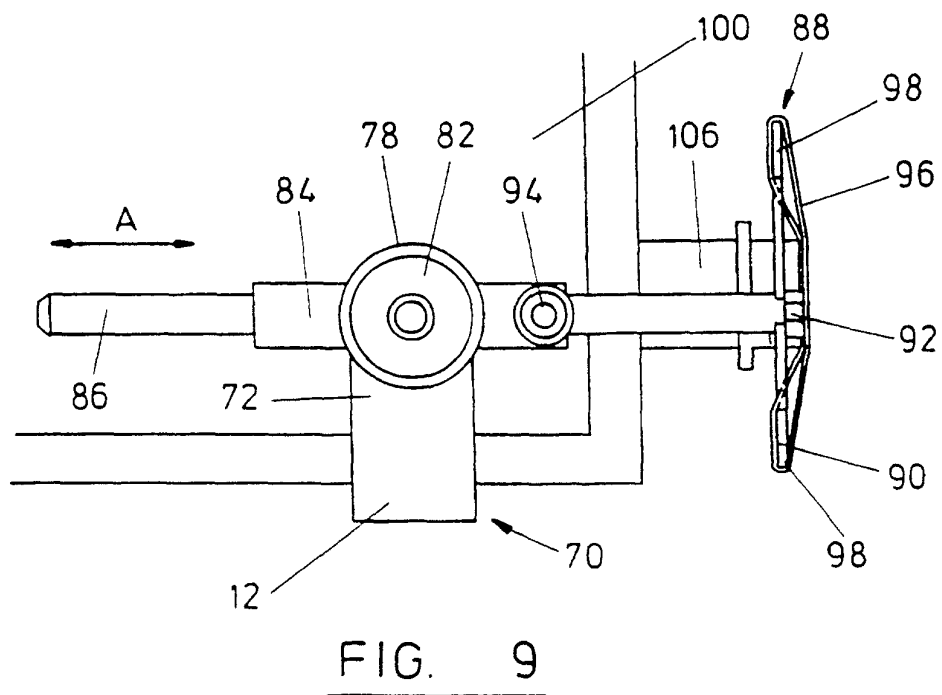
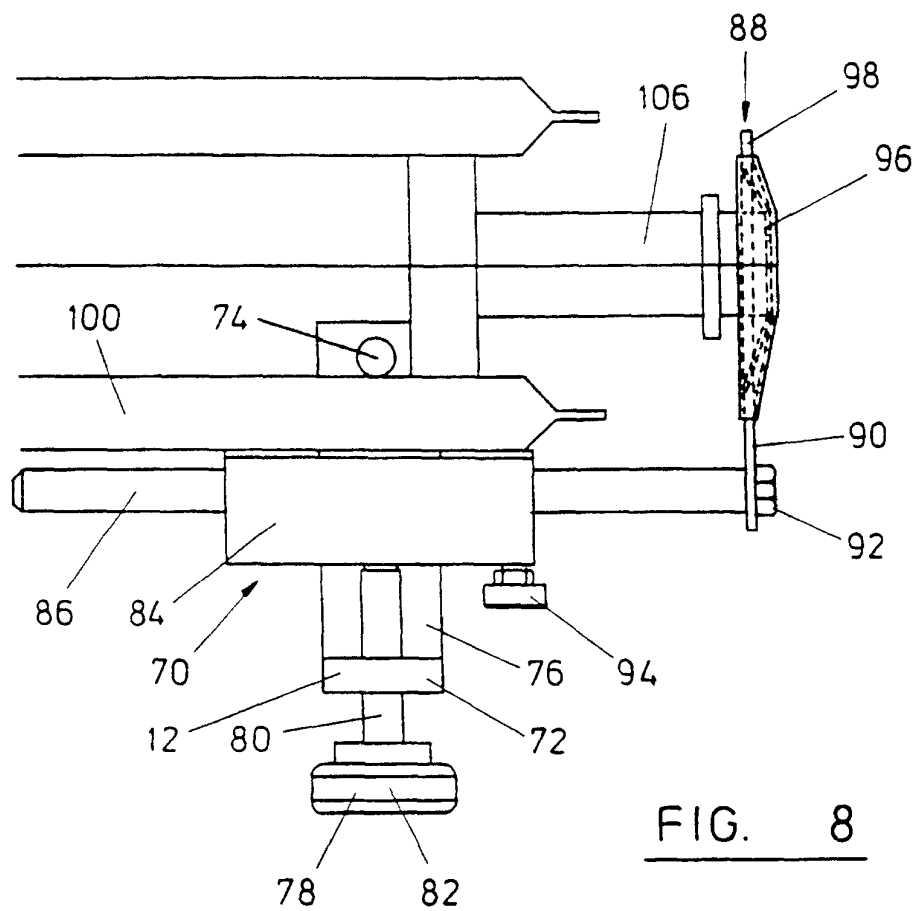


FIG. 7



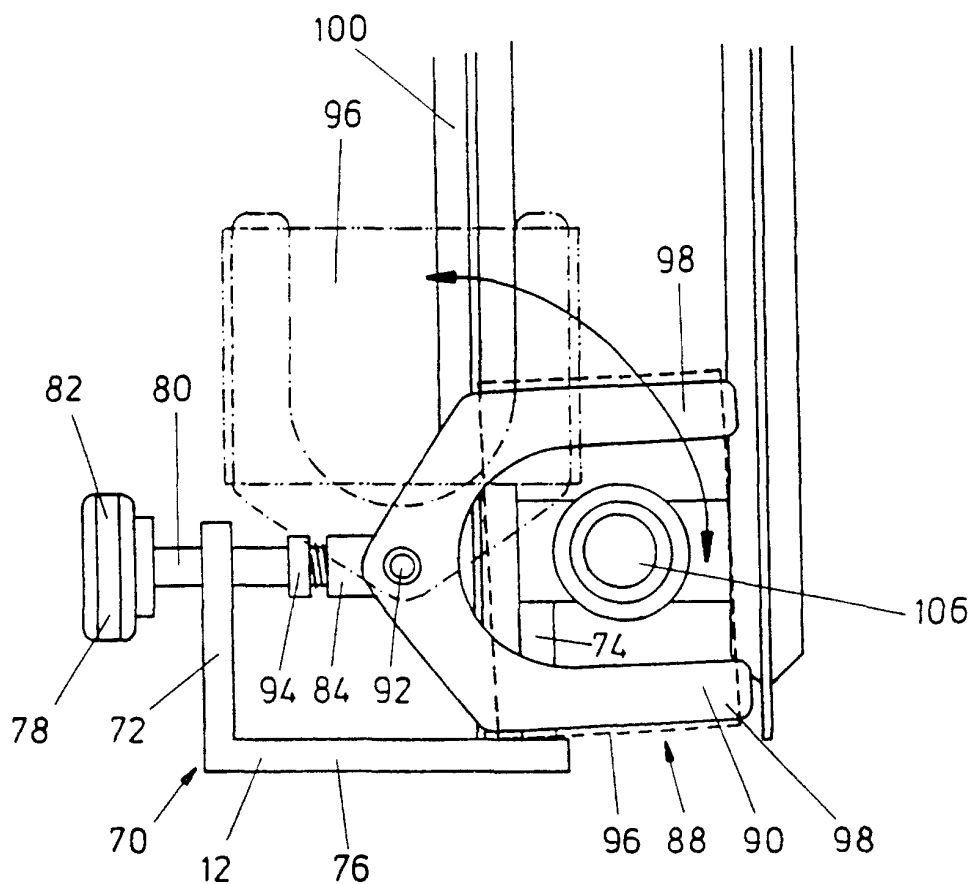


FIG. 10

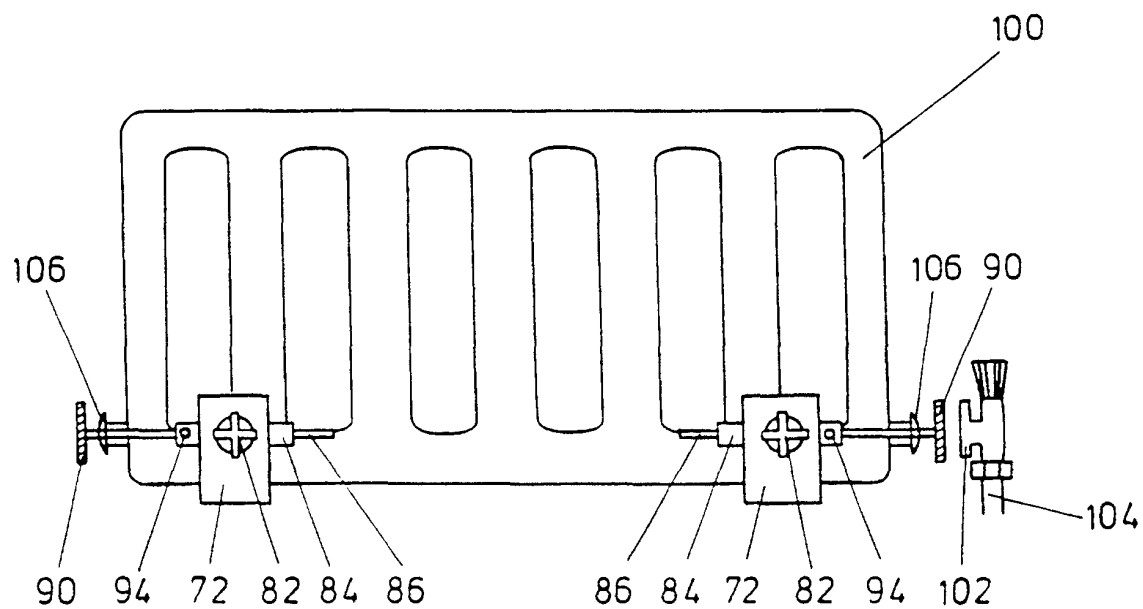


FIG. 11

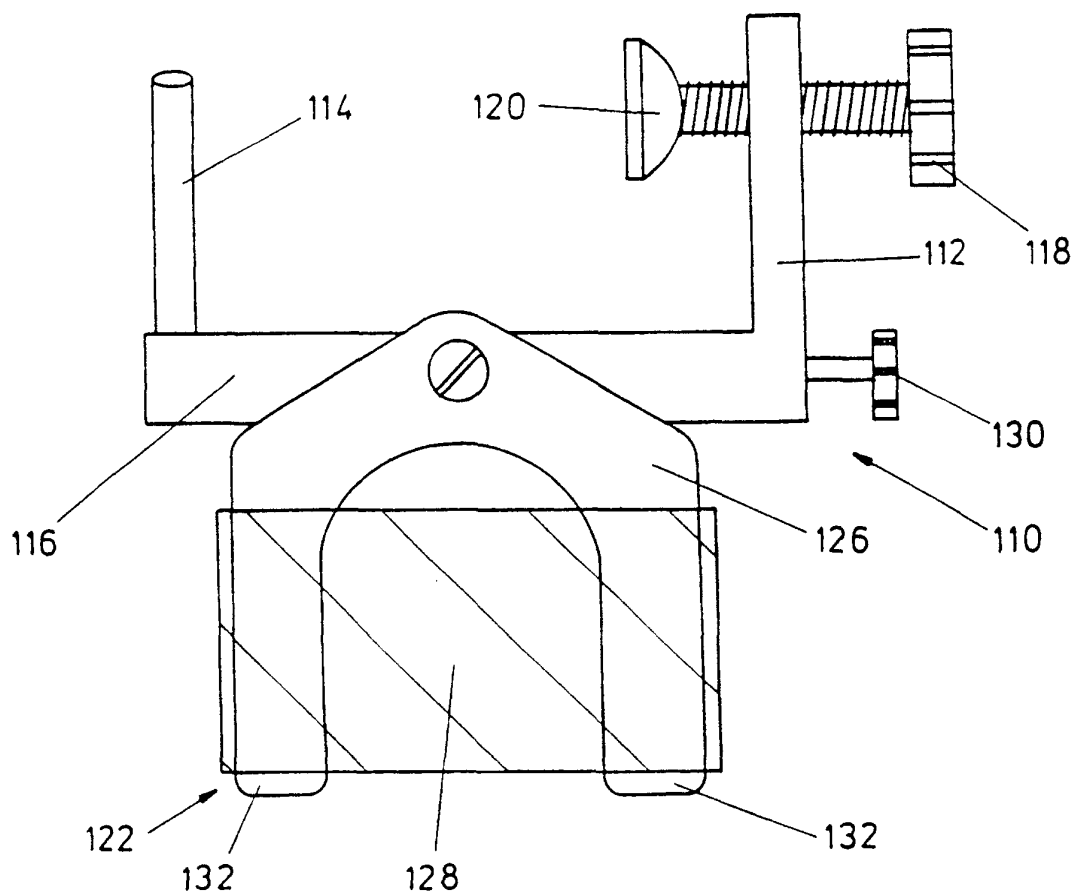


FIG. 12

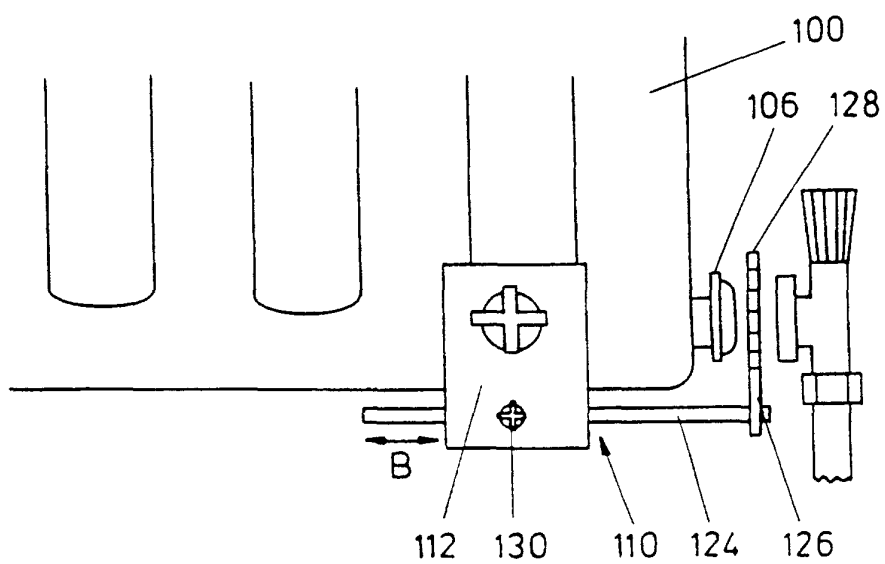


FIG. 13

