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(54) **Mounting device for a radiator comprising at least one tube.**

(57) A mounting device for a radiator comprising at least one tube, which mounting device comprises a base part to be fixed to a wall and a clamping part to be detachably connected to the base part. The clamping

part is provided with a clamping strap which extends around the tube in use, the ends of which clamping strap can be connected with one another.

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Description

[0001] The invention relates to a mounting device for a radiator comprising at least one tube, which mounting device comprises a base part to be fixed to a wall and a clamping part to be detachably connected to the base part, which clamping part can be clamped to the tube in use on a side remote from the base part.

[0002] With such a mounting device, as known from European patent application EP-A2-1 003 001, the clamping part comprises two shaped parts to be positioned on either side between two tubes of a radiator. The shaped parts each have a contour designed to conform to the diameter of the tubes of the radiator as well as to the spacing between said tubes. The two shaped parts are interconnected by means of a sleeve. The sleeve can then be detachably connected to the base part. A drawback of the known mounting device is the fact that the contour of the moulded parts must be adapted in dependence on the diameter of the tubes and the spacing between the tubes of the radiator. This renders the mounting device unsuitable for mounting radiators comprising tubes having mutually different diameters, with different spacings between said tubes.

[0003] The object of the invention is to provide a mounting device by means of which a radiator comprising at least one tube can be mounted to a wall in a simple manner, which mounting device obviates the drawbacks of the known mounting device.

[0004] This object is accomplished with the mounting device according to the invention in that the clamping part is provided with a clamping strap which extends around the tube in use, the ends of which clamping strap can be connected with one another.

[0005] Since the clamping strap is to be fitted round a single tube, the mounting device does not depend on the spacing between two tubes positioned adjacently to each other. In addition, the clamping strap can be arranged round a tube in a simple manner, irrespective of the diameter and the shape thereof. This makes it possible to use the mounting device with a large variety of radiators, with the clamping strap extending round the tube readily adjusting to the shape of the tube.

[0006] It is noted that from DT-A1-24.36.331 there is known a mounting device which comprises a strap which is passed round a column placed on a supporting surface. The strap ends are fixedly connected to a stud bolt. A clamping piece, which is movable with respect to said stud bolt, is pressed against a part of the radiator with a side remote from said strap. The strap will engage the column more loosely when the clamping piece is pressed against the radiator. Since the strap is fixedly connected to the stud bolt with both ends, it is moreover not possible to position the strap round a tube of the radiator, since such a tube is connected to other parts of the radiator with both ends.

[0007] One embodiment of the mounting device according to the invention is characterized in that the

clamping strap comprises a circular central portion, strap portions extending on either side of said central portion and ends connected to said strap portions on a side remote from said central portion.

[0008] The circular shape of the central portion enables easy positioning of the clamping strap round the tube, after which the ends of the strap that are connected to the strap portions on the side remote from the central portion can be interconnected.

[0009] Another embodiment of the mounting device according to the invention is characterized in that said ends can be moved towards each other against spring force.

[0010] In an unloaded position of the clamping strap, the ends thereof are positioned some distance apart, which enables easy fitting of the clamping strap round the tube. When subsequently in the ends are moved towards each other against spring force, the clamping strap is pulled round the tube.

[0011] Yet another embodiment of the mounting device according to the invention is characterized in that the ends of the clamping strap are provided with interlocking parts.

[0012] In this way a solid connection between the ends of the clamping strap is realised.

[0013] Yet another embodiment of the mounting device according to the invention is characterized in that each end of the clamping strap is provided with an opening, said openings being coaxial in the interconnected position of said ends, and a fastening element extends through said openings.

[0014] The ends can be interconnected in a simple manner by means of said fastening element.

[0015] Yet another embodiment of the mounting device according to the invention is characterized in that the clamping part comprises a sleeve to be connected to the base part, in which the ends of the clamping strap can be fixed by means of said fastening element.

[0016] The ends of the clamping strap can be interconnected in a simple manner by means of said sleeve and be drawn into the sleeve in a direction away from the tube, so that the clamping strap is pulled tightly round the tube.

[0017] The invention will now be explained in more detail with reference to the drawings, in which:

Fig. 1 is an exploded perspective view of a mounting device according to the invention;

Figs. 2A and 2B are perspective views of a clamping strap of the mounting device that is shown in Fig. 1, showing said clamping strap in an open position and in a closed position, respectively;

Fig. 3 is a perspective view of a mounting device according to the invention in assembled condition; Fig. 4 is a perspective view of the mounting device according to the invention with a tube attached thereto;

Figs. 5-8 are perspective views that shows the way

in which the clamping part of the mounting device according to the invention is attached to a radiator; Fig. 9 is a perspective view that shows the way in which base parts of mounting devices according to the invention are fixed to a wall;

Fig. 10 is a side view of the radiator mounted to a wall by means of mounting devices according to the invention; and

Fig. 11 is a top plan view of the wall-mounted radiator of Fig. 10.

[0018] Like parts are indicated by the same numerals in the figures.

[0019] Fig. 1 shows a mounting device 1 according to the invention, which comprises a tubular base part 2, which is provided with a horizontally extending, slotted opening 4 at one end. The tubular base part 2 is provided with circular recesses 5 at an end remote from the opening 4. The tubular base part 2 is provided with a threaded passage 6 between the circular recesses 5 and the opening 4. The base part 2 can be fixed to a wall W by means of a screw 8, which is to be screwed into a plug 7. A head 9 of the screw 8 is positioned in the base part 2, and the screw 8 extends through the opening 4.

[0020] The mounting device 1 furthermore comprises a clamping part 3, which comprises a tubular sleeve 10 that can be slid into the tubular base part 2 as well has a clamping strap 11 that can be positioned in said tubular sleeve 10. The sleeve 10 comprises a plate 12 provided with an opening 13 on a side facing towards the base part 2 (see Fig. 7). The sleeve 10 is provided with circular recesses 14 on sides facing towards the clamping strap 11. Said circular recesses 14 extend parallel to the circular recesses 5. As is clearly shown in Figs. 2A and 2B, the clamping strap 11 comprises a circular central portion 15, strap portions 16, 17 extending on either side of the central portion 15, and ends 18, 19 connected to the strap portions 16, 17 on a side remote from the central portion 15. The ends 18, 19 extend substantially transversely to the strap portions 16, 17. The strap portions 16, 17 can be moved towards each other against spring force from the open position that is shown in Fig. 2A to the closed position that is shown in Fig. 2B. In the closed position, the end 19 abuts against the end 18 on a side remote from the central portion 15. The end 19 is provided with an opening 20, which is bounded by an annular flange 21. In the position that is shown in Fig. 2B, the flange 21 is positioned in an opening 22 present in the end 18. The end 18 is provided with a square nut 23 on a side facing towards the central portion 15, an opening 24 of which nut is coaxial with the openings 20 and 22 in the ends 19 and 18 in the closed position that is shown in Fig. 2B.

[0021] The clamping part 3 furthermore comprises a bolt 26, which can be positioned in the plate 12 of the sleeve 10, through the opening 13, from a side remote from the clamping strap 11, and which can be brought

into engagement with the nut 23 of the clamping strap 11. The ends 18, 19 and the strap portions 16, 17 connected thereto are pulled into the sleeve 10 in the direction indicated by the arrow P1 by screwing the bolt 26 into the nut 23. As a result, the strap portions 16, 17 come to abut against the side walls 28, 29 of the sleeve 10, which extend parallel to each other, and the central portion 15 is tightened round a tube in use. Once the clamping strap 11 has been connected to the sleeve 10, the sleeve 10 is moved into the base part 2 in the direction indicated by the arrow P1, after which the sleeve 10 is fixed in position with respect to the base part 2 by means of a nut 30 that is to be fitted through the opening 6. The assembled mounting device 1 is shown in Fig. 3. Fig. 4 is a view of the mounting device 1 in assembled condition, from which the screw 8 has been left out for the sake of clarity. A tube 31 of a radiator 32 is now present in the space bounded by the circular central portion 15, which tube is firmly enclosed by the clamping strap 11 and connected to the sleeve 10. The circular recesses 14 abut against the outer side of the tube 31 in this position. If the tube 31 has a relatively small diameter, for example 20 mm, the portions of the circular central portion 15 adjacent to the strap portions 16, 17 will be pulled into the sleeve 10 as well when the nut 23 is being moved into the sleeve 10 in the direction indicated by the arrow P1 by means of the bolt 23. If the diameter of the tube 31 is relatively large, for example 30 mm, practically the entire central portion will surround the tube 31. The shape of the circular recesses 14 is preferably adapted to correspond to the diameter of the largest tube that can be mounted by means of the mounting device 1.

[0022] Now the mounting of a radiator 32 to a wall W by means of mounting devices 1 according to the invention will be explained in more detail with reference to Figs. 5-11.

[0023] Fig. 5 shows a radiator 32 comprising a number of tubes 31 extending parallel to each other. The radiator 32 is preferably mounted on a wall W by means of a number of mounting devices 1, e.g. four mounting devices 1, according to the invention. To that end, the clamping strap 11 of each mounting device 1 is positioned opposite a tube 31 of the radiator 32 in the open position that is shown in Fig. 2A, in such a manner that the clamping strap 11 can be moved round the tube 31 via an opening 34 present between the ends 18, 19. The clamping strap 11 is then rotated round the tube 31, in the direction indicated by the arrow P2, to the position that is shown in Fig. 5. Following that, the ends 18, 19 are moved towards each other, in the directions indicated by the arrows P3, P4, against the spring force of the clamping strap 11, causing the clamping strap 11 to move from the open position to the closed position (Fig. 6).

[0024] Following that, the sleeve 10 is slid over the strap portions 16, 17 of the clamping strap 11, after which the bolt 26 is passed through the opening 13 in

the plate 12 of the sleeve 10 into the aligned openings 20, 22 and 24 of the end 19, the end 18 and the nuts 23, respectively. By tightening the bolt 26, the ends 18, 19 are pulled in the direction of the plate 12 of the sleeve 10, with the strap portions 16, 17 connected to the ends 18, 19 likewise being pulled into the sleeve 10 and the central portion 15 being pulled tightly round the tube 31. The bolt 26 is tightened until further movement of the ends 18, 19 in the direction indicated by the arrow P1 is no longer possible. At that point the tube 31 is firmly connected to the clamping part 3 (see Fig. 7). This procedure is repeated until a desired number of clamping parts 3, e.g. four clamping parts 3, are attached to the radiator 32.

[0025] An equal number of base parts 2 are fixed to a wall W before, at the same time or after attachment of the clamping parts 3 to the radiator 32. To that end, a hole 35 is bored into the wall W, into which the plug 7 is inserted. Then the slotted opening 4 is positioned opposite the hole 35 and the screw 8 is screwed through the opening 4 into the plug 7 that has been inserted into the hole 35. The slotted configuration of the opening 4 makes it possible to adjust the base part 2 in horizontal direction.

[0026] Subsequently, the clamping parts 3 are moved into the base parts 2 and fixed in a desired position with respect to the base parts 2 (Fig. 10, Fig. 11) by means of a bolt 30 that is to be passed through the opening 6.

[0027] Fig. 10 is a side view of a radiator 32 that has been mounted to a wall W by means of mounting devices 1 according to the invention. Since the clamping strap 11 can be fitted round a tube 31 at practically any position, a desired spacing H between two mounting devices 1 positioned above each other can be realised in a simple manner. Since the sleeve 10 can be moved into and out of the base part 2, the spacing A between the radiator 32 and a wall W can be adjusted in a simple manner, and a correct mounted position of the radiator 32 can be obtained even if the wall W is not completely level.

[0028] Since the clamping strap 11 can be fitted round any tube 31 of the radiator 32, the spacing B between two mounting devices 1 positioned beside each other can be realised in a simple manner (Fig. 11).

[0029] Instead of using a square nut 24 it is also possible to provide the ends 18, 19 with threaded openings.

[0030] It is also possible to connect the sleeve 10 to the base part 2 by means of springs, which makes it possible in a simple manner to offset any changes in the dimensions B, H caused by expansion of the radiator upon heating thereof. The components of the mounting device 1 may be made of a metal or of a plastic material. The components of the mounting device 1 can easily be made in the same colour as a radiator. It is also possible, of course, to mount other types of pipes or tubes to a wall by means of the present mounting device.

[0031] It is also possible to provide the base part 2 with a recess near the opening 4, in which recess an insulating plate can be placed, thus preventing any di-

rect contact between the wall W and the radiator 32, so that any noise occurring in the radiator 32 will not be transmitted to the wall W and be amplified in the wall.

Claims

1. A mounting device for a radiator comprising at least one tube, which mounting device comprises a base part to be fixed to a wall and a clamping part to be detachably connected to the base part, which clamping part can be clamped to the tube in use on a side remote from the base part, **characterized in that** the clamping part is provided with a clamping strap which extends around the tube in use, the ends of which clamping strap can be connected with one another.
2. A mounting device according to claim 1, **characterized in that** the clamping strap comprises a circular central portion, strap portions extending on either side of said central portion and ends connected to said strap portions on a side remote from said central portion.
3. A mounting device according to claim 1 or 2, **characterized in that** said ends can be moved towards each other against spring force.
4. A mounting device according to any one of the preceding claims, **characterized in that** the ends of the clamping strap are provided with interlocking parts.
5. A mounting device according to any one of the preceding claims, **characterized in that** each end of the clamping strap is provided with an opening, said openings being coaxial in the interconnected position of said ends, and a fastening element extends through said openings.
6. A mounting device according to claim 5, **characterized in that** the clamping part comprises a sleeve to be connected to the base part, in which the ends of the clamping strap can be fixed by means of said fastening element.
7. A mounting device according to claim 5 or 6, **characterized in that** said fastening element is a bolt.
8. A mounting device according to claim 7, **characterized in that** at least one end is provided with a nut that mates with said bolt.
9. A mounting device according to claim 6, **characterized in that** said sleeve comprises at least two side walls extending parallel to each other, with strap portions connected to the ends of the clamping

strap extending substantially parallel to said side walls in use.

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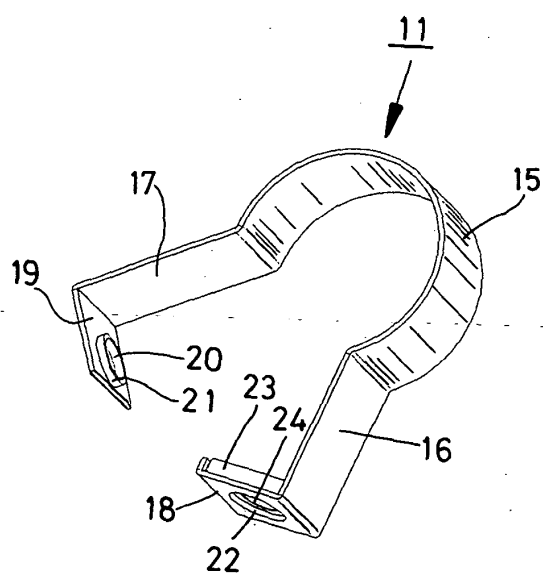
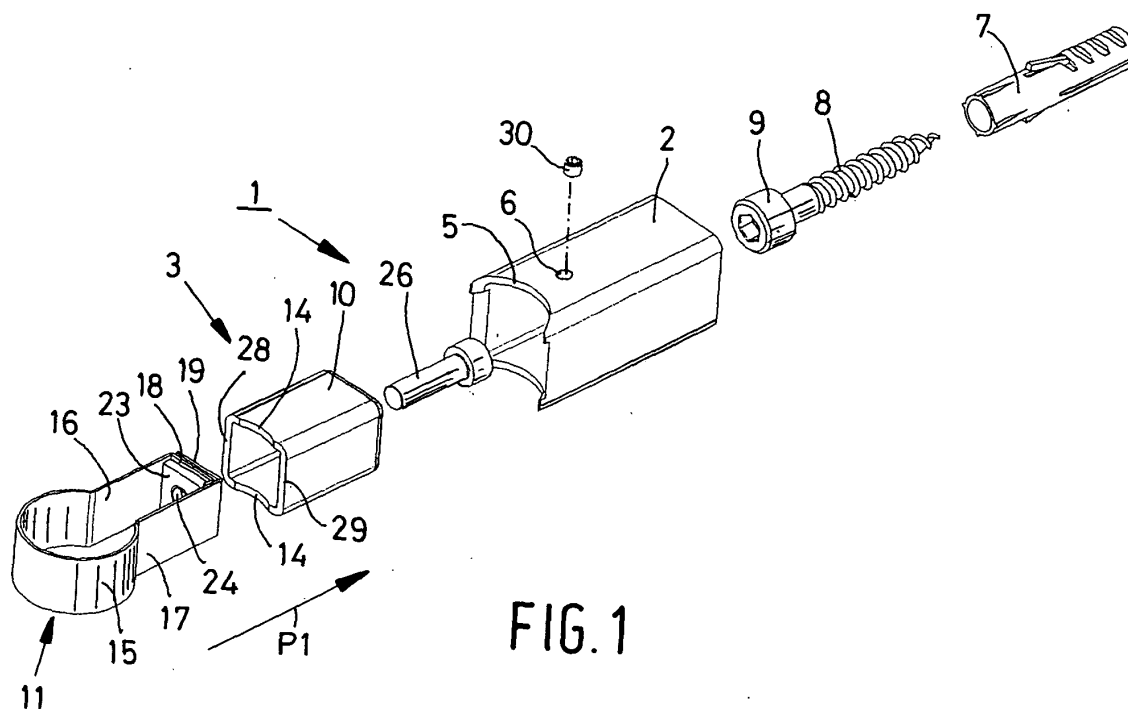


FIG. 2A

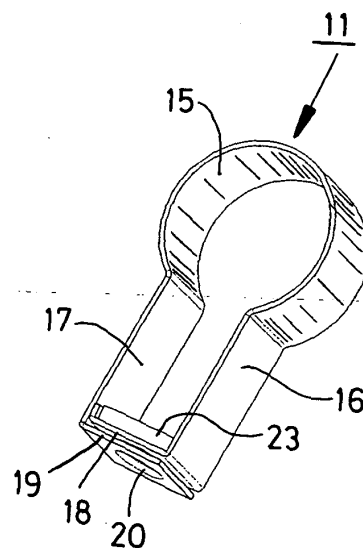


FIG. 2B

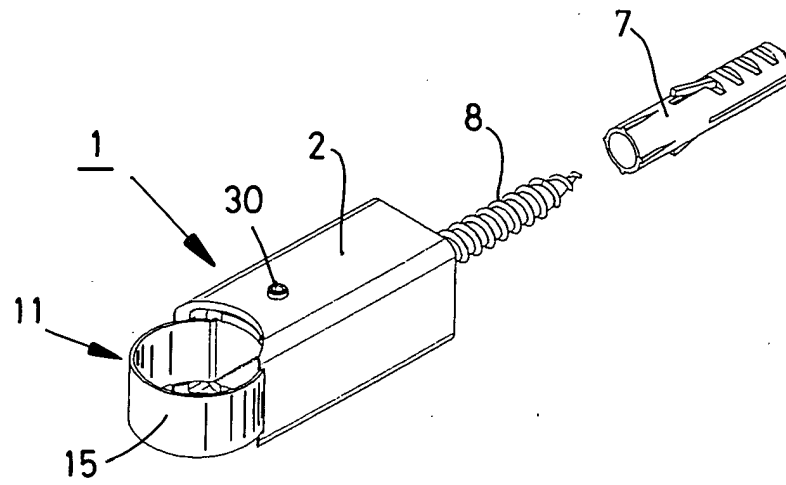


FIG. 3

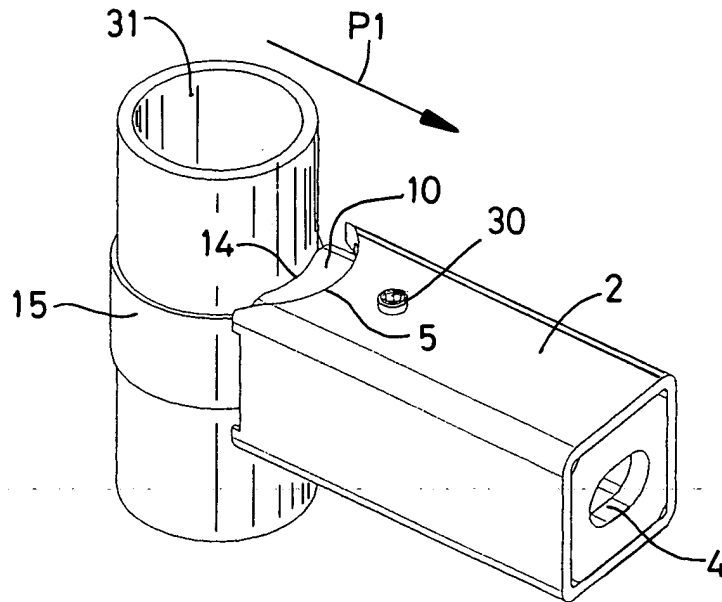


FIG. 4

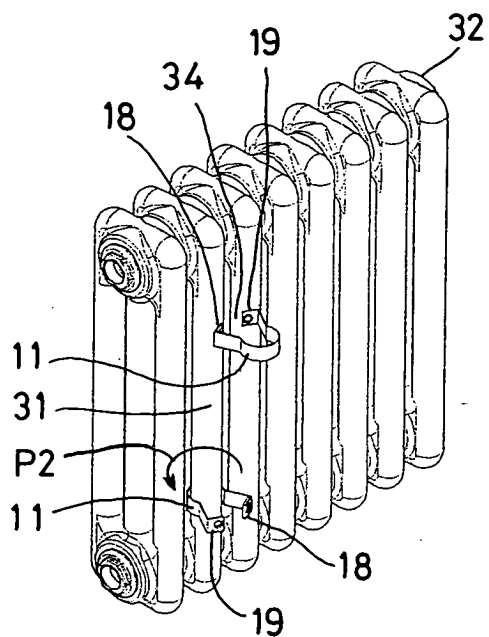


FIG. 5

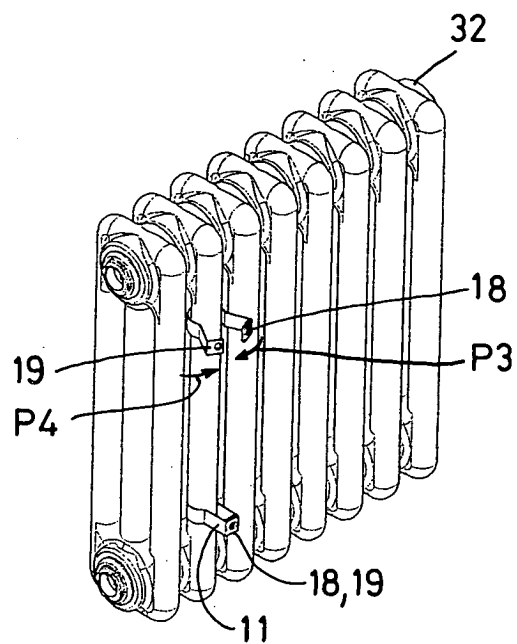


FIG. 6

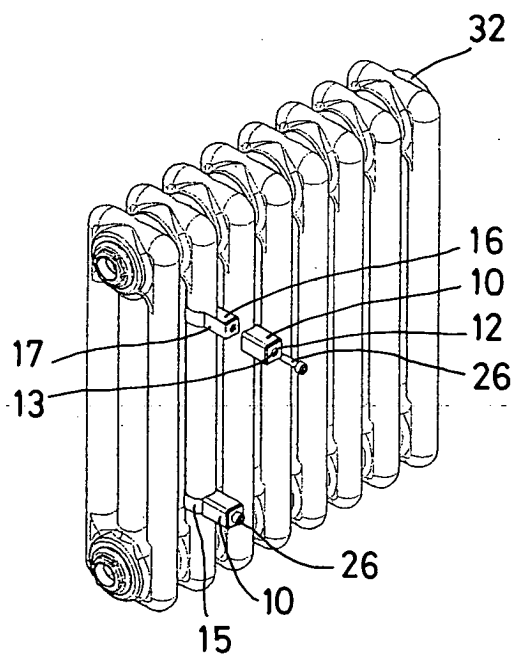


FIG. 7

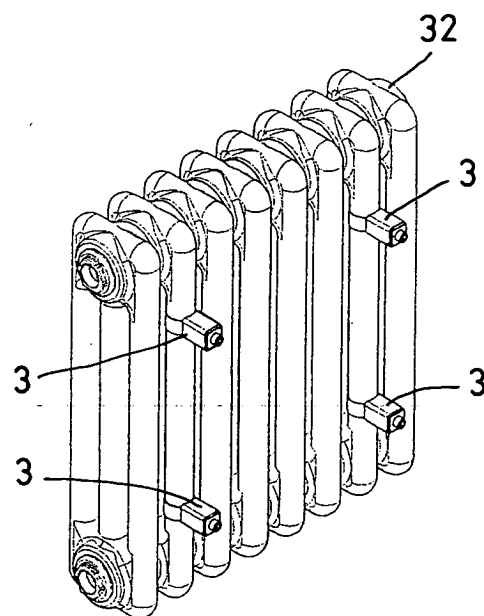


FIG. 8

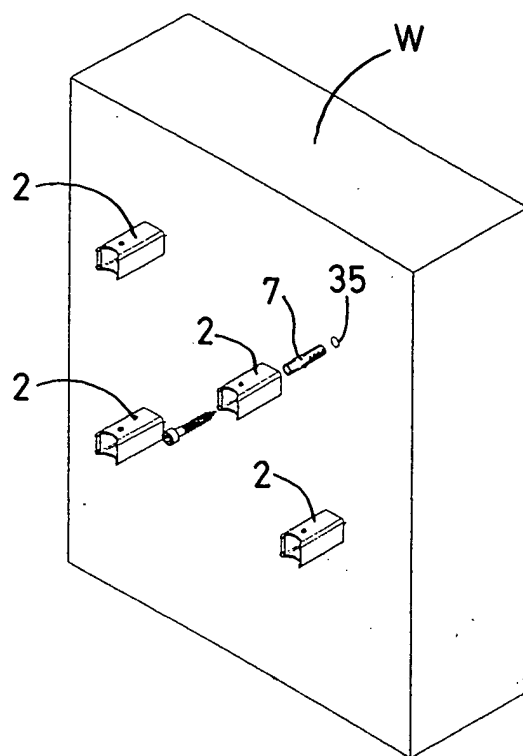


FIG. 9

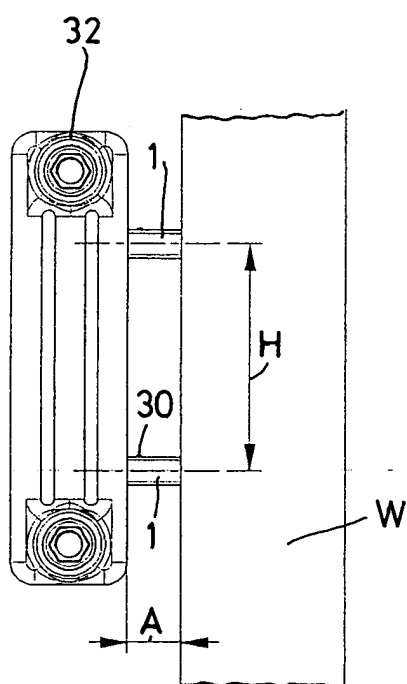


FIG. 10

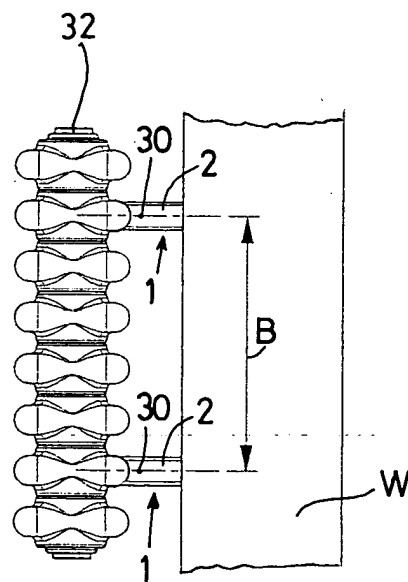


FIG. 11



European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 04 07 6473

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.CI.7)
X	DE 24 36 331 A (FOERSTER WOLFGANG) 12 February 1976 (1976-02-12) * claims 1,4; figures *	1	F24D19/02
A,D	EP 1 003 001 A (ZEHNDER VERKAUF VERWALTUNG) 24 May 2000 (2000-05-24) * abstract *		
			TECHNICAL FIELDS SEARCHED (Int.CI.7)
			F24D
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		30 August 2004	Van Gestel, H
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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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 04 07 6473

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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30-08-2004

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