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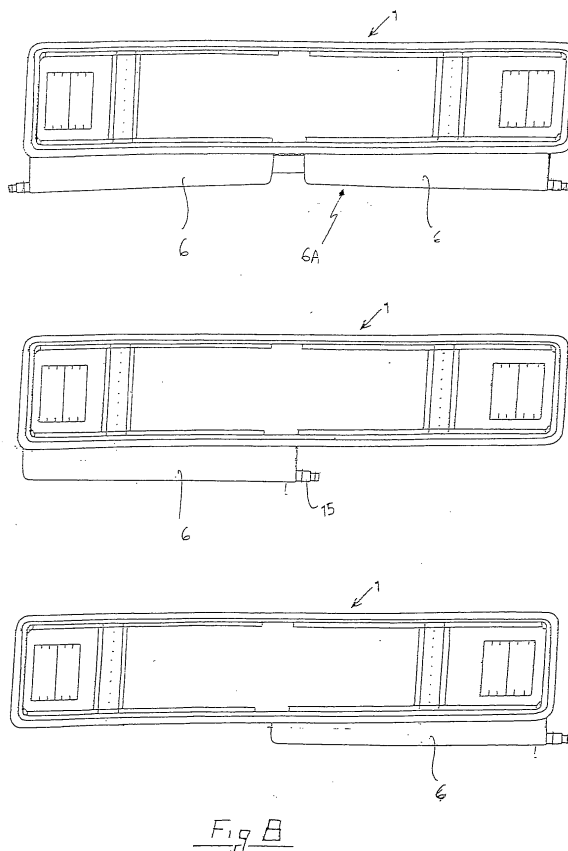
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(54) **Embedded structure for installing an air-conditioning system to a wall**

(57) An embedded box for housing electric cables, pipes and similar equipment for air conditioners, consisting of a body (1) provided with a plurality of lips (4A, 4) that can be removed from the body of said box in order to allow the mounting of a container (6A) thereon, which comprises at least one condensate collection tray (6) and the introduction of the conditioner connecting pipes.

Compared to traditional boxes, the inventive one offers the advantage of allowing at least one tray to be coupled according to several different configurations. The sliding plates 10 further allow the conditioner template to be easily anchored.



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Description

[0001] The object of the present invention is an embedded frame for the wall mounting of conditioning systems or conditioners.

[0002] The air conditioning systems (conditioners) are anchored to a support plate, or "template", which is in turn affixed to the wall by means of bolts, pressure nails or the like. A preparing (prearranging) box is wall-embedded behind the conditioner for the equipment power supply cables, conduits for the delivery of fluids used by the conditioner, condensate drain conduits, etc. to be passed therethrough and sorted out.

[0003] This preparing box generally consists of a rectangular parallelepiped boxlike body that is embedded in the wall and closed by a removable protective lid, in order to allow access to the box for the arrangement and connection of the several conduits to the conditioner that is hanged to the wall by means of the template.

[0004] The preparing box requires to be concealed from the user, mainly for visual appearance, and hence is covered by the conditioner.

[0005] When the direct coupling of the condensate outlet port is provided, i.e. the direct connection of the conditioner condensate pipe to the condensate drain tube being arranged by the operator, simple boxes are available on the market, which are provided with particular openings for said condensate tubes to pass there-through.

[0006] On the other hand, when the directly coupling of the condensate outlet port is either disadvantageous or impossible, such as in the case of structural restraints being present in the installation wall, embedded boxes are available which are made such as to have a collection tray on the lower side thereof for the condensate to flow therein and then be drained by means of a suitable port being provided in the tray.

[0007] At present, a skilled operator requires to manage both types of preparing boxes. To the purpose, the Applicant has provided all-purpose embedded boxes, which are protected by the IT MI2001 U 000011 property right, and can be configured, upon installation, either as simple or collection-tray boxes, according to the operator requirements. All-purposes preparing boxes of this type can be coupled, at the lower portion thereof, with a tray provided with a side drain port and having its longitudinal size equal to the preparing box size. This tray can be oriented in two directions such as to allow the drain port to be arranged at either one of the box side ends.

[0008] While the known all-purposes preparing boxes allow for a certain flexibility when being mounted, in many cases, the condensate drain trays do not permit a number of installation requirements to be fully satisfied, owing to their bulk and shape.

[0009] It often happens that the wall in which the box has to be embedded has restraints forcing the operator to orient the tray in only one direction, thereby prevent-

ing the possibility of selecting the most convenient direction, or forcing the operator to use direct coupling for the condensate outlet port.

[0010] Furthermore, when a number of conditioners are to be installed in a series, for example using only one box for arranging two conditioners, the known all-purposes boxes force the operator to place the tray outlet port in proximity of only one of both conditioners.

[0011] The object of the present invention is to provide an embedded frame of the all-purposes type, i.e. suitable for applications both with direct coupling for condensate outlet port, and with the possibility of applying a condensate collection tray, thereby overcoming the drawbacks of the all-purposes boxes conventionally used.

[0012] These and other objects are achieved with the structure according to claim 1. Several preferred embodiments of the inventive structure will emerge from the remaining claims.

[0013] Compared to the traditional embedded frames, the one according to the present invention allows for the coupling, in several distinct locations and orientations, with a lower container comprising at least one tray having a smaller longitudinal size than the box, thereby facilitating, as will be explained below, the mounting of the box in case of wall restraints.

[0014] The all-purposes box of the present invention has a non-negligible advantage of providing, among the various possible embodiments of the coupling with a tray, the outlet port being in a substantially centred position relative to the vertical axis of the box.

[0015] Furthermore, according to a preferred embodiment of the present invention, the lower container comprises at least two trays being aligned along the longitudinal axis and connected to each other via a junction element, which can be broken, if desired. Two distinct trays can be thus easily provided for one preparing box, or, by breaking the junction element, only one tray, the outlet port thereof can be placed and oriented according to various configurations along the lower wall of the preparing box.

[0016] These and other advantages and characteristics will be understood from the following description of several preferred embodiments of the structure according to the present invention, which are illustrated by way of non-limiting example, in the figures of the annexed drawings, in which:

- Figures 1 to 3 shows front, top and bottom views of the inventive box without tray, respectively;
- Figure 1A shows the closing lid of the box;
- Figures 4 and 5 show top and bottom views of a twin tray to be used with the box of the above figures, respectively;
- Figures 4A and 5A show top and bottom views of a single tray to be used with the box of the preceding figures, respectively;
- Figure 6 shows a cross-section of the inventive box

- as being mounted on an air conditioning system;
- Figure 7 shows the side sectional view of the box; and
- Figure 8 shows three possible mounting configurations of the box

of the above figures.

[0017] The all-purposes embedded frame according to the present invention consists of a body 1 having a substantially boxlike configuration developing along a longitudinal axis X (figures 1 and 2) and is open in the front to allow for the electric cables, or gas and water pipes to be inserted therein.

[0018] On the upper longitudinal 2 and lower coupling 3 walls of this body 1 there are provided some lips 4, and 4A being fixed at the pre-breaking lines 5, a preset number of these lips 4, 4A being removable by breaking the same, in order to obtain "windows" for the connecting pipes of the conditioner to be inserted therethrough and then subsequently applying a container 6A being provided with one or more condensate drain trays 6 (see figures 4, 5, 4A, 5A).

[0019] The container 6A can be fastened, as required, to the lower wall 3 of the boxlike body 1, via removable fixing means 5A, 8, allowing the coupling of this container 6A in distinct locations and orientations along this wall 3.

[0020] More particularly, the single tray 6, consisting of an elongated concave body 7 (figures 4A and 5A) with a substantially U-shaped section (figure 6), can be snap fixed to the body 1 of the box, by means of elastic hooks 8 being integral with the edges of tray 6 and suitable to engage within corresponding seats 5A, being provided along the lower wall 3 of the body 1.

[0021] The tray 6 is equipped with a condensate outlet port 15 being preferably arranged at a side end thereof, and according to an advantageous aspect, having two or more diameters in order to be connected to pipes having different diameters. The lower wall of the drain tray 6 can be biased in a sloping manner towards the outlet port 15, according to known techniques, in order to facilitate condensate drainage.

[0022] According to the present invention, the longitudinal linear development of tray 6 is less than the length (as considered on the X axis of figures 1-3) of the coupling wall 3, and preferably less than or equal to half the length thereof. In this way, due to the small size of the tray 6 relative to the body 1 and the removable fixing means 8 and 5A, the tray 6 can be coupled to the box 1, such as partially shown in figure 8, according to different positions and orientations, with the outlet port 15 coming either on the right, on the left, or in the center, thereby allowing a high installation flexibility.

[0023] This characteristic is particularly useful when the box 1 is to be mounted on the wall where obstacles are present which would prevent the use of a traditional tray, such as pipes, sharp corners, door and window frames, etc. If required, the tray 6 can be indeed shifted

relative to the box 1 and coupled therewith in a location where it does not interfere with such obstacles.

[0024] According to an alternative embodiment of the present invention, two trays 6 can be aligned along the longitudinal axis thereof and be connected to each other via a junction element, or partition wall, 16, such as shown in figures 4 and 5, such as to form the above container 6A.

[0025] In the event that the trays 6 have side outlet ports 15, the container 6A, the longitudinal extension thereof being preferably equal to the length of coupling wall 3 of the boxlike body 1, will be thus provided with outlets 15 that, after the container 6A has been mounted on the wall 3 of the boxlike body 1, will be arranged at the side ends of the latter.

[0026] According to a particularly advantageous aspect of the present invention, the partition wall 16 can advantageously have two prebreaking lines at each one of the trays 6, such that the container 6A, when required by the installation conditions, can be divided in the two trays 6. In this way, the box 1 of figures 1 and 3, can be either provided with one single condensate drain 6 that, as described above, can be variously positioned and oriented along the coupling wall 3 of the boxlike body 1, or with two drain trays 6.

[0027] The use of the container 6A with the two trays 6 being fastened by the partition wall 16 is particularly advantageous when one desires to mount two conditioners in a series using the same box 1 for each.

[0028] Still according to the present invention, the box from figures 1 to 3 is provided with an almost planar lower wall 3, for an optional condensate drain pump to be housed therein.

[0029] Particularly, the conditioner is affixed to the wall 14, the box 1 being previously embedded therein, for the arms 9 of the corresponding support plate (not illustrated) to be engaged thereon. To the purpose, the box 1 is provided on the front side thereof with a plurality of flanges 10, whether previously drilled or not, which are slidably mounted along guide ribs 11 provided on the edge 12 of the front opening of the box 1 (figures 1 and 6). These flanges are positioned at the arms 9 of figure 6, and offer the opportunity of anchoring the support template for the conditioner with screws 13 or the like.

[0030] To the inventive embedded frame, such as described above and illustrated in the annexed drawings, alterations can be carried out in order to obtain variant embodiments, all of them being however contemplated within the scope of the following claims.

Claims

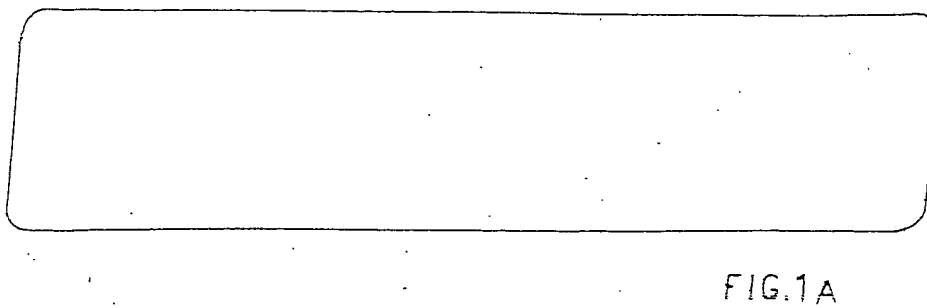
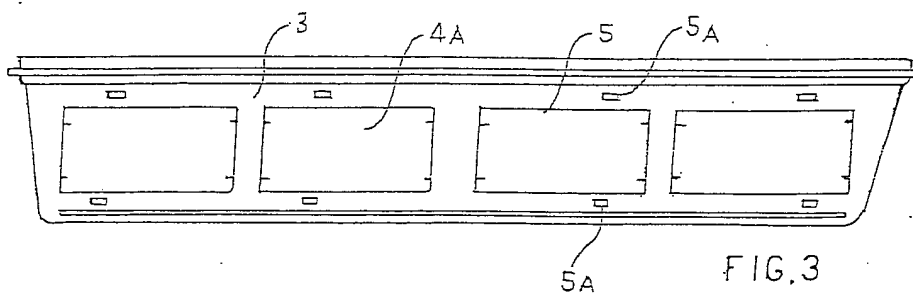
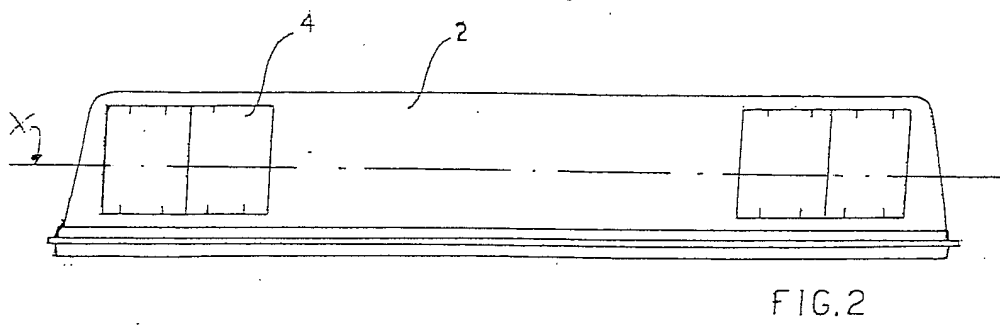
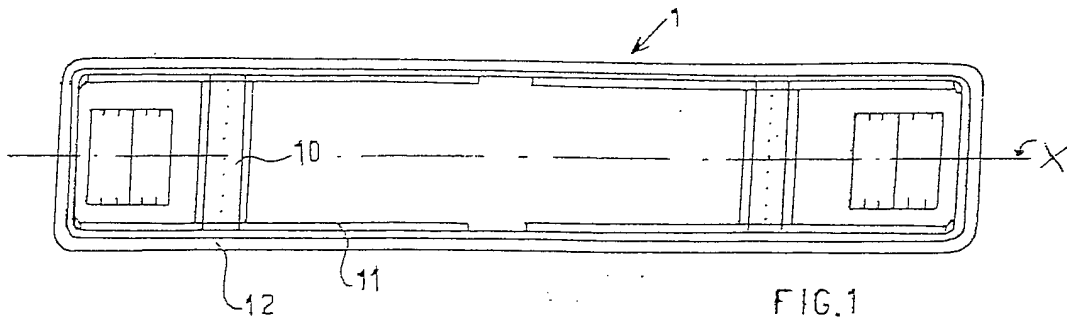
1. An embedded frame for the wall mounting of conditioning systems of the type comprising a boxlike body (1) being provided with at least one coupling wall (3) with a lower container (6A) for condensate

drainage, said lower container (6A) comprising at least one tray (6) having a condensate outlet port (15), **characterized in that** said tray (6) has a lower length than the length of said coupling wall (3) and said structure (1) also comprises means (5A, 8) for removably fixing said container (6A) in different positions and orientations along said coupling wall (3).

2. The frame according to claim 1, **characterized in that** the length of said tray (6) is less than or equal to half the length of said coupling wall (3) of the boxlike body (1). 10
3. The frame according to claim 1 or 2, **characterized in that** said container (6A) comprises at least two trays (6). 15
4. The frame according to claim 3, **characterized in that** said two trays (6) are aligned along the longitudinal axis thereof and are connected to each other by a junction element (16). 20
5. The frame according to claim 3 or claim 4, **characterized in that** each of said two trays (6) comprises an outlet port (15), said outlet ports being provided at the opposite longitudinal ends of the container (6A). 25
6. The frame according to any claim 3 to 5, **characterized in that** each of said two trays (6) comprises an outlet port (15) and has a lower wall being biased in sloping manner towards said outlet port (15). 30
7. The frame according to any claim 3 to 6, **characterized in that** said junction (16) can be broken in order to obtain the separation of said two trays (6). 35
8. The frame according to any preceding claim, **characterized in that** said fixing means comprise a plurality of grip hooks (8) being integral with the container (6A) and corresponding seats (5A) being formed in the boxlike body (1) at and/or in proximity of said coupling wall (3). 40
9. The embedded boxlike frame according to the preceding claims, **characterized in that** the coupling of said body with each tray (6) is provided by means of a plurality of removable lips (4A) and slots (5A) being provided on the lower wall (3) of said boxlike body (1). 45 50
10. The embedded boxlike frame according to the preceding claims, **characterized in that** said lips (4, 4A) are fixed at pre-breaking lines provided on the upper longitudinal wall, on the lower longitudinal wall, and side walls of said boxlike body (1). 55
11. The embedded boxlike frame according to the pre-

ceding claims, **characterized by** having one or more flanges or plates (10) being slidingly mounted on a guide rib (11) provided along the edge (12) of the front opening of said body (1).

12. The embedded boxlike frame according to the preceding claims, **characterized in that** said flanges or plates (10) are drilled.



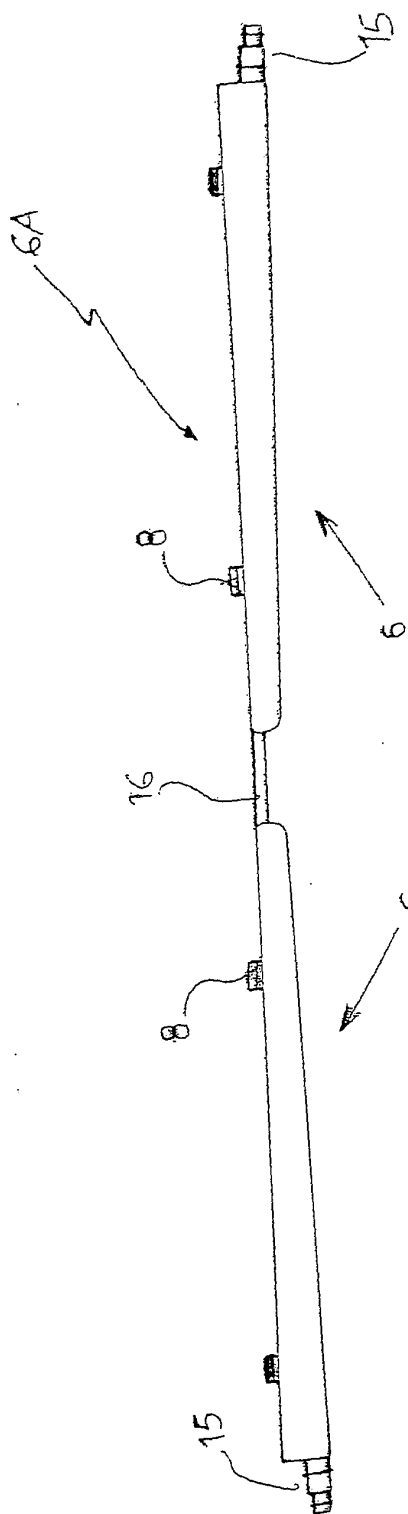


FIG. 4

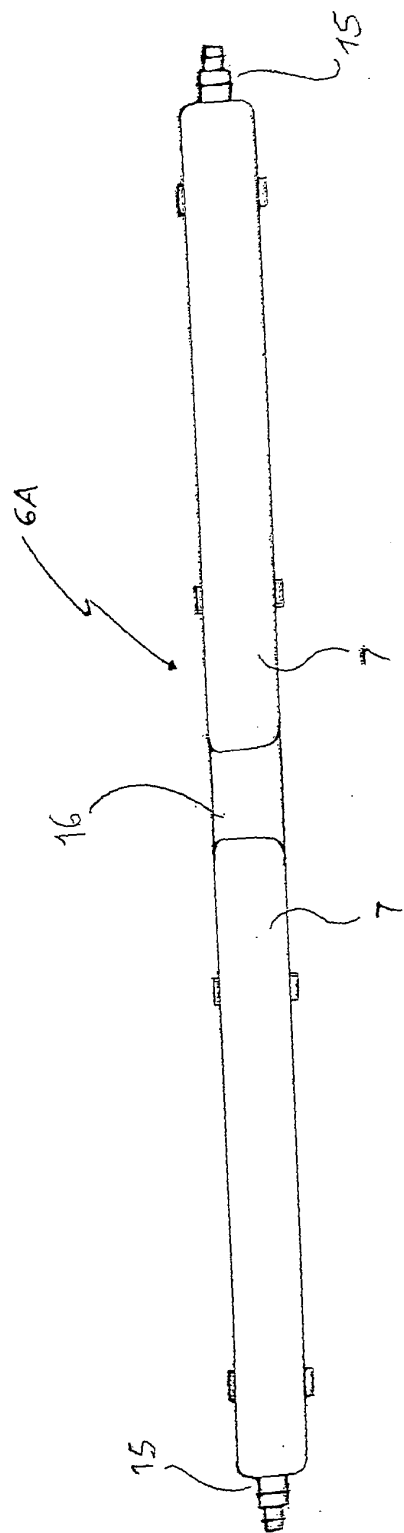


FIG. 5

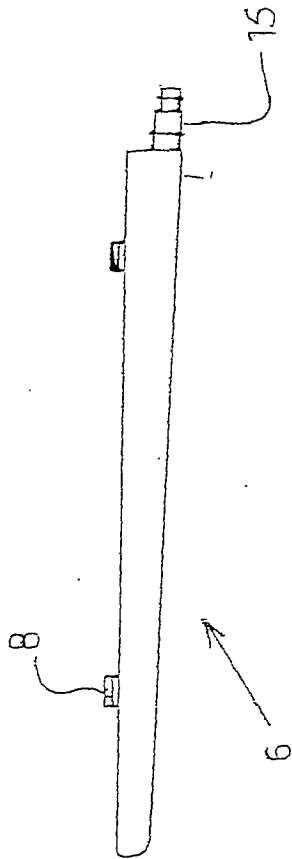


FIG. 4A

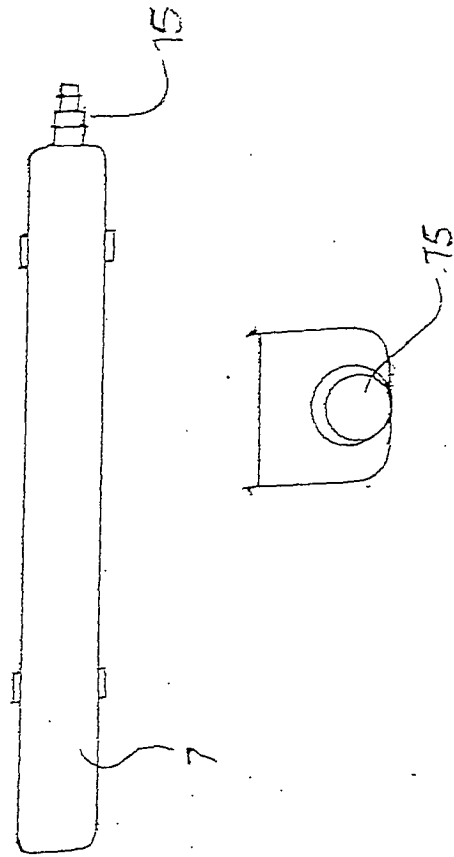
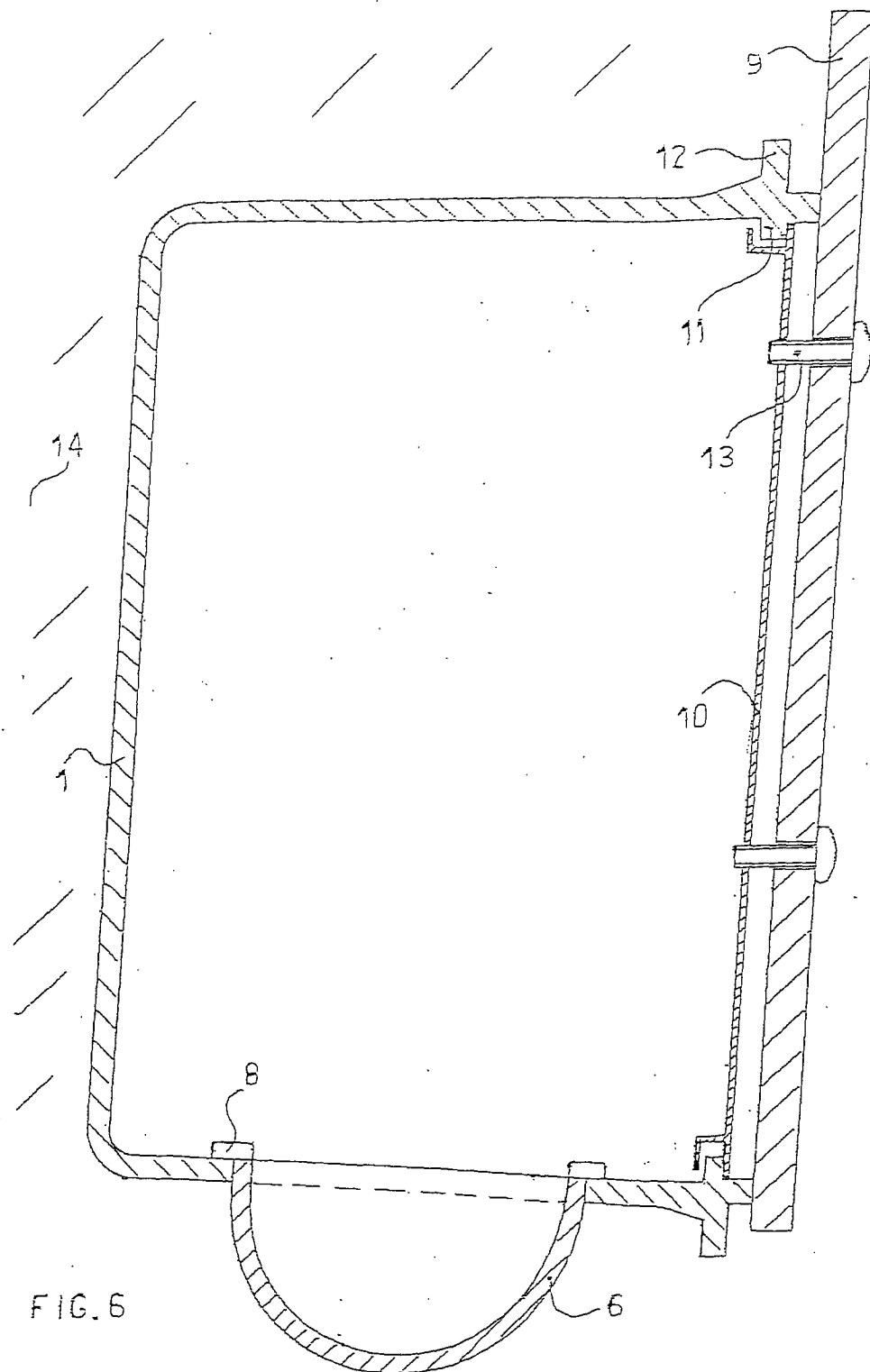


FIG. 5A



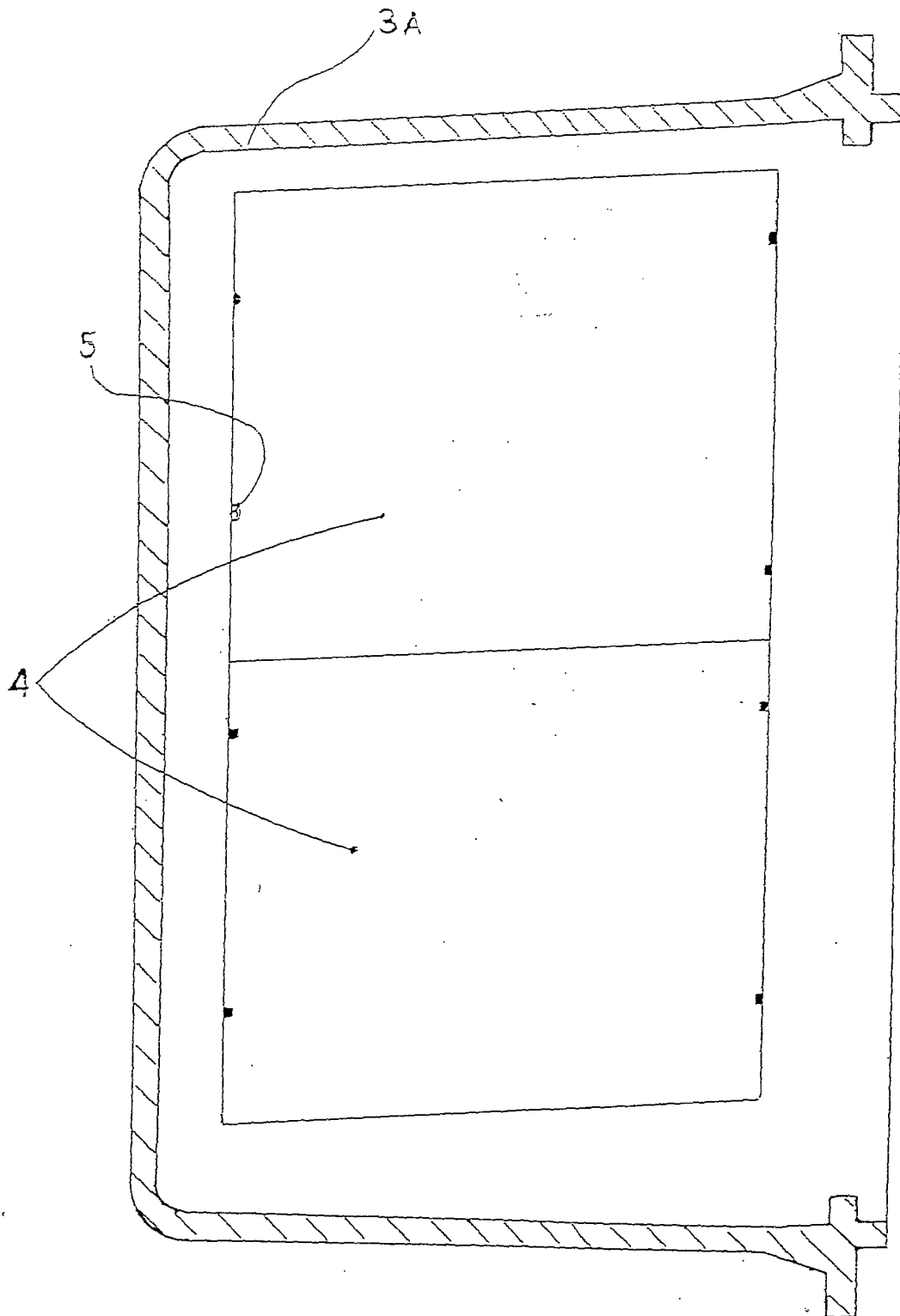


FIG.7

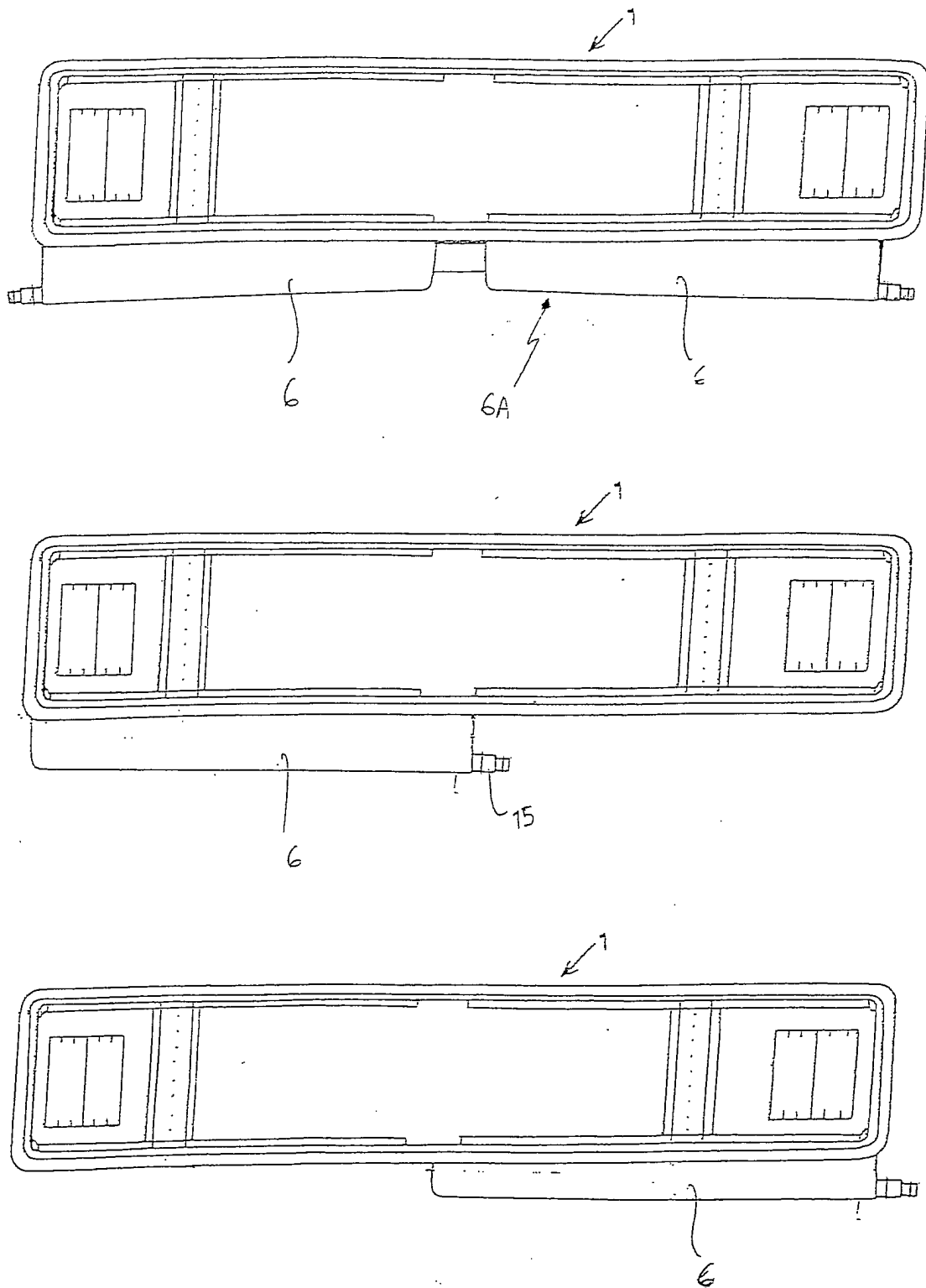


Fig A