



## Description

### FIELD OF THE INVENTION

**[0001]** The present invention concerns a support device and the relative method of assembly, to be used to install, position and support over time, enhancing panels with respect to blank walls, for example to achieve so-called ventilated walls.

**[0002]** Panels for ventilated walls are those which are positioned to enhance blank walls, leaving a space in which the air can circulate between the blank wall and the enhancing panels themselves.

**[0003]** Ventilated walls include enhancing panels of various types and sizes, according to the characteristic of the enhancement desired, when the facade is finished.

**[0004]** The present invention concerns support devices for the enhancing panels, which allow anchorage means to be located on the back of the panel itself without contacting the edges of the panel.

### BACKGROUND OF THE INVENTION

**[0005]** The problems that ventilated walls pose with regard to support devices to anchor enhancing panels to blank walls are well-known. Such known support devices have problems of supply for maintenance works, both in the production step and also over time, because known support devices are normally not only complex, but also they are studied mostly as a plurality of special elements, not standardized, and hence each one having its own characteristics.

**[0006]** Further problems of such known devices concern the cost of obtaining them, precisely due to the specific nature of their components, and problems in aligning and assembling the panels, because the parameters for positioning and attaching such devices with respect to the blank wall and the panels themselves do not allow for much adjustment.

**[0007]** Moreover, problems normally arise in maintaining the planarity and the reciprocal position of the panels over time, due to the cantilevered load normally applied on known support devices and the vibrations which often affect bearing walls.

**[0008]** The Applicant has therefore devised, tested and embodied a device that overcomes all the problems posed by current devices.

### SUMMARY OF THE INVENTION

**[0009]** The present invention is set forth and characterized in the main claims, while the dependent claims describe variants to the basic idea.

**[0010]** The purpose of the present invention is to embody a support device to anchor enhancing panels to bearing walls which will give greater adjustability of the positioning and attachment parameters, both with re-

spect to the bearing wall and also with respect to the enhancing panel, so as to reduce the problems of alignment and assembly, and also of cost.

**[0011]** Another purpose is to embody a support device that will maintain its planarity over time and the reciprocal position of the enhancing panels.

**[0012]** In accordance with these purposes, a support device to anchor enhancing panels on walls in order to make ventilated walls according to the present invention includes at least a box-like element anchored to the wall and provided with at least a front insertion compartment cooperating with support and positioning means attached on the back of the enhancing panels.

**[0013]** According to the invention, the support device substantially consists of a first part, or box-like element, attached to the wall to be enhanced by means of anchorage means, and a second part able to finely position and support the enhancing panel.

**[0014]** According to a first embodiment, the box-like element is directly anchored to the wall.

**[0015]** According to a variant, the box-like element is anchored on an intermediate positioning element, vertical and orthogonal to the wall.

**[0016]** According to the invention, the box-like element has a rear wall and a front wall element, or wall.

**[0017]** In the rear wall there are holes for anchorage and possible adjustment, according to one and/or the other axis parallel to the wall to be enhanced. According to a variant, there are more than one anchorage and/or adjustment holes, in order to prevent the presence of reinforcement rods in the wall to be enhanced making it impossible to anchor the panel.

**[0018]** In the front wall there is at least a supporting plane, for vertical positioning and fine adjustment, located substantially horizontal, with which the support and positioning means of the enhancing panel anchored on the back of the panel are in contact.

**[0019]** The box-like element can be all of one piece or made of two or more pieces. In the event that it is made of two or more pieces, once the first piece which constitutes the rear wall has been applied, the at least one second piece carrying the above-mentioned positioning plane is applied directly or indirectly.

**[0020]** According to a first embodiment, the box-like element made of at least two pieces has the lateral walls substantially parallel. In a second embodiment, the box-like element made of at least two pieces has the lateral walls tapering downwards, so as to configure a substantially trapezoid conformation at the front, with the parallel side located at the top.

**[0021]** It comes within the spirit of the invention to provide vertical interception means suitable to prevent, in the event of earth tremors or suchlike, the support and positioning means of the enhancing panel from becoming detached from said positioning plane.

**[0022]** It also comes within the spirit of the invention to provide that the support and positioning means of the enhancing panel have a geometric conformation like an

upside-down V, at least in the zone of cooperation with the positioning plane, so as to facilitate assembly and guarantee positioning.

**[0023]** It also comes within the spirit of the invention to provide adjustment means to be able to define at the desired value the distance between the seating of said upside-down V and the front face of the enhancing panel.

**[0024]** With the present invention it is therefore possible to achieve a simple support device, obtained with components easily found on the market, thus giving advantages as far as the maintenance and cost of production is concerned.

**[0025]** Other advantages of the present invention are given by the presence of adjustment and positioning eyelets, which allow a simple and rapid assembly of the panels, and great adjustability of the positioning and attachment parameters of the support device in its three axes with respect to the wall to be enhanced and the enhancing panels.

**[0026]** Moreover, since the device consists of a box-like element, it is possible to guarantee over time the planarity and reciprocal position of the enhancing panels, both one with respect to the other, and also with respect to the wall to be enhanced.

#### BRIEF DESCRIPTION OF THE DRAWINGS

**[0027]** With the aid of the attached drawings, given as a non-restrictive example, we shall now see some preferential embodiments of the invention.

**[0028]** In the figures we have:

- fig. 1 is an exploded three-dimensional view of a first form of embodiment of the invention;
- fig. 2 is a view from above, partly in section, of the device in fig. 1;
- fig. 3 is a three-dimensional, partly sectioned view of a second form of embodiment of the invention;
- fig. 4 is a view from above, partly in section, of the device in fig. 3;
- figs. 5a-5b show a preferential embodiment of part of the device in fig. 3;
- fig. 6 is a lateral sectioned view of a ventilated wall assembled with the method according to the present invention;
- fig. 7 shows a further variant.

#### DETAILED DESCRIPTION OF THE DRAWINGS

**[0029]** With reference to the drawings, according to a first preferential form of embodiment, a support device 10 to anchor an enhancing panel 25 to a wall to be enhanced, for example a blank wall 13, comprises a box-like element 16 substantially consisting of a first part, or bottom 34, attached by means of normal expansion-type anchorage systems 14 or otherwise, and a second part 35, having an adjustment plane 20; the second part

35 is attached to the first part 34 by means of attachment means 47, for example bolts, holes 46 and eyelets 42.

**[0030]** The eyelets 42 allow to put the front plane 43 of the second part 35 on the desired plane that may not be parallel to the wall to be enhanced, or blank wall 13.

**[0031]** The adjustment plane 20 is arranged on the plane of the horizon and connects to the lateral walls 44 of the second part 35 either with a connection piece or with an inclined plane 19.

**[0032]** In this case, the rear wall 36 of the first part 34 has a plurality of adjacent holes 39 which cooperate with eyelets 38 in order to attach the element 10 to the wall to be enhanced 13.

**[0033]** The holes 39 and the eyelets 38 allow to attach the element 10 to the wall to be enhanced 13 in any case, even when there are reinforcement rods 53 present.

**[0034]** The adjustment plane 20 and the connection piece, or inclined plane 19, define a compartment 51 open towards the top. A prevention element 49 cooperates with said compartment 51, and constitutes an interception means which is suitable to prevent the support and positioning means 21 of the enhancing panel 25 from emerging upwards from the compartment 51.

**[0035]** The prevention element 49 is anchored, in this case, in holes 48 present in the lateral walls 44 of the second part 35.

**[0036]** The front plane 43 is made lighter at the bottom so as to create a compartment 45 suitable, in this case, to allow easy access to the eyelets 38.

**[0037]** Between the rear wall 36 and the sides 37 deformations 52 may be defined, able to stiffen the angular connection between the wall 36 and the side 37.

**[0038]** In the rear wall 36, in a desired geometric position, an alignment and centering hole 40 may be provided with respect to the trace lines made on the wall to be enhanced. The hole 40 can be circular, rhomboid, triangular or other desired shape.

**[0039]** For greater precision and ease of positioning, in the upper and lower part of the rear wall 36, in cooperation with the hole 40, and for the same purposes, reference incisions 41 can be provided.

**[0040]** It is in the spirit of the invention to provide that the deformations 52 on the edges between the rear wall 36 and the side 37, cooperate with the hole 40 so that, with the incisions 41, they improve positioning.

**[0041]** The stiffening deformations 52 can also be provided between the front plane 43 and the lateral walls 44 of the second part 35.

**[0042]** Fig. 7 shows a variant to the embodiment of figs. 1 and 2, having lateral walls 44 inclined to close towards the bottom for reasons of greater safety.

**[0043]** The support and positioning means, or shaped wheel 21, are located in the compartment 51; in this case, they are shaped like a circular wheel with a V-shaped circumferential hollow 50.

**[0044]** Said support and positioning means 21 are anchored with axial attachment and adjustment means 22

to the rear wall of the enhancing panel 25.

[0045] The shaped wheel is substantially shaped like a yoyo. Such shaped wheel 21, in this case, is mounted and positioned on the rear of the enhancing panel 25 by means of conical headed screws 22 which cooperate with insertion hollows 23 made on the rear surface of every enhancing panel 25, and reinforced with a reinforcement profile 24.

[0046] A plurality of devices 10 are associated with each enhancing panel 25, arranged at pre-determined distances, for example using templates, whose structure and function are irrelevant to the present invention.

[0047] In the case shown here, the panels 25 have horizontal 26 and vertical 27 join elements. Both the horizontal 26 and the vertical 27 join elements include air passage and water conveying systems 29 and 28.

[0048] The method to assemble the support device 10 as described heretofore is as follows.

[0049] After tracing the positioning on the blank wall 13 to be enhanced, two adjustable spacers 54, of a known type, are positioned at a determinate distance; only one, advantageously the lower one, is attached at the final height of the interstice.

[0050] Subsequently, sighting through the positioning hole 40 and the possible reference incisions 41, the first part 34 of the box-like element 16 is positioned with respect to the blank wall 13 and attached, for example, by means of the expansion anchorage systems 14.

[0051] If there are reinforcement rods 53 present, the hole 39 is chosen and/or the non-interfering eyelet 38. The second part 35 is then positioned on the first part 34, and reciprocally clamped, so as to constitute the box-like element 16.

[0052] Then the enhancing panel 25 is positioned, by means of the shaped wheel 21, in cooperation with the insertion compartment 51 of the box-like element 16.

[0053] Once the panel 25 has been positioned, the prevention element 49 is arranged and the upper spacer 54 is adjusted until it abuts on the rear surface of the panel 25, so as to put the panel 25 in position, clamping it with respect to the blank wall 13.

[0054] The same operations are performed to position the adjacent panel 25 and so on.

[0055] In a second form of embodiment of the present invention (figs. 2 and 3), the support device 110 provides a linear element with an omega profile 11 which includes on its length an open part 12 determined by longitudinal contrasting fins 17.

[0056] The front part of the omega-shaped linear element 11 is correctly positioned, by means of normal expansion-type anchorage systems 14, or other type, with respect to the blank wall 13 according to the development that the enhancing panels 25 have to have when the enhancement is terminated.

[0057] On the front face of the omega-shaped linear elements 11 the box-like element 16 is applied by means of normal bracket-type anchorage systems 18.

[0058] In this preferential embodiment, the box-like el-

ement 16 is conformed vertically like a V, so that it can be obtained with only two elements 31, 32, welded together.

[0059] An alignment tooth 30, solid with the box-like element 16, cooperates with the contrasting fins 17 in order to guarantee that the assembly is axial.

[0060] The support and positioning shaped wheels 21 are inserted into the compartment 51 of the relative box-like element 16 so that the V-shaped circumferential hollow 50, whose conformation facilitates positioning, goes to cooperate with the adjustment plane 20 which allows a substantially horizontal lateral adjustment of the position of the panel 25, also correcting possible errors.

[0061] Figs. 5a and 5b show the two elements, respectively, the V-shaped element 31 and the open box-like element 32.

[0062] The open box-like element 32 has a vertical adjustment hole 33 and the alignment tooth 30.

[0063] The lines "a", "b", "c" and "d" are bending lines to obtain the box-like element 16 once the two elements 31 and 32 have been welded together. The presence of the alignment tooth 30 bent towards the rear of the box-like element 16 causes the lower rear part of the box-like element 16 to be open. Consequently, any water that might possibly enter the box-like element 16 automatically comes out without stopping therein.

[0064] Possible other discharge holes can be provided along the bending line "d" or in cooperation therewith.

## Claims

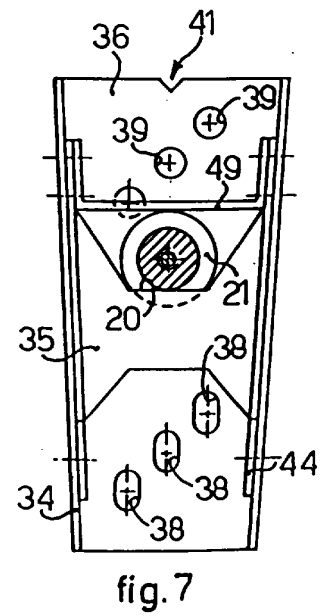
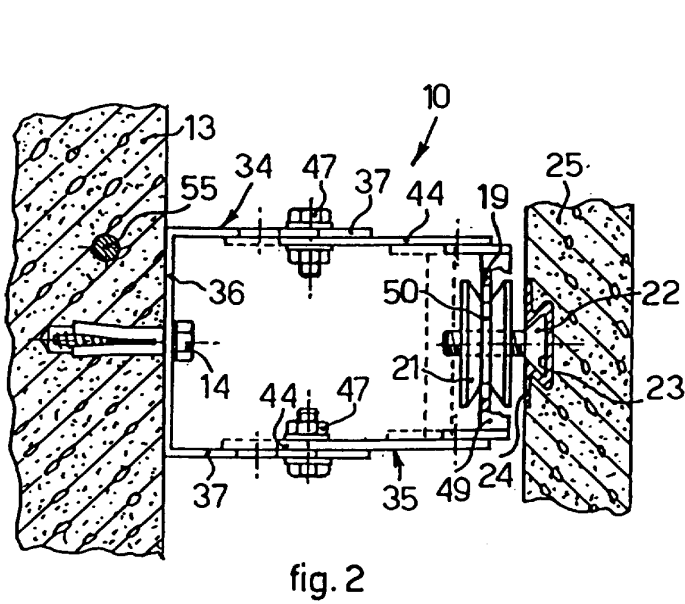
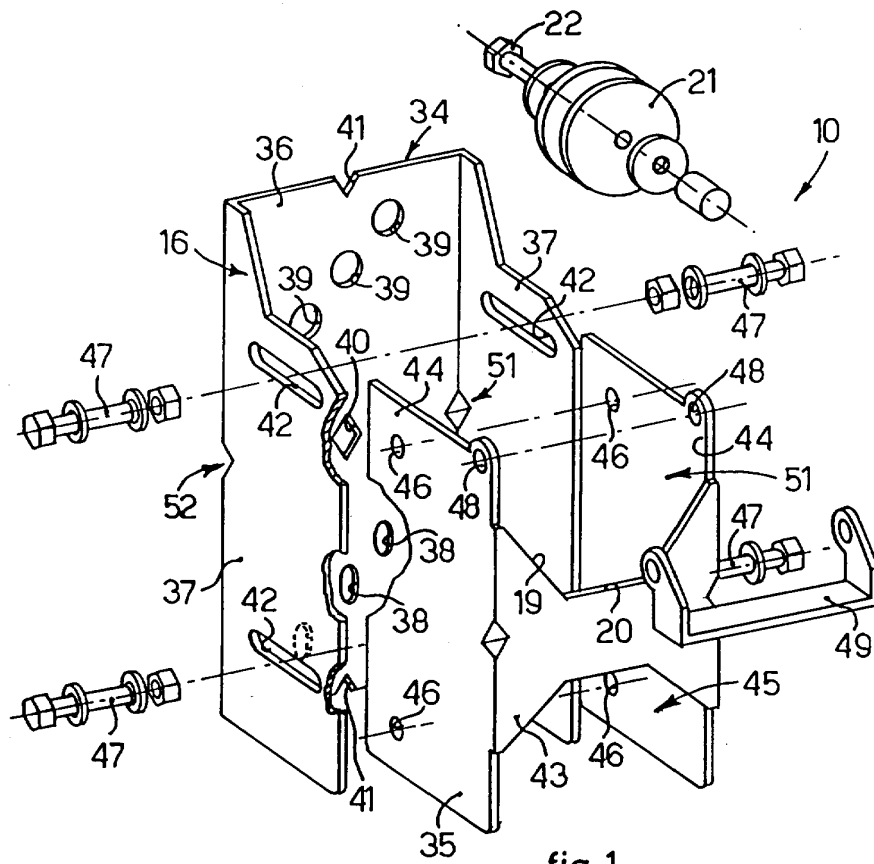
1. Support device to anchor enhancing panels (25) on walls to be enhanced (13) in order to make ventilated walls, **characterized in that** it consists of a box-like element (16) able to be positioned on said wall to be enhanced (13), including at least an insertion compartment (51) cooperating with support and positioning means (21) attached on the rear of the enhancing panel (25).
2. Support device as in claim 1, **characterized in that** the box-like element (16) comprises a first part or bottom (34) and at least a second part (35), said first part and said second part (34, 35) being connected in stable manner.
3. Device as in claim 2, **characterized in that** the first part (34) of the box-like element (16) is substantially C-shaped and comprises a rear wall (36) provided with at least an adjustment eyelet (38) and at least an attachment hole (39), and two lateral walls (37), each one provided with at least an eyelet (42) able to allow the reciprocal clamping of said second part (35) to said first part (34) and define the reciprocal positioning thereof.
4. Device as in claim 2 or 3, **characterized in that** the

rear wall (36) of the first part (34) of the box-like element (16) is provided with at least a centering hole (40) in a defined geometric position.

5. Device as in any claim from 2 to 4 inclusive, **characterized in that** at least in the upper part or the lower part of the rear wall (36) of the first part (34) of the box-like element (16) there is at least a reference incision (41).
6. Device as in claim 2, **characterized in that** the at least one second part (35) of the box-like element (16) is substantially C-shaped and comprises a front surface (43) and two lateral walls (44), said second part (35) having a size mating with that of said first part (34).
7. Device as in any claim from 2 to 6 inclusive, **characterized in that** at least in one of either the first part (34) or the second part (35) of the box-like element (16), in at least one edge between a wall (36, 43) and the side (37, 44), there is at least a stiffening deformation (52).
8. Device as in claims 4 and 5, **characterized in that** the centering hole (40) is coordinated at least with the reference incision (41).
9. Device as in any claim hereinbefore, **characterized in that** the insertion compartment (51) is made on the front wall (43) of the box-like element (16) and comprises an adjustment plane (20) which, when installed, is substantially horizontal.
10. Device as in any claim hereinbefore, **characterized in that** a removable prevention element (49) cooperates with the insertion compartment (51).
11. Device as in any claim from 3 to 8 inclusive, **characterized in that** the lateral walls (37, 44) are parallel.
12. Device as in any claim from 3 to 8 inclusive, **characterized in that** the lateral walls (37, 44) converge downwards.
13. Device as in claim 1, **characterized in that** it comprises a linear element (11), to be positioned and made solid with the wall to be enhanced, said box-like element (16) being anchored on said linear element (11).
14. Device as in claim 13, **characterized in that** the box-like element (16) includes two elements (31, 32) welded together.
15. Device as in claims 13 or 14, **characterized in that** the box-like element (16) includes, in the rear wall

(36), a vertical adjustment hole (33) and an alignment tooth (30) cooperating with contrasting fins (17) of the linear element (11).

16. Device as in any claim hereinbefore, **characterized in that** the box-like element (16) has at the lower part at least a hole to discharge water.
17. Device as in any claim from 9 to 16, **characterized in that** the support and positioning means comprise a resting means (21) with upside-down V means (50) at least in cooperation with said adjustment plane (20).
18. Device as in any claim hereinbefore, **characterized in that** the support and positioning means (21) cooperates with conical head screw means (22), in order to position the enhancing panel (25) on the rear and make it solid.
19. Method to assemble support devices to anchor enhancing panels (25) on walls to be enhanced or blank walls (13) in order to achieve ventilated walls, **characterized in that** on said blank wall (13) box-like elements (16) are reciprocally positioned and anchored, having at the front part an insertion compartment (51) with which support and positioning means (21), positioned and anchored on the rear of the specific enhancing panel (25), are made to contact.
20. Assembly method as in claim 19, **characterized in that** it provides the prior tracing of at least a reference line.
21. Assembly method as in claims 19 and 20, **characterized in that** it provides to position on said blank wall (13) omega-type linear elements (11) in order to obtain, with their front part, an intermediate reference surface coherent with the final enhanced surface.
22. Assembly method as in any claim from 19 to 21 inclusive, **characterized in that** said support and positioning means (21) are mounted and positioned on the rear of the specific panel (25) so that upside-down V means (50) included in said support and positioning means (21) are at a specific distance from the point of reference present on the front part of the panel (25).
23. Assembly method as in any claim from 19 to 22 inclusive, **characterized in that** the support and positioning means (21) are positioned vertically on an adjustment plane (20).



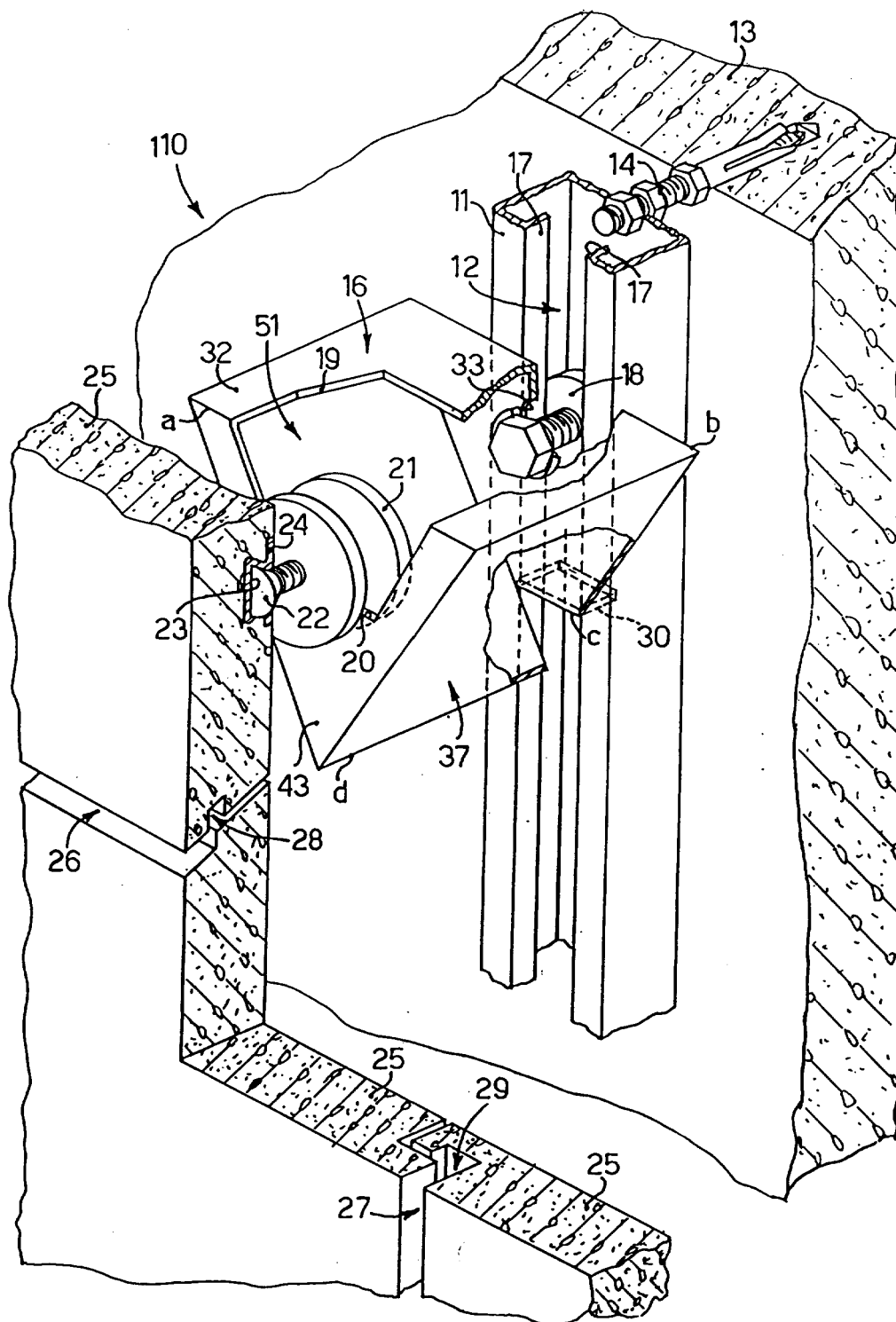


fig. 3

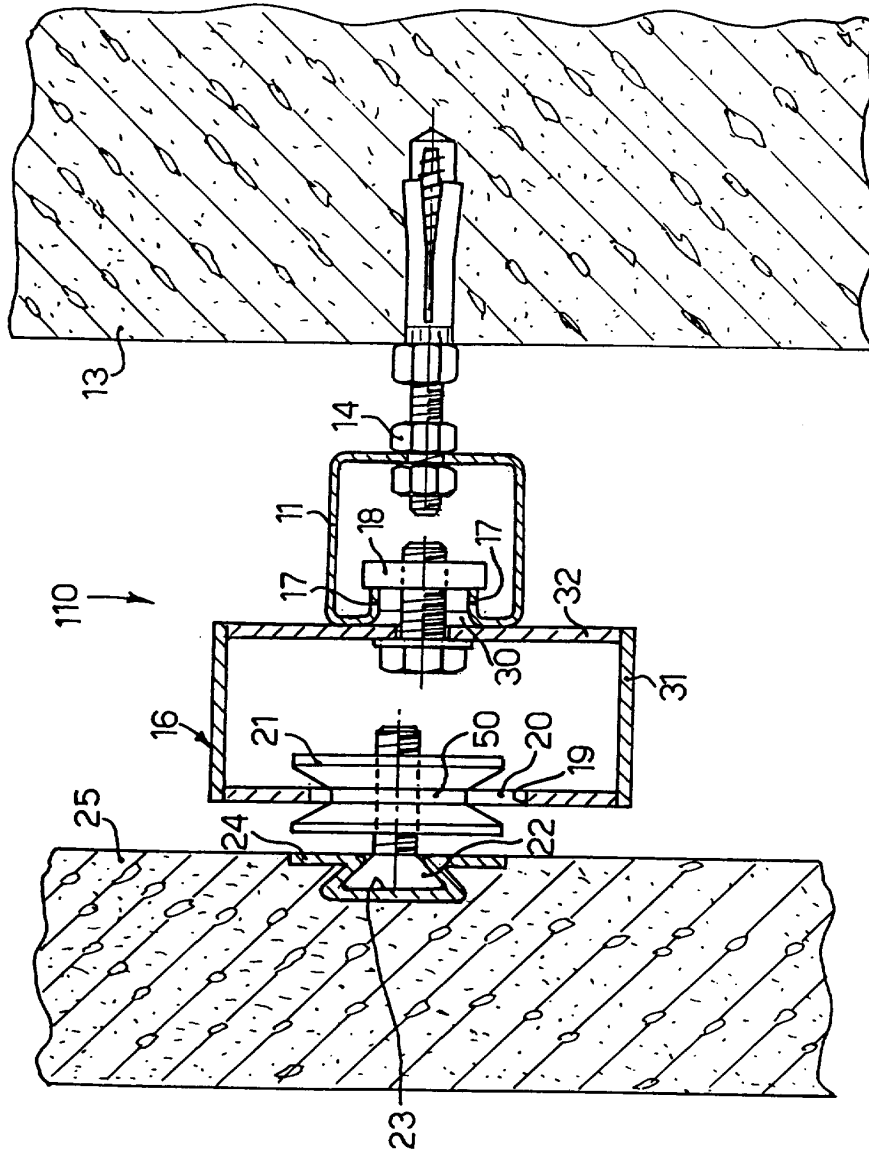


fig. 4





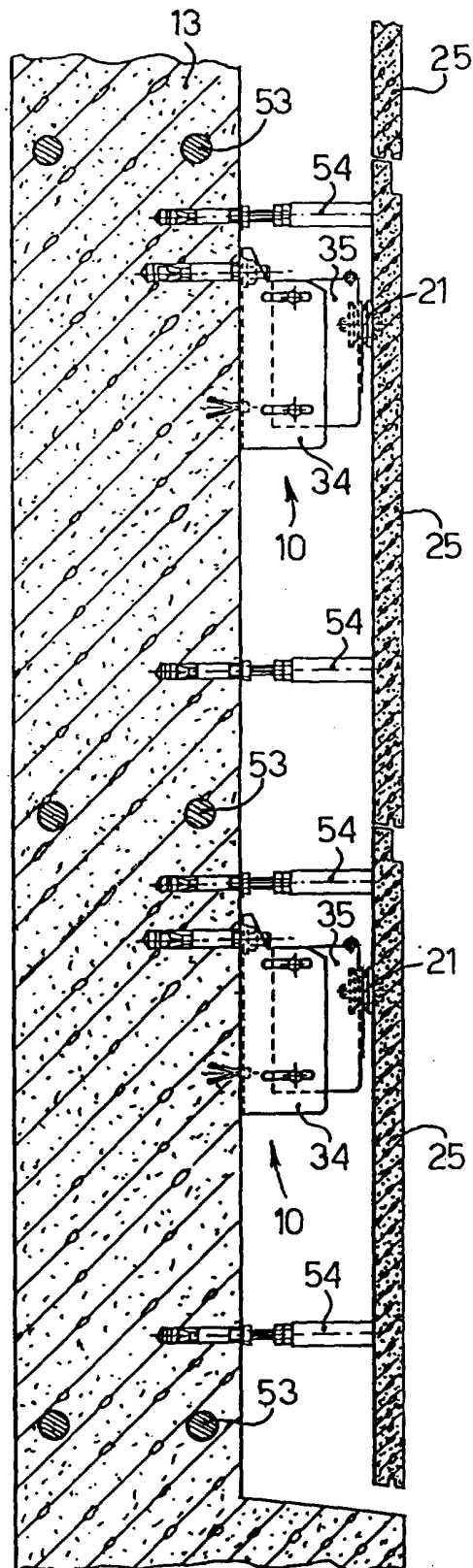


fig. 6