

DECLARATION IN SUPPORT OF VERIFIED
TRANSLATION OF INTERNATIONAL
APPLICATION PCT/EP97/00891

Subject: International Application No. PCT/EP97/00891
"Anchorage Mounting for Facade Panels"

I, Don Ullman, certify that I am familiar with both the German and the English language, that I have prepared the English translation attached hereto from the German language of International Application No. PCT/EP97/00891, and that the English translation is a true, faithful and exact translation of the corresponding German language document also attached hereto.

I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereto.

By Don Ullman

Anchor Mounting for Facade Panels

The invention involves an anchor mounting for facade panels with an anchor body that screws to a building wall and incorporates a rear wall penetrated by the slot for a screw and a front wall positioned at a distance in which a hole accepts a threaded bolt adjustable in length which is connected on its free end with the facade panels by means of a cross pin.

Such known anchor mountings serve to mount pre-hung facade panels, for example of natural stone, concrete or ceramic, which form a facade and are positioned at a distance from the building wall. In addition to normal adjustment in the vertical and horizontal directions parallel to the wall, the separation from the building wall must also be capable of adjustment. For that reason the threaded bolt is usually adjustable by means of two nuts on the anchor body. Execution models are also known, however, in which the hole in the front wall incorporates threading into which the threaded bolt can be screwed for adjustment.

In order that a larger distance between the pre-hung facade and the building wall can be covered without making the protruding length of the threaded bolt too long, it is known how to make various anchor bodies which differ in the distance between the rear wall and the front wall.

In a known anchor mounting of the type named at the outset (company name, "Duebel Anchor System 4 of the Lutz Anchoring Systems Co. Inc.), the anchor body consists of a flat material with several bent edges. A horizontal flange extends from the lower edge of the rear wall resting on the building wall on whose front edge the downward bent front wall connects. Its lower edge is connected to a horizontal flange extending rearward to the building wall. In order to transfer the vertical load caused by the weight of the facade panel and the resulting bending stress acting on the threaded bolt from the front wall to the back wall and thus to the building wall, a relatively thick flat material must be used in the manufacture of the anchor body. This causes a significant manufacturing effort and an increased weight of the anchor mounting. This is especially true for those execution models in which there is a relatively large distance between the rear wall and the front wall i.e., in anchor bodies which

protrude relatively far.

It is therefore the task of this invention to produce an anchor mount of the type named at the outset that is light in weight, even in execution models that protrude far outward, and can be manufactured with little effort.

This task is solved in the invention by the anchor body consisting of sheet metal and by two parallel side faces that are separated from each other being bent from both vertical side edges of the rear wall of the anchor body and which are connected to the two vertical side edges of the front wall.

The transfer of the vertical load and the bending stress between the front wall and the back wall by means of the two parallel side faces makes possible an execution model of the anchor body that is made of relatively thin sheet metal. A high load bearing capability for the anchor mount is thus attained with slight material effort.

The anchor body preferably is formed from a one-piece, sheet-metal blank with parallel edges, whereby the opposite side edges

of the sheet-metal blank rest on top of each other to form the back wall and front wall. The amount of manufacturing effort to produce this is very small, especially for the preparation of the sheet-metal blank where only simple bending processes are required and, due to the small thickness of the sheet metal, only simple tools and slight transformation forces are necessary. The joining of the two side edges of the sheet-metal blank by welding or other means is not necessary, since the two legs in the area of the back wall or the front wall rest on top of each other; that is sufficient to create the connection.

The anchor body so constructed has the form of a box open on the top and bottom which results in a high load bearing capability for the anchor mount because of the stability of the shape even when relatively thin sheet metal is used.

In one execution model of the anchor mount in which the threaded bolt bears an adjustable nut behind the front wall and a counter-nut in front of the front wall which can be locked against each other to fix the threaded bolt after it has been adjusted in length, the accessibility to the adjusting nut is facilitated because of the box shape of this version of the anchor mount.

In another version of the idea behind the invention it is envisioned, that the adjusting nut manifests knurling at least on its rear edge which faces away from the front wall. The knurling makes it possible to turn the adjusting nut with the fingers by reaching down or up into the anchor body, in order to set the desired length. The counter-nut, which is fashioned as a hexagonal nut in each instance, is then reversed laterally.

The adjusting nut is preferably a ring disk with a threaded hole with a knurled rear edge. Instead of that the adjusting nut can also have the form of a hexagonal nut with a knurled rear edge.

An execution model is favored primarily for flat anchor mounts in which the threaded bolt is screwed into a threaded hole in the front wall. This execution model of the invention is preferably achieved by welding the front wall to the two forward edges of the side faces. Preferably the front wall has a nut welded to the two side faces, for example, a hexagonal nut. The amount of manufacturing effort required for that is relatively low.

Other advantageous execution models of the invention are the objects of other sub-claims.

In the following section execution models of the invention are shown in more detail based on the drawings. Shown are:

Figure 1 - A vertical cut of an anchor mounting for facade panels,

Figure 2 - A view of the anchor mount of Figure 1 in the direction of the arrow II,

Figure 3 - A perspective view of the anchor body used in the anchor mount of Figures 1 and 2,

Figure 4 - An adjusting nut used for the anchor mount of Figures 1 and 2,

Figure 5 - A variation of an execution model of the anchor body of Figure 3 in a perspective view,

Figure 6 - A view from above of the two sheet-metal blanks of the anchor body of Figures 3 and 5,

Figure 7 - A variation of an execution model of the anchor body

of Figure 1 in a perspective view,

Figure 8 - A view from above of the anchor mount of Figure 7 in the direction of the arrow VIII,

Figure 9 - A vertical cut of another variant of the execution model of the anchor mount of Figure 1,

Figure 10 - A view of the tapered disk used in Figure 9 from the rear in the direction of arrow X.

The anchor mount 1 of Figures 1 and 2 serves to carry the facade panels 2, which are indicated by dashed lines, to form a pre-hung facade in front of a building wall 3. A sheet-metal anchor body 4 is secured to the building wall 3 by means of a screw 5, for example, by means of a plug, on anchor tracks, or on a steel sub-construction, and bears a horizontal threaded bolt 6. A round pin 7 is placed through the smooth end 6a of the threaded bolt 6 and engages into the side holes of the facade panels 2.

The anchor body 4 manifests a rear wall 8 which is secured to the building wall 3 and in whose upper portion there is a vertical

screw slot 5a through which the screw 5 passes.

Two side faces 9, which are parallel to each other at a separation, are bent from the two vertical side edges 8a of the rear wall 8. The faces 9 protrude at right angles from the rear wall 8 and are connected to the two vertical side faces 10a of the front wall 10.

As can especially be seen in Figures 2 and 3, the anchor body 4 consists of a one-piece sheet-metal blank 11, as shown in Figure 6. The two opposite side edges 11a of the sheet-metal blank 11 rest on each other and form the front wall 10. The lower edge 10b of the front wall and the lower edge 8b of the rear wall 8 are located at approximately the same height. The upper edges 9a of both side faces fall off at an incline from the upper edge 8c of the rear wall 8 to the upper edge 10c of the front wall 10.

A hole 12 is recessed in the front wall 10 through which the threaded bolt 6 is inserted. The threaded bolt 6 bears a plain washer 13 on the back side of the front wall 10 and an adjusting nut 14 which is constructed as a ring disk with a threaded hole.

15 (Figure 4) whose rear edge 16 is knurled. On the front side of the front wall 10 the threaded bolt 6 bears a plain washer 17 and a counter-nut 18 constructed as a hexagonal nut.

For fine adjustment of the separation between the building wall 3 and the facade panel 2, the adjusting nut 14 can be turned by hand. To do that the fingers need only reach the knurled rear edge 16 to turn the adjusting nut 14. When the desired adjustment has been attained, the counter-nut 18 is tightened against the front wall 10 on the front side, in order to tighten the screw connection.

As can be seen in Figure 1, the rear wall 8 manifests in its lower area a section 8d protruding toward the building wall 3. That serves to ensure that the anchor mount is supported on the lower end of its back wall against the building wall 3, even when there is unevenness on the building wall 3.

The anchor body 4 shown in Figure 5 differs from the previously described anchor body 4 shown in a similar manner in Figure 3, in that the rear wall 8 is formed by the two side edges 11a' of the sheet-metal blank 11', from which the anchor body 4' is

constructed, resting on each other. The part of the sheet-metal blank 11' forming the front wall 10 is located in the center section of the sheet-metal blank 11'.

Since the two anchor bodies 4 and 4' otherwise have the same dimensions, the two sheet-metal blanks 11' fit effortlessly into each other, so that with the exception of the holes a scrap-free manufacturing of anchor bodies 4 and 4' from sheet-metal is possible.

The execution model of the anchor body shown in Figures 7 and 8 differs from the anchor mount 1 shown in Figures 1 and 2, in that it is constructed with less protrusion and the two side faces 9" of the anchor body 4" are welded to a hexagonal nut 19 forming the front wall 10". The threaded bolt 6 is screwed into the nut 19 and must be turned for length adjustment. This execution model makes possible an especially flat method of construction for the anchor mount 1, because here there is no room for an adjusting nut and a counter-nut.

In order to fully utilize the diminished depth of the anchor body 4,' a hole 20 with a diameter greater than the threaded bolt 6 is

recessed in the back wall 8" for an extension of the threaded bolt 6. The threaded bolt 6 can hereby be screwed in so far until its rear, free end engages in the hole 20. If necessary, it is also possible to make a recess in the building wall in the area of the hole 20.

Figures 9 and 10 show, that in an anchor mount 1, otherwise like the execution model of Figure 1, a tapered disk 21 which can move laterally and manifests a tapered slot running at an angle (Figure 10) is located in the area of the slot for the screw between the rear wall 8 and the building wall 3. A shoulder 23 protruding from the back wall 8 supports itself on the upper edge 21a of the tapered disk 21. By means of a lateral displacement of the tapered disk 21 a height adjustment for the anchor mount 1 can thus be made.

In addition, Figure 9 shows, that the adjusting nut 14 can also be constructed as a normal nut, for example as a hexagonal nut.



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Anchor Mounting for Facade Panels

P a t e n t C l a i m s

1. Anchor mount for facade panels with an anchor body (4, 4', 4'') screwed to a building wall which manifests a rear wall (8) penetrated by a slot for a screw and a front wall (10) separated at a distance in which a hole (12) accepts a threaded bolt (6) adjustable in length which is connected on its free end to the facade panel by means of a cross pin thereby characterized by the anchor body (4, 4', 4'') consisting of sheet-metal and by two side faces (9, 9') parallel to each other and separated from each other at a distance being bent from the two vertical side edges (8a) of the rear wall (8, 8') of the anchor body (4, 4', 4'') and which are connected to the two vertical side edges (10a) of the front wall (10, 10').
2. Anchor mount according to Claim 1 thereby characterized by the anchor body being constructed of a one-piece, sheet-metal blank (11, 11') by means of parallel sides and by the opposite side edges (11a and 11a') of the sheet-metal blank (11, 11') resting on each other to form the back wall (8) or the front wall (10).
3. Anchor mount according to Claim 1 thereby characterized by the lower edges (10b and 8b) of the front wall (10) and the back wall (8) lying at approximately the same height and by the upper edges (9a) of the side faces (9) falling off at an angle from the upper edge (8c) of the rear wall (8) to the upper edge (10c) of the front wall (10).
4. Anchor mount according to Claim 1, whereby the threaded bolt bears an adjusting nut behind the back wall and a counter-nut in front of the front wall, thereby characterized by the adjusting nut (14) manifesting knurling on at least its rear edge (16) that faces away from the front wall (10).
5. Anchor mount according to Claim 4 thereby characterized by the adjusting nut (14) being a ring disk with a threaded hole (15)



with a knurled rear edge.

6. Anchor mount according to Claim 4 thereby characterized by the adjusting nut being a hexagonal nut with a knurled rear edge (16).

7. Anchor mount according to Claim 1, whereby the threaded bolt is screwed into a threaded hole in the front wall, thereby characterized by the front wall (10") being welded to the two front edges of the side faces (9").

8. Anchor mount according to Claim 7 thereby characterized by the front wall being a nut, for example a hexagonal nut, welded to the two side faces (9").

9. Anchor mount according to Claim 1 thereby characterized by the rear wall (8) manifesting in its lower area a section (8d) protruding toward the building wall (3).

10. Anchor mount according to Claim 1 thereby characterized by a laterally movable tapered disk (21) being located in the area of the screw slot (5a) between the rear wall (8) and the building wall (3) and by a shoulder (23) protruding from the back wall (8) supporting itself on the upper edge (21a) of the tapered disk (21).

11. Anchor mount according to Claim 1 thereby characterized by the back wall (8) manifesting a hole (20), whose diameter is greater than that of the threaded bolt (6), for the extension of the threaded bolt (6).