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(54) **SUPPORT MODULE FOR A WALL-BEARING CANTILEVER**

STÜTZMODUL FÜR EINEN WANDLAGERAUSLEGER

MODULE SUPPORT POUR CONSOLE PORTE-PAROI

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Description

TECHNICAL FIELD

[0001] The invention relates to a support module for a wall-bearing cantilever, which is used for supporting a revetment/facing wall constructed in front of a load bearing wall of a building.

BACKGROUND ART

[0002] In the industry, wall-bearing cantilevers for supporting such revetment/facing walls are widely used. The major element of these wall-bearing cantilevers is the so-called support module, which actually serves for transferring the weight load of the revetment wall to the - mostly concrete - load bearing wall of a building. Prior art support modules comprise a support element that can be fixed to the load bearing wall, as well as a web-plate connected to the support element. The support element is generally a lug allowing height adjustment and which is welded to the upper edge of the web-plate. Fixing to the load bearing wall is generally ensured by a screw joint implemented with an anchor plug going through the lug. In its position fixed to the load bearing wall, the web-plate is arranged perpendicular to the load bearing wall, in a vertical position, wherein a base plate for holding the revetment wall is fixed by welding to the bottom or front edge of said web-plate. Prior art support modules are furthermore fitted below and above the screw joint with supports resting on the load bearing wall.

[0003] Wall-bearing cantilevers comprising such support modules are described for example in József Kószó's book 'Family houses (5) - The outside facing of a building' (Zrinyi Publishing House, 1995). These prior art support modules are costly and complicated to manufacture due to the relatively complex support elements and their welded joints with the web-plates.

[0004] In DE 196 10 408 A1 support modules for wall-bearing cantilevers are disclosed. The support modules comprise a support plate to be fixed to a load bearing wall of a building, and a pair of web-plates formed integrally with the support plate by bending. In a preferred embodiment, the support plate comprises an opening allowing fixing to the load bearing wall, as well as protrusions formed as a lower support abutment below the opening and an upper support abutment above the opening on the side opposite the web-plate. Further, support modules for wall-bearing cantilevers are disclosed for example in EP 0 566 829 A1, GB 2 204 620 A and DE 39 10 286 A1.

DISCLOSURE OF INVENTION

[0005] It is an object of the invention to provide a support module for a wall-bearing cantilever, which is compatible with generally used prior art wall-bearing systems, but which - as a result of its design - is more cost efficient

than prior art models, from the aspect of both material and production costs. It is also an important object to ensure that the inventive design of the support module is not detrimental to significant parameters, for example the overhang and loadability.

[0006] These objects can be achieved by a design, in which the support element is formed integrally with the web-plate, consequently it is not necessary to produce a separate support element and to weld it to the web-plate. For the integral support element, appropriate supports are to be provided for, in addition to a simple method for enabling a height adjustment in relation to the fixing point.

[0007] Therefore, the invention is a support module for a wall-bearing cantilever, the support module comprising a support element to be fixed to a load bearing wall of a building, and a web-plate connected to the support element, wherein the web-plate fixed to the load bearing wall by means of the support element is essentially perpendicular to the load bearing wall, and wherein a wall-bearing element of the cantilever is secured to the web-plate, the support element being a support plate arranged essentially perpendicular to the web-plate and being formed integrally with the web-plate by bending, wherein the support plate comprises an opening allowing fixing to the load bearing wall, as well as protrusions formed as a lower support abutment below the opening and an upper support abutment above the opening on the side opposite the web-plate. The support module has one web-plate, and the lower and upper support abutments are formed as square portions pressed out from the support plate, wherein the support plate is sheared along top and bottom edges of the pressed out portions, and is bent at lateral edges of said portions.

[0008] The support module according to the invention can be manufactured from a single plate by bending and punching/pressing out, practically without any additional welding or other machining operations. The support module having one web-plate enables a simple and low cost manufacture. It is extremely simple to form the inventive protrusions necessary for appropriate positioning and holding of the support module.

[0009] The height adjustment of the support module can be implemented especially advantageously, if the opening is formed as a longitudinal cut-out in parallel with the bending, and the fixing to the load bearing wall is implemented through a square backing plate which comprises a longitudinal opening arranged essentially diagonally therein and wherein in the fixed position, the upper edge of the backing plate rests on the lower edge of the upper pressed out portion.

[0010] From the aspect of proper loadability and installation of the support module, it is advantageous if the support plate has a form of a vertical oblong, and the web-plate has a nose shape having a slanted edge including an angle of 55 to 80° with the horizontal and a horizontal edge joining into the upper edge of the support plate at the top of the nose shape.

[0011] The wall-bearing element is preferably a base plate being fixed by welding to the lower edge of the web-plate.

BRIEF DESCRIPTION OF DRAWINGS

[0012] The invention will hereinafter be described on the basis of preferred embodiments depicted by the drawings, where

Fig. 1 is a view of a support module according to the invention with a base plate welded to it and elements for fixing,

Fig. 2 is a cross sectional view of the support module depicted in Fig. 1 taken along plane II-II, and

Fig. 3 is a view of a facade supporting cantilever comprising two support modules, in an installed position.

MODES FOR CARRYING OUT THE INVENTION

[0013] In Fig. 1 a support module 10 is depicted, which consists of two main parts, a support plate 11 and a web-plate 12. The support plate 11 is formed integrally with the web-plate 12 by a vertical bending 13 in a way that the support plate 11 is essentially perpendicular to the web-plate 12. The bending 13 is preferably curved, wherein the bending radius may change subject to the plate thickness, but it preferably should not be shorter than 3 mm.

[0014] The web-plate 12 may have for example a conventional shape as shown in Fig. 1, but differently shaped web-plates 12 may also be used. The depicted preferred web-plate 12 is of a nose shape, which has a slanted edge 12c that includes an angle of 55 to 80° with the horizontal, and there is also a horizontal edge 12a joining into the upper edge of the support plate 11 at the top of the nose shape.

[0015] The support plate 11 has an essentially vertical oblong shape, and an opening 14 is formed therein that enables fixing to the load bearing wall. The opening 14 is formed preferably as a longitudinal cut-out in parallel with the bending 13, and it enables a height adjustment of the support module against the position of a wall plug. A lower support abutment 15 below the opening 14 and an upper support abutment 16 above the opening 14 are formed as protrusions in the support plate 11. In the depicted preferred embodiment, the lower and upper support abutments 15 and 16 are formed as pressed out portions having a rectangular form from the support plate 11. The material of the support plate 11 - as shown in Fig. 2 - is sheared along upper edges 15a, 16a and bottom edges 15b, 16b of the pressed out portions, and is bent at lateral edges of the portions. The sheared surfaces are preferably smooth and perpendicular to the bending 13.

[0016] The upper support abutment 16 plays an important role in fixing the support module 10. The fixing of the support module 10 to the load bearing wall 24 can be implemented by means of an anchor plug 18, as well as a washer 19 and a nut 20 screwed thereon. The anchor plug 18 is arranged through the opening 14 of the support plate 11 and through an opening 22 of a square backing plate 21. The latter has a longitudinal opening 22 located diagonally in the backing plate 21. In a fixed position, an upper edge 21 a of the backing plate 21 rests on the lower edge 16b of the upper pressed out portion 16. In such a way, a strong fixing with simple height adjustment is established between the load bearing wall 24 and the support module 10, which ensures that the position of the support module 10 is maintained, and furthermore that the weight load of the wall is safely absorbed.

[0017] The lower support abutment 15 has two important functions. On the one hand it ensures the parallel location of the support plate 11 of the support module 10 with the load bearing wall 24, and on the other the supporting force emerging on it is converted into a friction force to ensure the desired stability of the support module 10.

[0018] In the depicted preferred embodiments, a wall-bearing element of the wall-bearing cantilever is fixed to a lower edge 12b of the web-plate 12. The element holding the wall can be a horizontal base plate 17 having an L profile, but other types of support elements for example flat base plates may also be used. It is also possible that the base plate 17 with an L profile is connected to a vertical front edge of the web-plate 12 instead of the lower 12b edge, using the vertical leg of the L profile. The base plate 17, the material of which is preferably identical with that of the support module, is preferably fixed to the web-plate 12 by a double fillet weld.

[0019] In Fig. 3 a wall-bearing cantilever is depicted in an installed position, which has two support modules 10 connected to the joint base plate 17. In an insulation 25 fixed to the load bearing wall 24, openings are formed around the fixing points. The revetment wall 23 carried by the cantilever is generally made of bricks, but other types of walls made of marble or decorative stone for example can be conceived. Between the revetment wall 23 and the load bearing wall 24, an air gap may also be preferably formed outside the insulation 25.

[0020] The inventive support module can be of course formed differently from those depicted above. For example, it is possible to form the protrusions of the support plate 11 by welded-on plate pieces, welded or pressed abutments or by folding out the support plate 11. The web-plate 12 of the support module 10 formed integrally may have any preferred shape, and the support module 10 may have either a right hand or a left hand design. The support module according to the invention also enables the implementation of horizontal dilatation fields used in the art.

[0021] The material of the support module is generally stainless steel plate, for example steel plate KO33 or

KO35, preferably with a plate thickness of 3 to 6 mm. The support module according to the invention is excellent for designing support modules falling into the load-bearing capacity categories of 3.5 kN, 7.0 kN and 10.5 kN into applied in the art.

[0022] Regarding functionality and loadability, the support module according to the invention can be designed in a way that it is equivalent with prior art support modules, while the manufacturing costs are much lower.

[0023] It will be evident to those skilled in the art that the above disclosure is exemplary only and that various other alternatives, adaptations and modifications may be made within the scope of the present invention as defined by the following claims.

Claims

1. A support module (10) for a wall-bearing cantilever, the support module (10) comprising a support element to be fixed to a load bearing wall (24) of a building, and a web-plate (12) connected to the support element, wherein the web-plate (12) configured to be fixed to the load bearing wall (24) by means of the support element is in the fixed position essentially perpendicular to the load bearing wall (24) and wherein a wall-bearing element of the support module (10) is secured to the web-plate (12) the support element being a support plate (11) arranged essentially perpendicular to the web-plate (12) and being formed integrally with the web-plate (12) by bending (13), wherein the support plate (11) comprises an opening (14) allowing fixing to the load bearing wall (24), well as protrusions formed as a lower support abutment (15) below the opening (14) and an upper support abutment (16) above the opening (14) on the side opposite the web-plate (12), **characterised in that** the support module (10) has only one web-plate (12), and that the lower and upper support abutments (15, 16) are formed as square portions pressed out from the support plate (11), wherein the support plate (11) is sheared along top and bottom edges (15a, 15b; 16a, 16b) of the pressed out portions, and is bent at lateral edges of said portions.
2. The support module (10) according to claim 1, **characterised in that** the opening is formed as a longitudinal cut-out in parallel with the bending (13), and the support module (10) further comprises a square backing plate (21) for the fixing to the load bearing wall (24), which comprises a longitudinal opening (22) arranged essentially diagonally therein, and wherein in the fixed position the upper edge (21 a) of the backing plate (21) rests on the lower edge (16b) of the upper pressed out portion.
3. The support module (10) according to claim 1, **characterised in that** the support plate (11) has a form

of a vertical oblong, and the web-plate (12) has a nose shape having a slanted edge (12c) including an angle of 55, to 80° with the horizontal and a horizontal edge (12a) joining into the upper edge of the support plate (11) at the top of the nose shape.

4. The support module (10) according to claim 1, **characterised in that** the wall-bearing element for supporting a revetment wall is a base plate (17) being fixed by welding to the lower edge (12b) of the web-plate (12).

Patentansprüche

1. Stützmodul (10) für einen Wandlagerausleger, wobei das Stützmodul (10) ein an einer tragenden Wand (24) eines Gebäudes zu befestigendes Stützelement und eine mit dem Stützelement verbundene Stegplatte (12) umfasst, wobei die Stegplatte (12), die dazu ausgelegt ist, mittels des Stützelementes an der tragenden Wand (24) befestigt zu werden, in Befestigungslage im wesentlichen senkrecht zur tragenden Wand (24) verläuft, und wobei ein Wandlagerelement des Stützmoduls (10) an der Stegplatte (12) befestigt ist, wobei das Stützelement eine Stützplatte (11) ist, die im wesentlichen senkrecht zur Stegplatte (12) angeordnet und durch eine Biegung (13) einstückig mit der Stegplatte (12) ausgebildet ist, wobei die Stützplatte (11) eine Öffnung (14), die ein Befestigen an der tragenden Wand (24) zulässt, sowie Vorsprünge aufweist, die als unteres Widerlager (15) unter der Öffnung (14) und als oberes Widerlager (16) über der Öffnung (14) auf der der Stegplatte (12) gegenüberliegenden Seite ausgebildet sind, **dadurch gekennzeichnet, dass** das Stützmodul (10) nur eine Stegplatte (12) aufweist und das untere und das obere Widerlager (15, 16) als viereckige Abschnitte ausgebildet sind, die aus der Stützplatte (11) herausgedrückt sind, wobei die Stützplatte (11) entlang Ober- und Unterkanten (15a, 15b; 16a, 16b) der herausgedrückten Abschnitte abgesichert und an Seitenkanten der Abschnitte gebogen ist.
2. Stützmodul (10) nach Anspruch 1, **dadurch gekennzeichnet, dass** die Öffnung (14) als Längsausschnitt parallel zur Biegung (13) ausgebildet ist und das Stützmodul (10) ferner eine viereckige Rückplatte (21) zum Befestigen an der tragenden Wand (24) umfasst, die eine darin im wesentlichen diagonal angeordnete Längsöffnung (22) aufweist, wobei in Befestigungslage die Oberkante (21a) der Rückplatte (21) auf der Unterkante (16b) des oberen herausgedrückten Abschnittes aufliegt.
3. Stützmodul (10) nach Anspruch 1, **dadurch gekennzeichnet, dass** die Stützplatte (11) die Form

eines vertikalen Rechtecks und die Stegplatte (12) eine Nasenform mit einer Schrägkante (12c), die einen Winkel von 55 bis 80° mit der Horizontalen einschließt, und mit einer horizontalen Kante (12a) aufweist, die am oberen Ende der Nasenform in die Oberkante der Stützplatte (11) übergeht.

4. Stützmodul (10) nach Anspruch 1, **dadurch gekennzeichnet, dass** das Wandlagerelement zum Halten einer Verkleidungsmauer eine Grundplatte (17) ist, die mittels Schweißen an der Unterkante (12b) der Stegplatte (12) befestigt wird.

Revendications

1. Module de support (10) pour console d'appui mural, le module de support (10) comprenant un élément de support à fixer sur un mur porteur (24) d'un bâtiment, et une tôle d'âme (12) reliée à l'élément de support, dans lequel la tôle d'âme (12) configurée pour être fixée au mur porteur (24) au moyen de l'élément de support est, dans la position fixée, sensiblement perpendiculaire au mur porteur (24), et dans lequel un élément d'appui mural du module de support (10) est fixé à la tôle d'âme (12), l'élément de support étant une plaque-support (11) disposée sensiblement perpendiculairement à la tôle d'âme (12) et étant formée d'un seul tenant avec la tôle d'âme (12) par cintrage (13), dans lequel la plaque-support (11) comprend une ouverture (14) permettant la fixation au mur porteur (24), ainsi que des saillies formées comme une butée de support inférieure (15) en dessous de l'ouverture (14) et une butée de support supérieure (16) au-dessus de l'ouverture (14) du côté opposé à la tôle d'âme (12), **caractérisé en ce que** le module de support (10) comporte seulement une tôle d'âme (12), et **en ce que** les butées de support inférieure et supérieure (15, 16) sont façonnées comme des parties carrées formées par pression à partir de la plaque-support (11), dans lequel la plaque-support (11) est cisailée le long de bords supérieurs et inférieurs (15a, 15b ; 16a, 16b) des parties formées par pression, et elle est cintrée au niveau de bords latéraux desdites parties.

2. Module de support (10) selon la revendication 1, **caractérisé en ce que** l'ouverture (14) est formée comme une découpe longitudinale parallèlement au cintrage (13), et **en ce que** le module de support (10) comprend en outre une plaque d'appui carrée (21) pour la fixation sur le mur porteur (24), qui comprend une ouverture longitudinale (22) disposée sensiblement en diagonale dans celle-ci, et dans lequel, dans la position fixée, le bord supérieur (21a) de la plaque d'appui (21) repose sur le bord inférieur (16b) de la partie supérieure formée par pression.

3. Module de support (10) selon la revendication 1, **caractérisé en ce que** la plaque-support (11) a une forme verticale oblongue, et la tôle d'âme (12) a une forme de nez ayant un bord incliné (12c) comprenant un angle de 55 à 80° avec l'horizontale, et un bord horizontal (12a) rejoignant le bord supérieur de la plaque-support (11) au sommet de la forme de nez.

4. Module de support (10) selon la revendication 1, **caractérisé en ce que** l'élément d'appui mural destiné à supporter un mur de revêtement est une plaque de fond (17) fixée par soudure au bord inférieur (12b) de la tôle d'âme (12).

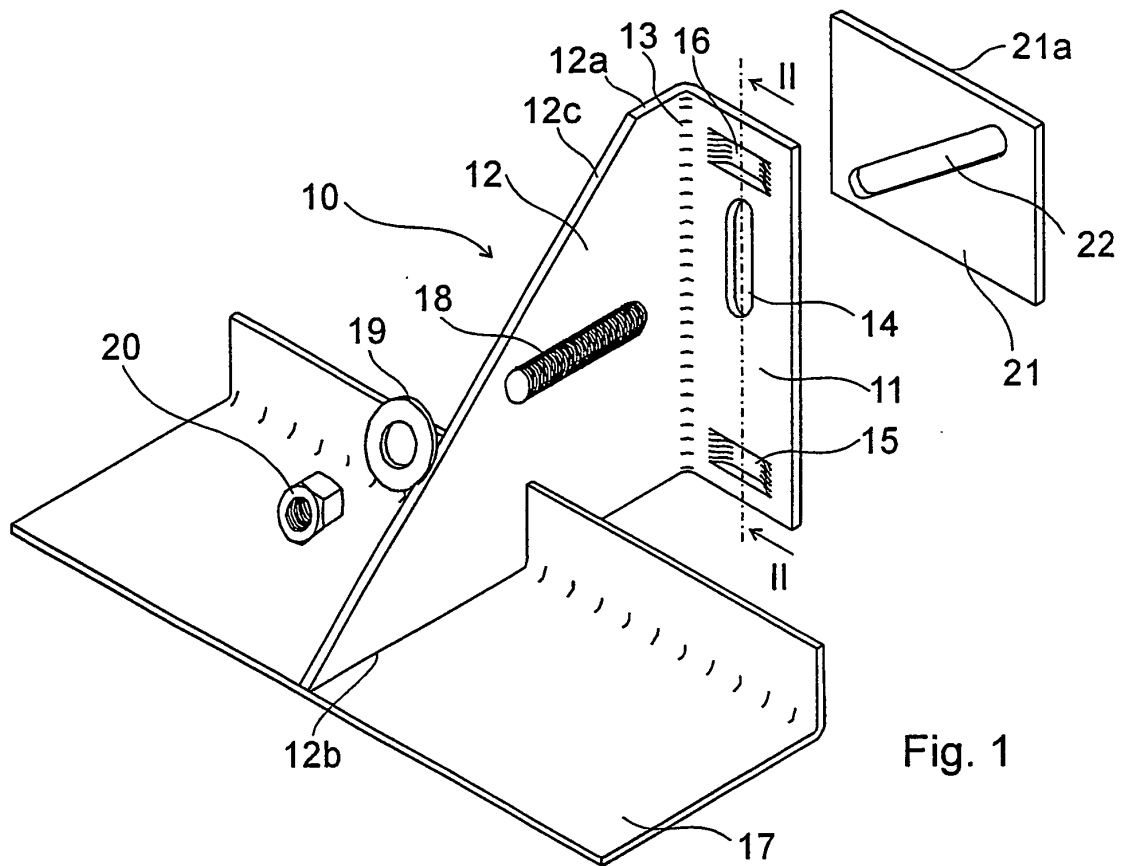


Fig. 1

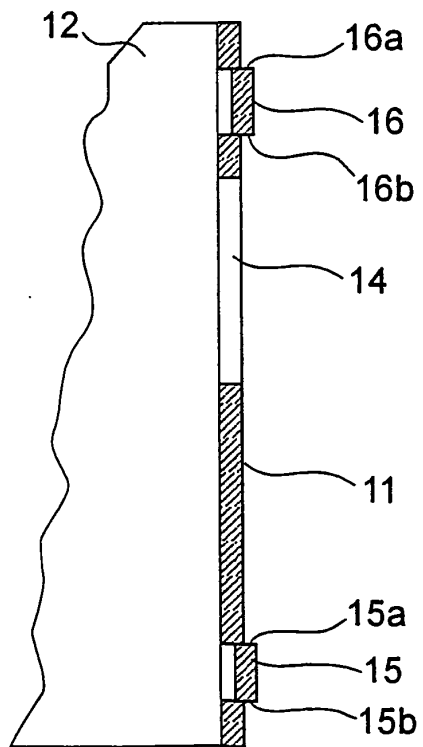


Fig. 2

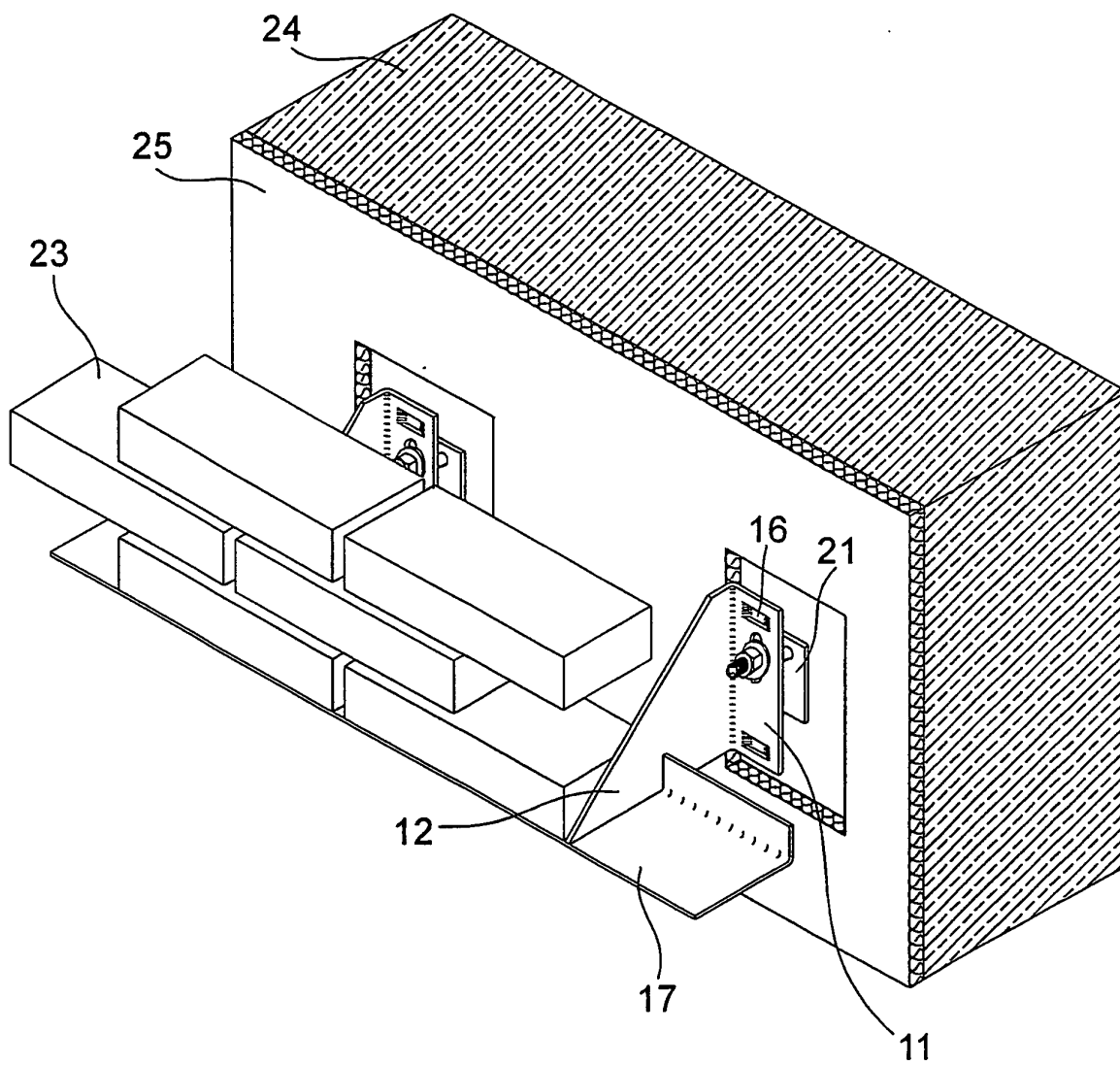


Fig. 3

REFERENCES CITED IN THE DESCRIPTION

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