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(54) **Prefabricated panel for construction of walls and wall comprising said prefabricated panel**

(57) The present invention relates to a prefabricated panel for the construction of enclosures which features an upper and lower grooving which permits, once the mortar used to join the panels has been poured, the array of panels thus formed to act as a single element, and

also relates to an enclosure which comprises at least a prefabricated panel of those mentioned above that is parallel to another wall and wherebetween insulating means, preferably an air chamber, are provided, thus constituting a ventilated facade.

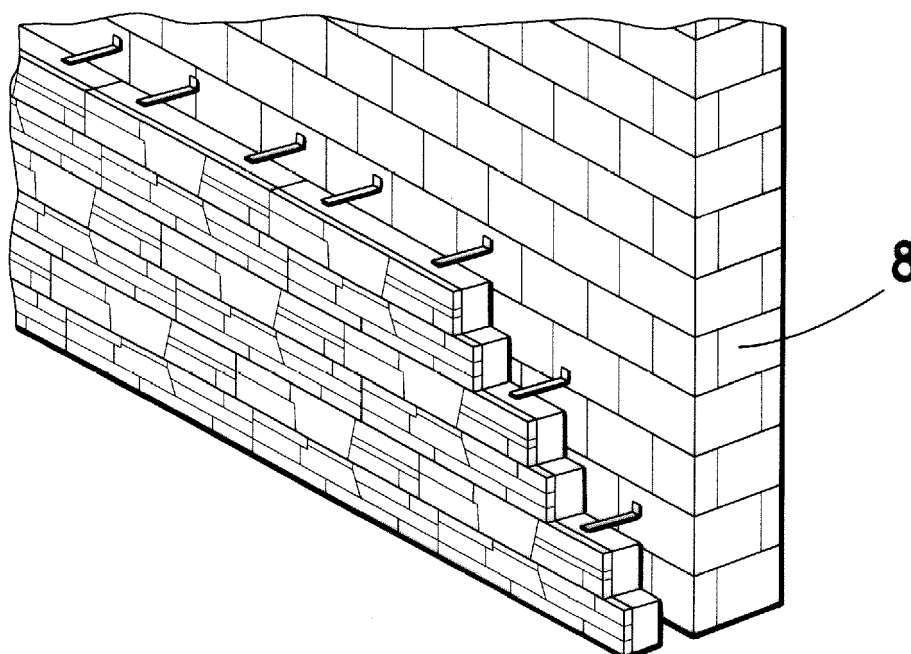


FIG.1

STATE OF THE ART

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Description

OBJECT OF THE INVENTION

[0001] The present invention relates to a prefabricated panel for the construction of enclosures with which the construction of an enclosure is carried out, that absorbs the shear stresses produced in the direction perpendicular to the plane of the enclosure, thus preventing separation between the different panels which make up the enclosure.

[0002] The object of the invention consists of a prefabricated panel which features an upper and lower grooving that permits, once the mortar used to join the panels has been poured, the array of panels thus formed to act as a single element.

[0003] Due to its special configuration, the prefabricated panel of the present invention features additional means which facilitate the joining to the adjacent panel, these additional means increasing the rigidity of the panel against shear stresses.

[0004] Likewise, another object of the present invention is an enclosure which comprises at least one prefabricated panel of those mentioned which is parallel to another wall and wherebetween insulating means are arranged.

BACKGROUND OF THE INVENTION

[0005] Prefabricated panels made of reinforced concrete with natural stone or similar faces are known in the state of the art, particularly applicable in coatings and floors, which are made up of a reinforced concrete base, of the desired dimensions and where to the pieces of natural stone or similar remain fixed after hardening, arranged with the chosen distribution across the entire moulding surface.

[0006] Among these is Spanish Utility Model ES1053364U, which uses an array of panels of those described above, making use of a template for placing the natural stone or similar.

[0007] However, when the preceding prefabricated panel is used to build a vertical enclosure, it is necessary to use additional fixing or joining means between panels so that the resulting shear stresses produced in the direction perpendicular to the plane of the enclosure can be absorbed by the enclosure.

[0008] These additional means require a much slower and more costly installation process, due to the fact that an in situ or prior fixing thereof must be carried out to prevent that displacement in the direction perpendicular to the plane of the enclosure.

[0009] Likewise, enclosures which feature two parallel walls wherebetween insulating means are provided are known in the state of the art. These enclosures are known by the term "cavity wall".

[0010] The prefabricated panels from the Spanish Utility Model ES1053364U cannot be used in the previous

type of enclosure since when the insulating material is air; there is no support surface for the panels to absorb the stresses in the direction perpendicular to the panel.

[0011] The prefabricated panel for the construction of enclosures of the present invention resolves all of the abovementioned drawbacks with a configuration which absorbs the shear stresses produced in the direction perpendicular to the plane of the enclosure.

[0012] Likewise, a ventilated facade wherein the exterior wall features a stone, brick, synthetic or similar material appearance constituted from prefabricated panels with a concrete, mortar or similar base and with sufficient structural rigidity and suitable ventilation conditions to meet the current ventilated facade regulations, can be formed by means of several prefabricated panels for the construction of enclosures of the present invention.

DESCRIPTION OF THE INVENTION

[0013] The present invention relates to a prefabricated panel for the construction of enclosures with which the construction of an enclosure is carried out which absorbs the shear stresses produced in the direction perpendicular to the plane of the enclosure, thus preventing separation between the different panels which make up the enclosure.

[0014] The prefabricated panel comprises a concrete, mortar or similar base of certain dimensions where to are fixed one or several blocks of stone, brick, synthetic material or similar, where the prefabricated panel thus constituted comprises an upper and lower grooving which permits, once the mortar used to carry out the joining between the panels has been poured into said grooving, the enclosure made up by the array of panels to act as a single element.

[0015] The prefabricated panel further comprises fixing means which facilitate the joining thereof to an adjacent panel, means which increase the rigidity of the panel against shear stresses.

[0016] The prefabricated panel of the present invention permits the forming of an enclosure where features at least one prefabricated panel arranged parallel to a wall or inner structural wall and wherebetween first insulating means or an air chamber are provided.

[0017] The joint between the wall and the prefabricated panel(s) is carried out by means of anchoring means or locking pins which additionally set the distance between both the wall and the prefabricated panels.

[0018] These anchoring means or locking pins support both the inner wall or side and the upper grooving of the prefabricated panels and pass through routing at the same height as the upper grooving provided in the inner face of the prefabricated panel.

[0019] The prefabricated panels which form one of the parts of the enclosure comprise one or more vertical through holes where through vertical rods are arranged that link and connect the prefabricated panels and stiffen the enclosure.

[0020] The enclosure further comprises rods or horizontal stiffening means that are embedded in the mortar and provided in each joint between two prefabricated panels, which permits the reinforcement of the horizontal joint in said joints, which are critical points regarding structural rigidity.

[0021] The enclosure further comprises support profiles which are anchored to the inner wall or side of the enclosure, which is the one that supports the load, and which are provided every certain number of vertically arranged prefabricated panels.

[0022] The enclosure further comprises expansion joints, which can be provided underneath the support profiles, to absorb the expansions and contractions of the prefabricated panels of the enclosure.

[0023] The enclosure further comprises second insulating means provided between the first insulating means or air chamber and the structural inner wall or side.

DESCRIPTION OF THE DRAWINGS

[0024] To complete the description that is being made, and with the object of assisting in a better understanding of the characteristics of the invention, in accordance with a preferred example of practical embodiment thereof, accompanying said description as an integral part thereof, is a set of drawings wherein, by way of illustration and not restrictively, the following has been represented:

Figure 1 shows a perspective view of an enclosure which features two parallel walls wherebetween insulating means are provided, known in the state of the art by the term "cavity wall".

Figure 2 shows a perspective view of the prefabricated panel of the present invention.

Figure 3 shows a cross-sectional view of the enclosure which comprises two prefabricated panels of those mentioned above, which are parallel to another wall and wherebetween insulating means are provided.

Figure 4 shows a perspective view of the enclosure of the present invention wherein one or several vertical through holes are observed in the prefabricated panels wherethrough are provided vertical rods which link and connect the prefabricated panels and stiffen the enclosure.

Figure 5 shows a close up view of the joint between one prefabricated panel of the exterior wall and the structural inner wall shown in Figure 4.

Figure 6 shows a close up view of the support profiles and the expansion joints provided in the structural inner wall or side of the enclosure or ventilated facade disclosed in the present invention.

Figure 7 shows a vertical cross-sectional view of the enclosure from figure 4.

PREFERRED EMBODIMENT OF THE INVENTION

[0025] In light of the figures, a preferred mode of embodiment of the prefabricated panel for the construction of enclosures is described below.

[0026] The present invention relates to a prefabricated panel for the construction of enclosures which comprises a mortar base (1) where to are fixed one or several blocks of natural stone (2), where the prefabricated panel thus constituted comprises an upper (3) and lower (4) grooving arranged in the mortar base (2), upper (3) and lower (4) grooving that are facing each other when the joining between an upper panel and a lower panel is carried out, wet mortar (7) is provided in the cavity formed by said grooving (3, 4).

[0027] The prefabricated panel further comprises joining means (5, 6) which facilitate the joining thereof to an adjacent panel in horizontal direction, means which comprise a projection (5) present on a side of the panel which opposes a recess (6) present in the adjacent side of the adjoining panel.

[0028] On the other hand, the prefabricated panel comprises a step (30) disposed in the longitudinal direction thereof which opposes an opposing cavity (31) present on the opposite side of an adjacent panel, which increase the rigidity of the joint between panels.

[0029] The prefabricated panel of the present invention permits the forming of an enclosure which features a partition or exterior wall formed by at least one prefabricated panel arranged parallel to a wall or structural inner wall (8) and wherebetween first insulating means (9) are provided which, in this example of preferred embodiment, is an air chamber. Figure 1 shows an enclosure of this type belonging to the state of the art.

[0030] In the present invention, and due to the configuration of the panel, the joint between the wall or structural inner wall (8) and the prefabricated panels of the partition or exterior wall is carried out by means of anchoring means or locking pins (10) which comprise a hook, where the bent side (11) thereof is arranged in the upper grooving (3) of the panel, the other end (12) being fixed to the wall or structural inner wall (8).

[0031] The anchoring means or locking pins (10) can feature a central span (20) and two antisymmetric end spans (21) that rest on the upper grooving (3) of the prefabricated panels and are built into the structural inner wall or side (8), in addition to a fold, plastic disc (22) or similar element adjacent to the structural inner wall (8) which prevents the passage of humidity through to said structural inner wall (8).

[0032] The structural inner wall or side (8) supports the horizontal wind loads transmitted by the exterior wall, through the locking pins (10).

[0033] The locking pins (10) that rest in both the inner wall and the upper grooving (3) of the prefabricated panels pass through routing (16) provided in the inner face of the concrete, mortar (1) or similar of the prefabricated panel.

[0034] The enclosure features horizontal stiffening means or rods (13) embedded in the mortar (7) provided in the cavity formed by the upper grooving (3) and the lower grooving (4) which face each other when the joint between an upper panel and a lower panel of the exterior wall is carried out, where the stiffening means or horizontal rods (13) are arranged horizontally in each joint between two prefabricated panels.

[0035] The prefabricated panels further comprise at least two vertical through holes (14) where through vertical, corrugated or threaded, stainless steel or similar rods (15) are provided that vertically connect the prefabricated panels. The vertical rods (15) can vertically link several prefabricated panels.

[0036] The enclosure further comprises horizontal support profiles (23) that are anchored to the structural inner wall (8), preferably arranged at a height of every 6 m. The support profiles (23) preferably are provided in the lower part of the enclosure and in the upper part of hollows such as windows or doors (not shown) of the structural inner wall (8). The exterior wall of prefabricate panels projects out from the support profiles (23) at a maximum distance of 15 mm.

[0037] Expansion joints (24) are provided horizontally underneath the support profiles (23) to guarantee the free mobility of the exterior wall of prefabricated panels, insulated from the outside by means of a sealing element (27).

[0038] The enclosure further comprises first insulating means or an air chamber (9) of a minimum thickness of 40 mm provided between the exterior wall and the structural inner wall or side (8), which forms a ventilated facade, due to a lower aperture (25) and an upper aperture provided in the exterior wall for the free circulation of air. The air chamber (9) begins in the lower aperture (25) and continues uninterruptedly to the upper aperture.

[0039] In the event that the continuity of the air chamber (9) is interrupted, for example by the horizontal support profiles (23), it has been provided that the exterior wall incorporates drilled through holes (29) which pass there-through, putting the air chamber (9) in contact with the outside underneath and above said support profile (23), as observed in figure 7.

[0040] The enclosure further comprises second insulating means (26) provided in the air chamber (9) and fixed to the structural inner wall (8), where the second insulating means (26) are mineral wool plates, polystyrene plates, foamed in situ or similar.

[0041] In its lower part adjacent to the structural inner wall or side (8), the ventilated facade comprises a waterproof element (28) with a slope facing outwards for its protection against humidity.

Claims

1. Prefabricated panel for the construction of enclosures which comprises a concrete, mortar or similar base (1) where to are fixed one or several blocks of

stone (2), brick, synthetic material or similar, **characterized in that** it comprises an upper grooving (3) and a lower grooving (4) which face each other when the joining between an upper panel and a lower panel is carried out, a cavity which permits the provision therein of wet mortar (7) defining said grooving (3, 4).

2. Prefabricated panel for the construction of enclosures according to claim 1, **characterized in that** the upper grooving (3) and the lower grooving (4) are provided in the mortar base (1).

3. Prefabricated panel for the construction of enclosures according to either of the preceding claims, **characterized in that** comprises a step (30) arranged in the longitudinal direction thereof, which opposes an opposing cavity (31) present in the other side of an adjacent panel.

4. Enclosure which comprises a partition or exterior wall formed by at least the prefabricated panel disclosed in any of the preceding claims, **characterized in that** it comprises a wall or structural inner wall (8) arranged parallel to the partition or exterior wall.

5. Enclosure according to claim 4, **characterized in that** a first insulating means (9) is provided between the wall or structural inner wall (8) and the partition or exterior wall.

6. Enclosure according to claim 5, **characterized in that** the first insulating means (9) is an air chamber thus constituting a ventilated facade.

7. Enclosure according to claim 6, **characterized in that** the prefabricated panels of the exterior walls comprise one or more vertical through holes where through vertical rods (15) are provided that link and connect the prefabricated panels.

8. Enclosure according to claim 7, **characterized in that** the joint between the wall or structural inner wall (8) and the prefabricated panels of the partition or exterior wall is carried out by means of anchoring means or locking pins (10) which set the distance between both the wall or structural inner wall (8) and the partition or exterior wall.

9. Enclosure according to claim 7, **characterized in that** it features horizontal stiffening means or rods (13) embedded in the mortar (7) provided in the cavity formed by the upper grooving (3) and the lower grooving (4) which face each other when the joint between an upper panel and a lower panel of the exterior wall is carried out, where the stiffening means or horizontal rods (13) are arranged horizontally in each joint between two prefabricated panels.

10. Enclosure according to claim 8, **characterized in that** the anchoring means or locking pins (10) rest in both the inner wall and the upper grooving (3) of the prefabricated panels and pass through routing (16) provided in the inner face of the prefabricated panel. 5
11. Enclosure according to claim 10, **characterized in that** the anchoring means or locking pins (10) comprise a central span (20) and two antisymmetric end spans (21) that rest on the upper grooving (3) of the prefabricated panels and are built into the structural inner wall (8). 10
12. Enclosure according to claim 10 or 11, **characterized in that** the locking pins (10) comprise a fold or plastic disc (22) adjacent to the structural inner wall (8) to prevent the passage of humidity through to said structural inner wall (8). 15
13. Enclosure according to any of claims 4 to 12, **characterized in that** the ventilated facade further comprises horizontal support profiles (23) which are anchored to the structural inner wall (8). 20
14. Enclosure according to claim 13, **characterized in that** the ventilated facade comprises expansion joints (24) provided underneath the horizontal support profiles (23) and sealing elements (27) which insulate the expansion joints (24) from the outside. 25
15. Enclosure according to any of claims 4 to 14, **characterized in that** the exterior wall (8) comprises a lower aperture (25) and an upper aperture that connect with the air chamber (9) for the free circulation of air. 30

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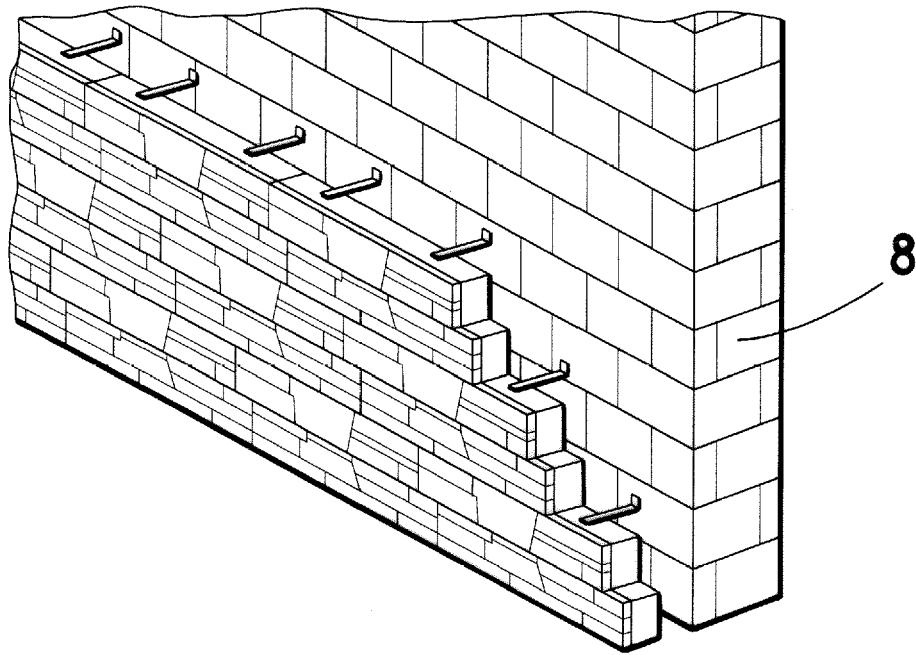


FIG.1

STATE OF THE ART

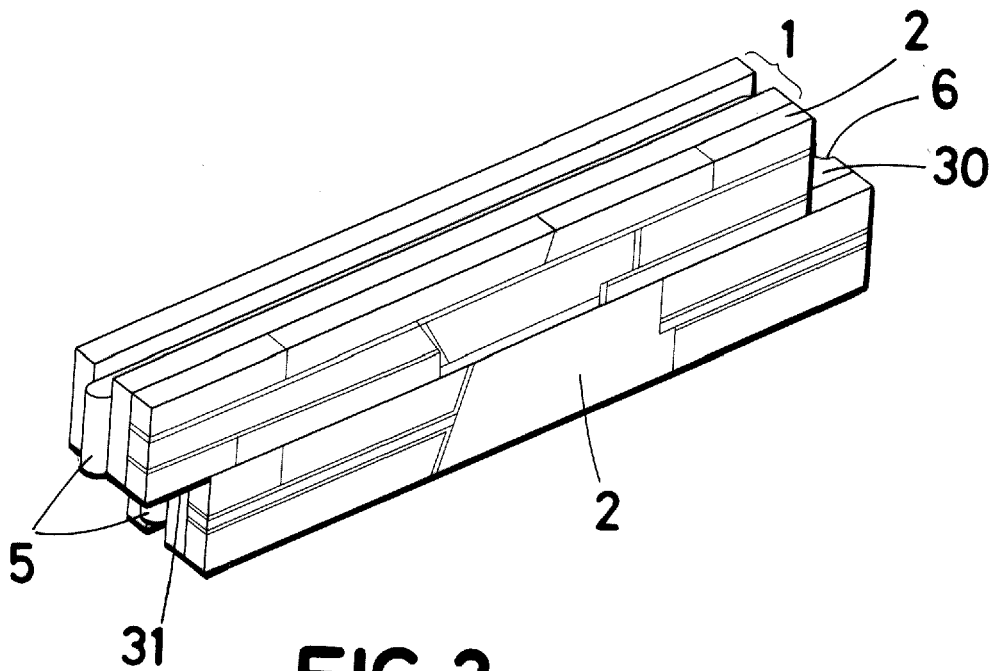


FIG.2

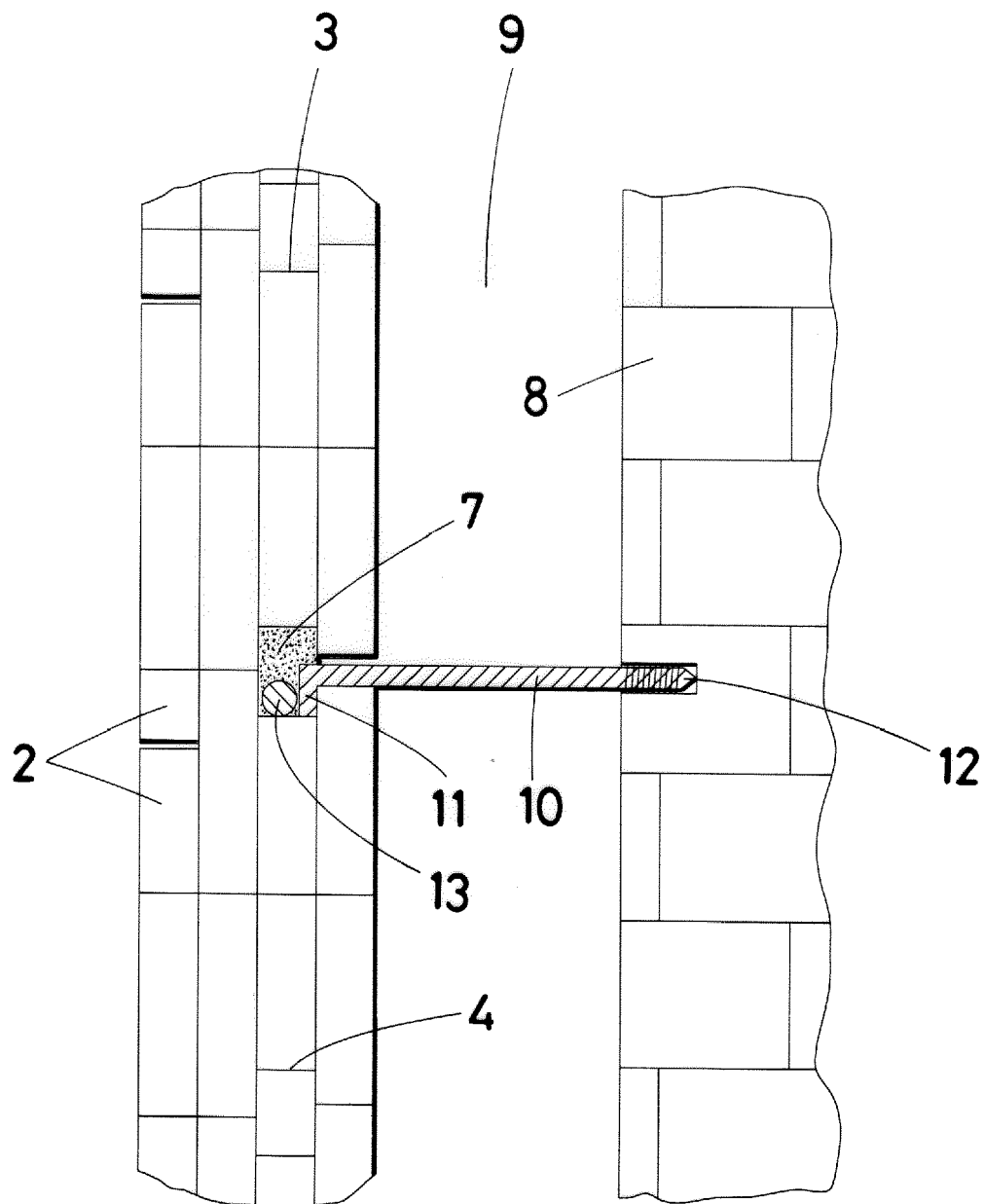


FIG.3

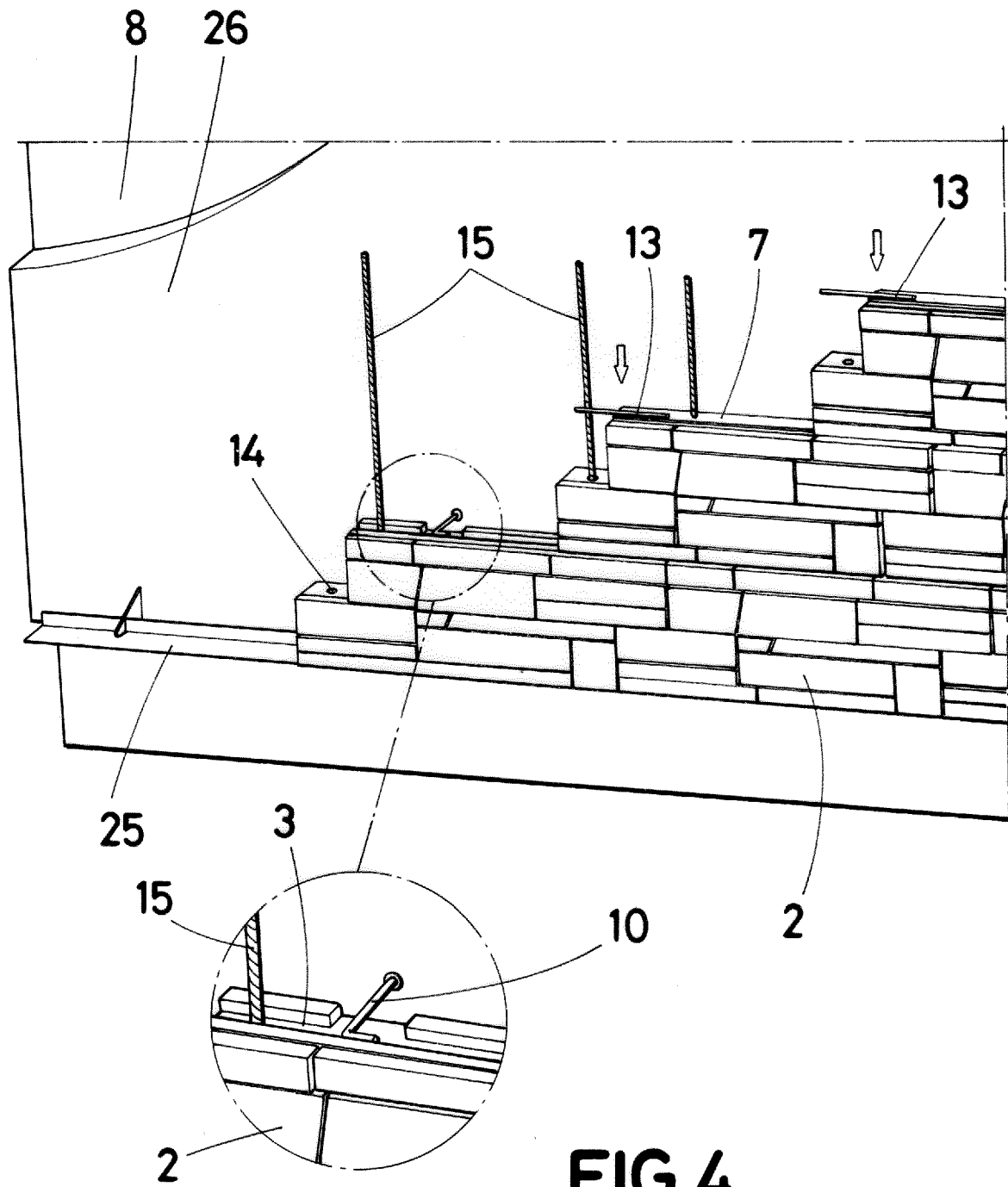


FIG.4

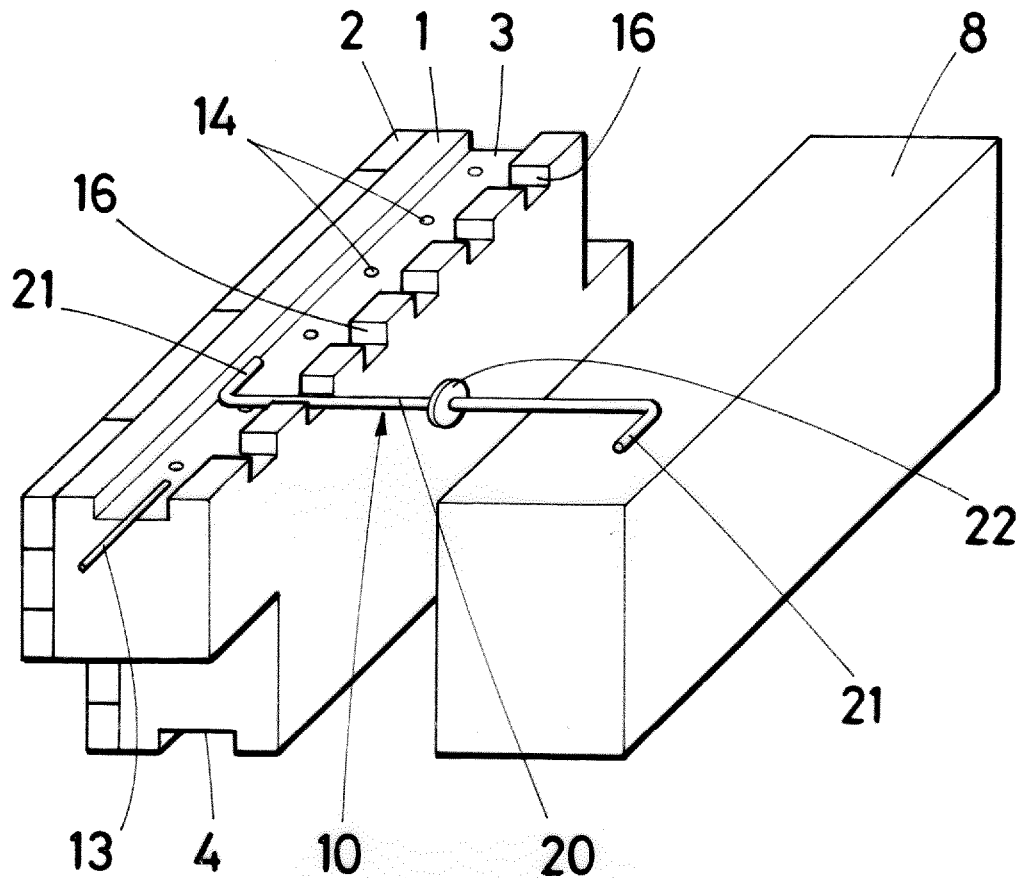


FIG. 5

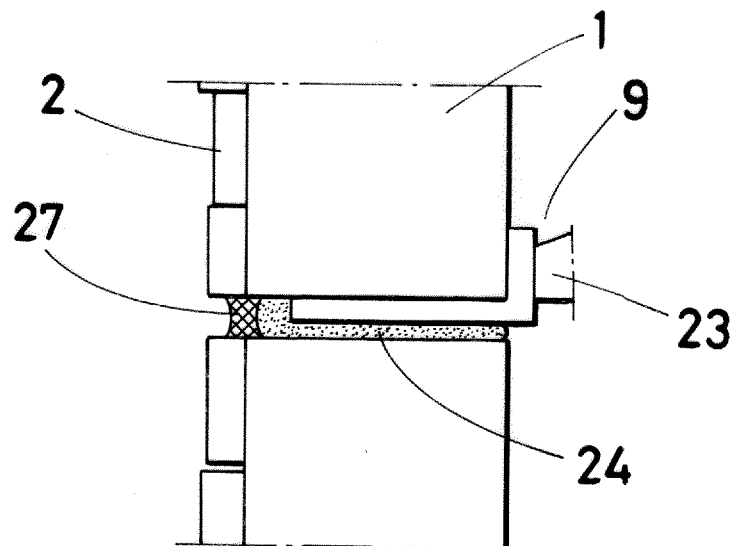


FIG. 6

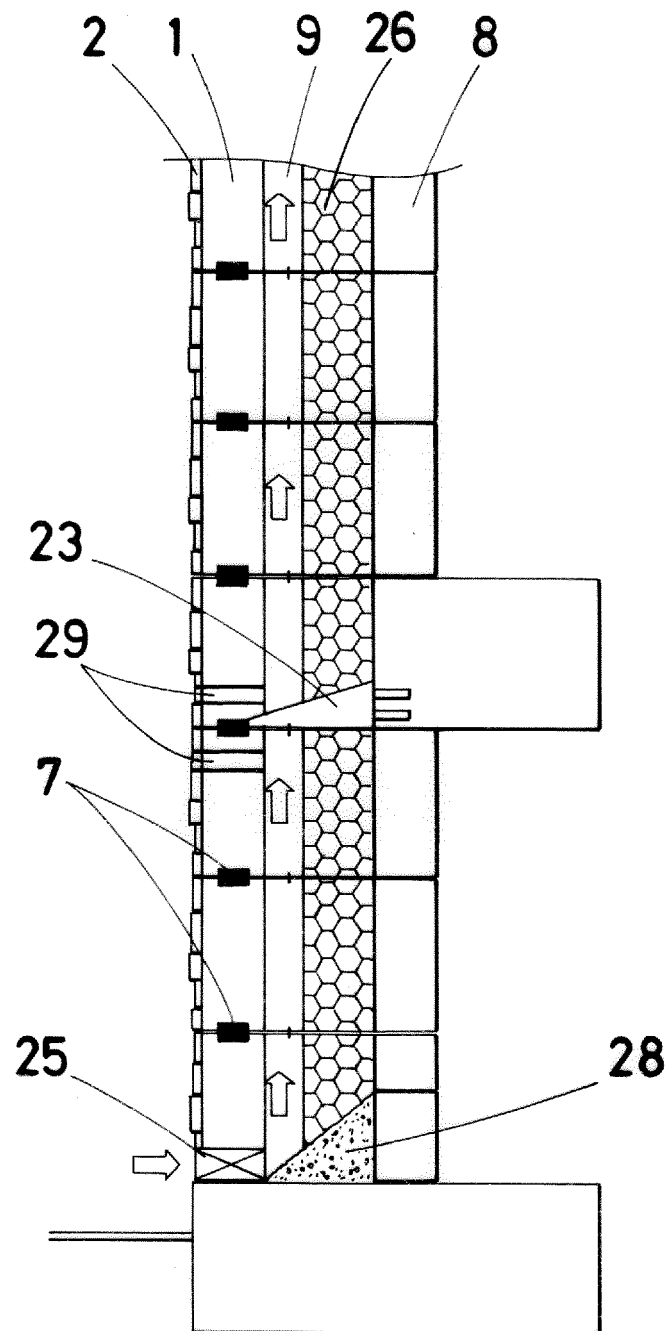


FIG.7

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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