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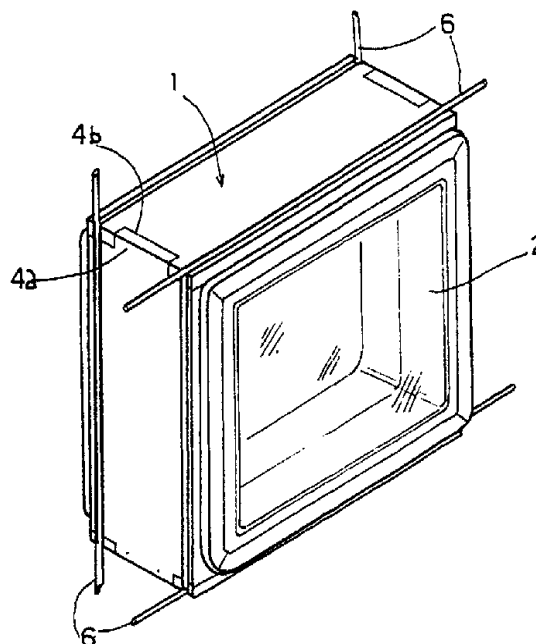
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(54) Title: A PROCEDURE FOR THE CONSTRUCTION OF VERTICAL WALLS USING GLASS BRICKS AND A REINFORCEABLE MODULAR ELEMENT USED IN SAID PROCEDURE

(57) Abstract

The present invention pertains to the field of the building trade. The procedure envisages the laying of reinforceable glass modular bricks (2), being provided with an external retaining structure (1) and placed on a row of other glass bricks (2) already laid or on any base; the subsequent insertion of a reinforcement, constituted by rods or metal bars (6) having circular or polygonal sections, into grooves (5) correspondingly shaped for containing a half part of said rods or metal bars (6), said grooves being obtained in the external retaining structure (1) of each glass brick; the laying of other glass bricks (2) until completion of the wall to be constructed. The brick (2) is characterised in that said framework (1) is shaped in such a way that it shows, on each side of the framework itself, at least a longitudinal groove (5) along the whole length of the side, which is shaped as a half part so as to accommodate a rod or metal bar (6) having a section whose shape corresponds to that of the groove (5). The brick is therefore a reinforceable modular element and the construction of walls is made notably easier.



A procedure for the construction of vertical walls using glass bricks and a reinforceable modular element used in said procedure.

Description

The object of the present invention is a procedure for the construction of vertical walls using glass bricks and a reinforceable modular element made out of glass used for carrying out said procedure.

05 The so called brick and glass tiles or reinforced concrete and glass tiles are manufactured articles made of glass and are used for the construction of walls and/or flooring.

10 According to a traditional technique, the laying procedure envisages the manufacturing of formwork shuttering in which metal reinforcements are arranged and concrete is injected for binding the single glass bricks to each other.

15 When the concrete is solidified the reinforcements are then removed.

Said procedure is particularly difficult to carry out and expensive.

In the patent number FR 2542353 are described

frameworks which comprise the glass bricks and are provided with projections and recesses destined to fit, by coupling, into the corresponding recesses and projections of adjacent bricks, thus
05 constituting construction modular structures.

Said frameworks have a non symmetrical configuration and so, in the case of the application of glass bricks with unequal facings or defined orientation, it is necessary to pay
10 particular attention when applying the framework so that said framework is applied in the correct direction.

A further drawback is due to the insufficient seal of a wall which is obtained by means of a simple
15 fitting of the above mentioned framed bricks, said wall lacking reinforcement.

Also the patent number EP-B-0115279 describes modular bricks having the same characteristics and the same drawbacks as those in the French document
20 mentioned above.

In particular, said patent shows glass bricks provided with a framework made of plastic material equipped with cylindrical recesses which, coupled with cylindrical projections and seal
25 gaskets, permit the assembling without cracking.

The first row of bricks also requires a base section as a support.

This solution is also particularly expensive.

The solutions of the known technique are therefore constituted by modular but not reinforceable bricks or by reinforceable and not modular bricks which are difficult
5 to lay.

FR-A-2 700 182 discloses a process for the construction of vertical walls.

The French document discloses the use of a plastic framework for the glass bricks and the plastic framework, constituted by a single piece, is die-cast directly on the glass bricks, with an expensive and complex process.

10 Furthermore it is necessary to employ expensive glues for plastic material during the mounting of the wall, to anchor the frameworks of the bricks each other.

Summary of the Invention

It is the object of the present invention to overcome or substantially ameliorate at least one of the above disadvantages.

15 There is disclosed herein a process for the construction of vertical walls and/or floors with glass bricks, the process including the steps of:

laying reinforceable modular glass bricks each having an external retaining structure on a row of laid glass bricks or on a base, including a preliminary step of forming the retaining structure by disposing a structure element made of wood or
20 plywood on each side face of the brick and fixing each element to adjacent elements;



inserting a reinforcement, including rods or metal bars having circular or polygonal sections, into grooves disposed in the external retaining structure of each glass brick, said grooves being correspondingly shaped for substantially containing a half sectional part of said rods or metal bars;

5 laying further glass bricks until completion of the wall or floor.

Preferably, the reinforcement includes bars, the bars being inserted into grooves disposed in different parallel planes.

There is further disclosed herein a modular element for the construction of walls, the modular element including a glass brick having an external retaining structure, the retaining structure including structure elements made of wood or plywood fixed to each other by means of adhesive substances and reciprocal fitting, each side of the retaining structure having at least a longitudinal groove along the whole length thereof and wherein said groove is shaped to substantially receive a half sectional part of a correspondingly shaped rod or metal bar.

15 Preferably, each side of the retaining structure comprises two longitudinal parallel grooves.

Preferably, the retaining structure is fixed to the glass brick by means of an elastic element or resin.

20 Preferably, the grooves are equidistant from their respective nearest external border of the retaining structure.

Preferably, the retaining structure is narrower than the brick.



Preferably, each wood element of the retaining structure has male parts and/or female parts which engage corresponding male or female parts afforded by adjacent wood elements.

Brief Description of the Drawings

5 Preferred forms of the present invention will now be described by way of example only, with reference to the accompanying drawings, wherein:

Figure 1 shows a glass brick in a perspective view;

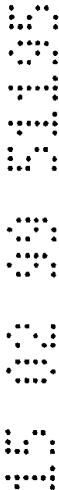
Figure 2 shows the glass brick in a vertical section;

Detailed Description of the Preferred Embodiments

10 With reference to the figures, 1 denotes, as a whole, a retaining structure, preferably made of wood or of plywood and substantially of a fixed type, for a glass brick 2, often called brick and glass tiles or reinforced concrete and glass tiles.

The framework 1 is constituted by four sides constrained to each other by conventional means or adhesives and which is connected to the brick by means of an
15 elastic element 7, such as, for example, resin.

The four sides of the framework can be shaped in such a way to reciprocally fix into each other so



as to permit a greater solidity, as shown in figure 1 where a male part 4a of a side is fixed into a female part 4b of the adjacent side of the framework.

05 Each wood element 3 constituting a side of the framework can include two male ends 4a or two female ends 4b (as shown in figure 1 where the horizontal element has two recessing ends and the vertical element has two projecting ends), or,
10 according to a variation not shown, each element 3 is provided with a male end 4a and with a female end 4b. By means of the fittings and the connection to the framework a single block with the brick and glass tiles and the elastic element
15 7 is obtained.

Each element 3 is also provided with cavities or grooves 5 for the insertion of metal reinforcements which are preferably constituted by rods or polygonal rods 6.

20 The grooves 5 have a substantially complementary shape with respect to that of the reinforcement to be inserted into said grooves. Said grooves can have transversal, round or also square or polygonal sections.

25 In each case the above mentioned half parts are

destined to be completed by means of the insertion of the reinforcement and by means of the approaching of another brick in such a way that the other half part of the groove envisaged on said brick completes the cageing of the rod constituting the reinforcement.

As shown in figure 1, two grooves 5 are generally provided for each side of the framework and they are placed in such a way that each groove is received by the corresponding groove of the adjacent side.

When building a wall and laying the modular elements, the vertical and horizontal reinforcements have to be inserted into grooves skew to each other, as shown in figure 1, in such a way that the horizontal and vertical reinforcements do not cross each other. As shown in figure 2, the sides of the framework are narrower than the brick, in such a way that, once the construction of the wall has been completed, recesses are left between a brick and those immediately adjacent to it. In said recesses it is possible to arrange finishing frames or to apply mixtures of various colours or mixtures which can be painted. Said brick 2 is therefore a modular

and reinforceable brick with which walls and flooring can be obtained, which are particularly strong (owing to the reinforcement) and at the same time easy to construct (owing to the brick modularity and to the particular simplicity of the laying).

The laying procedure of the bricks in order to construct a wall envisages the laying of the bricks on a row of other glass bricks already laid or on any kind of base (for example a floor); the subsequent insertion of a reinforcement, constituted by rods or metal bars 6, having circular or polygonal sections, into the shaped grooves 5; the laying of other glass bricks until completion of the wall.

The glass bricks are laid with the interposition of adhesive or binding material between the bricks to be laid and the row of bricks already laid or the underlying base.

Said binding material is constituted by adhesive substances, glues or resins.

Thanks to the particular arrangement of the grooves 5, as well as to the fact that all the grooves 5 are equidistant from the nearest external border of the framework, the modular

brick can be perfectly symmetrical during the mounting phase, i.e., in the case of a square brick this can be laid on any of its own sides and have any of the glass sides displayed.

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The claims defining the invention are as follows:

1. A process for the construction of vertical walls and/or floors with glass bricks, the process including the steps of:
laying reinforceable modular glass bricks each having an external retaining
5 structure on a row of laid glass bricks or on a base, including a preliminary step of forming the retaining structure by disposing a structure element made of wood or plywood on each side face of the brick and fixing each element to adjacent elements;
inserting a reinforcement, including rods or metal bars having circular or polygonal sections, into grooves disposed in the external retaining structure of each
10 glass brick, said grooves being correspondingly shaped for substantially containing a half sectional part of said rods or metal bars;
laying further glass bricks until completion of the wall or floor.
2. The process as claimed in claim 1, wherein the reinforcement includes bars, the bars being inserted into grooves disposed in different parallel planes.
- 15 3. A modular element for the construction of walls, the modular element including a glass brick having an external retaining structure, the retaining structure including structure elements made of wood or plywood fixed to each other by means of adhesive substances and reciprocal fitting, each side of the retaining structure having at least a longitudinal groove along the whole length thereof and wherein said groove is
20 shaped to substantially receive a half sectional part of a correspondingly shaped rod or metal bar.
4. The modular element as claimed in claim 3, wherein each side of the retaining structure comprises two longitudinal parallel grooves.
5. The modular element as claimed in claim 3 or 4, wherein the retaining
25 structure is fixed to the glass brick by means of an elastic element or resin.
6. The modular element as claimed in claim 3, 4 or 5, wherein the grooves are equidistant from their respective nearest external border of the retaining structure.
7. The modular element as claimed in any one of claims 3 to 6, wherein
30 the retaining structure is narrower than the brick.
8. Walls constructed by means of the process as claimed in claim 1 or 2 or by means of the use of modular elements with glass bricks as claimed in any one of claims 3 to 7.
9. A modular element as claimed in claim 3, wherein each wood element
35 of the retaining structure has male parts and/or female parts which engage corresponding male or female parts afforded by adjacent wood elements of the same retaining structure.

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10. A process for the construction of vertical walls and/or floors with glass bricks, the process substantially as hereinbefore described with reference to the accompanying drawings.

11. A modular element for the construction of walls, the modular element substantially as hereinbefore described with reference to the accompanying drawings.

Dated 18 June, 1999

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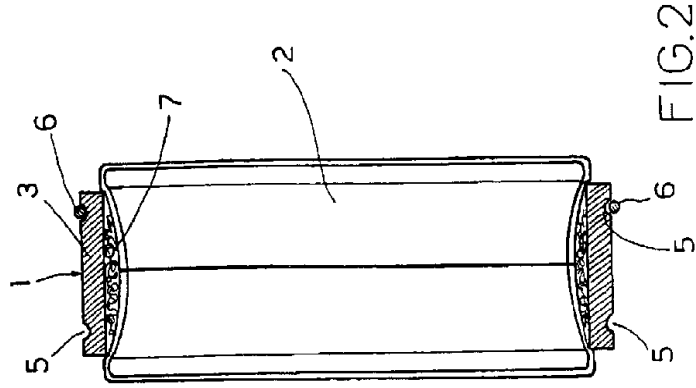


FIG. 2

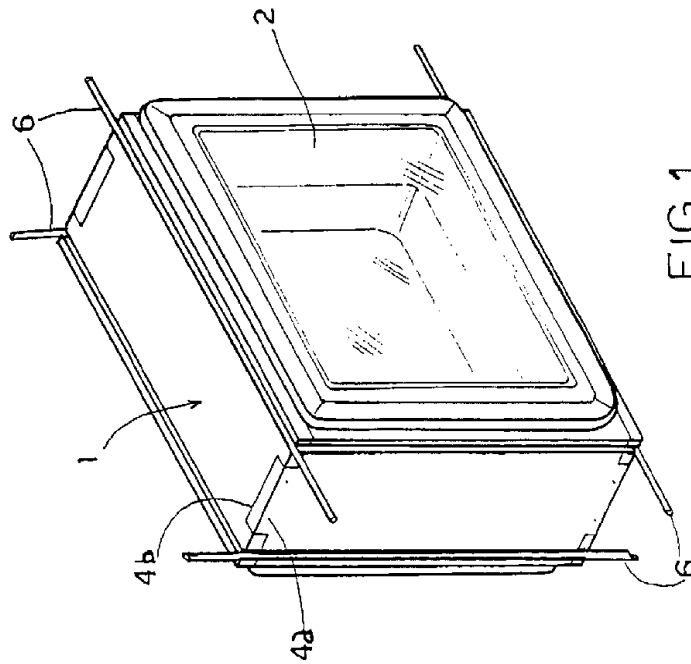


FIG. 1