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(54) **Plastic block for building walls like glass block walls, like partitions, shower walls and the like**

(57) Plastic block (20) for building walls like glass block walls, as partition walls, shower wall and the like comprising a perimetrical middle band (1) and frontal plates (2, 3), wherein on the middle band (1) are provided snap coupling means (25, 26) for coupling adjacent blocks (20), wherein said middle band (1) is provided on each frontal side thereof with an overhanging perimetrical frame (4, 6) which has an housing seat (13) for housing, through a geometrical engagement, a block frontal plate (2, 3) the external surface of which, after the block assembling, is substantially coplanar with the external surface of the associated frame (4; 6), wherein in said middle band (1) and on said frontal plates (2, 3) are further provided snap coupling means (9, 16).

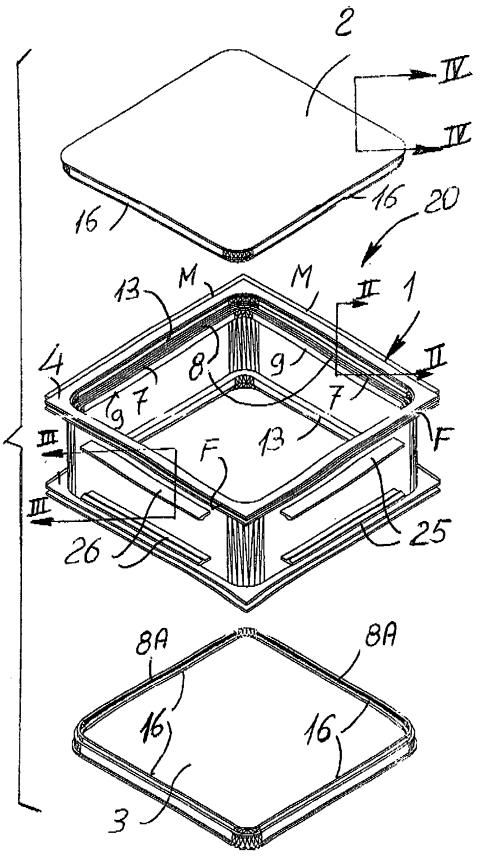

Fig. 1

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Description

Technical field

[0001] The present invention relates to a plastic block for building walls like glass block walls, as partitions, shower walls and the like according to the preamble of claim 1.

Background of the invention

[0002] Plastic blocks, for example polycarbonate blocks, of the mentioned type are already known in several embodiments, wherein said known blocks allow a snap assembling and disassembling thereof by means of snap coupling elements provided on the four block perimetrical sides.

[0003] Blocks made of plastic, for example polycarbonate, formed by two molded block-halves are disclosed in the document EP 0 438 110 Al.

[0004] These disclosed blocks made of transparent plastic are offered as an alternative choice to the hollow glass blocks used for building walls which are similar to the so called glass block walls.

[0005] On the perimetrical sides of said blocks are provided snap lock assemblies having the double function of spacers and coupling element for assembling adjacent blocks, so that between said adjacent blocks is formed an air space which must be filled with a layer of bonding mortar.

[0006] After having built a such glass block wall the latter can not be later disassembled. Therefore, it is not possible to use again the blocks of a built glass block wall for building a new wall or to modify an already built glass wall.

[0007] No teaching is given concerning the securing of the wall made of plastic blocks to the floor, the ceiling and the walls of the room in which said plastic block wall is built.

[0008] The document US-A-5 033 245 discloses blocks 10 made of molded plastic which are provided with adjacent removable snap lock connectors 40 at each block corner. In more details, each removable snap lock connector 40 is provided with a middle tongue 42 or 43 having on both sides a pair of grooves 44 which are formed between said tongue and a triangular shaped spacer 46 or a finger 48.

[0009] The task of said connectors is to assemble the blocks and to secure the latter in a positive way in a correct position while maintaining an air space "S" between the assembled blocks, wherein in said air space "S" - after the completion of a wall - an adhesive 38 is applied for forming a hardy adhesive bead (Figure 6 and 6b) which from the outside looks like a typical mortar joint.

[0010] In this document is further put in evidence that the adhesive enters through openings 58 and slots 59 between adjacent blocks 10 and form a very strong joint which is much stronger than the securing force of a typical cement or mortar joint as actually used with glass blocks. This means that even if the blocks 10 are provided with removable snap blocking connectors the wall, completed with the necessary adhesive sealing means joints, can not be disassembled without breaking the blocks 10 or parts thereof. Further, this document does not show how to secure the formed wall to the floor, the ceiling and the walls of the room in which said block wall is built.

[0011] The document WO-A-97 34058 discloses partition structures 100 formed by construction blocks 10 made of plastic and provided with snap coupling means. The proposed snap coupling means are substantially formed by a hook-shaped receptacle 24 and a hook 34, respectively, -- in a correspondent number and position along the length of the block sides --, wherein said hook-shaped receptacle or seat 24 and said hook 34 (Figures 11 and 12) after the coupling thereof (Figure 13) do not allow a subsequent disassembling of the blocks so that a partition structure or wall built with blocks of this type can not at all be disassembled without breaking the blocks or parts thereof.

[0012] As stated on page 8, lines 13 to 24 "The two lips 28 and 38 hold one another and prevent the blocks 10 from being separated from each other. The blocks 10 can be separated from each other only by permanent invalidation of one of the blocks. The "disassembling concept" is not provided for in the stated objects of the document WO-A-97 34058. On page 9, lines 2 to 5 is set forth that "Once two blocks 10 are interconnected, the overlap of each first pair of spacing flange 20 with its corresponding second pair of spacing flange 30 can be ultrasonically welded or otherwise fastened to further secure adjacent blocks 10 to each other.".

[0013] It is therefore obvious that the snap coupling means suggested in the document WO-A-97 34058 can not be utilized in blocks for building disassemblable partition walls or structures.

[0014] A plastic block is further known which is formed by two block-halves which are assembled together and are perimetrically provided with sliding coupling means formed by two ribs which are longitudinally aligned on each perimetrical block side. The fit is carried out by a first abutment movement of one block towards another one, so that the coupling ribs of said two blocks are consecutively aligned, and a subsequent sliding movement along the whole length of said ribs.

[0015] The chosen kind of said fit allows, on the one hand, to eliminate the use of a sealing means but has, on the other hand, several drawbacks.

[0016] First of all a wall built with such blocks does not have - due to the necessary sliding clearance - the necessary stiffness and strength required for partition walls in houses, flats, offices and so on. Secondly, by the disassembling of a built partition wall said coupling ribs tend to break away particularly if, for safety purposes, thin adhesive stripes are placed between the blocks, and thirdly a complicated block assemblability is to be stressed which involves practical difficulties and limits

when building the walls, particularly in connection with the perimetrical wall edges. The plastic blocks are sold as such so that the wall assembler has to decide, for each wall, how to secure the block wall to the floor, the ceiling and the walls of the room in which the block wall is built.

[0017] A plastic block is further known which is formed by three block parts, and in more details by a perimetrical ribbon-like frame, on the perimetrical side of which are provided strip-like elements allowing a removable coupling, and by two frontal plates which are provided in the inside thereof with a perimetrical groove-like seat in which is housed, and secured by glueing, the perimetrical edge of an end perimetrical edge of the mentioned middle ribbon-like frame. Said frontal plates are provided with a small perimetrical abutment flange for the abutment of two adjacent blocks.

[0018] Said frontal plates may be of a color at will, wherein on the abutment sides of adjacent blocks is provided a direct abutment contact between said perimetrical flanges of said frontal plates so that between adjacent blocks a joint having a contrast color is missing, wherein just said contrast color joint represents in fact the basic feature of the known glass block walls.

[0019] From the document WO99/67476 is further known a set of modular components for building transparent walls and walls made with said components, wherein said document discloses a plastic block of the considered type, the features of which common with those of the plastic block according to the present invention are set forth in the preamble of claim 1 and the content of which is here fully included for reference, particularly with reference to details concerning the plastic block itself and the modular components thereof.

[0020] The block for building disassemblable walls disclosed in this document is provided on the perimetrical sides thereof with strip-like removable male and female coupling means which preferably have an equal outline and are placed as a double track. The proposed block is formed by two hollow block-halves in each of which is provided a perimetrical band-like half-frame terminating at one side thereof open and forming, on the other side, a frontal integrated plate.

[0021] The disclosed blocks, for example polycarbonate blocks, have structures which require high manufacturing costs and have frontal surfaces having only one color equal to the color of the integrated half-frame. A further disadvantage of the known blocks of the considered type is to be seen in the fact that the possible replacement of a block in a built wall, due for example to the damage of a block frontal plate, requires a disassembling of the wall up to the reaching of the block to be replaced, and subsequently the need to build again the before disassembled wall part.

Summary of the invention

[0022] The main object of the present invention is to provide a plastic block for the building of walls of the type of the known glass block walls like partition walls, shower walls and the like, which plastic block allows a quick and simple replacement of damaged block frontal sides without requiring any disassembling of the built wall and subsequent rebuilding of the wall.

[0023] This object is achieved according to the present invention with a block of the considered type which latter has the features set forth in claim 1.

[0024] Further advantageous embodiments and developments of the proposed block are inferable from the dependent claims.

[0025] With the block according to the present invention several and important advantages are obtained.

[0026] First of all the manufacturing of for example polycarbonate blocks can be carried out at lower manufacturing costs. By providing block large sides or block frontal plates which may be removably secured to the perimetrical band middle block frame it is possible to replace in a simple and quick manner said frontal plates in case of damages thereof due, for example, to scratches made by playing children.

[0027] A further important advantage is to be seen in the fact that by providing block removable frontal plates said frontal plates may have a different color with respect to a frame or flange-like perimeter provided on each block frontal side. This allows the building of walls having a great chromatic contrast effect between the color of block frontal plates of adjacent blocks and the color of joints between adjacent blocks, and this without any formation of air spaces so that walls are obtained having continuous two-color facades, and without interposition of perimetrical plastic gaskets as necessary for the known blocks having integral molded frontal sides or plates having only one color and not replaceable.

Brief description of the drawings

[0028] Further features, advantages and details of the plastic blocks for building walls like glass block walls like partition walls, shower walls and the like according to the present invention will be further apparent from the following description taken in connection with the accompanying drawings showing a preferred embodiment of a block according to the present invention and in which:

Figure 1 shows an exploded view of a block according to the invention in a preferred embodiment;
Figures 2 and 3 show two enlarged details in a sectional view along the sectional planes II-II and III-III in the perimetrical middle band of Figure 1;
Figure 4 shows an enlarged detail in a sectional view along the sectional plane IV-IV of a frontal block plate according to Figure 1;
Figure 5 shows an enlarged detail in a sectional view illustrating the housing for a block frontal plate in the middle band of the assembled block of Figure 1:
Figure 6 shows a frontal view of the block of Figure

1 after the assembling thereof;

Figure 7 shows the assembling of, for example, five blocks according to the invention, coupled with a snap fit, of a wall portion; and

Figure 8 shows a detail of a wall in a cross sectional view illustrating the removal step of a scratched block frontal plate to be substituted.

Detailed description of the preferred embodiment

[0029] In the shown figures equal parts are denoted by equal numerals.

[0030] As inferable from Figure 1, the block 20 according to the invention is formed, in a preferred embodiment, of a perimetrical middle band 1 and two frontal plates 2, 3. Said middle band 1 may be formed either by one-piece band or by two band-halves which are bonded together, for example by thermowelding. On each frontal side said middle band 1 is provided with a perimetrical frame 4 and 6, respectively, each of which is provided on two adjacent sides thereof with respectively a male profile M and a female profile F, respectively which are both designed in order to allow an assembling of two adjacent blocks, as disclosed hereinafter.

[0031] Said male profiles M and female profiles F illustrated in the depicted example are clearly inferable from the sectional details shown in Figures 2 and 3. The same profiles are provided on both frontal sides of said perimetrical middle band 1.

[0032] In particular, from Figures 2 and 3 is inferable that inside said middle band 1 below the external male and female profiles M and F is provided a step 7 having a groove 8 and subsequently a hook-like conformation 9 defining an oblique leg 11 and an horizontal leg 12, wherein between said step 7 and the external side of the perimetrical frame 4 and 6, respectively, is provided a housing seat 13 for housing a frontal plate 2 and 3, respectively.

[0033] From Figure 4 is inferable that said cover plates 2, 3 are perimetrically provided with an abutting step 14 and a strip-like overhang 16 having a counterhook-like conformation 16 defining an oblique leg 17 and an horizontal leg 18. Said hook-like and counterhook-like conformations 9 and 16 are designed for obtaining a geometrical form engagement at the end of the insertion phase for inserting a frontal plate 2, 3 into the associated seat 13 of the middle band 1, as shown in Figure 5.

[0034] From the Figures is further inferable that in the groove 8 provided on the four sides of the middle band 1 in the rabbet sides or step 7 is housed a gasket 8A with a circular cross section, like an O-ring, in the form either of four segments, as shown, or as one-piece gasket.

[0035] After the insertion of the frontal sides 2, 3 into the respective seats 13 in the middle band 1 (Figure 5) the external surface of said frontal plates 2, 3 will be coplanar with the external surface of said frames 4, 6, so that during the wall assembling a perfect smooth and continuous wall facade surface is obtained due to the fact that said male and female conformations 1A and 1B are adapted to allow a practically clearance-free abutment between adjacent blocks, as shown in Figure 7.

[0036] By providing, according to the invention, frontal plates 2, 3, which are distinct and joinable to a one-piece middle band 1 having frontal frames 4, 6, it is apparent that said frontal plates 2, 3 may have a different color with respect to the color of said middle band 1 or of the frontal frames 4, 6 thereof, respectively, which frontal frames are visible after the wall assembling (Figure 7), so that said frontal frames 4, 6, which are provided for example white or with an ice color, allow to form a pleasant and remarkable joint whitish effect similar to the white joint color of the known glass block walls, wherein according to the invention the color of the frontal plates 2, 3 may be freely chosen and in the built walls they may have a single color or said walls may contain blocks with different front plates colors according to fancy pattern, that is like a mosaic.

[0037] Practically the width of the visually perceptible joint will be double with respect to the width of the sides forming the block frontal frames 4, 6, as shown in Figure 7.

[0038] The replacement of a damaged frontal plate 2, 3 is carried out in any proper way, after previous breaking/removal of the frontal plate. In Figure 8 is shown the possibility to previously make in a damaged frontal plate a hole 21 with an usual drill and then to insert in said hole any proper hook-like element 22 and subsequently apply on the latter an outwards force, as indicated by the arrow, in order to cause the breaking of the damaged frontal plate 2 or 3 and provide therewith a free access to the seat 13 in the middle band 1. The new frontal plate 2 or 3 will then be inserted with pressure in said seat without the use of any special tools, as illustrated hereinabove.

[0039] The operation for the replacement of a damaged frontal plate does not therefore require any partial or total disassembling of the considered built wall.

[0040] For assembling of the single blocks 20 the latter are provided with snap coupling means which are externally provided on the single block sides as in itself known, for example as disclosed in the document WO99/67476 briefly discussed in the above introductory part.

[0041] Therefore, for example, said snap coupling means may be carried out by rail-like profiled ribs 25, 26 which are parallel positioned like male and female tracks, as shown in Figure 1.

[0042] The termination of a partition wall, a shower wall or the like can be advantageously carried out with the components disclosed in the mentioned document WO99/67476.

[0043] From the above structural and functional description it is inferable that with the block consisting of a middle band and replaceable frontal plates it is possible to efficiently achieve the above stated object and to obtain the advantages set forth hereinabove.

[0044] The dimensions and the plastics, as polycarbonate, as well as the single conformations of the hook-

like and counterhook-like means, that is the male and female means, may be freely chosen without leaving the scope of the present invention.

Claims

1. Plastic block for building walls like glass block walls, shower walls and the like comprising a perimetrical middle band and frontal plates, wherein on said middle band are provided snap coupling means for coupling adjacent blocks, **characterized in that** said middle band is provided on each frontal side thereof with an overhanging perimetrical frame which has an housing seat for housing a frontal plate the external surface of which, after the block assembling, is substantially coplanar with the external surface of the associated frame.

2. Plastic block according to claim 1, **characterized in that** inside said middle band are provided hook-like means adapted to cooperate with counterhook-like means which overhang from the inside of said frontal plates and to assure a stable housing of the latter in said middle band.

3. Plastic block according to claim 1, **characterized in that** said housing seat of a frontal plate is defined by an horizontal step provided in said middle band.

4. Plastic block according to claim 3, **characterized in that** in said step defining said housing seat for a frontal plate is provided a groove adapted to house a gasket, preferably having a circular cross section, in the form of sectors or of a ring.

5. Plastic block according to claim 1, **characterized in that** the frames of said middle band are externally provided with male and female conformations on respectively two adjacent sides, wherein said conformations are adapted to allow a practically clearance-free abutting between said frames of adjacent blocks.

6. Plastic block according to one or more of the preceding claims, **characterized in that** said middle band is made of polycarbonate and/or ABS whereas said frontal plates are made of sanstirolo and/or PET.

7. Plastic block according to one or more of the preceding claims, **characterized in that** said middle band and said frontal plates have different colors.

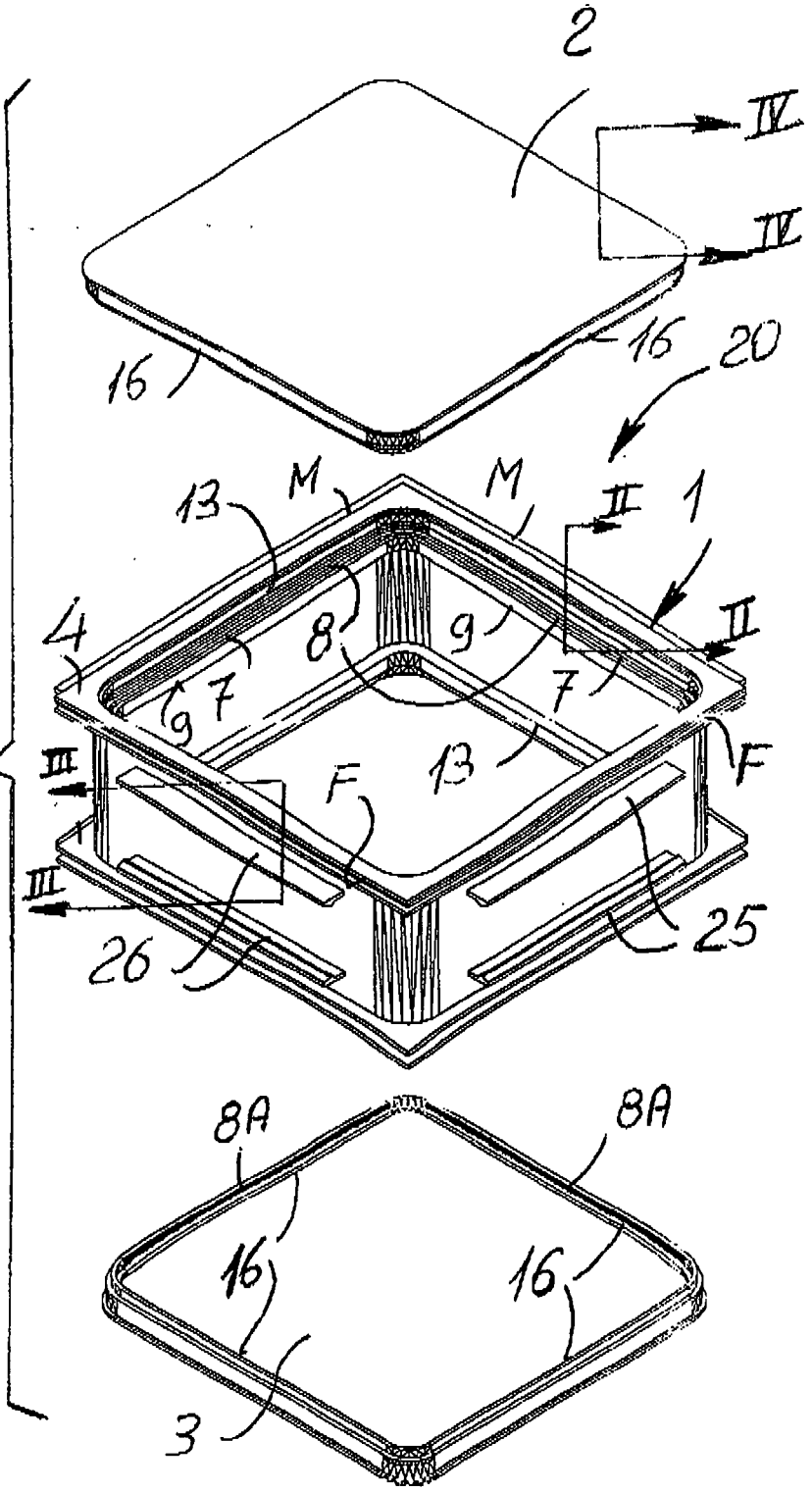
8. Plastic block according to one or more of the preceding claims, **characterized in that** alternatively to said hook-like and counterhook-like means positioning said frontal plates in the respective seat in the middle band, said frontal plates are glued in said seats with adhesives having a low adhesiveness.

9. Plastic block according to one or more of the preceding claims, **characterized in that** alternatively to said hook-like and counterhook-like means in said rabbet step is provided a perimetrical groove in which is engaged a corresponding perimetrical rib provided on the inside of said frontal plates.

10. Partition wall, shower wall and the like, **characterized in that** it is built with blocks according to one or more of the preceding claims.

11. Shower cabin, **characterized in that** it comprises at least one cabin wall and/or door which are partially or completely built with blocks according to one or more of the claims 1 to 9.

Fig. 1



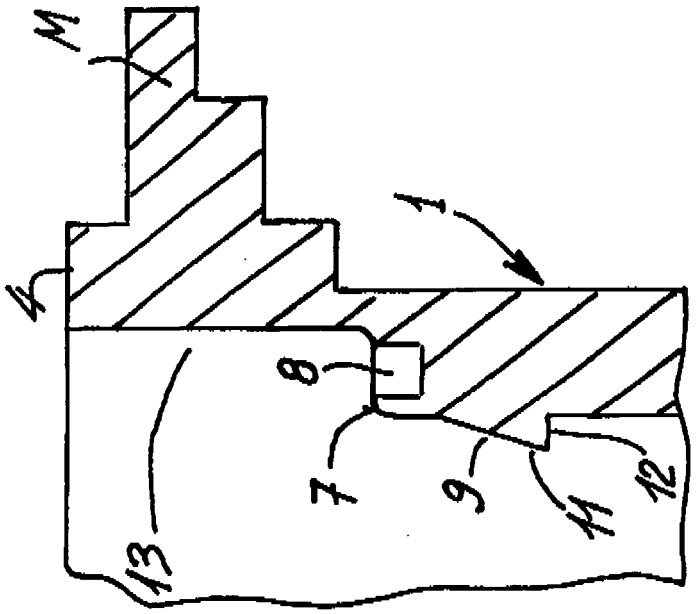


Fig. 2

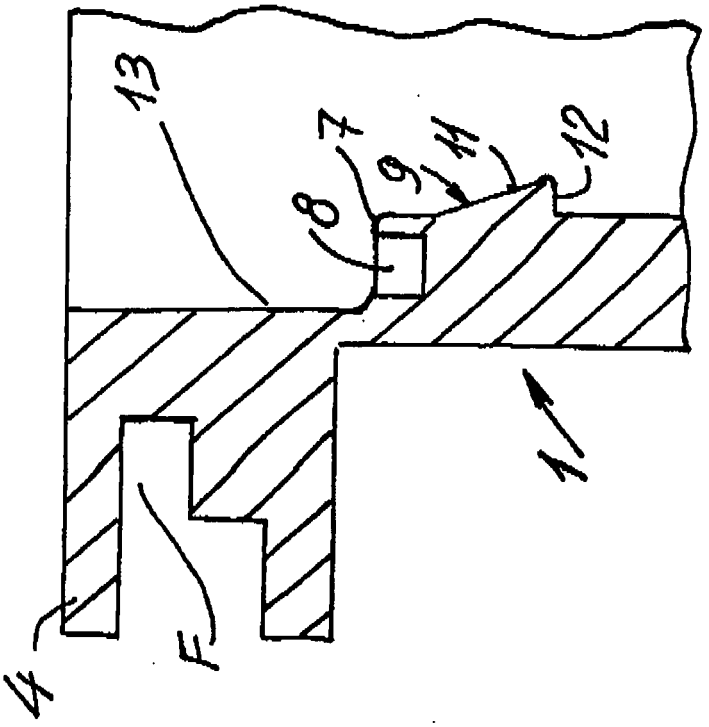


Fig. 3

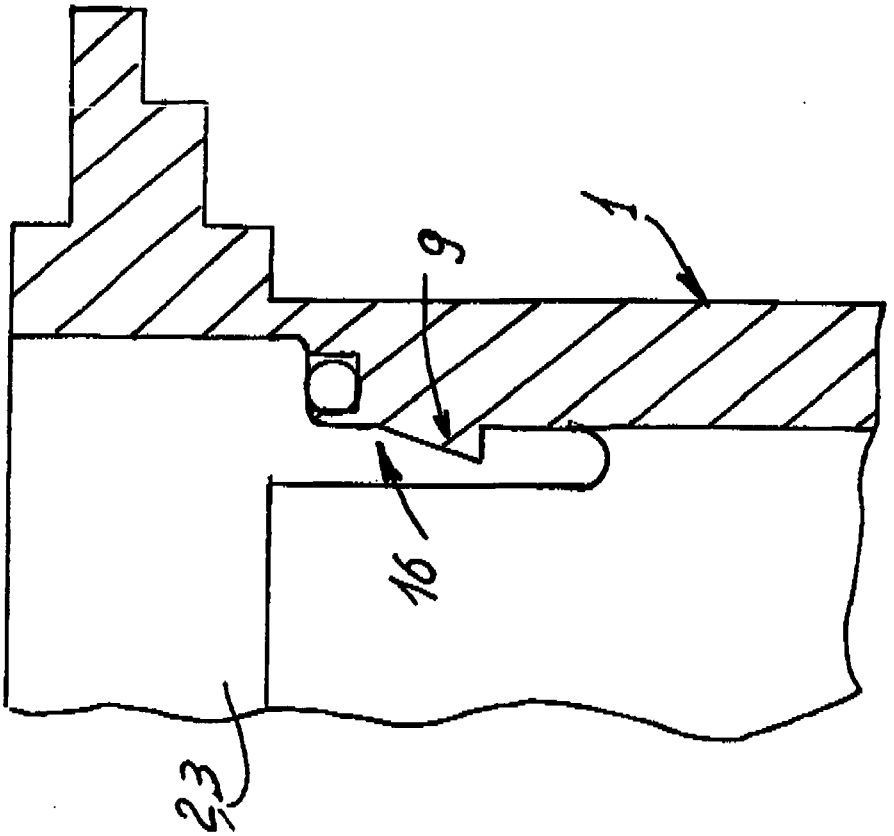


Fig. 5

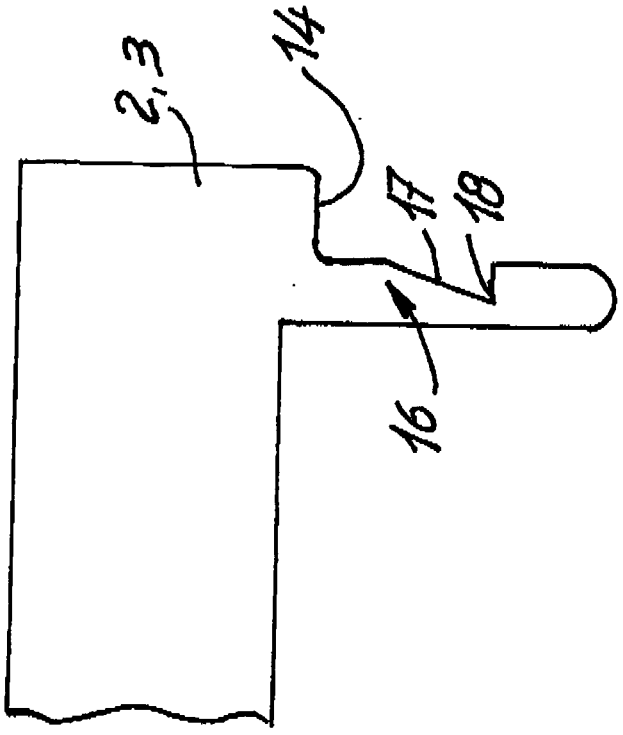


Fig. 4

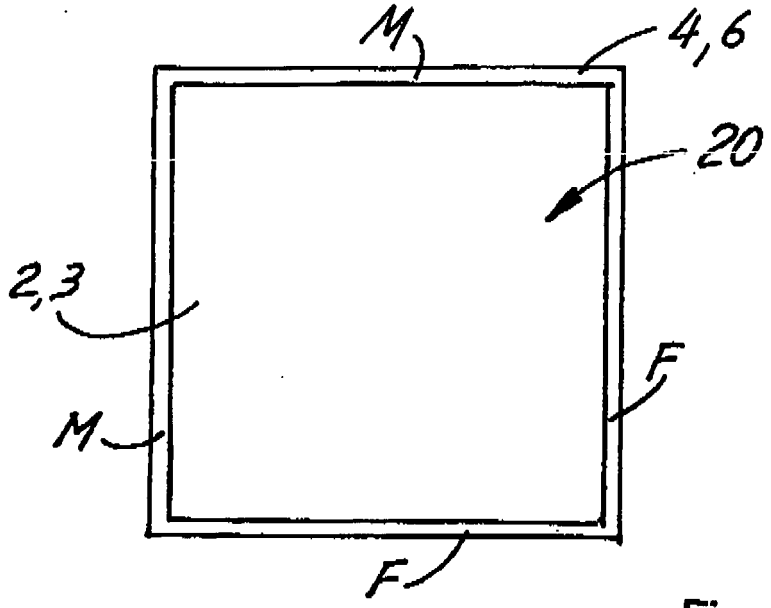


Fig. 6

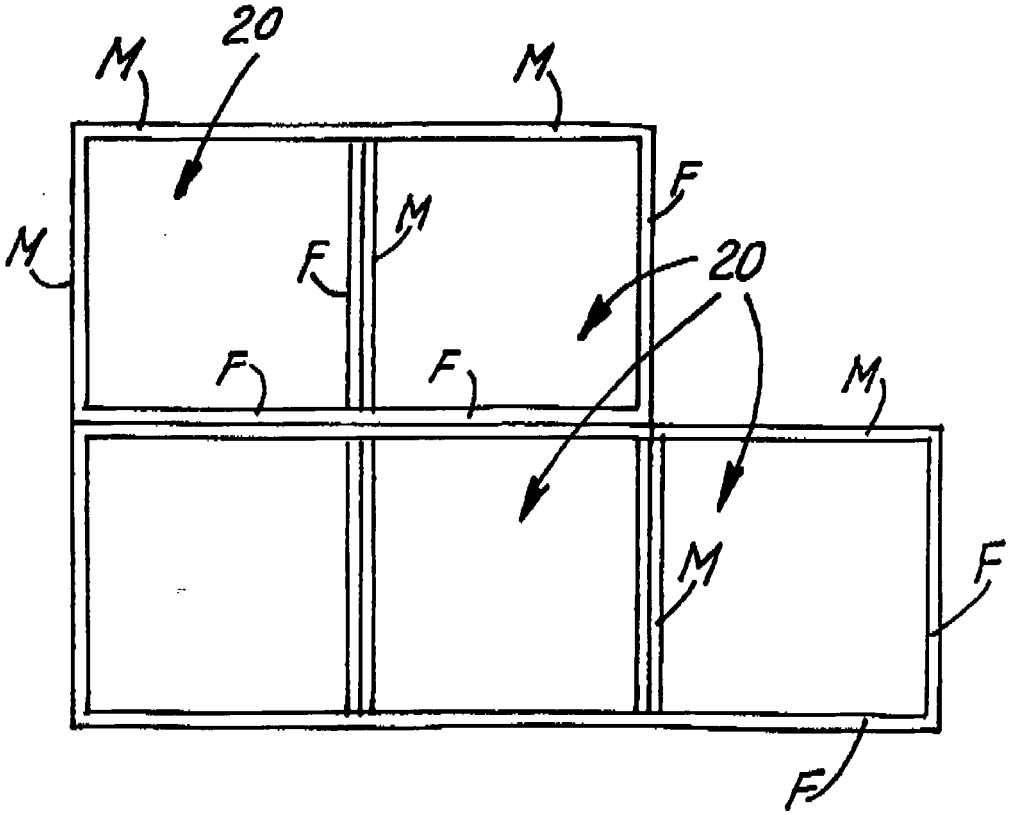


Fig. 7

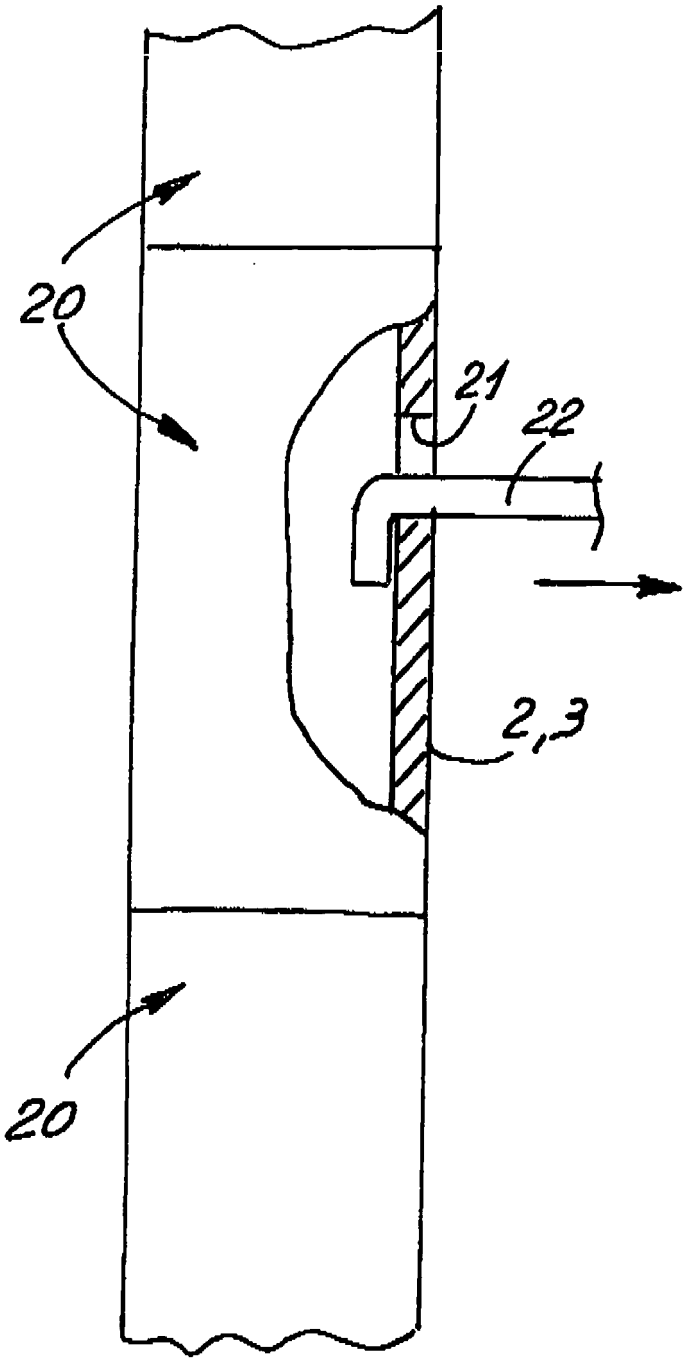


Fig. 8

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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- US 5033245 A **[0008]**
- WO 9734058 A **[0011] [0012] [0013]**
- WO 9967476 A **[0019] [0040] [0042]**