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(54) **BRICK SIDING SYSTEM**

(57) The invention relates to a brick siding system fixed to a skeleton attached to a structural wall (10), with a ventilation gap between the front surface of the structural wall (10) and the reverse side surface of the brick siding system. The skeleton is made of vertical drawbars (1) and means for their fixing to the structural wall (10),

whereby the drawbars (1) are provided with protrusions to hang horizontally arranged cladding panels (2) by means of a recess in the reverse side of these cladding panels (2), whereby the cladding panels (2) are adjacent to each other with their horizontal and vertical circumferential surfaces.

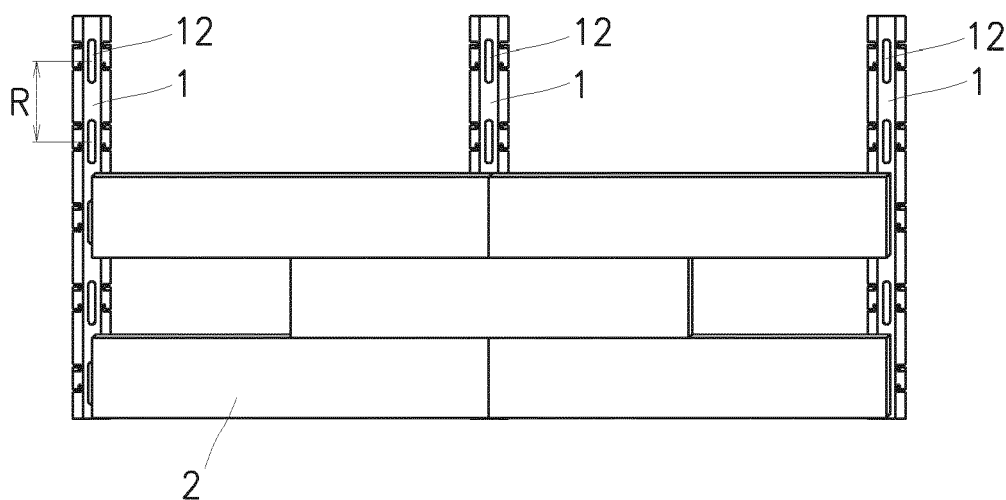


Fig. 1

Description

Technical field

[0001] A brick siding system fixed to a skeleton frame attached to a structural wall, with a venting gap between the front surface of the structural wall and the reverse side surface of the brick siding system for providing active ventilation of the building shell.

Background art

[0002] To ensure ventilation of the space between the tiles and the structural wall of a building, brick siding systems are generally made such that they are attached to the structural wall at a certain distance from its surface. Thus, air flow in the formed gap is created due to stack effect.

[0003] Elements of the cladding shell are usually anchored by screws or bolts by means of vertical load-bearing bars attached to the exterior surface of the structural wall of the building.

[0004] Document US 2002056243 A1 uses a system of joining cladding elements to the structural wall of the building by gluing by means of profile bars coated with layers of polyethylene, polypropylene or fluorine resin. However, due to the low strength of these joints, their use is limited to lighter claddings. Another disadvantage is their limited durability.

[0005] The document WO2010057273A1 discloses a mortar free construction of a vertical wall formed by vertical bearing columns, to which are fixed profile beams arranged horizontally on top of each other, in whose grooves are inserted vertical inner panels and exterior cladding panels with their upper edges and lower edges. The wall installation requires a lot of labour to be done on the site, which mainly concerns the traditional process of attaching the horizontal bearing elements to the vertical columns.

[0006] Exterior cladding of a structural wall resembling the structure of a roof system with rows of superimposed tiles is described in the document US 2012272603 A1. The load-bearing structure of the wall is formed by a system of interconnected vertical and horizontal elements, whereby the vertical elements are on their front side provided with fixing devices, in which the individual cladding boards are installed substantially with their lower ends. The upper surfaces of the cladding boards are partially overlapped by a row of boards arranged above them. The individual boards substantially in the shape of wide roof tiles are positioned with a slight inclination in relation to the vertical, or their locks are configured to be arranged substantially vertically. However, the wall is very complicated and its assembly is laborious. Moreover, it is evidently applicable only to small areas or surfaces.

[0007] US 9140007 B2 discloses drywall cladding, whereby in an exemplary embodiment plasterboard panels are used. Plasterboard panels are secured with

screws to vertical load-bearing columns which constitute the skeleton frame of the wall. In areas of the load-bearing columns, vertically arranged hollow profile bars abut against the front surface of the drywall. These have a shape of a rectangular "U" profile and are with their bottom in contact with the front surface of the dry wall. Screws inserted into the vertical load-bearing columns pass through holes in the bottom of U-shaped profile of the profile bars. An open cavity of the U-shaped profile is covered with a vertical strip overlapping on both sides laterally profile "U", to which the vertical strip is secured with flexible hooks to engage with protrusions on inner parallel surfaces of U-shaped profile. The rear side of the square and/or rectangular cladding panels abuts against the front side of the vertical strips. The cladding panels are in an exemplary embodiment attached to the vertical strips by means of rivets. U-shaped profile of the vertical bars or strips has been modified into the shape of the letter "Z" for the vertical ends of the peripheral panels or into the shape of the letter "V" for the inner corners of the cladding panels.

[0008] The elements of the skeleton frame of the above-mentioned cladding systems in the background art are designed as semi-finished products, which after being secured to the drywall have to be provided with respective holes at the construction site so that cladding panels can be fixed by means of rivets and bolts. However, this method is laborious and therefore time-consuming and expensive.

[0009] The aim of the invention is above all to reduce the amount of work that must be performed at the construction site and provide a brick siding system which has a great resistance to external environmental conditions and which would prevent rainwater from leaking into the joints between the board panels. Furthermore, the individual parts of the skeleton frame and the cladding panels would be light to reduce transport costs and to facilitate manual operations. Moreover, with this brick siding system it would not be necessary to perform static calculations of anchoring.

Principle of the invention

[0010] The goal of the invention is achieved by a brick siding system fixed to a skeleton frame connected to a structural wall with a gap between the front surface of the structural wall and the rear surface, which serves to create stack effect, thus ensuring active ventilation of the building shell, whose principle consists in that the skeleton comprises vertical drawbars provided with protrusions for hanging horizontally arranged cladding panels by means of a recess in the rear side of these cladding panels, whereby preferably a part of the circumference of the cladding panel is provided with protrusions constituting tongues while another part of the circumference is provided with respective grooves, whereby the cladding panels thus interconnected by means of a system of tongues and grooves are hung with no possibility of mu-

tual movement.

[0011] A great advantage lies in the fact that no additional connecting elements and special tools are required for hanging the panels and connecting them.

Description of drawings

[0012] An exemplary embodiment of a brick siding system is schematically represented in the drawings, wherein, Fig. 1 is an elevation view of the brick siding system, Fig. 2 is a plan view of Fig. 1, Fig. 3 is a view of the front side of drawbars, Fig. 4 is a view along the direction P1 of Fig. 3, Fig. 5 is a view along the direction P2 of Fig. 3, Fig. 6 is an elevation view of a cladding panel, Fig. 7 is a view along the direction P3 of Fig. 6, Fig. 8 is a view along the direction P4 of Fig. 6, Fig. 9 is an exploded view of a corner joint taken from the side of the holes in the corner portion, Fig. 10 is a view from the opposite side from Fig. 9 and finally, Fig. 11 is a view of the connecting elements of the attachment of the drawbars to the structural wall.

Examples of embodiment

[0013] Fig. 1 shows a front view of a part of a brick siding system, which is fixed to a structural wall by means of vertically arranged drawbars 1 shown in more detail also in Figs. 2 to 5, or 11. The drawbars 1 are sheet metal profiles, having a cross-section 11, whose central part has a shape of rectangular letter "U". In an exemplary embodiment, the sheet metal has thickness T1=1.5 mm. The drawbars 1 are secured in the manner described below by means of bolts (not represented in this figure), which pass through longitudinal holes 12 in the base of the drawbars 1. The edges 13 of the drawbar 1 are bent in a plane parallel with the base of the drawbar 1. In the vicinity of the longitudinal holes 12 the edges 13 are partially cut and the partially cut parts, which are directed upwards, are bent skew in a direction away from the surface of the edges 13. By this bending, hooks 14 are formed for hanging the cladding panel 2. In an exemplary embodiment, the drawbars 1 have length L1= 2000 mm and width S1= 46 mm. The width S2 of the longitudinal holes 12 amounts to 8 mm, the total length L2 of the longitudinal hole 12, including semi-circular ends, being 50 mm. The longitudinal holes 12 are positioned in a longitudinal direction with pitch R= 100 mm between them. The free width S3 of the central part of the drawbar 1 is 22 mm, its depth H1 being 10 mm. The angle α of the bending of the hooks 14 is 45°.

[0014] The cladding itself consists of cladding panels 2 in the shape of a rectangle according to Figs. 1, 2 and 6 to 8. The material of the cladding panel 2 is preferably a lightweight concrete mixture containing, for example, perlite, cinder, sawdust and the like. In an exemplary embodiment, the cladding panel 2 has length L3 = 500 mm, thickness T2 = 20 mm and height V1 = 100 mm. The circumference of the cladding panel 2 is on one long side

and one short side provided with a tongue 21 and on the other long side and the other short side it is provided with a corresponding groove 22. The height V2 of the tongue 21 is 5 mm, which corresponds to the depth of the dovetail groove 23. Both the horizontal connection and the lateral connection of the adjacent cladding panels 2 by means of the tongue 21 and the groove 22 not only strengthens the assembled brick siding system, but it also creates a labyrinth joint, which prevents water from leaking into it and thus ensures water drainage from this joint.

[0015] A longitudinal dovetail groove 23 is formed on the rear side of the cladding panel 2 in the central area of its height V1. The longitudinal dovetail groove 23 serves to hang the cladding panel 2 onto inclined hooks 14 of two adjacent vertical drawbars 1. The cladding panel 2 can be easily hung if the width S4 of the dovetail groove 23 at the level of the rear surface of the cladding panel 2 is 8 mm. In an exemplary embodiment, the mutual position of the dovetail grooves 23 with respect to the height V1 of the cladding panel 2 and the position of the hooks 14 with respect to length L1 of the drawbars 1 is chosen in such a manner that the ends of the drawbars 1 correspond to the longitudinal edges of the cladding panels 2.

[0016] In addition, the dovetail groove 23 serves to connect two adjacent cladding panels 2 in the corners of the cladding. Here the connection is made by a corner element 3 according to Figs. 9 to 10. In the middle of the height of two adjacent sides of the corner element 3 are formed cavities 31, whose cross-section corresponds to that of the dovetail groove 23 in the cladding panels 2, whereby its position corresponds to the height position of the dovetail groove 23 in the cladding panel 2. Profile connectors 32 are inserted into the dovetail groove 23 of two cladding panels 2 adjacent in the corners and into the cavities 31 in the corner element 3, by which means a corner connection is created.

[0017] The basic means of attaching the drawbars 1 to the structural wall 10 is a combined adjusting screw 4, which has one end for being screwed into the wall plug 5 mounted in a pre-drilled hole of the structural wall 10 provided with a corresponding screw thread 41, whereas its other end is in an exemplary embodiment provided with a metric thread 42. In the exemplary embodiment, the thread M8 is used.

[0018] Moreover, the adjusting screws 4 are used for fastening thermal and/or sound insulation layer 6. For that purpose, a large-area disk threaded washer 7 can be screwed on the metric thread 42, allowing to fasten safely soft fibrous insulation layers. To secure the drawbars 1, a support nut 8 is mounted on the metric thread for supporting the drawbars 1. The support nut 8 is afterwards tightened from the front face with a screwed nut 9 with an enlarged abutting surface.

[0019] The basic steps of the assembly process of the brick siding system, whose elements dimensionally correspond to the above-described exemplary embodiment, include

- | | |
|----|--|
| 1 | drawbar |
| 10 | structural wall |
| 20 | 11 cross section of the drawbars |
| | 12 longitudinal hole (in the drawbar) |
| | 13 edge of the drawbars |
| | 14 hook (to hang of the cladding panel on the drawbar) |
| 25 | 2 cladding panel |
| | 21 tongue (on the circumference of the cladding panel) |
| | 22 groove (on the circumference of the cladding panel) |
| 30 | 23 dovetail groove (in the rear surface of the cladding panel) |
| | 3 corner element |
| | 31 cavity in the corner element |
| | 32 profile connector |
| 35 | 4 combined adjusting screw |
| | 41 screw thread (at one end of the adjusting screw) |
| | 42 metric thread (at the other end of the adjusting screw) |
| | 5 wall plug |
| 40 | 6 insulating layer (on the surface of the structural wall) |
| | 7 disk threaded washer |
| | 8 support nut (for the drawbar) |
| | 9 nut (for tightening the drawbars on the support nut) |
| 45 | H1 depth of the central part of the drawbars |
| | L1 length of the drawbars |
| | L2 length of the longitudinal hole in the drawbar |
| | L3 length of the cladding panel |
| | R pitch of the longitudinal holes in the drawbar |
| 50 | T1 thickness of the sheet metal of the drawbars |
| | T2 thickness of the cladding panel |
| | S1 width of the drawbars |
| | S2 width of the longitudinal holes in the drawbar |
| | S3 free width of the central part of the drawbars |
| 55 | S4 width of the dovetail groove in the cladding panel |
| | V1 height of the cladding panel |
| | V2 height of the tongue of the cladding panel |
| | α angle of the bending of the hooks |

[0021] The brick siding system according to the invention provides a comprehensive solution, which leads to reduction in assembly time and therefore also reduces installation costs in situ. The system of drawbars eliminates the need for special installation tools, small dimensions and low weight of the individual parts of which the

Claims

1. A brick siding system fixed to a skeleton frame attached to a structural wall (10), with a venting gap between the front surface of the structural wall (10) and the reverse side surface of the brick siding system, **characterized in that** the skeleton frame comprises vertical drawbars (1) and means for fastening them to the structural wall (10), whereby the drawbars (1) are provided with protrusions for hanging horizontally arranged cladding panels (2) by means of a recess in the reverse side of these cladding panels (2), whereby the cladding panels (2) abut against one another with their horizontal and vertical circumferential surfaces. 5
2. The brick siding system according to claim 1, **characterized in that** a part of the circumference of the cladding panel (2) is provided with protrusions constituting tongues (21), whereas another part of the circumference of the cladding panel (2) is provided with respective grooves (22), whereby the cladding panels (2), interconnected by means of tongues (21) and grooves (22) are hung with no possibility of mutual movement. 10 25
3. The brick siding system according to claim 1 or 2, **characterized in that** the protrusion for hanging horizontally arranged cladding panels (2) the hook (14) is composed by a part of the drawbar (1), which is partially cut and bent towards the cladding panel (2), whereby the recess in the reverse side of the cladding panel (2) is formed by a longitudinal dovetail groove (23). 30 35
4. The brick siding system according to any of the preceding claims, **characterized in that** the skeleton frame further comprises corner elements (3) provided with cavities (31), whose vertical profile corresponds to the transverse profile of the recesses in the reverse side of the cladding panels (2), whereby the cavities (31) of the corner elements (3) and the recesses in the reverse side of the cladding panels (2) are interconnectable by inserting a profile connector (32). 40 45
5. The brick siding system according to any of the preceding claims, **characterized in that** the means for attaching the vertical drawbar (1) to the structural wall (10) are formed by adjusting screws (4) provided at one end with a screw thread (41) to engage with a wall plug secured in the structural wall (10), whereby their other end is intended for hanging the drawbars (1) by means of a hole formed in it, whereby this end of the adjusting screw (4) is provided with a thread (42) for a screw joint to connect at least one component with an inner thread. 50 55
6. The brick siding system according to claim 5, **characterized in that** a support nut (8) is screwed on the thread (42) of the adjusting screw (4), being spaced from the surface of the structural wall (10), forming a support area for the abutting surface of the hung drawbar (1), which is fixed by tightening another nut (9). 5
7. The brick siding system according to claim 5 or 6, **characterized in that** an insulation layer (6) is arranged in contact with the outer surface of the structural wall (10), whereby the insulation layer (6) is fastened on the adjusting screw (4) by means of the hole formed in it in the insulation layer (6) and is pressed against the surface of the structural wall (10) by means of a disk threaded washer (7). 10 15

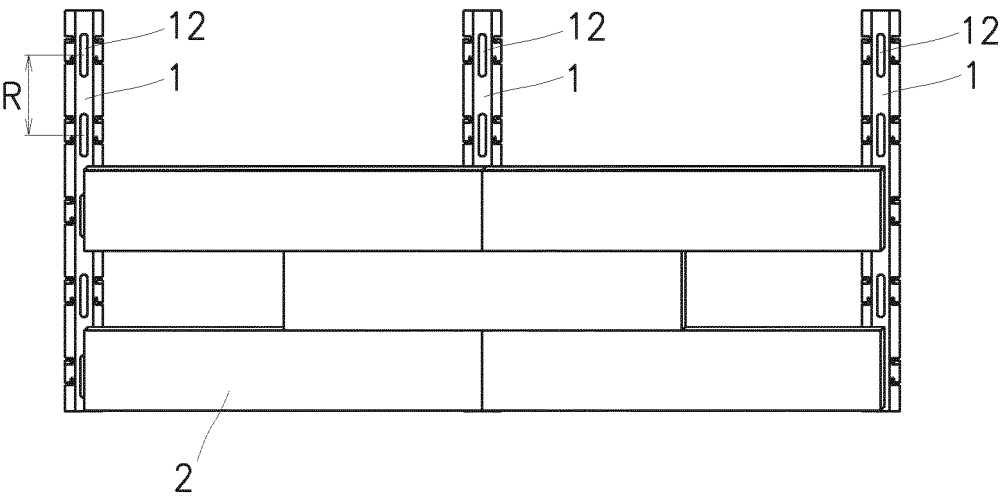


Fig. 1

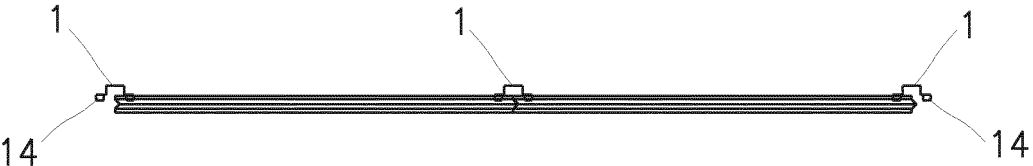


Fig. 2

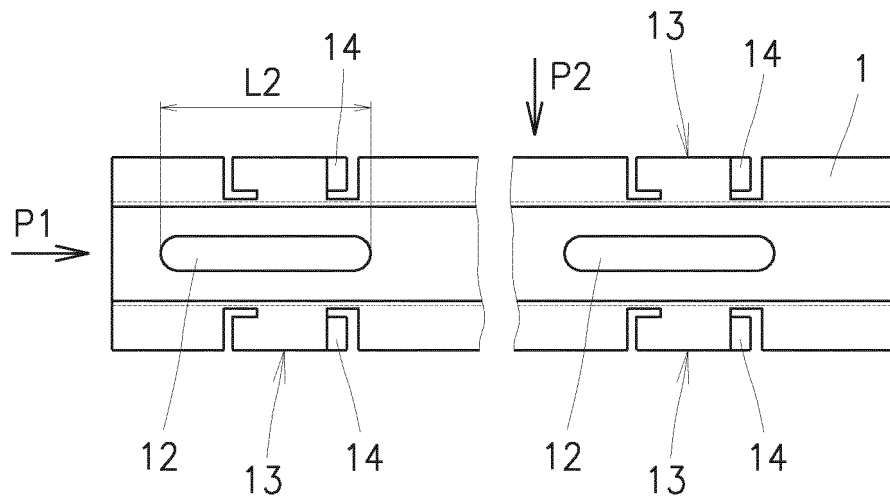


Fig. 3

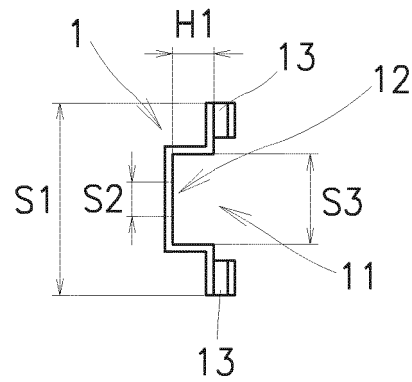


Fig. 4

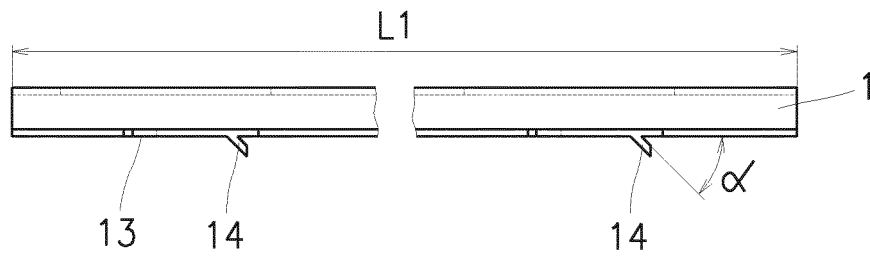


Fig. 5

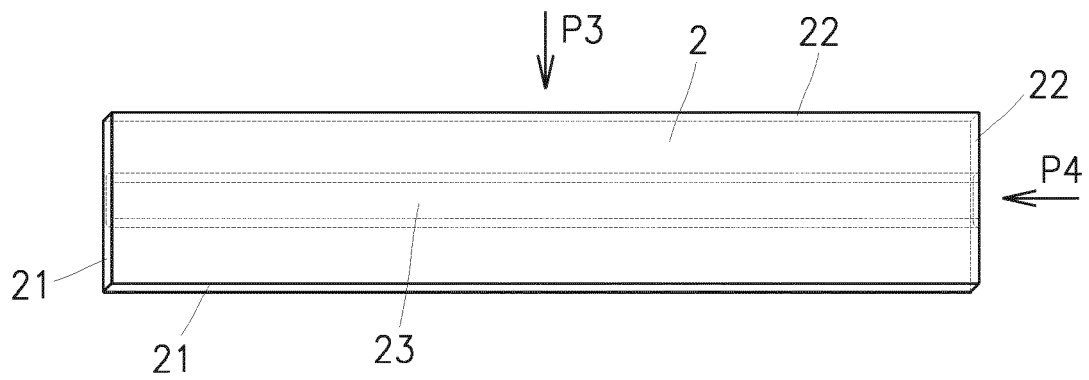


Fig. 6

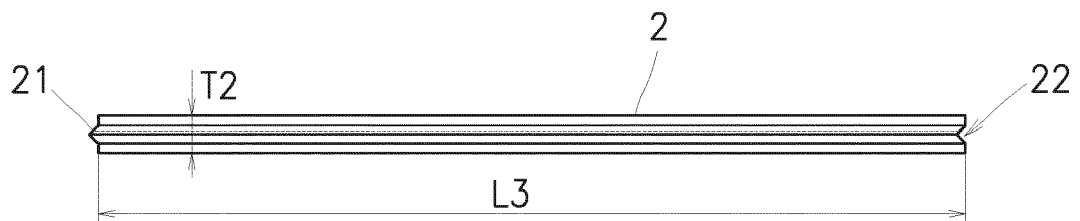


Fig. 7

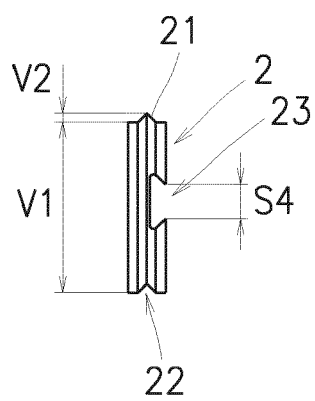


Fig. 8

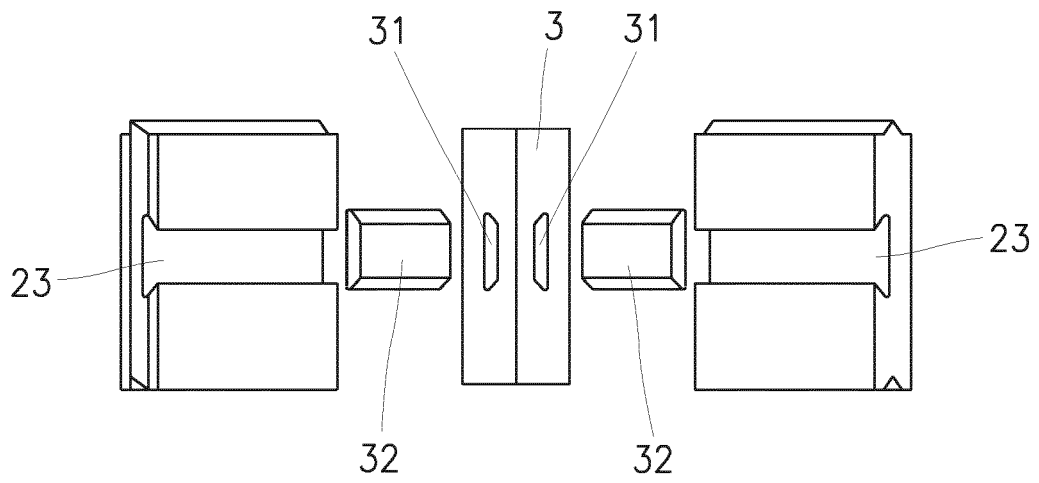


Fig. 9

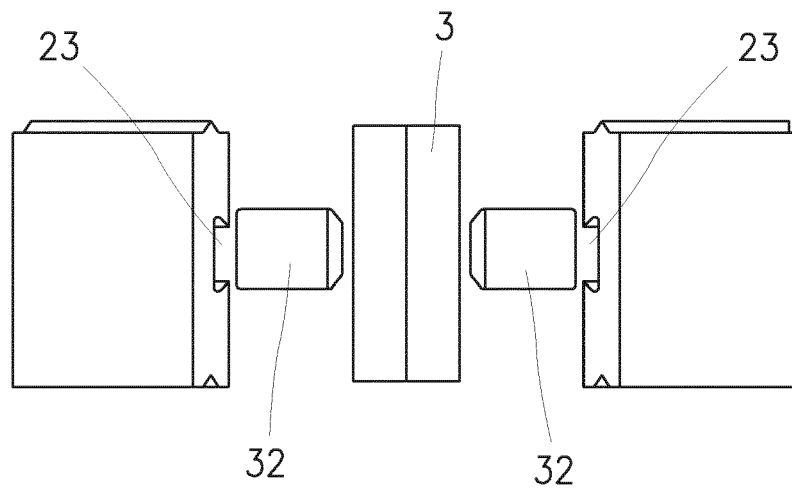


Fig. 10

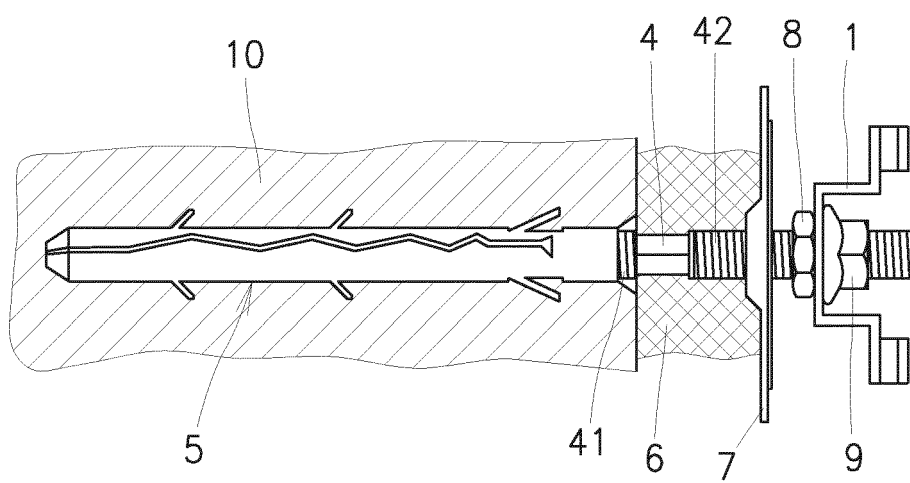


Fig. 11



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Place of search Munich		Date of completion of the search 21 April 2017	Examiner Khera, Daljit
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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