(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 681 403 A2

# (12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
**19.07.2006 Bulletin 2006/29**

(51) Int Cl.:
***E04F 13/08*** *(2006.01)*

(21) Application number: **06425011.1**

(22) Date of filing: **12.01.2006**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI SK TR**
Designated Extension States:
**AL BA HR MK YU**

(30) Priority: **14.01.2005 IT AN20050005**

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## (54) Equipment for construction of modular equipped walls

(57) The present invention refers to an equipment for the construction of modular equipped walls, characterised in that it makes use of a spacing template basically consisting in a metal section with a large longitudinal stiffening rib and also provided with regularly spaced identical series of through holes used to fix additional modules on the front of the template (such as, for example: cover panels, shelves or object-holding compartments, additional bearing sections) and corresponding spacers on the back of the template used to fix it on the wall, next to identical ones, in order to create a bearing framework for the equipped wall.

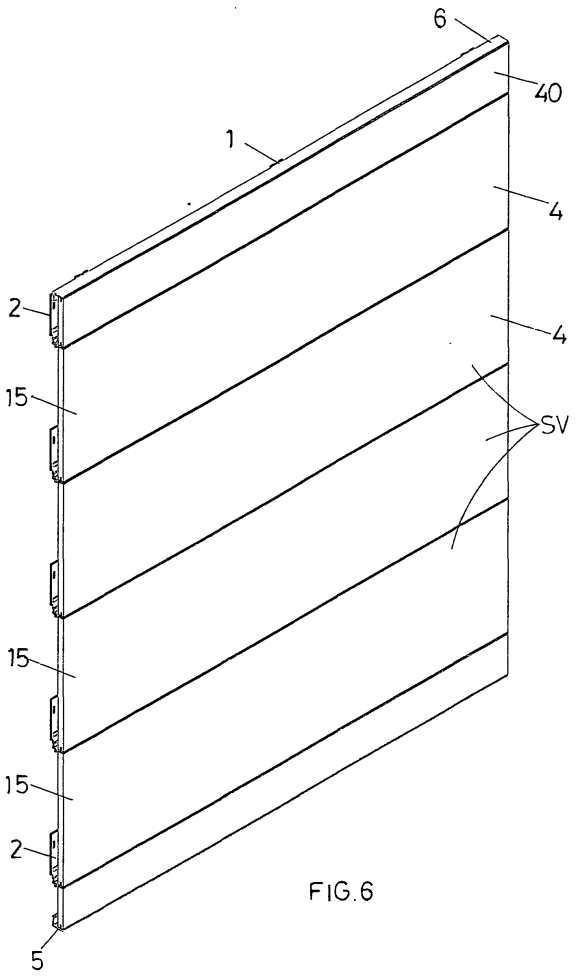


FIG.6

EP 1 681 403 A2

## Description

**[0001]** The present patent application for industrial invention refers to an equipment for the construction of modular equipped walls.

**[0002]** As it is known, equipped walls, boisieries and similar structures are getting more and more popular as architectural solutions, both in interior and exterior decoration, due to known technical, functional and aesthetical characteristics.

**[0003]** The fields of application for these structures are very numerous and especially refer to the decoration sector, not only with reference to private houses, but also with reference to offices, stores and public spaces in general.

**[0004]** The solutions that are currently available for the construction of equipped walls can be basically classified into two groups: fixed systems and removable systems.

**[0005]** The first group includes solutions such as coatings with plates made of different materials (plasterboard, fibre panels, etc.) permanently fixed to spacing structures generally obtained with metal, plastic or wood sections.

**[0006]** These solutions, however, are impaired by the fact that they generally make use of aesthetically poor materials, which require finishing on site, and by the fact that they cannot be inspected from the back or dismounted in a non-destructive way.

**[0007]** The second group includes modular solutions.

**[0008]** The most popular construction technique provides for a sequence of modules in vertical (or horizontal) direction so that fixing of each module to the bearing wall (either directly or with the interposition of special spacers) can be hidden by the next module, while automatically guaranteeing perfect matching between contiguous elements.

**[0009]** The most popular solutions provide for construction in vertical direction, starting at floor level and alternating modules (made of wood, coated fibre panels, plastic or metal materials) with metal horizontal sections used for fixing.

**[0010]** Dismounting must be necessarily executed in reverse order.

**[0011]** In particular, it is not possible to extract a single module individually, since it is necessary to previously dismount all the elements of the composition located at the higher lever, strongly limiting the access to inspection in the back.

**[0012]** The solutions that allow to dismount the modules in an independent way with regards to the rest of the composition are generally impaired by aesthetic limitations, such as the presence of visible elements of the fixing system (either visible or hidden in different ways) or functional limitations, such as the low flexibility of spacing frames with regards to cables, pipes and technical conduits, both in horizontal and vertical direction.

**[0013]** The present invention intends to give a new stimulus to the technique, with the specific purpose of overcoming the aforementioned drawbacks of traditional constructions.

**[0014]** The first purpose of the present invention is to provide a modular equipment for the construction of equipped modular walls, characterised by easy mounting and dismounting and, most of all, able to ensure individual dismounting of each panel (or module) for replacement or inspection, without having to dismount the entire structure of the equipped wall.

**[0015]** The second, equally significant, purpose of the present invention is to provide a modular structure designed to support the equipped wall that can be maintained at a certain distance from the bearing masonry wall, leaving the space free from any obstacles; this creates a gap between the modular structure and the bearing masonry wall that can be used to "hide" cables or pipes from different installations.

**[0016]** Another purpose of the present invention is to provide a modular structure able to guarantee perfect perpendicular installation of the panels of the equipped wall (regardless of irregularities on the surface of the masonry wall used for fixing), as well as perfect perpendicular direction of contiguous walls.

**[0017]** A further purpose of the equipment of the invention is to give a pleasant aesthetics to the equipped wall obtained with it, characterised by clean linear shapes due to the fact that the means used to attach the different panels that create the vertical surface of the equipped wall are not visible.

**[0018]** The last purpose of the present invention is to provide a bearing modular structure for equipped walls characterised by high functional versatility, able to support the panels used to create the vertical surface of the equipped wall according to the different combination of the bearing modular elements.

**[0019]** In particular, the equipment of the invention is made of two elements (or modules) that are suitably combined to create a bearing vertical structure used to frontally support a series of cover panels forming the continuous vertical surface of the equipped wall under construction.

**[0020]** The first module is a special metal section designed to be mounted in vertical position on the front of the masonry wall; the second module is a special spacer used to fix the metal section against the masonry wall (the number of spacers being determined by the number of sections).

**[0021]** Each metal section is provided with a regularly spaced series of holes designed to receive suitable screws used to fix the section to the vertically aligned spacers.

**[0022]** The presence of the series of holes used for fast "guided" matching of spacers converts each metal section into a spacing template, which imposes a predetermined fixing distance to the corresponding vertical row of spacers.

**[0023]** In a first embodiment of the invention, spacers may have a fixed length, chosen from time to time according to the specific installation needs of the bearing

equipment for equipped walls.

**[0024]** The main advantage is represented by the fact that, as mentioned earlier, the vertical templates that create the fixing structure of the cover panels may be positioned at a predefined distance from the masonry wall, thus creating a space used to "hide" different types of installations.

**[0025]** The decision to fix the templates of the structure to the wall by means of back spacers results in additional advantages, as illustrated below.

**[0026]** The fact that the spacing templates are anchored to the wall in punctiform configuration provides total freedom in case of horizontal or vertical cables and installations on the back of the equipped wall under construction.

**[0027]** In particular, being the anchoring points of the templates exactly located and characterised by very small volume, the equipment of the invention allows to install the said installations against the masonry wall before mounting the equipped wall and, most of all, without the need to chase cables in the masonry wall.

**[0028]** This is because the spacing templates can be successively anchored to the wall without interfering with the said installations.

**[0029]** From the operating viewpoint, it is no longer necessary to execute mounting works in two different phases (first phase: structure; second phase: coating modules) to arrange installations.

**[0030]** This results in considerable organisational benefits and reduces labour costs, it being possible to execute mounting in one single session.

**[0031]** In a second embodiment of the invention, the spacers can have a telescopic structure to adjust their length as desired during installation together with the corresponding vertical template.

**[0032]** The telescopic structure further increases the technical-functional efficacy of the spacers.

**[0033]** In fact, each telescopic spacer is composed of a bearing prismatic body designed to be rigidly fixed to the masonry wall, and of an external coupling exactly matched with the bearing body and capable of sliding horizontally with respect to the bearing body; of course, the sliding coupling is designed to be joined with the back of each template.

**[0034]** Considering that each template is fixed to the wall with the interposition of multiple spacers in vertical alignment, it appears evident that each template (regardless of irregularities of the masonry wall) can be made perfectly perpendicular by adjusting the length of the telescopic spacers that belong to the vertical row used to support it.

**[0035]** It can be said that the templates, in cooperation with telescopic spacers, can adjust their position and offset non-perpendicular irregularities of the bearing wall and of the two contiguous bearing walls designed to be coated with the equipped wall obtained with the equipment of the invention.

**[0036]** In this perspective, a higher length is given to the spacers that are fixed in depressions or concavities of the bearing walls, by extracting the sliding couplings, while a shorter length is given to the spacers that are fixed in projections on the wall.

**[0037]** Practically speaking, the adjustment of each template is facilitated by the fact that the operator simply needs to adjust the length of the first and last spacer of the vertical row associated with the template.

**[0038]** Once the template is perpendicular with respect to the two final spacers, being joined to the template due to its calibrated longitudinal rigidity, all intermediate spacers will automatically adjust their length as the template translates (that is to say rotates slightly) until the desired perpendicular position with respect to the floor is achieved.

**[0039]** Evidently, the different adjustment of the telescopic spacers ensures perfect alignment of the "heads" of the sliding couplings in the same row of spacers with an imaginary vertical plane.

**[0040]** This condition allows the template fixed in the same vertical row of spacers to acquire and maintain a position perfectly perpendicular to the floor.

**[0041]** In order to obtain perfect planarity of the entire equipped wall, all templates of the bearing structure of the equipped wall must be positioned in perfect coplanarity.

**[0042]** This can be easily obtained by adjusting the telescopic spacers as illustrated above, in such a way that the heads of all the spacers of the different templates are placed on the same imaginary vertical plane.

**[0043]** Another advantage of the use of the said spacers is related to the fact that the spacers are made with sections having a considerable moment of inertia and therefore a considerable flexional resistance.

**[0044]** In this way, they have a considerable bearing capacity including in projected position, thus making it possible to obtain spaces with large and variable thickness between the masonry wall and the modular equipped wall by simply using spacers with the required length.

**[0045]** The weight of the modular coating, as well as the other loads applied on shelves or other decoration elements, are therefore transferred to the bearing wall without floor support; this also makes it possible to obtain completely cantilevered equipped walls.

**[0046]** Moreover, the new equipment of the invention can also be realised in a more sophisticated version, in which the front panels are not directly fixed (for example by means of vertical straps of structural velcro on the back) against the spacing templates, being matched with suitable metal sections fixed on the front of the templates and therefore converted into additional modular elements (or simply "modules") of the equipment.

**[0047]** According to this specific embodiment, the modular equipment of the invention is composed of a primary framework, formed by the aforementioned parallel series of vertical templates, and of a secondary framework, formed by a regular series of metal sections,

preferably mounted in horizontal position.

**[0048]** Another advantage of the equipment is represented by the fact that the templates fixed to the masonry wall (creating the primary framework) are also provided with precision holes with predefined gauge designed to be used to fix the metal sections of the secondary framework.

**[0049]** The metal sections are provided with a series of slots used to insert the fixing screws designed to be engaged into the predefined gauge holes on the templates.

**[0050]** The presence of the holes with predefined gauge ensures exact and easy construction of the secondary framework, while it makes mounting of the bearing structure (formed by the combination of templates and sections) independent from the application of coating modules, or panels.

**[0051]** This allows to dismount each module individually and independently from all the other modules, while ensuring perfect matching.

**[0052]** The possibility to dismount each coating panel also allows to inspect the space behind the equipped wall as desired, without having to dismount the entire structure.

**[0053]** Moreover, an advantageous self-blocking "snap-in" system is used to fix the panels that cover the double bearing framework; this system takes advantage of the special shape of the ribs located on the metal sections of the secondary framework.

**[0054]** The presence of these ribs ensures easy mounting and dismounting of the cover panels, without creating aesthetical limitations, being a completely hidden mechanism.

**[0055]** Corresponding longitudinal borders are suitable located above the sections of the secondary framework, designed to be matched with a longitudinal groove on the lower edge of the cover panels.

**[0056]** The borders have an especially flared shape that, on one side, facilitates coupling between the borders and the lower longitudinal grooves on the cover panels and, on the other side, places the cover panels in standby position with a simple rotation movement (vasistas-type opening), thus giving access to the space in the back without removing the panels from their original housing, it being especially useful for rapid maintenance operations.

**[0057]** For purposes of clarity the description of the invention continues with reference to the enclosed drawings, which are intended for purposes of illustration only and not in a limiting sense, whereby:

- figure 1 is an axonometric view of a section of the "omega-shaped" spacing template used in the equipment of the invention;
- figure 1 A is an axonometric view of a spacing template fixed against the masonry wall by means of a row of spacers;
- figure 2 shows three spacing templates mounted one next to another to create a section of the primary framework, in useful position for being fixed to cover panels;
- figure 2A is the same as figure 2, except for it refers to an embodiment of the invention in which the spacing templates are associated with telescopic spacers, in order for the templates to be positioned at different distances with respect to the masonry wall and be advantageously used to support cover panels with curved profile;
- figure 2B is a top view of figure 2A;
- figure 3 is an axonometric view that shows the initial mounting phase of the modular equipment of the invention in double framework version;
- figure 4 is a side view of figure 3;
- figure 5 is an axonometric view that shows the intermediate mounting phase of the modular equipment of the invention;
- figure 6 is an axonometric view of an equipped wall obtained after mounting of the modular equipment of the invention is completed;
- figure 7 is an axonometric front view of the spacer shown in figures 1A and 2;
- figure 8 is an axonometric rear view of the spacer shown in figure 7;
- figure 7A is the same as figure 7, except for it refers to the telescopic version of the same spacer used to support templates;
- figure 8A is an exploded rear view of the same telescopic spacer shown in figure 7A;
- figures 9 and 10 are respectively axonometric front and rear views of a snap-in embodiment of the cover panel used in the equipment of the invention;
- figure 11 is an axonometric view of the intermediate section used in the secondary framework of the equipment of the invention;
- figure 12 is a cross-section of figure 11 with plane Z-Z;
- figure 13 is an axonometric view of the lower end section used in the secondary framework of the equipment of the invention;
- figure 14 is a cross-section of figure 13 with plane Y-Y;
- figure 15 is an axonometric view of the upper end section used in the secondary framework of the equipment of the invention;
- figure 16 is a cross-section of figure 15 with plane Q-Q;
- figure 17 is an axonometric view of the support section designed to cooperate with the section of figure 15;
- figure 18 is a cross-section of figure 17 with plane K-K;
- figures 19A and 19A are side views that show the sequence of operations used to fix the cover panels to their corresponding sections that form the secondary framework of the equipped wall;
- figure 20 is an axonometric view of an alternative

mounting solution of the two frameworks of the equipment of the invention;

- figure 21 is an axonometric view of an alternative mounting solution with the two frameworks of the equipment of the invention, expressly designed to be covered with curved panels;
- figure 21A is a top view of figure 21;
- figure 22 is an axonometric view of an additional constructive solution of the equipment of the invention designed to support shelves; for easier reference, this embodiment of the invention is shown without cover panels;
- figure 23 is an enlarged side view of a section of the equipment shown in figure 22;
- figure 24 is an axonometric view of an additional mounting solution of the equipment of the invention, in which two pieces of equipment are mounted in "back against back" configuration.
- figure 25 is an axonometric view of two pieces of equipment according to the present invention, without cover panels, mounted in perpendicular configuration;
- figure 25A is a top view of figure 25;
- figure 26 is an axonometric view of an embodiment of the equipment according to the present invention provided with special object-holding box-shaped elements;
- figure 26A is a side view of figure 26;

**[0058]** As mentioned earlier, the equipment of the invention makes use of modules used in the number needed for the specific configuration.
With reference to figures 1, 1A and 2, the first module is composed of a template (1) with preferably "omega-shaped" transversal section, that is to say provided with a prominent central rib. The second module is a special spacer (200) designed to be fixed on the back to the bearing masonry wall and on the front against the back of one template (1).

**[0059]** In particular, a vertical row of spacers (200) is designed to support a template (1) in perfect vertical position, as shown in figure 1A.

**[0060]** Multiple parallel rows of spacers (200) are designed to support the templates (1) that form the primary framework (O1) of the equipped wall in perfectly parallel position at a predefined distance from the masonry wall, as shown in figure 2.

**[0061]** As mentioned earlier, the equipment of the invention may also be provided with a telescopic version (2) of the said spacer, provided with a length adjustment system - which will be illustrated hereinafter - actuated by the operator in charge of installing the equipment of the invention.

**[0062]** It appears evident that the capability to extend or reduce the length of this special version of spacer (2) can be advantageously used to adjust the position of the corresponding template (1) according to the masonry wall and more precisely to give it a perfectly vertical position, regardless of irregularities of the masonry wall, as shown in figure 4.

**[0063]** The presence of the telescopic spacers (2) also makes it possible to give different distances from the masonry wall to the contiguous templates (1), in order to mount cover panels with curved profile (400), as shown in figures 2A and 2B.

**[0064]** In a preferred embodiment of the equipment of the invention, only the first and the last spacers of the row of telescopic spacers (2) associated with a template (1) are provided with an adjustment system with screw.

**[0065]** All the intermediate spacers (2000) are basically "idle", since they are simply able to extend and reduce their length, without fine adjustment means, as shown in figure 4.

**[0066]** In fact, once a template (1) is associated with a similar row of spacers, the operator will have to adjust the length of the first and last spacer of the row, by means of the said fine adjustment systems, until the heads of the two adjustable spacers (2) are perfectly aligned on an imaginary vertical plane.

**[0067]** Evidently, the extension of the two adjustable end spacers (2) moves the template (1) forward; being joined with the intermediate idle spacers (2000), the template exerts traction that makes the heads of the intermediate idle spacers (2000) reach the imaginary vertical plane that contains the heads of the upper and lower adjustable spacers (2).

**[0068]** In any case, once a parallel series of vertical templates (1) is mounted, the primary framework (O1) of the equipment of the invention is obtained and can be used to fix (for example by means of vertical straps of structural velcro applied both on the front of the templates and on the back of the panels) cover panels that form the contiguous vertical surface (SV) of the equipped wall.

**[0069]** The decision to give an "omega-shaped" cross-section to the templates (1) has a double technical explanation.

**[0070]** The first explanation refers to the need to make the template (1) rigid; such a rigidity may be advantageously used to adjust the perfect vertical position of each template with respect to the two telescopic spacers that occupy the lower and upper end position in the same row of spacers designed to support the template.

**[0071]** More precisely, the rigidity of the template (1) prevents the template (1) from bending, which could impair the final vertical position during the adjustment of the length of the two telescopic spacers (2) at the ends.

**[0072]** At the same time, the rigidity of the template (1) ensures simultaneous balanced traction or compression during the said operations (followed by the desired extension or reduction in length) with respect to all the intermediate spacers of the row.

**[0073]** The second explanation refers to the fact that the central longitudinal groove of the templates (2) needs to act as fulcrum with respect to the sections (3) of the secondary framework (02) when the secondary framework (02) needs to be mounted.

**[0074]** As a matter of fact, a further module of the equipment of the invention is composed of a metal section (3) designed to be fixed in parallel position with respect to identical modules on the front of the parallel series of templates (1) to create the so-called secondary framework (02) of the equipment, as shown in figure 3.

**[0075]** Each metal section (3) is designed to support - as illustrated hereinafter - a corresponding cover panel (4), which basically consists in an additional module of the equipment of the invention.

**[0076]** The sections (3) are fixed with a distance that allows the cover panels (4) mounted one above the other to create the vertical surface (SV) of the equipped wall; figures 5 and 6 show the sequence of mounting operations of the said cover panels (4) on the secondary framework (02).

**[0077]** For easier understanding of the cooperation modes between the modules (1, 2, 3, 4), it must be noted that each template (1) is provided with regularly spaced series of four through holes (10, 11 a, 11 b, 12) in cross-configuration, as expressly shown in figure 1.

**[0078]** With reference to figures 7 and 8, each non-telescopic spacer (200) - of the type shown in figure 2 - consists in a plate (200a) fixed to the wall and provided with an opposite pair of lateral slots (200b) used to fix the plate (200a) against the masonry wall.

**[0079]** The plate (200) is fixed to a section of box-shaped metal section (201) with basically rectangular cross-section (a sort of coupling, practically speaking) provided on the internal sides with horizontal cores (202) and with an upper parallel core (203); in particular, the core (203) is supported in the centre of the section (201) by a suitable horizontal partition (203a) that internally projects from one side.

**[0080]** One section of the templates (1) provided with the said series of through holes (10, 11 a, 11 b, 12) is engaged and fixed against the section of box-shaped extruded section (201).

**[0081]** As shown in figure 7, the template (1) is fixed to the spacer (200) by means of self-threading screws (37) inserted through the two parallel holes (11 a, 11 b) of the template (1) and engaged against the cores (202) of the spacer(200).

**[0082]** With reference to this figure, it must be noted that the hole (10) of the template (1) is used to fix the metal sections (3) designed to form the secondary framework (02).

**[0083]** In particular, the self-threading screw used for fixing is first inserted into the suitable hole (10) on the template (1) and then engaged against the central core (203) of the metal section (201) of the spacer (200).

**[0084]** With reference to figures 7A and 8A, each telescopic spacer (2) is composed of a plate (20) fixed to the wall, a box-shaped extruded section (21) with basically rectangular cross-section designed to be perpendicularly fixed against the plate (20), and a coupling (22) designed to be exactly inserted in external position on the metal extruded section (21), with the possibility of sliding, and then permanently blocked with respect to the metal extruded section (21) once the desired projected position is reached.

**[0085]** The bearing plate (20l is provided with an opposite pair of lateral slots (20a) used to fix the plate (20) against the masonry wall.

**[0086]** The plate (20) is also provided with two holes (20b) in slightly internal position with respect to one of the horizontal borders of the plate (20).

**[0087]** The holes (20b) are drilled on the vertical symmetrical axis of the plate (20) and are used to insert self-threading screws engaged in corresponding cores (23a) in internal position on the upper and lower walls of the metal extruded section (21), under central rectilinear grooves (23) that are longitudinally present on the same walls.

**[0088]** Two additional rectilinear grooves are present in opposite position on the sides of the metal extruded section (21), halfway the height of the metal extruded section (21).

**[0089]** Each groove has an irregular shape, being composed of an upper part (24) with basically the same profile has the lower and upper grooves (23) and a lower part (24a) with higher height and lower depth.

**[0090]** The metal extruded section (21) has a second rectilinear groove (25) in lateral position, with depth equal to half of the width and located above the central grooves (24).

**[0091]** The metal extruded section (21) contains an horizontal partition (26) under the two central grooves (24), from which a rounded longitudinal profile (27a) projects in lower position, defining a basically circular conduit (28) in cooperation with a second rounded longitudinal profile (27b) in opposite position above the lower core (23a).

**[0092]** The circular conduit (28) is designed to house a special screw (29) that engages with a nut (30) permanently engaged in the intermediate section of the conduit (28) through a suitable window (31) on the side of the metal extruded section (21).

**[0093]** The length of the screw (29), which is frontally provided with a thin cylindrical stem (29a) with threaded front end (29b), is such that the screw (29) considerably exceeds the front of the extruded metal section (21), as shown in figure 7A, although it is engaged in the nut (30).

**[0094]** The threaded end (29b) is frontally provided with a diameter notch (29c) for the point of a screwdriver used to rotate the entire screw (29) with respect to the nut (30).

**[0095]** The coupling (22) is prismatically coupled with the metal extruded section (21), with the possibility of sliding forward and backwards.

**[0096]** The extruded section (21) and the coupling (22) are mutually matched because the coupling (22) is provided with internal profiles able to match the grooves (23, 24, 25) on the four sides of the extruded section (21).

**[0097]** The lower and upper sides of the coupling (22) are internally provided with central rectilinear cores (33)

designed to penetrate and slide in the grooves (23) in external position on the upper and lower sides of the extruded section (21).

**[0098]** The sides of the coupling (22) are provided with two rectilinear ribs (34a) in perfectly specular position, designed to penetrate and slide in the lower parts (24a) of the grooves on the sides of the extruded section (21); likewise, the rectilinear cores (34) slightly above the ribs (34a) are designed to penetrate and slide in the upper parts (24) of the grooves on the sides of the extruded section (21).

**[0099]** The function of the rectilinear ribs (34) on the internal sides of the coupling (22) is also to provide threaded holes (36) through the sides of the coupling (22).

**[0100]** A horizontal partition (35a) ending with a core (35) is positioned above the lateral cores (34) of the coupling (22) in internal position on one of the sides of the coupling (22), designed to penetrate and slide in the deeper groove (25) on one of the sides of the extruded section (21).

**[0101]** The threaded holes (36a) on the sides of the coupling (22) are designed to receive corresponding pins (36) designed to interfere against the sides of the extruded section (21) to prevent the mutual sliding of the two elements (21, 22) as soon as the desired total length of the spacer (2) is achieved, as illustrated hereinafter.

**[0102]** In this case also, the front end of the spacer (2) is designed to be engaged and fixed against the back side of a template (1); in particular, the mutual fixing between the two modules (1, 2) is obtained by means of the two self-threading screws (37) inserted from the template (1) into the two parallel holes (11a, 11b) in intermediate position in the series of holes with cross-configuration that are regularly spaced on each template (1).

**[0103]** After going through the holes (11 a, 11 b) of the template (1), the screws (37) engage against the cores (34) on the sides of the coupling (22).

**[0104]** The special deep-drawing (that is to say thickening) executed on the holes (11 a, 11 b) of the template (1) used to fix the sliding coupling (22) permits a fulcrum function in support points; this allows to mount the template (1) according to a perfectly rectilinear configuration including when it is positioned in a direction not exactly parallel to the bearing wall.

**[0105]** This is extremely useful in case of irregular walls that are not perfectly orthogonal to the floor.

**[0106]** When the template (1) is engaged against the coupling (22) of the spacer (2), the threaded end (29b) of the cylindrical stem (29a) of the screw (29) is inserted in the hole (12) of the template (1) in lower position with respect to the two parallel holes (11 a, 11 b), thus exceeding the length of the template (1).

**[0107]** Once the template (1) and the spacer (2) are fixed, the spacer (2) can be adjusted with a screwdriver, from the external side of the template (1), on the notch (29c) on the front end of the cylindrical stem (29a) of the screw (29).

**[0108]** Evidently the rotation of the screw (29) with respect to the fixed nut (30) makes the coupling (22) and the template (1) joined with it slide forward and backward, with respect to the bearing extruded section (21).

**[0109]** The cylindrical stem (29b) of the screw (29) is preferably provided with a small groove along the circumference near the external end, designed to receive an elastic ring (Seeger type) (not shown in the figures) mounted as soon as the stem (29b) comes out from the template (1) through the hole (12).

**[0110]** The ring is designed to interfere against the external side of the template (1) when the screw (29) is rotated to reduce the length of the spacer (2); in fact, the interference between the ring and the external side of the template (1) causes the template (1) to move backwards, together with the coupling (22) joined to it, when the screw (29) is moved backwards.

**[0111]** In any case, once the desired length of the coupling (22) is selected, the following two operations must be executed: as mentioned earlier, the first operation consists in tightening the transversal pins (36) into the holes (36a) on the sides of the coupling (22), until the point interferes with the sides of the extruded section (21) to prevent free sliding between the two components (21, 22).

**[0112]** The second operation consists in tightening a safety nut (38) on the threaded end (29b) of the stem (29a) of the screw (29) exceeding on the template (1), until the nut (38) strictly interferes against the external side of the template (1) by means of the elastic ring.

**[0113]** In this way the nut (38) can ensure stable and permanent connection between the spacer (2) and the template (1).

**[0114]** Each template (1) is designed to be associated with a vertical series of spacers (2); in particular, the number of spacers (2) associated with each template (1) depends on the number of series of holes with cross-configuration on the template (1).

**[0115]** The adjustable spacer (2) shown in figures 7 and 8 is only used in the two upper and lower ending position in the same vertical series of spacers; the intermediate positions are occupied by the "idle" telescopic spacer (2000) that, although it has the same structure as the adjustable spacer (2), differs from it in that it is not provided with the fine adjustment screw (29).

**[0116]** Once the template (1) has reached a perfectly vertical position, the intermediate telescopic spacers (2000) need to be block in place by means of the lateral pins (36).

**[0117]** Once the primary framework (O1) is obtained by means of multiple vertical templates (1) in parallel position, the sections (3) used to form the secondary framework that supports the cover panels (4) must be engaged and screwed against the templates (1).

**[0118]** With reference to figures 9, 10 and 19, each panel (49), with preferably rectangular shape, is provided with a longitudinal groove (4a) milled in the centre of the lower horizontal border; the back of the upper horizontal

border is provided with a series of elastic squares (4b) with a flexible shaped tab (4c) with basically horizontal direction designed to project on the back of the panel (4).

**[0119]** With reference to figures 11 and 12, each section (3) has a basically "U-shaped" cross-section and is provided with a regularly spaced series of slots (3b) with horizontal axis on the rear edge (3a).

**[0120]** In particular, the distance between the slots (3c) determines the distance between each parallel template (1) of the primary framework (O1), since the fixing of a section (3) against the parallel series of templates (1) requires the perfect alignment between the slots (3b) on the section (3) and the holes (10) that occupy the upper position in the series of holes with cross-configuration on the templates (1).

**[0121]** Once alignment is achieved, final fixing can be obtained by means of self-threading screws inserted into one of the slots (3b) of each section (3), into the upper hole (10) of one of the series of holes with cross-configuration on the template (1) and finally engaged in the spacer (2) matched with the template (1).

**[0122]** More precisely, the point of the screw is engaged with the back of the template (1) in the core (35) basically positioned in the centre of the coupling (22), being supported by the horizontal partition (35a) that projects from one of the internal sides of the coupling (22).

**[0123]** As shown in figure 12, each section (3) has a special cross-section in order to favour fast and permanent matching with the cover panel (4).

**[0124]** The upper side of the section (3) is provided with a second, lower edge (3c) in slightly forward parallel position with respect to the rear edge (3a); the lower side of the section (3) is provided with two longitudinal ribs (3d, 3e) with vertical axis, in intermediate position between the two edges (3a, 3c), the front rib (3d) having a lower height and the rear rib (3e) having a higher height and ending with enlarged rounded head, with mushroom-shaped configuration.

**[0125]** The construction of the secondary framework (02) also requires the use of the end modules (5, 6) basically consisting in two L-shaped metal sections mounted in opposite position; the two modules (5, 6) are respectively shown in figures 13/14 and 15/16.

**[0126]** That is to say: with the concave part upwards when acting as base element (5) in the second framework (02) and with the concave part downwards when acting as top element (6) in the same framework, as shown in figures 3, 4 and 5.

**[0127]** As for the metal sections (3), the lower end module (5) is fixed to the primary framework (O1) by means of screws that are inserted into suitable slots (5b) on the rear edge (5a) and engaged against the templates (1) of the primary framework (O1).

**[0128]** Both end modules (5, 6) have a special cross-section provided with a lower front edge (5c, 6c) in parallel position to the read edge (5a, 6a).

**[0129]** The special cross-section has been devised to favour the fast permanent matching between each end module (5, 6) and the cover panel (4).

**[0130]** In order to mount a cover panel (4) on an intermediate section (3) of the secondary framework (02), the cover panel (4) is placed above the section (3) in such a way the longitudinal groove (4a) on the horizontal lower border of the cover (4) is exactly matched with the front edge (3c) above the section (3), as shown in figure 5.

**[0131]** Now the panel (4) is simply pushed backwards, using the edge (3c) of the section (3) as hinge, as shown in figures 19A and 19B.

**[0132]** Once rotation is completed, the cover (4) reaches a perfectly vertical position, with the upper border touching the shorter, more advanced rib (3d) in lower position on the section (3), as shown in figure 19A.

**[0133]** In this condition, the squares (4b) on the back of the upper border of the panel (4) snap-in against the second rib with enlarged head (3e) in lower position on the section (3), thanks to the special configuration of the elastic tabs (4c).

**[0134]** The mounting of one of the cover panels (4) on the lower end module (5) is performed as illustrated above, since the lower end module (5) is provided with the front edge (5c) designed to be exactly matched with the lower longitudinal groove (4a) of the panel (4).

**[0135]** In this case, the panel matched with the end module (5) snaps-in with the lower side of the intermediate section (3) immediately above, as illustrated before.

**[0136]** The fixing of the panel (4) designed to occupy the upper position in the vertical surface (SV) of the equipped wall requires some special measures.

**[0137]** Firstly, a special section (7) with basically S-shaped cross-section, being formed of two vertical wings (7a, 7b) joined by an outward ascending intermediate section (7c) so that the lower wing (7a) occupies a more internal position with the upper wing (7b), must be mounted on the top of the primary framework (O1), as shown in figures 19A and 19B.

**[0138]** In particular, the lower wing (7a) of this section is designed to touch the templates (1) of the primary framework (O1) and be fixed to the templates (1) by means of ordinary self-threading screws that, after going through the slots with horizontal axis (7d) that are suitably provided on the lower wing (7a), are engaged on the templates (a) by means of the holes (10).

**[0139]** Once fixing is completed, the upper wing (7b) in more advanced position of the section (7) is placed at a certain distance from the series of templates (1), forming a sort of longitudinal pocket (T).

**[0140]** The upper panel (40) is characterised by the fact that it is provided with a central groove (40a) on each longitudinal borders and by the fact that it is not provided with elastic brackets (4b).

**[0141]** The mounting of the upper panel (40) is obtained by matching the lower longitudinal groove (40a) with the external edge (3c) of the intermediate section (3) on top and then rotating it inwards to achieve a perfectly vertical position.

**[0142]** Now the end upper module (6) is placed from

above downwards in a bayonet-coupling configuration.

**[0143]** This operation results in the strong insertion of the rear edge (6a) of the end upper module (6) inside the pocket (T) defined by the more advance upper wing (7b) of the S-shaped section (7) and in the insertion of the front edge (6c) of the end module (6) into the longitudinal groove (40a) on the upper longitudinal border of the panel (40)

**[0144]** Obviously, the removal of the top panel (40) requires the previous removal of the end module (6).

**[0145]** For clearer reference, this description continues with the preferred sequence of mounting operations for the equipment of the invention, in the embodiment provided with telescopic spacers (2):

A) Drawing on the ground of the line defined by the project for the intersection of the equipped wall at floor level. In case of construction of contiguous walls, for which perfect orthogonality is required, the lines must be perfectly perpendicular.

B) Placement of the lower end module (5) of the secondary framework (02) on the line on the floor. The section is perfectly levelled with suitable shims, if necessary.

C) Anchoring of the spacing templates (1) of the primary framework (O1) to the bearing wall. This operation simply requires to drill the wall on the holes located on the plates (20) of the telescopic spacers (2) and then fix the plates (20) with fisher screws. The templates (1) are positioned according to the predefined distance (i.e. multiple of a predefined base module). A perfectly levelled horizontal line is drawn to ensure perfect alignment of the plates (20) of the spacers (2) and consequently perfect levelling of the entire structure.

D) Adjustment of spacing templates. The templates are adjusted with a screwdriver by means of the screws (29) of the two telescopic spacers (2) located at the lower and upper ends of each template (1). The spacer (2) at the lower end is adjusted until the corresponding template (1) is perfectly aligned with the lower end module (5) and then blocked by means of the pin (36). The spacer (2) at the upper end is adjusted until the corresponding template (1) is perfectly perpendicular and then blocked by means of the pin (36). This double operation results in the forward translation of the template

(1) and, because of the rigidity of the template (1), the heads of all idle intermediate spacers (2000), matched with the template (1) are perfectly aligned with the heads of the two adjustable spacers (2) at the ends. Finally the intermediate spacers (2000) are blocked by means of the pins (36).

E) Fixing of the secondary framework. This operation is executed by fixing the lower end module, the intermediate sections (3) and the anchoring section (7) of the upper end module (6) to the templates (1) by means of the holes with predefined distance. Fixing is obtained by means of self-threading screws positioned on the slots (5b, 3b, 6b, 7d) of the sections (5, 3, 6, 7). In particular, the self-threading screws (37) that correspond to the intermediate sections, in addition to go through the omega-shaped templates (1), can be firmly fixed to the cores (34) in internal position on the sides of the sliding coupling (22) of the corresponding telescopic spacer (2).

F) Fixing of panels (4). The panels are mounted by inserting the groove (4a) on the lower edge of each panel (4) into the corresponding edge (3c, 5c) on each intermediate section (3) and on the lower end module (5) of the secondary framework (02). Once the panel is inserted, the panel (4) is blocked with a rotation movement, making the elastic squares (4b) on the back of the upper edge of each panel (4) snap in the tab (3d) in lower position on each intermediate section (3) of the secondary framework (02). To fix the upper panel (40), the S-shaped section (7) is fixed to the top of the primary framework (O1), the panel (40) is placed by means of the hinge offered by the longitudinal edge (5c) of the intermediate section (3), and the upper end module (6) is mounted from above downwards by means of the longitudinal pocket (T) formed by the S-shaped section (7). In this way, the edge (6c) in lower position on the end module (6) can penetrate the longitudinal groove (40a) on the upper longitudinal border of the top panel (40).

**[0146]** The equipment of the invention is characterised by fast and simple dismounting, which is executed in reverse order with respect to mounting.

**[0147]** Each cover panel (4) provided with fixing squares (4b) can be removed after removing the snap-in connection between the elastic squares 84b) and the ribs (3e) in lower position on each intermediate section (3) by exerting an energetic traction with a suitable suction cup.

**[0148]** Finally, it must be said that, without leaving the scope of the invention, alternative constructive solutions of the equipment of the invention can be provided.

**[0149]** In the case of embodiment with two frameworks (01, 02), the arrangement of the primary framework (O1) and the secondary framework (02) can be inverted, that is to say with spacing templates (1) in horizontal direction and sections (3) in vertical direction.

**[0150]** Moreover, the secondary framework (02) can be arranged in oblique direction with respect to the primary framework (O1), according to non-perpendicular directions.

**[0151]** The 45° arrangement of the sections (3) with respect to the templates (1) allows to mount modular coatings with "opus reticulatum" layout, with a peculiar aesthetical result that can be hardly obtained with tradi-

tional fixing methods, as shown in figure 20.

**[0152]** Also in the case of the embodiment with two frameworks (01, 02), cover panels (4000) with curved profile - as shown in figures 21 and 21A - can be used and coupled to the secondary framework (02) as illustrated above, due to the presence of suitable grooved longitudinal edges and snap-in fixing squares.

**[0153]** In this case, the templates (1) of the primary framework (O1) must be maintained at a different distance from the masonry wall, while all the sections (3, 5, 6, 7) of the secondary framework (02) must have a flexible structure in order to withstand the radius of curvature imposed by the different distance of the templates (1) from the masonry wall.

**[0154]** The front of the sections (3) of the secondary framework (02) can also be provided with a sort of longitudinal grooved bordered by a parallel pair of horizontal lips (30) to receive the rear border of object-holding shelves (M) in projected position on the front of the secondary framework (02), as shown in figures 22 and 23. The high load-bearing capacity of the shelves is guaranteed by the presence of spacers for ideal load transfer to the wall.

**[0155]** As a matter of fact, although not shown in the enclosed figures, the shelves (M) would be projected on the front of the continuous vertical surface obtained with the cover panels (4).

**[0156]** According to another embodiment of this inventive idea, two pieces of the modular equipment of the invention are placed in "back-to-back" configuration; in this case, the series of templates (1) of the primary frameworks (O1) are connected by means of rows of special spacers (250), capable of adjusting their length on both sides, being composed of a single extruded piece and two sliding couplings on opposite sides. Should adjustment be not necessary, to privilege the issues related with thermal and acoustic insulation, spacing uprights made of insulating material can be provided in replacement of metal couplings.

**[0157]** In this way, partition walls for modular coating can be provided on both sides (as shown in figure 24).

**[0158]** Figures 25 and 25A show two pieces of the equipment of the invention, without cover panels (4), mounted on two adjacent masonry walls in corner configuration, but not perfectly perpendicular.

**[0159]** In particular, the figures show that a suitable adjustment of the telescopic spacers (2) ensures the perfect perpendicular arrangement of the two metal bearing structures for the equipped walls, after the application of cover panels (4).

**[0160]** Figures 26 and 26A refers to a possible implementation of the equipment of the invention, in which the two frameworks (01, 02) originate a regular series of boxes (C) in chess-board configuration, being perfectly aligned in horizontal rows and vertical columns.

**[0161]** In this case, the equipment also includes two additional modules, the first module being a simple cover panel (8) with such a shape and surface that it can completely hide one of the boxes (C) defined by the frameworks (01, 02).

**[0162]** The second additional module is a box-shaped hollow element (9) shaped as a parallelepiped, with a front opening (9a) defined by a perimeter frame (9b) that projects externally.

**[0163]** Each module (9) is exactly contained in horizontal position in one of the boxes (C), in such a way that the front opening (9a) is flush with the vertical surface of the box (C) and the box-shaped body projects on the back of the primary framework (O1).

**[0164]** At the same time the perimeter frame (9b) completely hides the parts of the frameworks (01, 02) that border the box (C).

**[0165]** Once it is fixed in this position, each box-shaped element becomes a compartment of the equipped wall and can be used to contain objects.

**[0166]** Practically speaking, the cover panels (8) and the box-shaped elements (9) of the equipment of the invention are fixed as illustrated above: each panel and each box-shaped element are provided with lower longitudinal grooves (8a, 9c) able to cooperate with edges (5c, 3c) respectively located on the upper side of the lower end module (5) and of the intermediate sections (3) and upper elastic squares (8b, 9d) mounted in internal position on the upper longitudinal borders, being designed to cooperate with the two longitudinal ribs (3d, 3e) under each intermediate section (3).

**[0167]** Also in this case, the top panels or the top box-shaped elements are provided with a second longitudinal groove also on the upper borders; the said upper groove allows them to cooperate with the upper end module (6) after mounting the S-shaped section (7).

**[0168]** In the latter embodiment, the spacers (2) used to support the templates (1) of the primary framework (O1) on the front of the masonry wall must have a length compatible with the depth of the box-shaped elements (9) contained in the boxes (C).

**[0169]** Another possible embodiment of the present invention is related to the possibility of anchoring the modular structure of the invention to simple vertical panels, rather than to a bearing masonry wall.

**[0170]** Such a solution allows for easy construction of partition walls equipped with installations and conduits that, in addition to the aesthetical advantage given by the modular coating, are also characterised by a large series of advantages, among which limited weight, easy mounting and dismounting, adjustable thickness.

**[0171]** These characteristics make them a very interesting solution for use in offices and trade shows.

**[0172]** Finally, with some slight adjustments made by an ordinary technician, the equipment of the invention can be used with a horizontal arrangement, rather than vertical, to create accessible false ceilings or raised floors.

## Claims

1. Equipment for construction of modular equipped walls, **characterised in that** it uses a spacing template (1) basically consisting in a metal section with a large longitudinal stiffening rib and also provided with regularly spaced identical series of through holes (10, 11 a, 11b, 12) used to fix additional modules (400, 3, 5, 7) of the same equipment on the front of the template (1) and corresponding spacers (2, 200, 2000) on the back of the template (1) to fix it on the wall, one next to another, in order to create a primary bearing framework (O1) for the equipped wall.

2. Equipment for construction of modular equipped walls, as defined in claim 1, **characterised in that** each spacer (2, 200, 2000) is composed of a plate (20, 200a) provided with two lateral fixing slots (20a, 200b), with a projecting box-shaped metal section (22, 201) provided with two longitudinal cores (34, 202) on the internal side and with one additional upper nut (35, 203), in parallel position to the first two nuts, supported in perfectly centred position by means of a suitable horizontal partition (35a, 203a) that projects from one of the internal sides; it being also provided that each series of holes on the template (1) comprises at least two parallel holes (11 a, 11 b) for the insertion of screws (37) able to engage with the nuts (34, 202) of the box-shaped element (22, 201) of a corresponding spacer (2, 200, 2000), as well as a third hole (10) in central position with respect to the first two holes (11, 11b), suitable to receive a screw used to fix one of the additional modules (400, 3, 5, 7) of the equipment and also designed to engage with the central nut (35) of the box-shaped element (22, 201) of the spacer (2, 200, 2000).

3. Equipment as defined in the preceding claims, **characterised in that** the box-shaped element (201) of the spacer (200) is fixed directly on the front of the bearing plate (200a).

4. Equipment as defined in claims 1 and 2, **characterised in that** the box-shaped element (22) is exactly inserted in external position in a box-shaped extruded section (21) directly fixed on the front of the bearing plate (20); it being provided that the metal element (22) axially slides with respect to the extruded section (21) until it is blocked by means of suitable pins (36) engaged into corresponding threaded holes (36a) drilled on the sides and designed to interfere against the sides of the extruded section (21).

5. Equipment as defined in claims 1, 2 and 4, **characterised in that** it is provided with means (29) positioned between the two components (22, 21) used to adjust the of the metal element (22) with respect to the bearing extruded section (21).

6. Equipment as defined in claims 1, 2 and 4, **characterised in that**, in a preferred embodiment of the spacer (2000), the bearing extruded section (21), with basically rectangular cross-section, is provided with two central rectilinear grooves (23) on the external side of the lower and upper walls, with corresponding cores (23a) and two additional rectilinear grooves (24), with irregular profile, halfway on the sides, in addition to a deeper and higher groove (25) that horizontally projects in internal position on one of the sides; it being provided that the central upper and lower grooves (23) of the extruded section (21) are designed to exactly receive corresponding nuts (33) suitably located in internal position on the lower and upper walls of the sliding section (22), while the deep groove (25) of the same extruded section (21) is designed to exactly house the horizontal partition (35a) and the end nut (35) of the same sliding section (22) and the deeper upper section (24) of the lateral grooves on the sides of the extruded section (21) are designed to exactly house the nuts (34) located in internal position on the sides of the sliding section (22), while the lower shallower section (24a) is designed to receive the rectilinear ribs (34a) in lower position on the nuts (24) and create the threaded through holes (36a) used to engage the blocking pins (26); it being also provided that the lower and upper nuts (23a) obtained on the extruded section (21), once the extruded section (21) touches against the plate (20), are perfectly aligned with the holes drilled on the symmetrical axis of the plate (20) in order to allow the insertion of the fixing screws that engage inside the nuts (23a).

7. Equipment as defined in claims 1, 2, 4 and 5, **characterised in that**, in a preferred embodiment of the spacer (2), the bearing extruded section (21), with basically rectangular cross-section, is provided with two central rectilinear grooves (23) on the external side of the lower and upper walls, with corresponding cores (23a) and two additional rectilinear grooves (24), with irregular profile, halfway on the sides, in addition to a deeper and higher groove (25) that horizontally projects in internal position on one of the sides; it being provided that the central upper and lower grooves (23) of the extruded section (21) are designed to exactly receive corresponding nuts (33) suitably located in internal position on the lower and upper walls of the sliding section (22), while the deep groove (25) of the same extruded section (21) is designed to exactly house the horizontal partition (35a) and the end nut (35) of the same sliding section (22) and the deeper upper section (24) of the lateral grooves on the sides of the extruded section (21) are designed to exactly house the nuts (34) located in internal position on the sides of the sliding section

(22), while the lower shallower section (24a) is designed to receive the rectilinear ribs (34a) in lower position on the nuts (24) and create the threaded through holes (36a) used to engage the blocking pins (26); it being also provided that the lower and upper nuts (23a) obtained on the extruded section (21), once the extruded section (21) touches against the plate (20), are perfectly aligned with the holes drilled on the symmetrical axis of the plate (20) in order to allow the insertion of the fixing screws that engage inside the nuts (23a); it being provided that the extruded section (21) is provided with a lower cylindrical conduit (28) with horizontal axis designed to receive a nut (30) contained in it through a window (31) on the side of the extruded section (21), which can be helicoidally coupled with a screw (29) housed inside the same compartment (28) and provided with a thin cylindrical stem (29a) in the front ending with a threaded end (29b), with a front diameter notch (29c) and a groove on the circumference suitable to receive a safety elastic ring; it being provided finally that the length of the screw (29) is such that the threaded end (29b) of the cylindrical stem (29a) can insert and come out of a corresponding hole (12) drilled in lower position with respect to the parallel holes (11a, 11b), in the centre of the corresponding template (1) in such a way that it can be helicoidally matched with a corresponding fixing nut (38) and cooperate with a suitable elastic ring.

**8.** Equipment as defined in one or more of the preceding claims, **characterised in that** it provides for the use of an additional module (400) consisting in a cover panel, with either straight or curved profile, fixed on the front of the primary framework (O1), obtained by means of multiple templates (1), being a removable connection, obtained by means of suitable pair of vertical straps of structural velcro respectively applied on the front side of the templates and on the back side of the cover panels.

**9.** Equipment as defined in one or more of claims 1 to 7, **characterised in that** it provides for the use of six additional modules (3, 5, 6, 7, 4, 40), of which:

- the first module (3) consists in a section with basically L-shaped transversal cross-section designed to create a secondary framework (02) on the front of the primary framework (O1) and in cooperation with other modules of the same type; it being provided that the rear vertical edge (3a) of the module (3) is provided with some slots with horizontal axis (3b) at constant distance used to insert the fixing screws engaged in the holes (10) of the templates (1) of the primary framework (O1), while the front horizontal wing is provided with a lower longitudinal edge (3c) and a lower pair of longitudinal ribs with vertical direction (3d, 3e) positioned between the longitudinal edges (3a, 3c), of which the front rib (3d) has a lower height and the back rib (3c) has a higher height and ends with an enlarged rounded head;
- the second module (5) consists in an end section, with basically L-shaped cross-section, designed to be mounted on the front of the primary framework (O1) parallel to the sections (3) as base element of the secondary framework (02); it being provided that the end section (5) is provided, on the rear vertical edge (5a), with horizontal slots at constant distance used to insert the fixing screws engaged in the holes (10) of the templates (1) of the primary framework (O1), while the front horizontal wing is provided with an upper lower longitudinal edge (5c);
- the third module (7) consists in a section with basically S-shaped cross-section, composed of two basically vertical wings (7a, 7b) joined by an intermediate ascending section (7c) designed to be mounted on top of the primary framework (O1) parallel to the sections (3, 5) of the secondary framework (02); it being provided that the lower wing (7a) in backward position of the section (7) is provided with horizontal slots at constant distance used to insert the fixing screws engaged in the holes (10) of the templates (1) of the primary framework (O1); it being provided that the upper wing (7b), in forward position, of the section (7) originates a longitudinal pocket (T) on top of the primary framework (O1);
- the fourth module (4) consists in a cover panel designed to cooperate with the intermediate sections (3) and the lower end module (5) of the secondary framework (02) to originate the continuous vertical surface (SV) of the equipped wall under construction; it being provided that each panel (4) is provided with a lower longitudinal groove (4a) designed to be coupled with free travel with the edges (3c, 5c) that project from the sections (3, 5) and provided, on the back of the upper longitudinal borders, with elastic squares (4b) ending with a flexible shaped tab (4c), basically horizontal, suitable to snap in with the rear rib (3e) in lower position on each intermediate section (3) when the upper border of the panel (4) touches the adjacent rib (3d) in slightly forward position;
- the fifth module (40) consists in an additional panel designed to occupy the top of the vertical surface (SV) of the equipped wall under construction and cooperate with the intermediate section (3) that occupies the top of the secondary framework (02); it being provided that the panel (40) is provided on one of the two longitudinal borders with rectilinear grooves (40a), of which the lower groove is designed to be cou-

pled with free travel with the upper edge (3c) of the section (3);
- the sixth module (6) consists in an additional end section, with basically overturned U-shaped cross-section, designed to be mounted on the front of the primary framework (O1) parallel to the sections (3, 5, 7) as upper finish element of the secondary framework (02); it being especially provided that the section (6) is provided with a rear edge (6a) designed to be forced from above downwards into the longitudinal pocket (T) on the top of the secondary framework by means of the S-shaped section (7), as well as a lower edge (6c) designed to be exactly received into the rectilinear groove (40a) on the upper border of the top panel (40).

**10.** Equipment as defined in one or more of the preceding claims, **characterised in that** the parallel holes (11 a, 11 b) of each regularly spaced series of holes on the spacing template (1) have drawn or thickened perimeter borders.

**11.** Equipment as defined in one or more of the preceding claims, **characterised in that** the metal sections (3, 5, 6, 7) that originate the secondary framework (02) are mounted in perpendicular direction with respect to the templates (1) of the primary framework (O1).

**12.** Equipment as defined in one or more of the preceding claims, **characterised in that** the metal sections (3, 5, 6, 7) that originate the secondary framework (02) are mounted in oblique direction with respect to the templates (1) of the primary framework (O1).

**13.** Equipment as defined in one or more of the preceding claims, **characterised in that** the sections (3, 5, 6, 7) that originate the secondary framework (02) are intrinsically flexible in such a way that the can assume a curved profile on the front of the templates (1), at a suitable distance from the bearing wall, of a primary framework (O1) in order to cooperate, according to the aforementioned modes, with curved cover panels (4000) suitable provided with grooved longitudinal borders and elastic fixing squares.

**14.** Equipment as defined in one or more of the preceding claims, **characterised in that** it is provided with an additional module, consisting in a special version of the aforementioned intermediate section (3), frontally provided with a close pair of longitudinal lips (30), with horizontal axis, designed to receive and fix the rear border of a shelf (M) that projects from the continuous vertical surface (SV) obtained thanks to the secondary framework (02).

**15.** Equipment as defined in one or more of the preceding claims, **characterised in that** it is provided with an additional module, consisting in a special bilateral telescopic spacer (250), provided with a single extruded bearing element and two sliding couplings on opposite sides, designed to be mounted in intermediate position between the primary frameworks (O1) of the equipped walls positioned at a short distance, in back-to-back configuration.

**16.** Equipment as defined in one or more of the preceding claims, **characterised in that** it is provided with two additional modules (8, 9) designed to be used when the frameworks (01, 02) are arranged in perpendicular configuration, thus forming a regular series of boxes (C) in chessboard configuration, respectively consisting in:

- a cover panel (8) provided with such a shape and surface that it can exactly hide one of the boxes (C) defined by the frameworks (01, 02); it being provided that the panel (8) cooperates with the sections (3, 5, 6, 7) of the secondary framework (02) for the stable fixing in the box (C), as illustrated above, due to the presence of suitable grooved longitudinal borders (8a) and suitable elastic squares (8b) for snap-in fixing;
- one hollow box-shaped element (9) provided with a basically parallelepiped shape and a front opening (9a) bordered by a perimeter frame (9b) that projects externally, designed to be exactly received and blocked in horizontal position into one of the boxes (C), in such a way that the front opening (9a) is basically flush with the sections (3, 5, 6, 7) of the secondary framework (02); it being provided that the box-shaped body (8) is designed to cooperate with the sections (3, 5, 6, 7) of the secondary framework (02) for the stable fixing in the box (C), as illustrated above, due to the presence of suitable grooved longitudinal borders (9c) and suitable elastic squares (9d) for snap-in fixing.

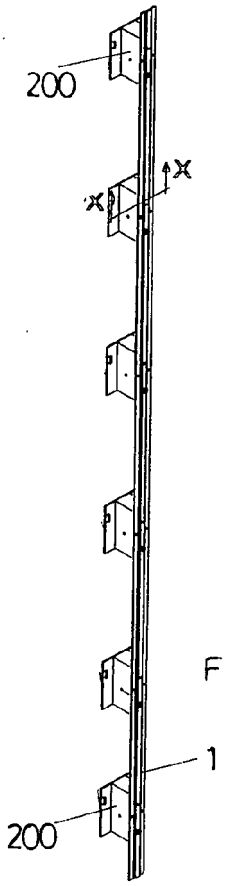


FIG. 1A

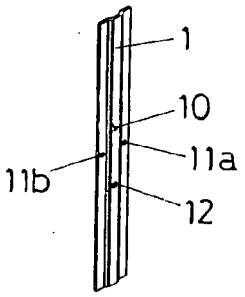


FIG. 1

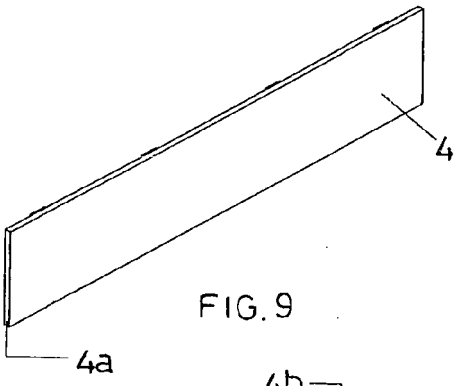


FIG. 9

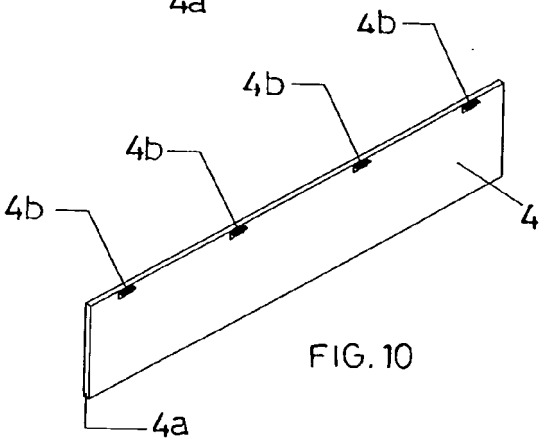


FIG. 10

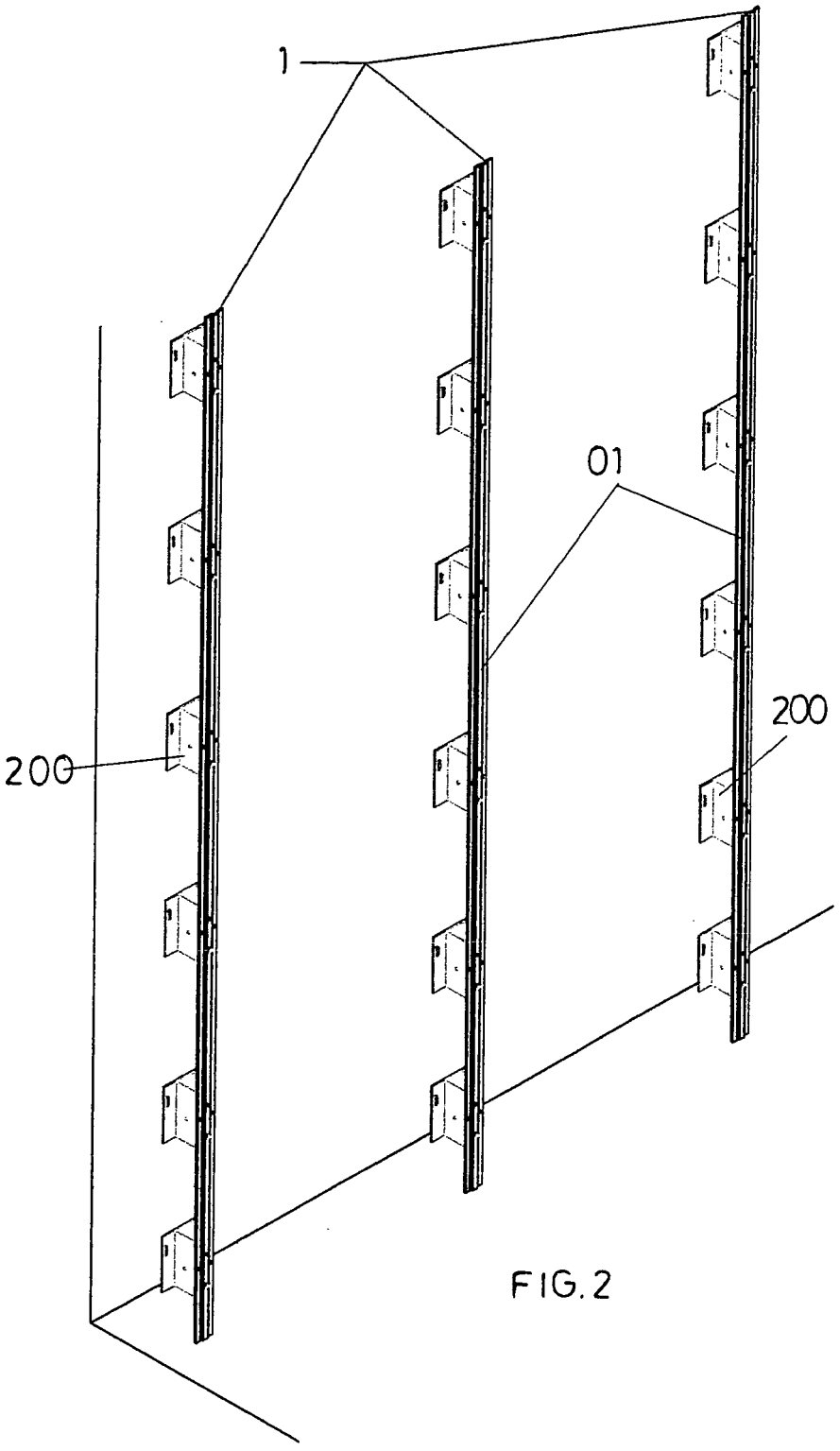


FIG. 2

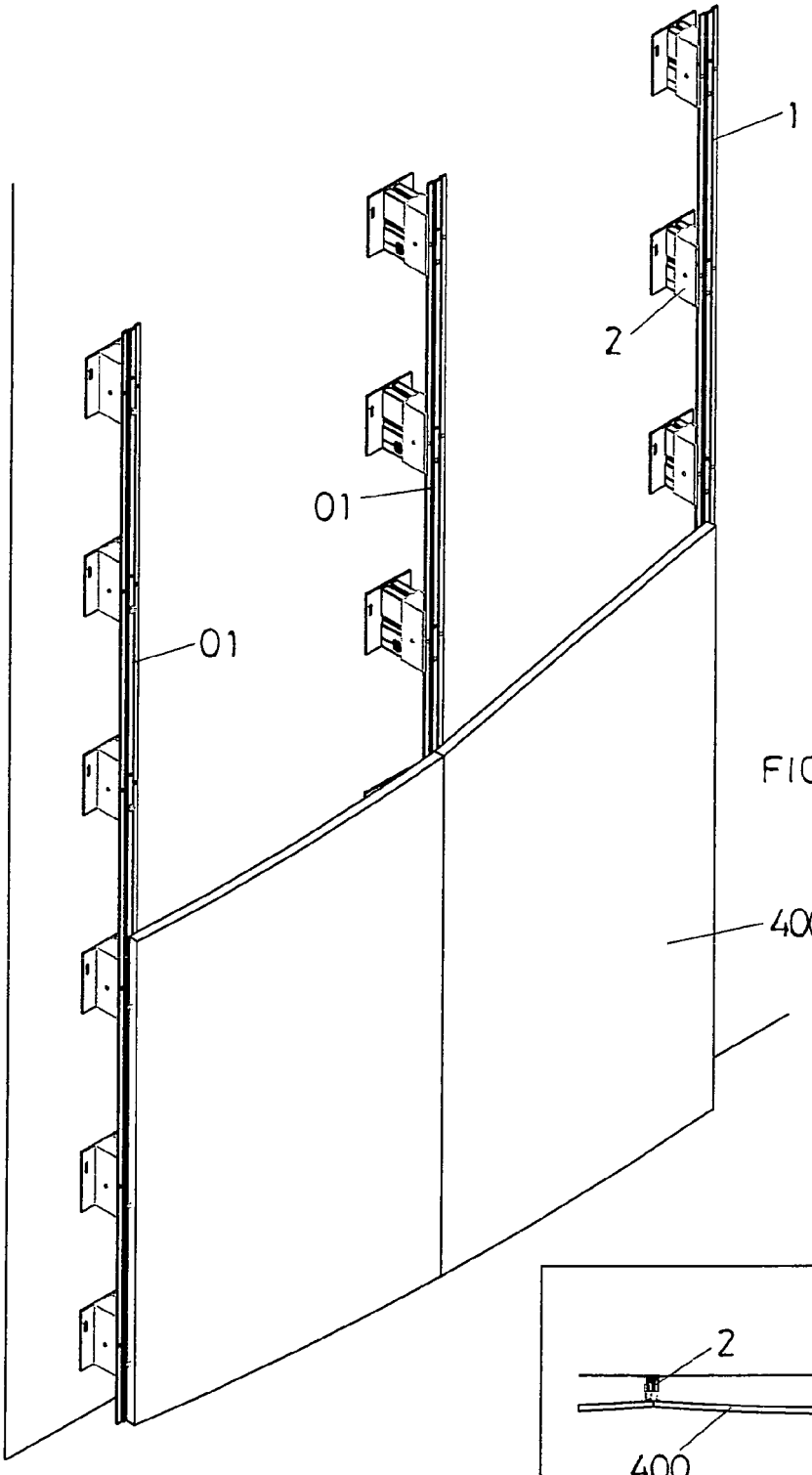


FIG. 2A

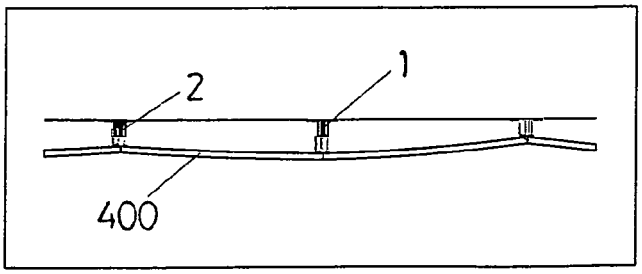


FIG. 2B

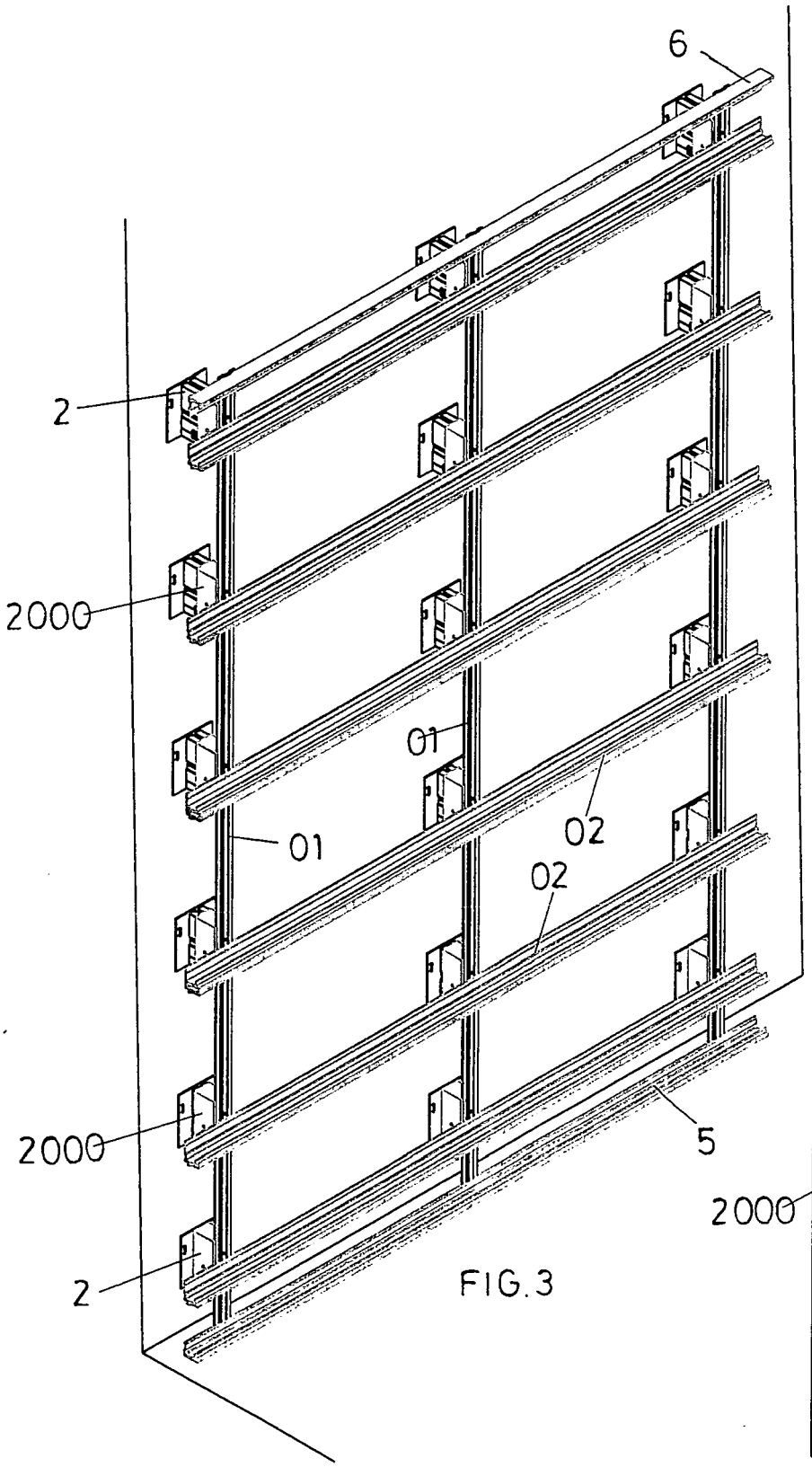


FIG.3

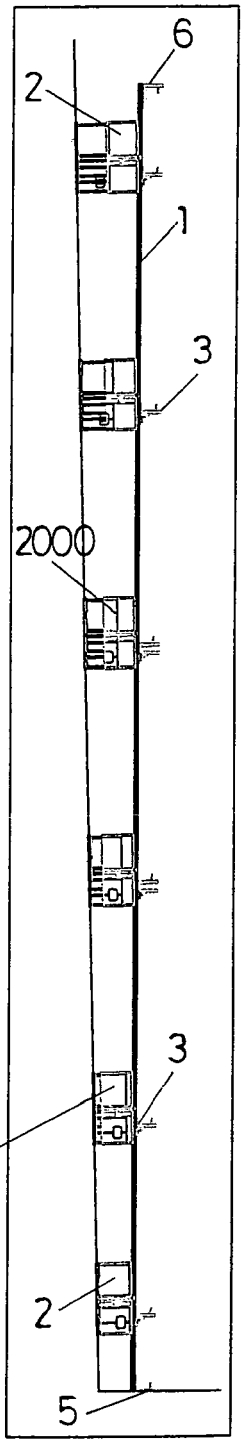


FIG.4

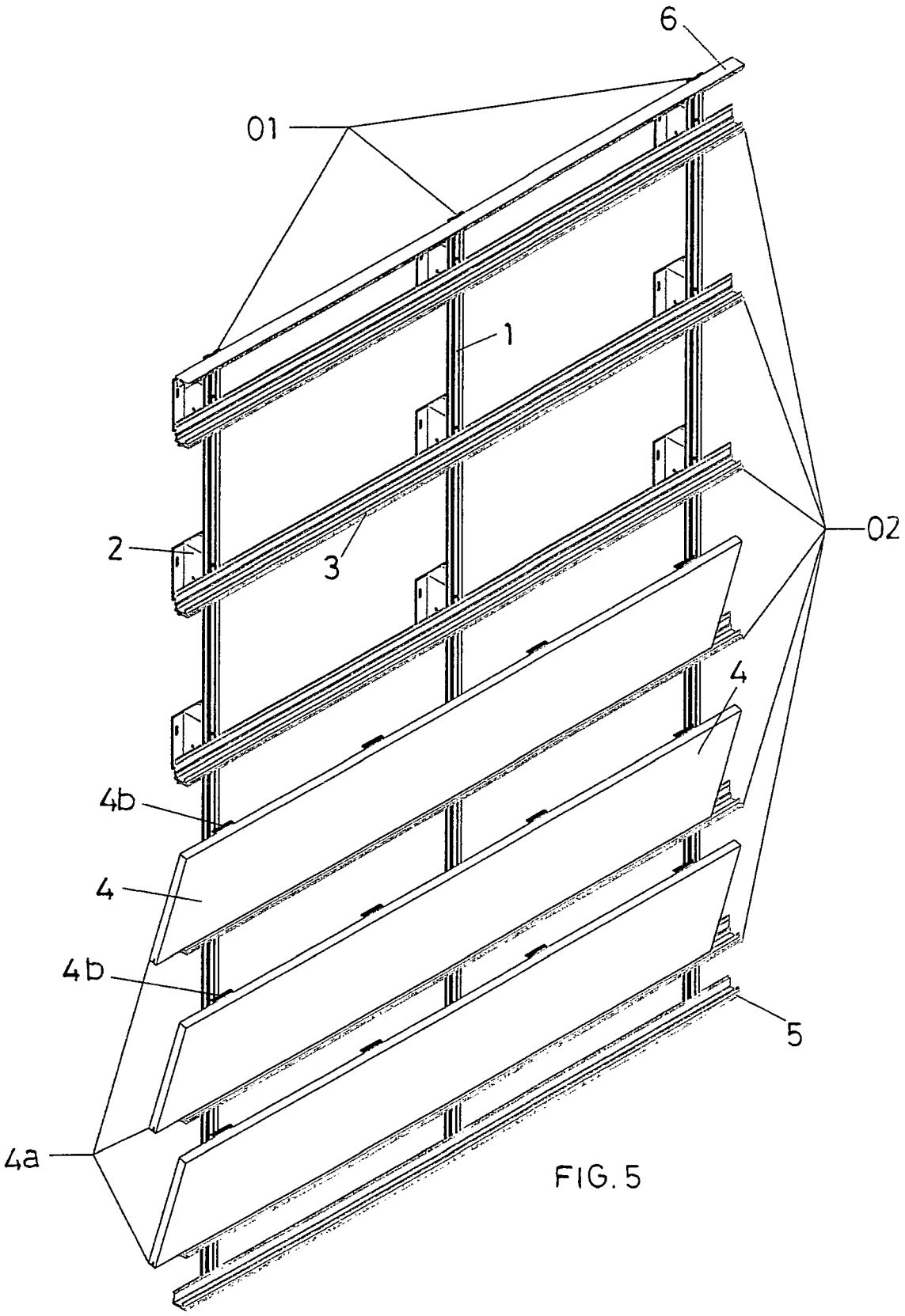


FIG. 5

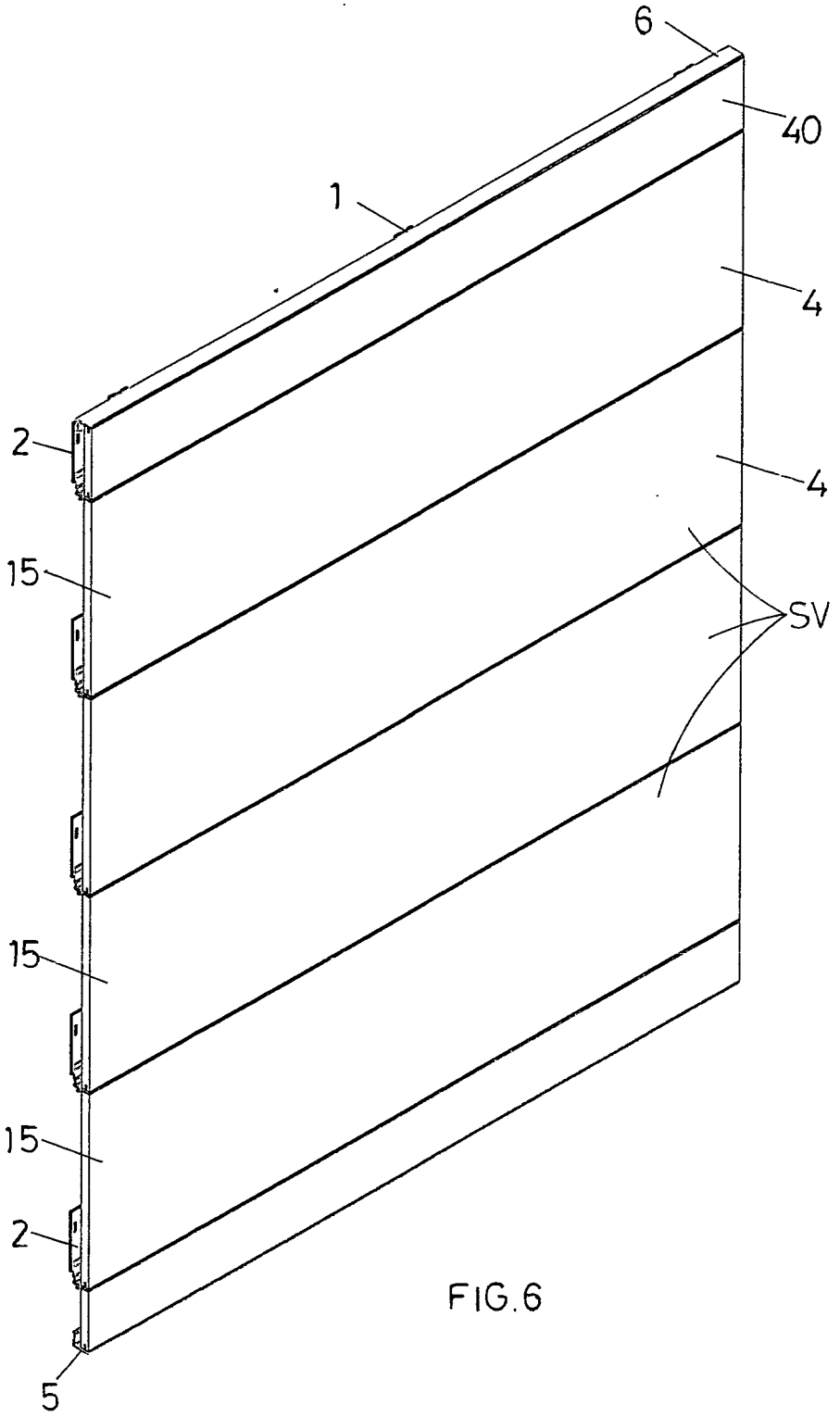


FIG.6

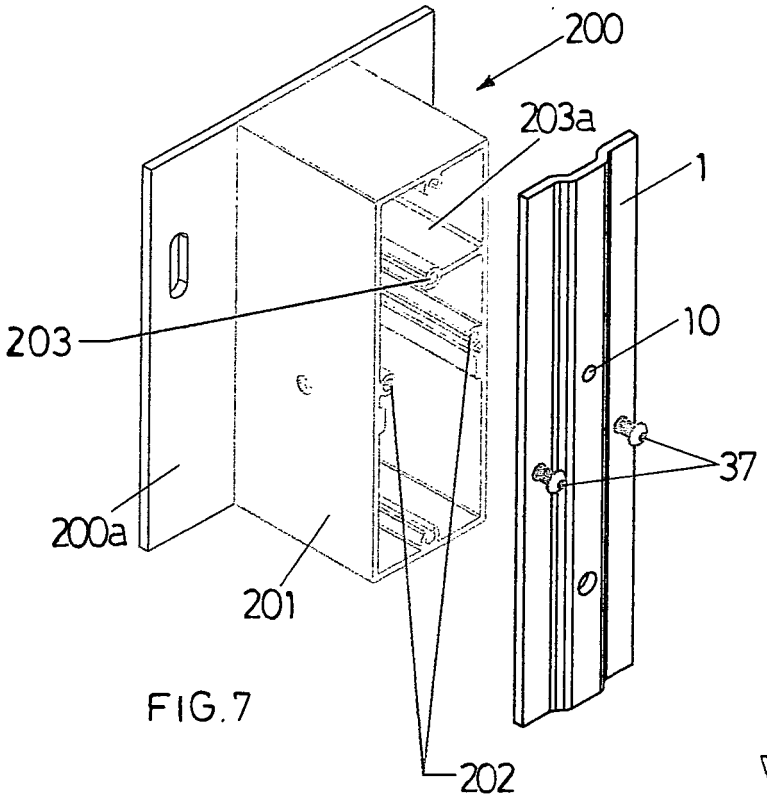
200
203a
1
203
10
37
200a
201
202

FIG. 7

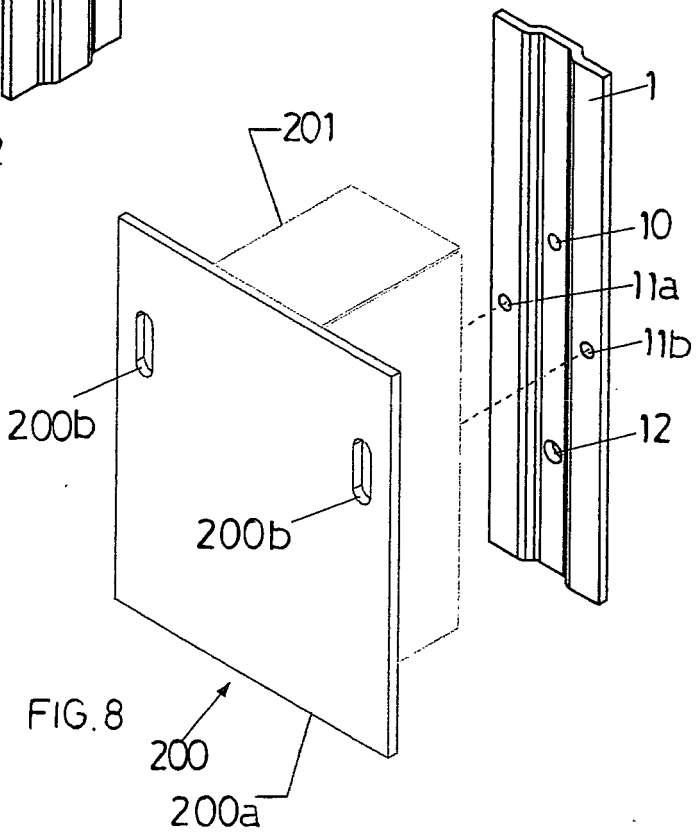
1
201
10
11a
11b
12
200b
200b
200
200a

FIG. 8

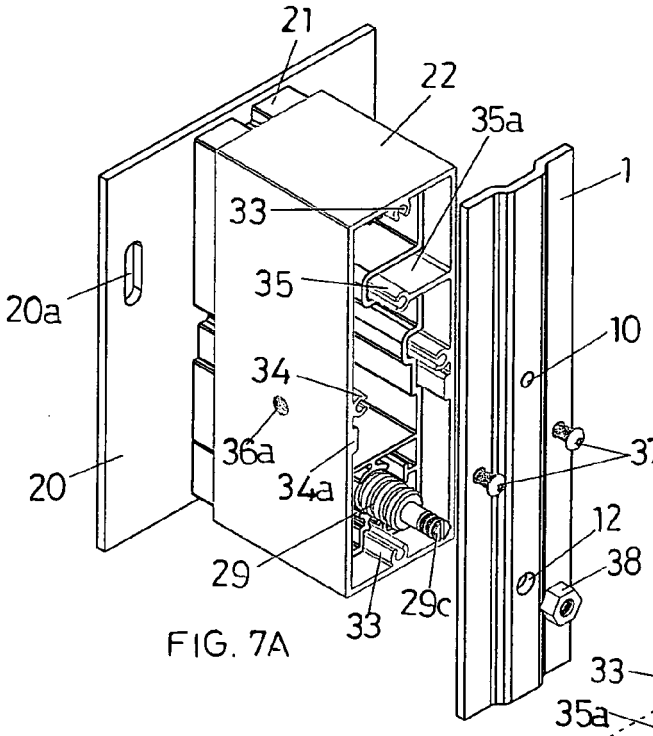
21
22
35a
1
33
35
20a
10
34
37
36a
34a
20
12
38
29
29c
33

FIG. 7A

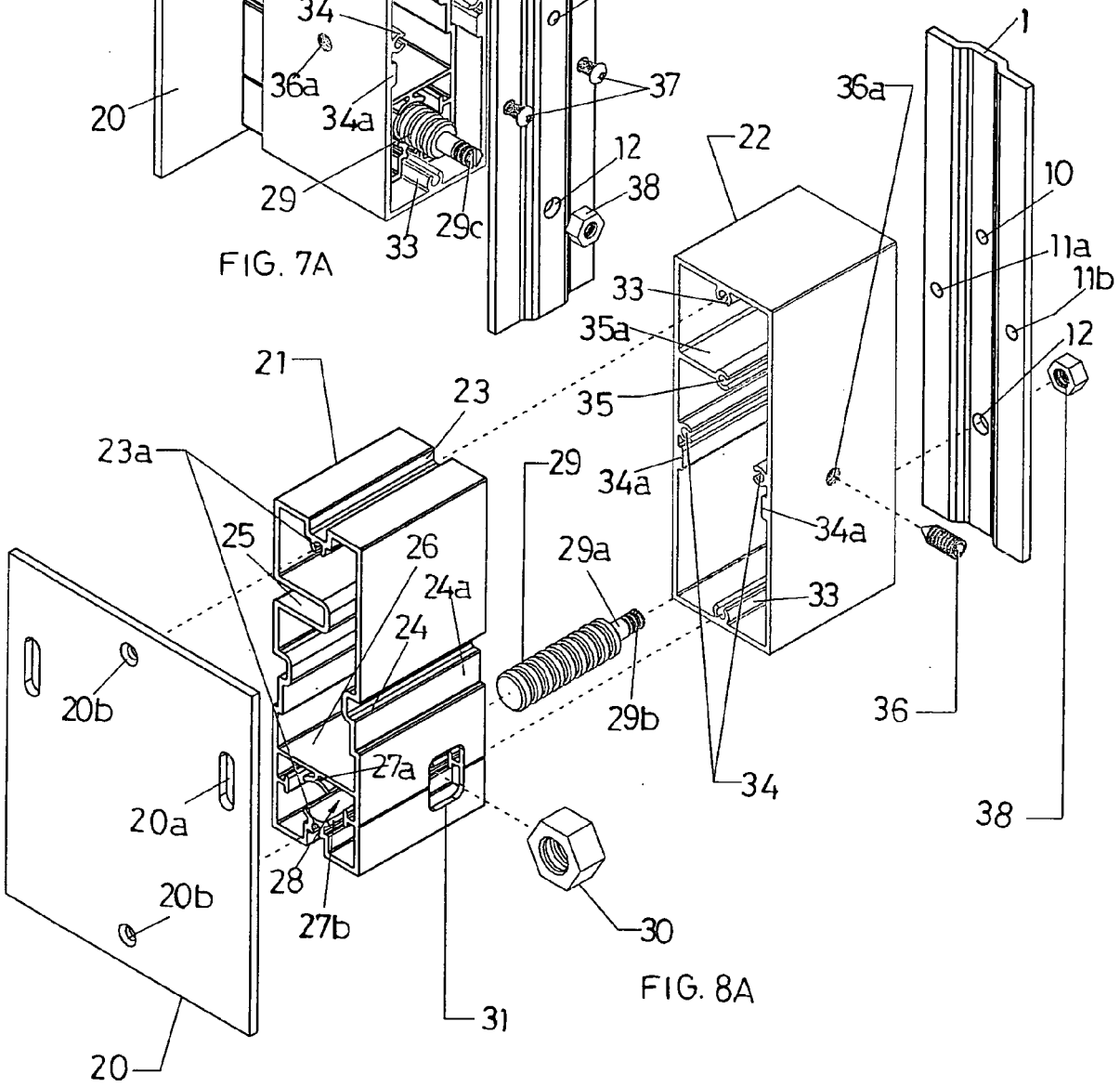
1
36a
22
10
11a
11b
12
33
35a
35
21
23
23a
29
34a
34a
25
26
29a
24a
24
33
20b
29b
36
34
38
27a
20a
28
20b
27b
30
31
20

FIG. 8A

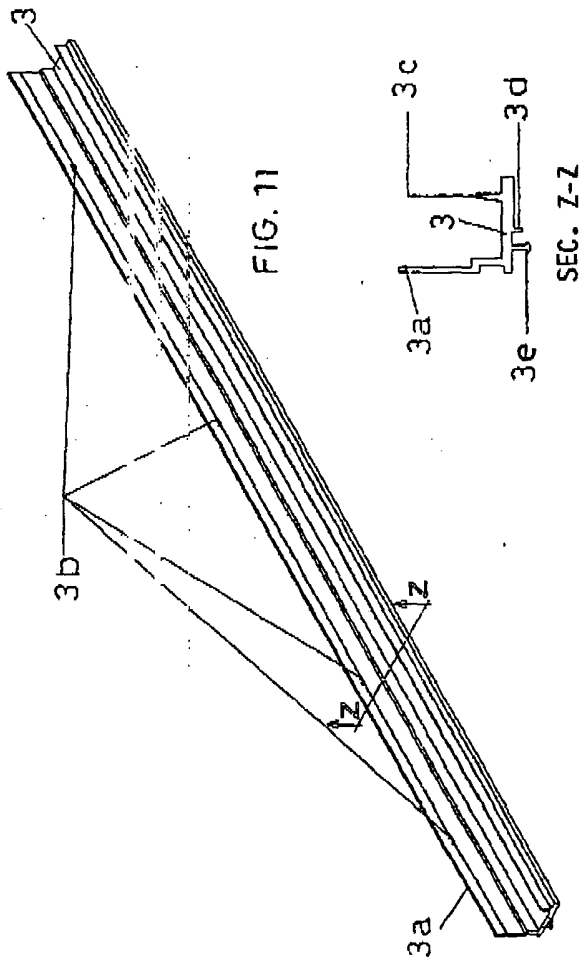


FIG. 11




SEC. Z-Z
FIG.12

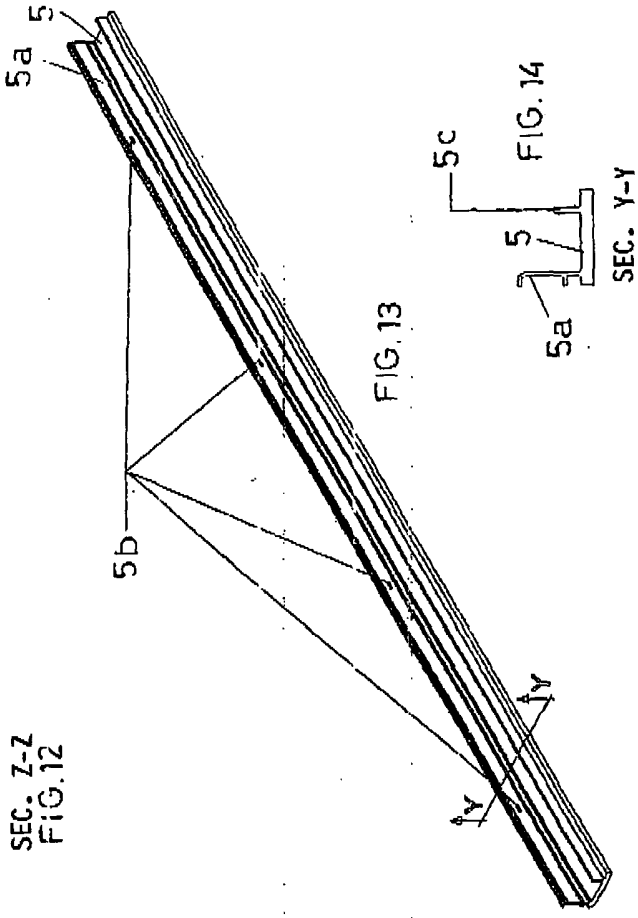


FIG. 13




FIG. 14
SEC. Y-Y

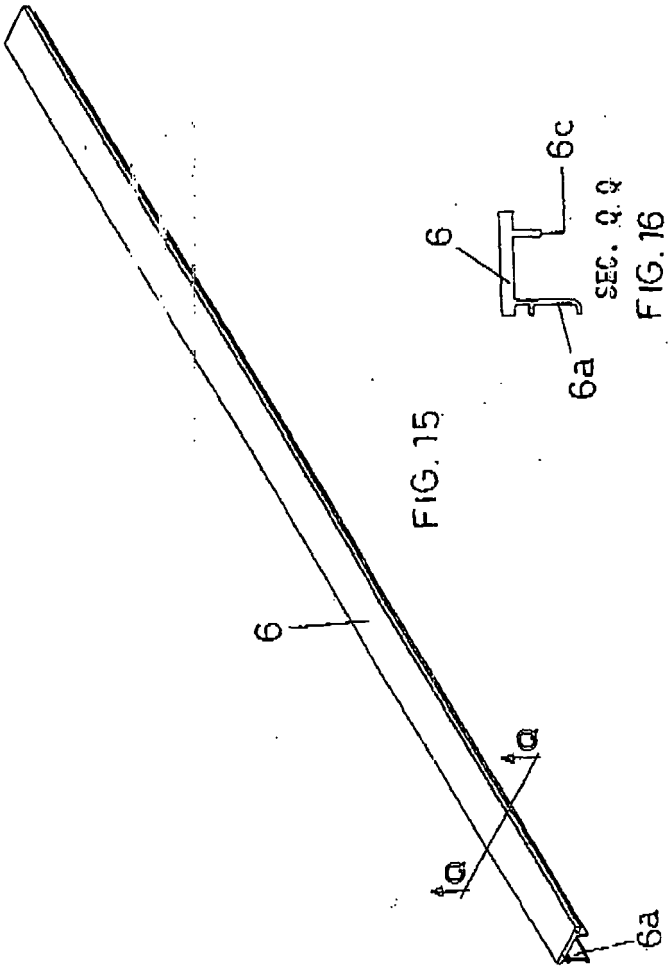


FIG. 15




SEC. Q-Q

FIG. 16

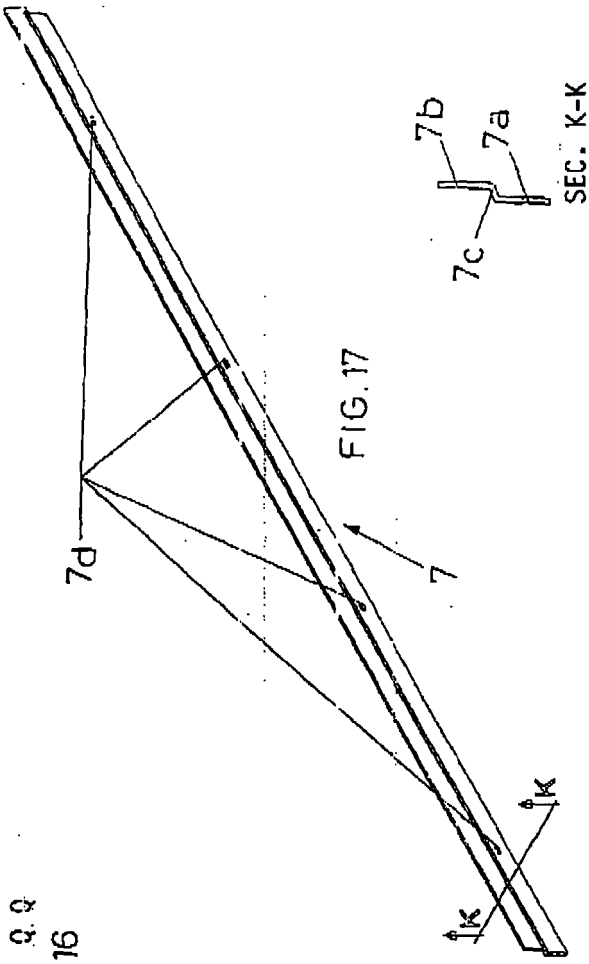


FIG. 17




SEC. K-K

FIG. 18

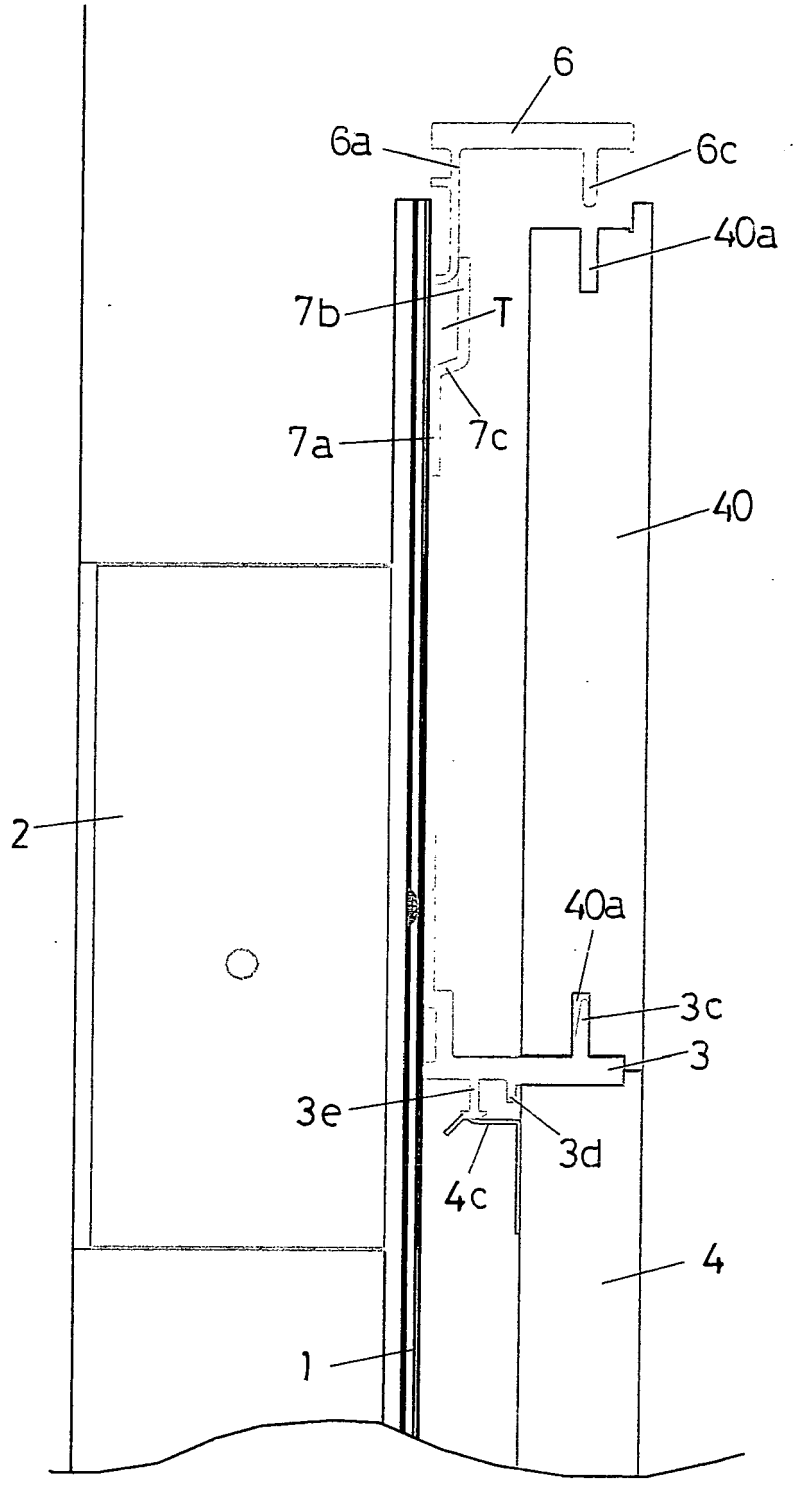


FIG. 19A

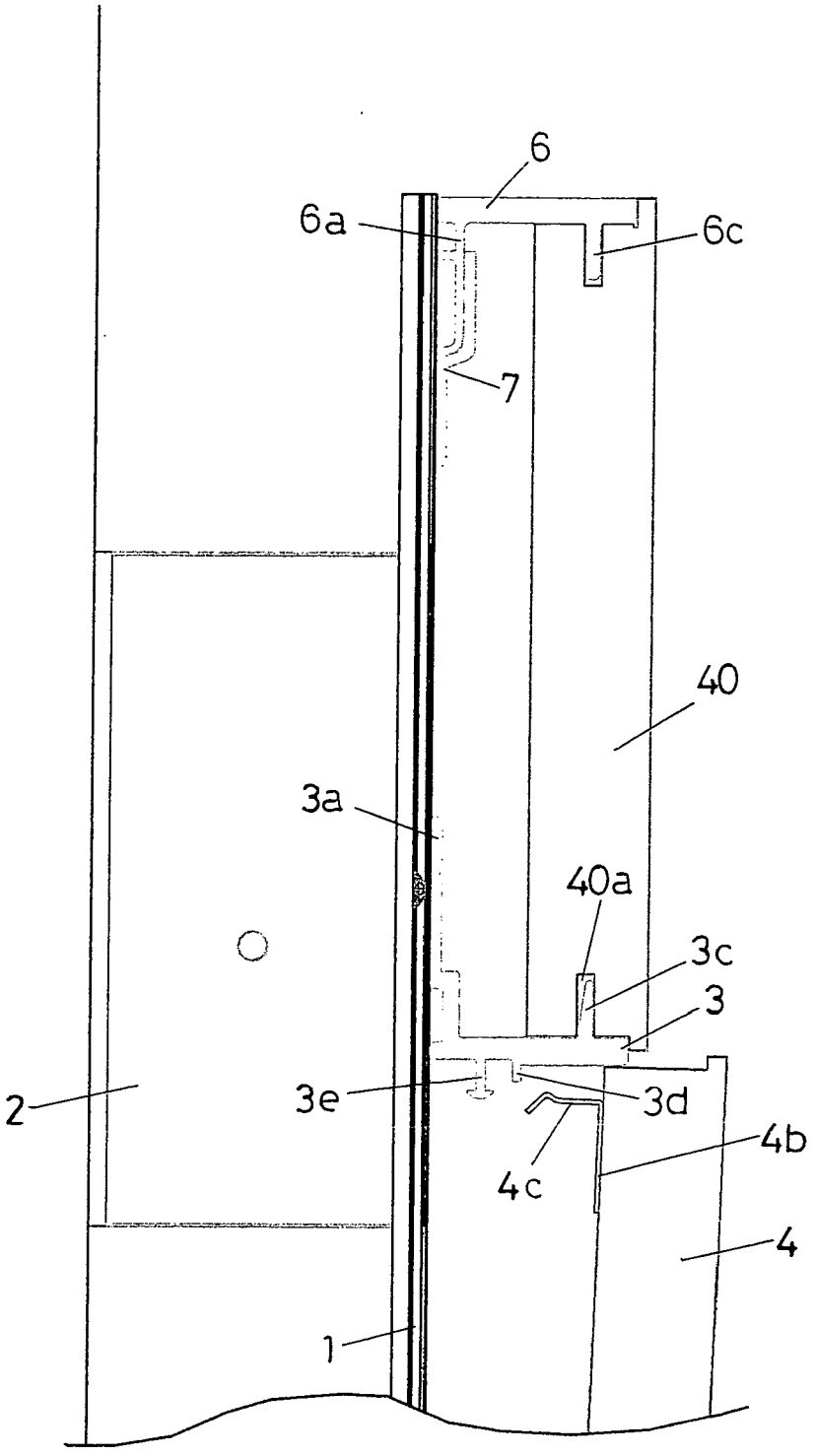


FIG. 19B

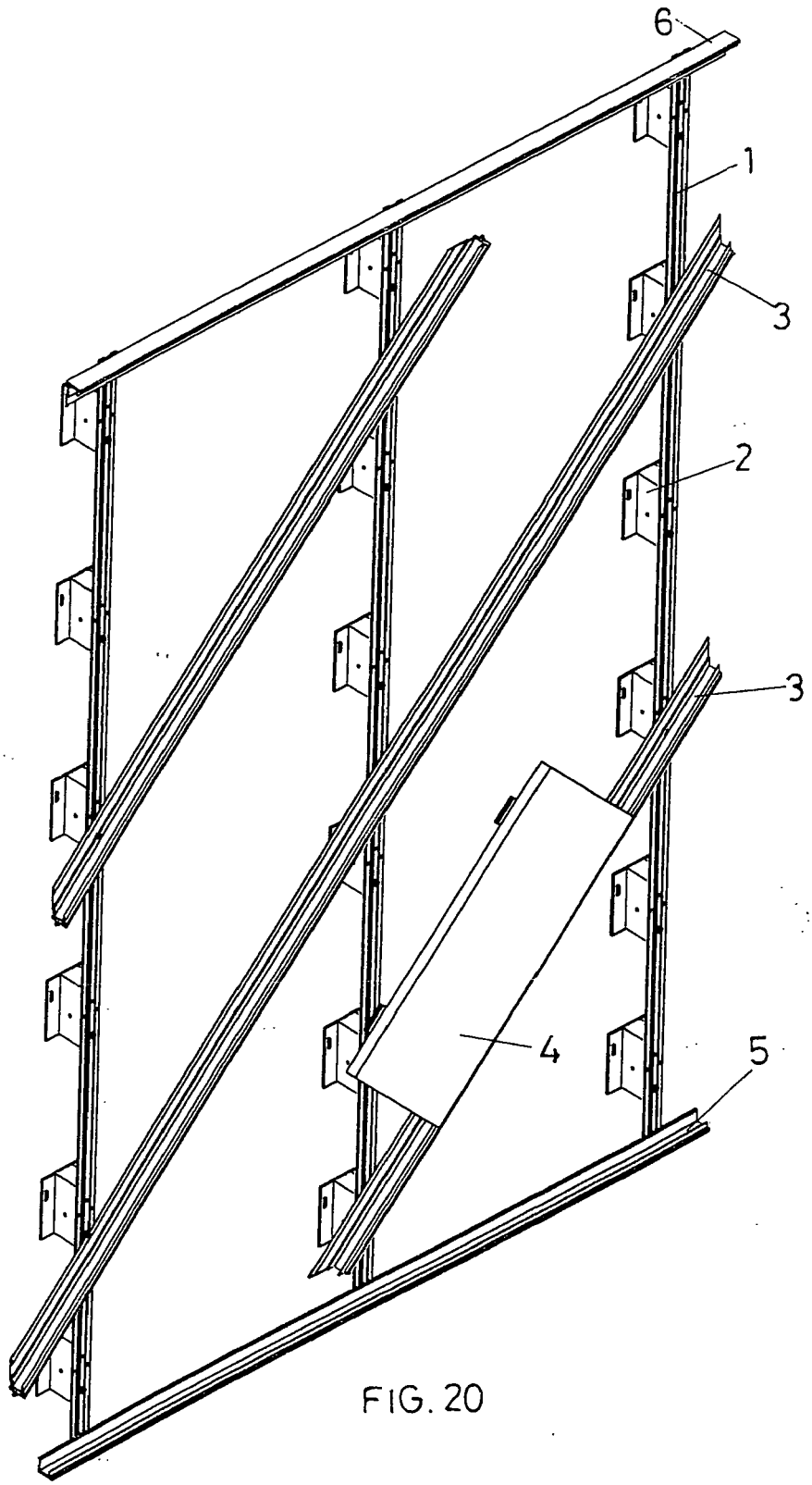


FIG. 20

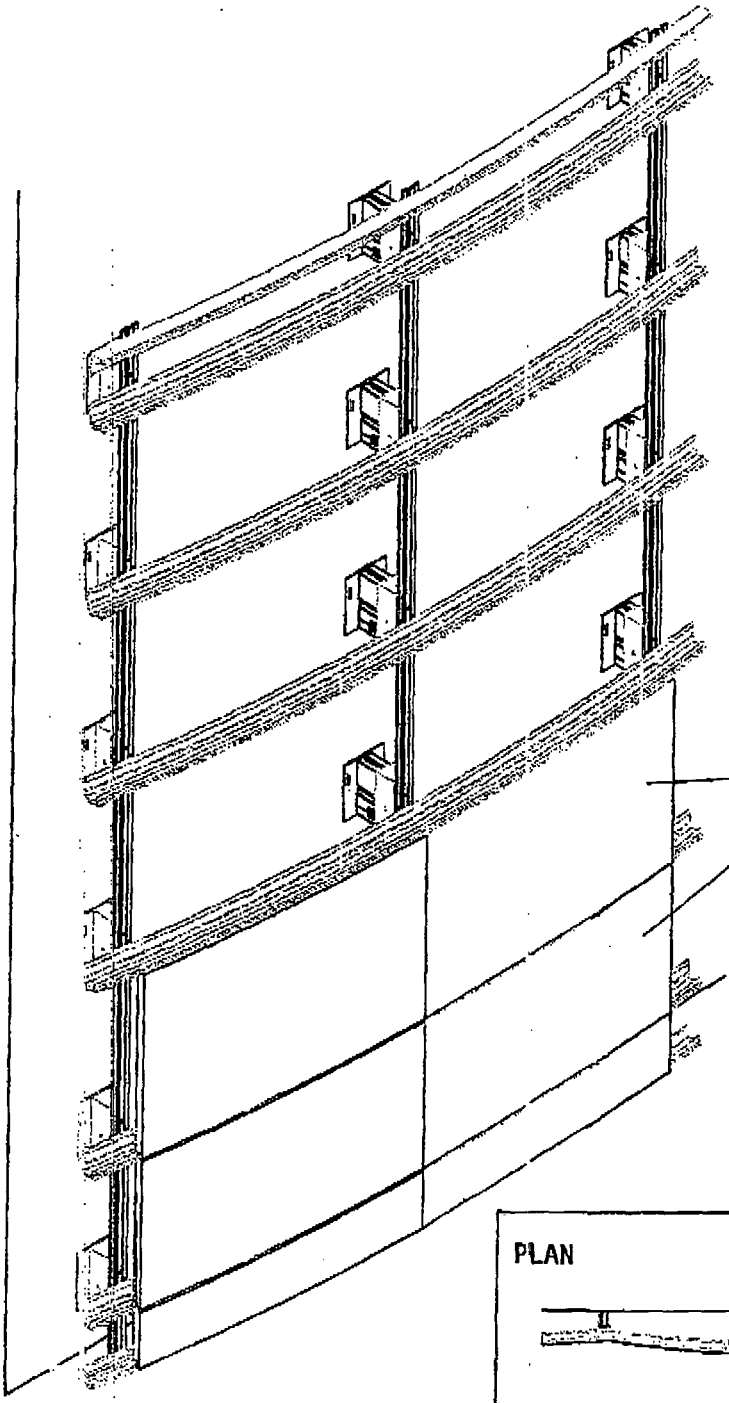

FIG. 21

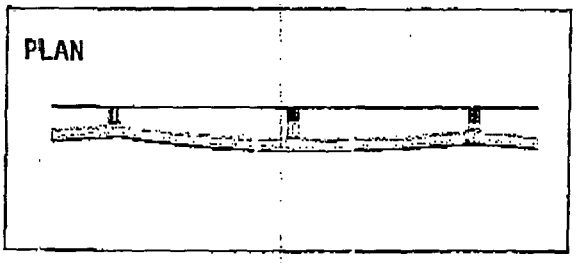


FIG. 21A

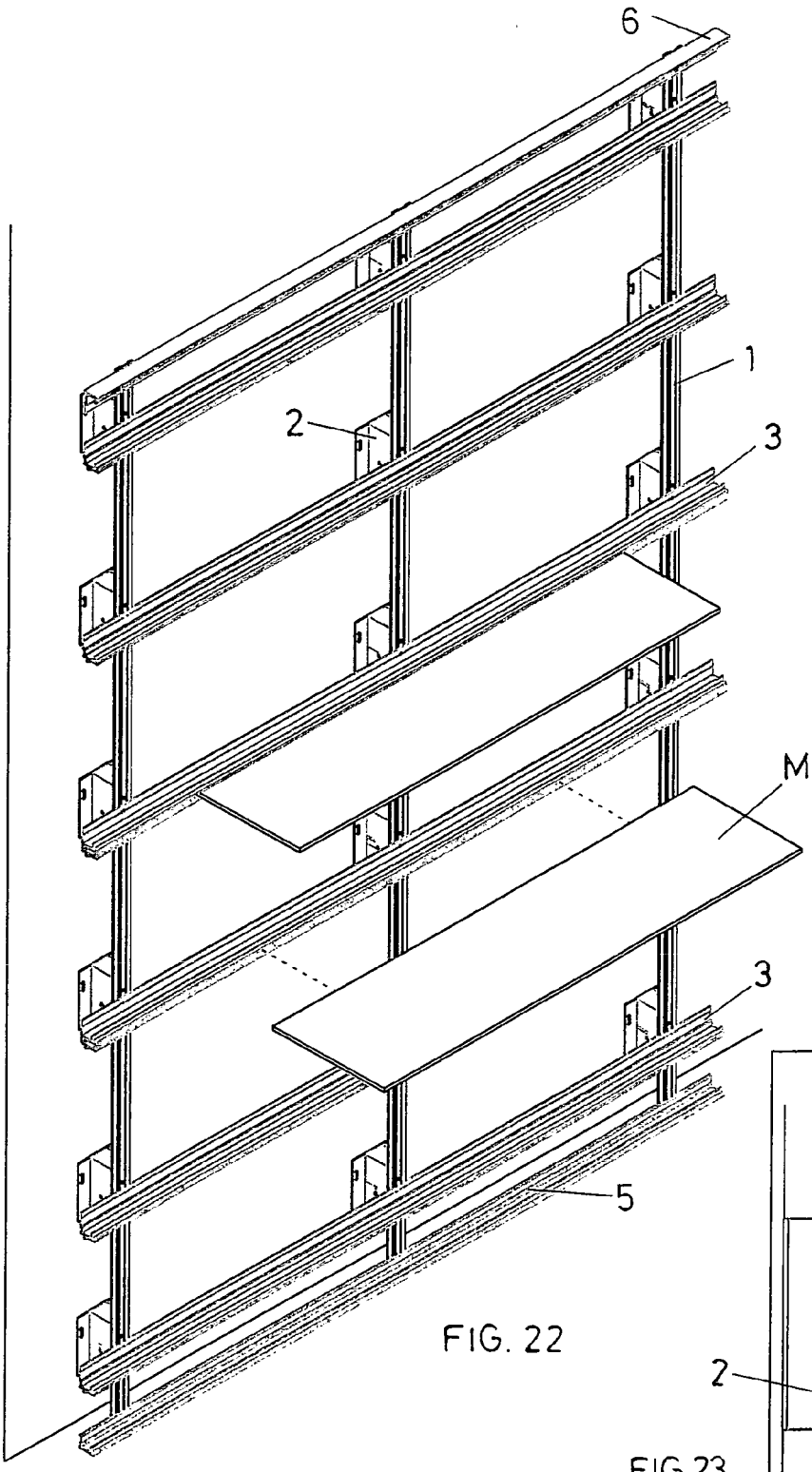


FIG. 22

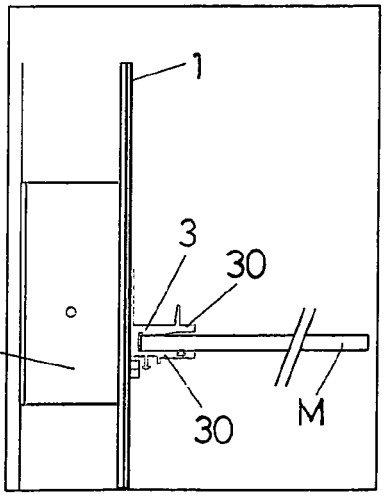


FIG. 23

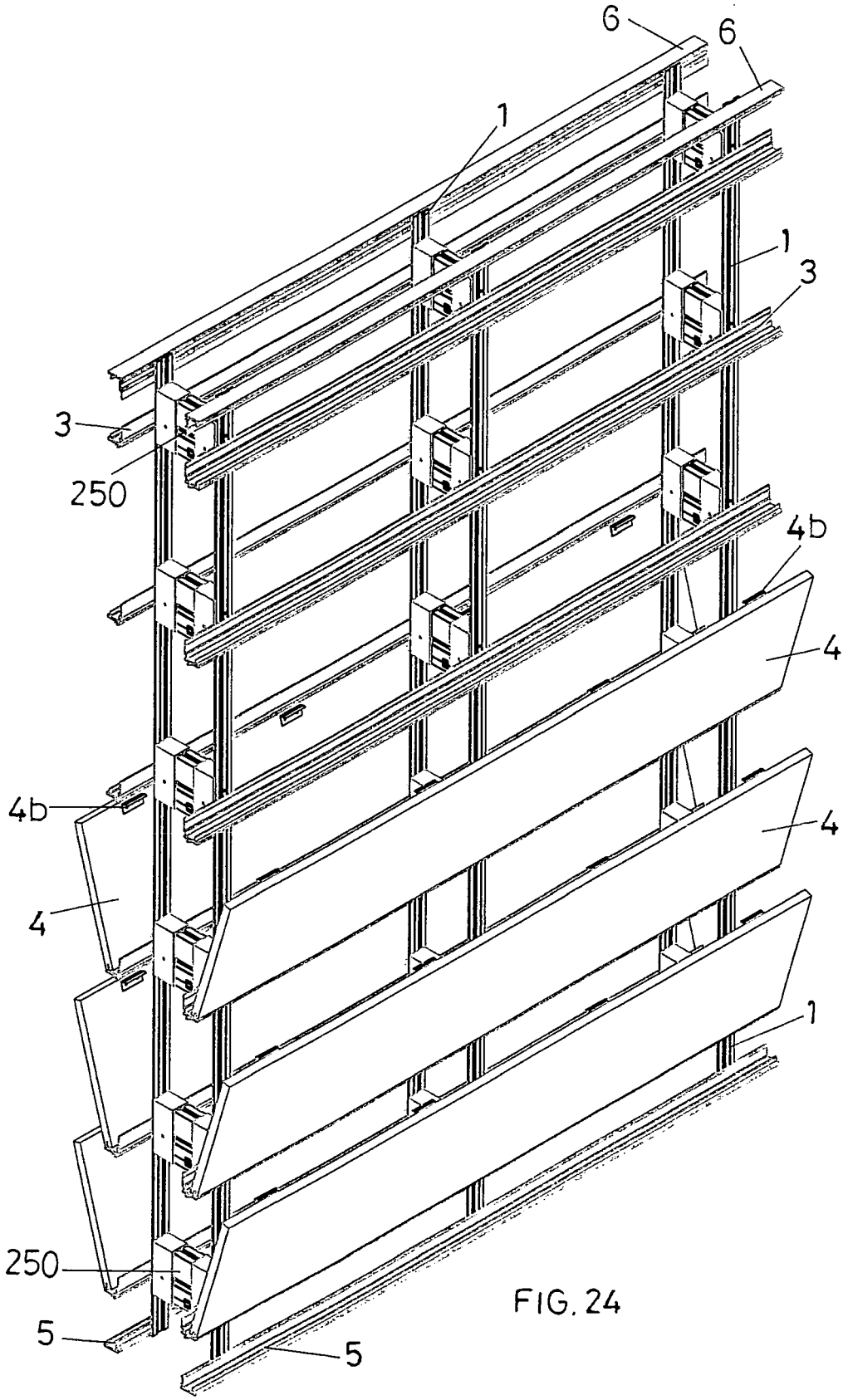


FIG. 24

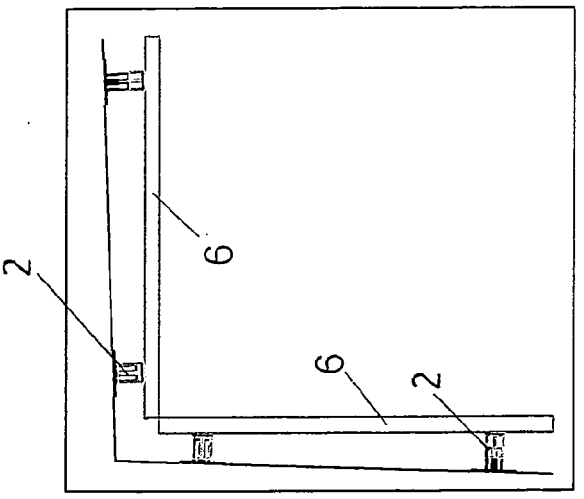


FIG. 25A

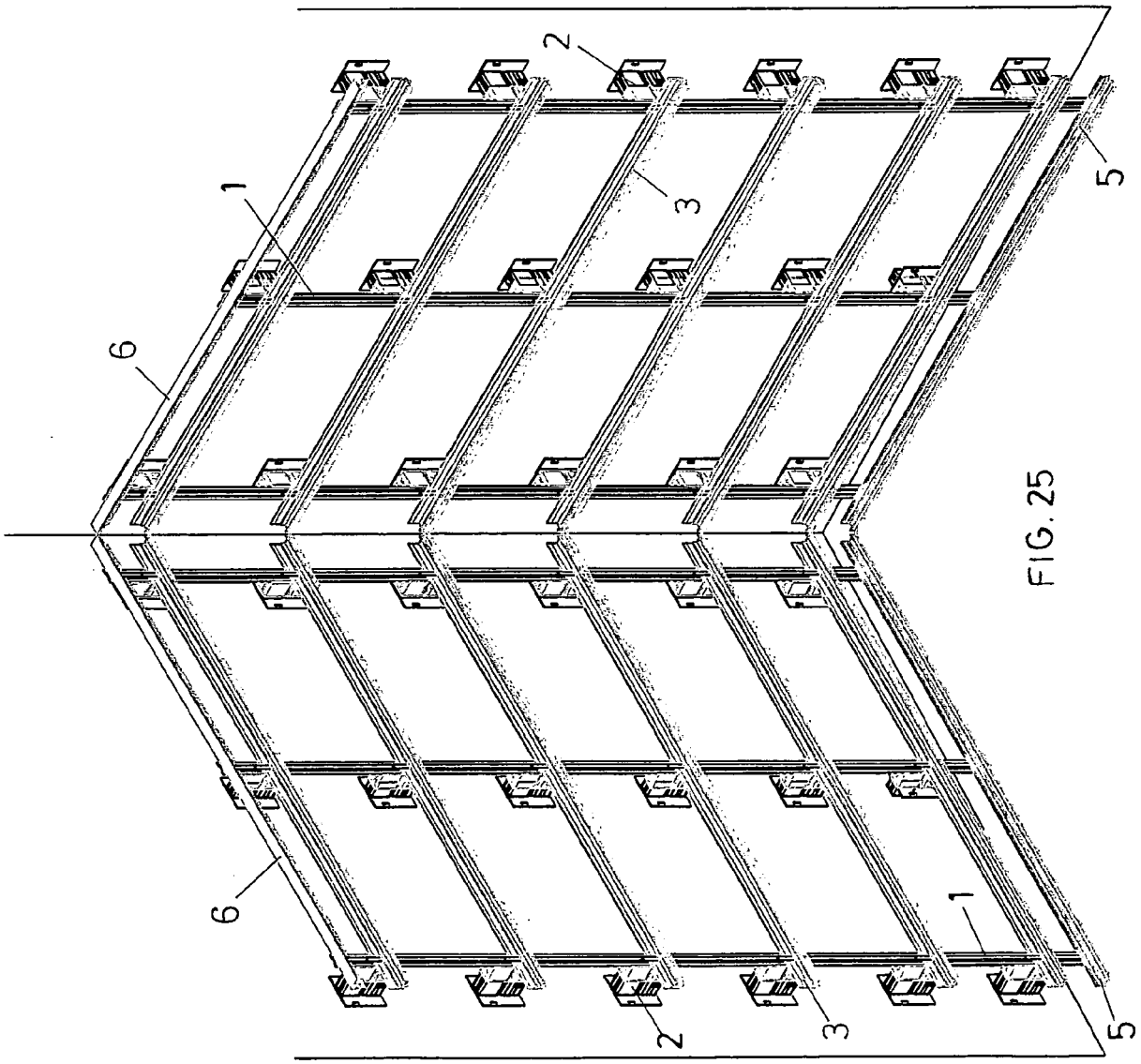


FIG. 25

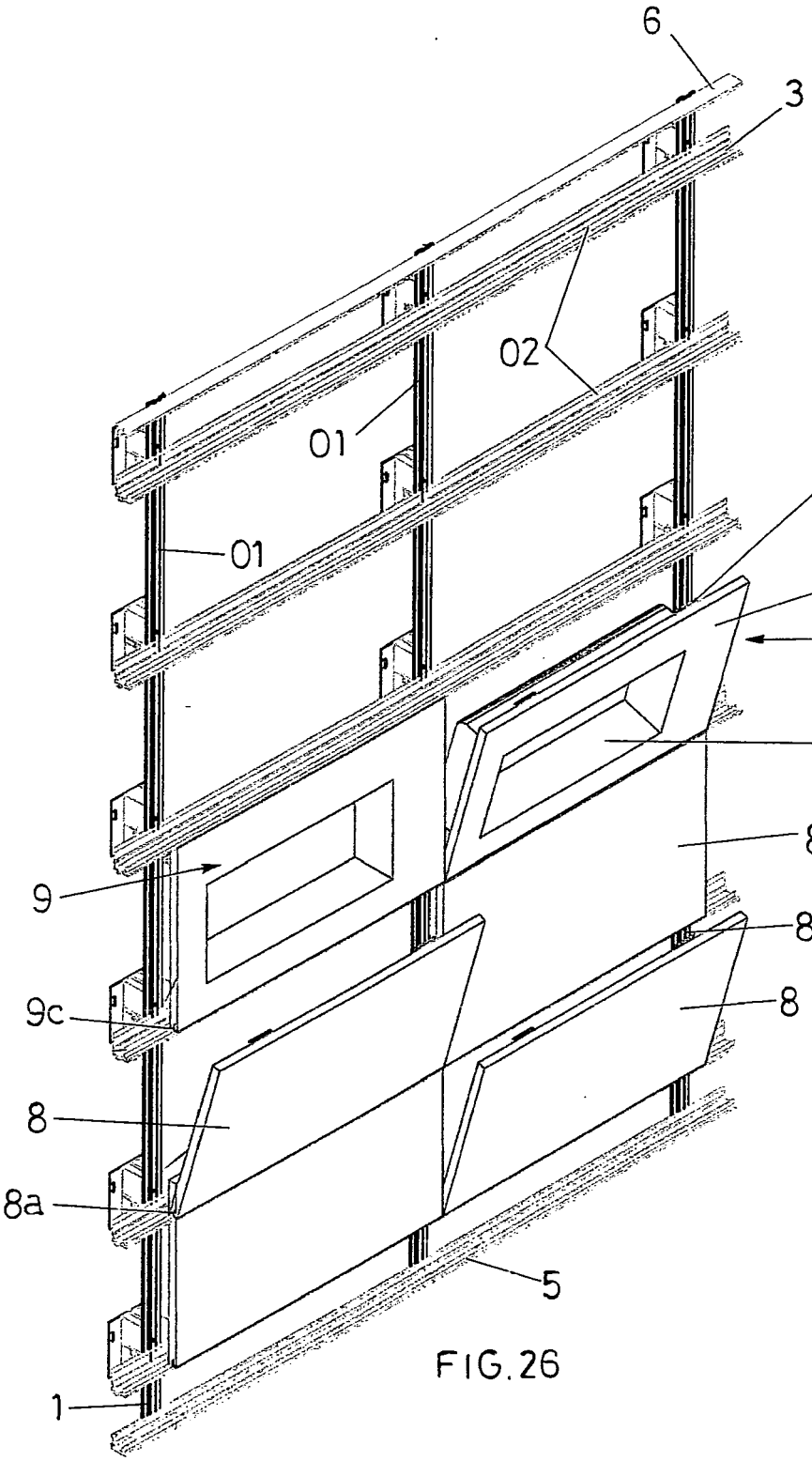


FIG. 26

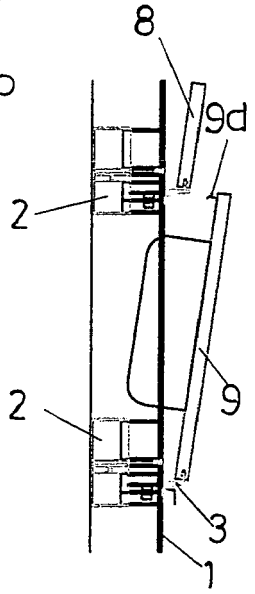


FIG. 26A