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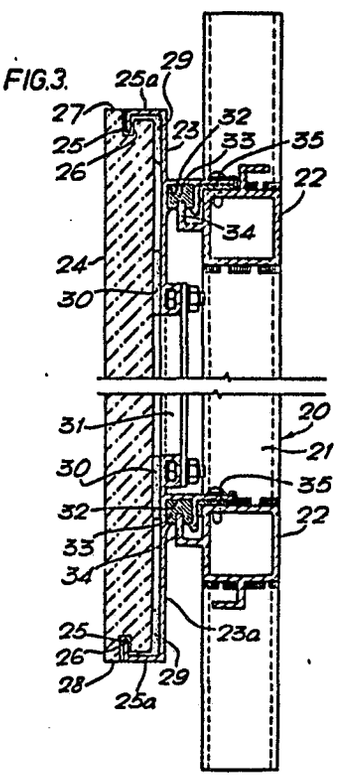
(54) Supporting structure for cladding panels.

(57) Support structure for locating a cladding panel 24 of reduced thickness compared to conventional granite curtain walling, comprises a weight bearing framework 20 which includes at least two substantially upright support posts 21 interconnected by at least two substantially horizontal support beams 22. The support beams are fitted to an intermediate coupling member 23,23a for securing the cladding panel to the framework, the coupling members having a lip 25 seated in the cladding panel such that the lip of one coupling member is seated within a recess 26 in the uppermost edge and the lip 25 of the lower coupling member 23a being seated within a corresponding recess 26 in the lowermost edge of the panel 24.

Such an arrangement can permit curtain walling to be deployed with panels of reduced thickness and weight leading to constructional and dimensional improvements.

FIG.3.



Croydon Printing Company Ltd.

Supporting Structure for Cladding Panels

This invention concerns a supporting structure for cladding panels. More particularly it is concerned with a supporting structure that can be used to provide an external wall for a building in which the external wall comprises a series of weather-resistant cladding panels. The invention is particularly concerned with the provision of a support system for a cladding panel in which the cladding panel is of a relatively heavy material such as granite, slate, stone, reconstituted stone, marble or specially prepared composites or aggregates such as reconstituted natural stone.

There are two conventional methods of providing granite walling as an external wall of a building. In a known form of granite walling the granite material is comparatively thick and heavy having a typical thickness of 125 millimetres, the base granite element bearing its weight on the same surface as the brickwork of which the building is constructed. Supplementary panels of granite are superimposed on the base element through pointing and are interconnected by a non-ferrous dowel. Additionally the granite walling is connected to the brickwork for support through a non-ferrous cramp.

In another form of granite wall cladding the brickwork structure of the building is supported upon reinforced concrete and a specially constructed granite block which comprises the base member of the granite wall cladding. Subsequent panels of

granite having a typical thickness of 40 millimetres are placed above the base member through pointing and adjacent granite panels are interconnected through use of a non-ferrous dowel. A non-ferrous cramp is positioned between the brickwork and granite panel whereby the cramp is angled with respect to the brickwork and engages a recess in the rear face of the granite panel to additionally support same. Additionally a cavity tray damp course is inserted between the brickwork and the junction of the base granite member and first cladding panel supported thereon.

An illustration of the traditional methods of providing granite walling is provided hereinafter. Traditional granite walling has a number of disadvantages. A comparatively thick panel of granite is required which inevitably increases costs. Because of the size and weight of the granite panels a heavy and costly structure is required for supporting them. The additional wall thickness associated with these known walling panels provides less usable floor space in the building.

During construction of the wall cladding or granite walling the total building requires scaffolding to be erected which inevitably increases costs. The method of construction is slow and requires a long fixing period which delays completion of the building. Because of the necessary scaffolding work there is a consequent delay in all external works adjacent the facades which extends the period of construction. Because of the thickness,

weight and cost of the granite, the design moulding of the building is severely restricted.

It is from a consideration of these disadvantages that has led to the development of the present invention.

According to this invention there is provided a support structure for locating a cladding panel comprising a weight-bearing framework including at least two substantially upright support posts interconnected by at least two substantially horizontal support beams each of said beams being fitted to an intermediate coupling member for securing the cladding panel to the framework, the coupling members having a lip seated in the cladding panel such that the lip of one coupling member is seated within a recess in the uppermost edge of the cladding panel and the lip of another coupling member is seated within a recess in the lowermost edge of the cladding panel.

Preferably insulating material is used between the support beam and intermediate coupling member and also between the cladding panel and intermediate coupling member whereby the cladding panel is thermally insulated from the supporting framework.

The support posts are preferably hollow columns which are preferably of the same cross-section as the support beams.

The support beams preferably have a protruding lip of similar configuration to the lip of the intermediate coupling members and which is adapted to receive insulating gasket material.

Preferably the coupling members which are used to support the uppermost and lowermost edge of the same cladding panel are interconnected and therefore strengthened by the use of one or more connecting struts. In order that the invention may be more clearly understood and illustrated reference will now be made to the accompanying drawings illustrating both prior art constructions of granite walling and an embodiment of the present invention, wherein:

Figure 1 is a section through load bearing granite walling,

Figure 2 is a section through granite wall cladding,

Figure 3 is a cross-section through a support structure according to the invention,

Figure 4 is an exploded isometric view of the structure shown in Figure 3, and

Figure 5 is a rear elevation of Figure 3.

Referring firstly to Figure 1, granite blocks of thickness 125 millimetres 1 bear their weight directly on the same surface as the building brickwork 2. Adjacent granite panels 1 are separated by pointing (mastic)5 and interconnected via dowel 4. A cramp 3 supports the brickwork to granite walling being embedded within the brickwork 2 and the connecting mastic 5.

Referring to Figure 2, this shows a conventional means of achieving a granite wall-clad structure. The brickwork 2 of the building structure is conventionally supported on reinforced

concrete 7 at the outer periphery of which is provided a base granite member 10 such that the brickwork 2 is also supported thereon. Granite panels 10a of a thickness 40 millimetres are placed above the base member 10 so as to clad the building structure. Some or most of the weight of the panels 10a is taken by the angled cramps 30. The granite panels are connected via a dowel 4 embedded within pointing 5. A cavity tray damp course 6 is provided between the brickwork and base granite member 10.

These known forms of granite walling have the disadvantages as hereinbefore mentioned.

Referring to Figures 3, 4 and 5, a support structure according to the invention is illustrated wherein the support framework 20 includes two upright supporting columns 21 interconnected by a pair of horizontal support beams 22 each of which has a protruding lip 34 formed from an extension of the support beam. A granite panel 24, for example having a thickness of 30 millimetres, is connected to the supporting framework 20 through the intermediate coupling members 23 (uppermost) and 23a (lowermost). Although this invention is applicable to cladding panels of granite, it is equally applicable to cladding other preferably comparatively heavy materials such as stone, reconstituted natural stone, marble, slate or the like.

The panel 24 is supported at its uppermost edge 27 via a projecting lip 25 of the coupling member 23. The lip 25 of each

coupling member is formed as a U-shaped channel section at the remote end of the coupling member. The recess 26 is in the form of an L-shaped cut-away portion into the material of the panel 24. The configuration of the recess 26 at the uppermost edge 27 of the panel 24 corresponds in cross-section to the particular recess 26 at the lowermost edge 28 of the panel 24.

As clearly shown in Figure 3, the lowermost edge 28 of the panel 24 lies in the same plane as the exterior surface 25a of the coupling member 23a. Equally, the uppermost edge 27 of the panel lies in the same plane as the outermost surface 25a of the coupling member 23.

Thermally and/or acoustically insulating material 29 is interposed between the panel 24 and the U-shaped channel section of the coupling members 23,23a. Compression tape 30 is provided between the inwardly facing end of the coupling members 23,23a and the panel 24. The coupling members are interconnected by means of a supporting strut 31 in the form of a "soldier strap connector". Two such struts 31 are shown in the embodiment.

The coupling members 23,23a are furthermore provided with a channel section 32 in which a portion of thermal and/or acoustic insulating material 33 is positioned, the projecting lip 34 of each support beam 22 being embedded in such material 33. Additionally a further layer of such insulating material 35 is provided between an arm of the coupling member and the

upper face of the support beam 22. A secure connection between the coupling member 23 and the support beam 22 is made at this juncture by use of appropriate bolts. For economy and convenience the cross-section of the column 21 corresponds with the cross-section of the support beam 22. The insulating material 29,33, and 35 may be low modulus silicone. The posts of the support framework may be aluminium tubular sections. The coupling members 23,23a may also be of aluminium. It is preferred that the horizontal support posts are connected to the vertical support posts by means of fillet welds.

The principal use of the support structure according to the invention is for cladding buildings with a weather-proof wall in a method which can be faster and less costly than prior known arrangements. The size and shape of the sections may vary depending upon the use of the building, the span of the floors and the width of the planning module adopted.

The invention affords significant advantages over known granite clad structures. A panel of less thickness can be used thereby providing greater usable area in the building itself. The components afford a reduced load and the structure can therefore be more economical. The structure can be in the form of a complete dry walling and the components thereof can be manufactured within a factory and so reduce site fixing operations. Greater degrees of quality control can be

exercised in the factory as opposed to situations on site. The structure can have greater ability to cope with structural expansion and creep. An improved opportunity is provided to fully insulate external walls using dry materials. A higher degree of assistance in controlling acoustic performance can be provided. The structure may be installed without the use of scaffolding. Fire resistance can be improved and the system may need less maintenance than known structures. The support structure can also allow versatility in modelling of the building facade. A significant cost reduction can be achieved by the use of panel material of less thickness than known structures.

The invention includes within its scope a supporting structure including a plurality of panels supported thereon and a building structure which includes such a supporting structure wherein the panels are clad in vertical and/or horizontal rows with or without pointing (mastic) between the edges of adjacent panels.

CLAIMS

1. A support structure carrying a cladding panel, wherein the structure comprises a weight-bearing framework including at least two substantially upright support posts interconnected by at least two substantially horizontal support beams each of the beams being fitted to an intermediate coupling member for securing the cladding panel to the framework, the coupling members having a lip seated in the cladding panel such that the lip of one coupling member is seated within a recess in the uppermost edge of the cladding panel and the lip of another coupling member is seated within a recess in the lowermost edge of the cladding panel.

2. A support structure as claimed in claim 1, wherein insulating material is employed between the support beam and intermediate coupling member and/or between the cladding panel and intermediate coupling member to thermally insulate the cladding panel from the supporting framework.

3. A support structure as claimed in claim 1 or claim 2, wherein the support posts are hollow columns having the same cross-section as the support beams.

4. A support structure as claimed in any preceding claim, wherein the support beams include a protruding lip of similar configuration to the lip of the intermediate coupling member.

5. A support structure as claimed in any preceding claim, wherein the coupling members used to support the uppermost and lowermost edge of the same cladding panel are interconnected by one or more connecting struts.

6. A support structure as claimed in any preceding claim, in which the cladding panel is of a heavy material such as stone, reconstituted natural stone, granite, marble, slate or a composite of two or more thereof and optionally of a thickness of approximately 30 mm.

7. A support structure as claimed in any preceding claim, wherein each recess in the panel is in the form of an L-shaped cut-away portion.

8. A support structure as claimed in any preceding claim, wherein the lowermost edge of the panel is coplanar with the exterior surface of the coupling member lip seated therein and the uppermost edge of the panel is coplanar with the exterior surface of the coupling member lip seated therein.

9. A support structure as claimed in any preceding claim, further including thermal and/or accoustically insulating material interposed between the panel and the coupling members seated therein.

10. A support structure as claimed in any preceding claim or building structure, including a plurality of panels supported in vertical and/or horizontal rows with or

without material interposed between the edges of adjacent panels.

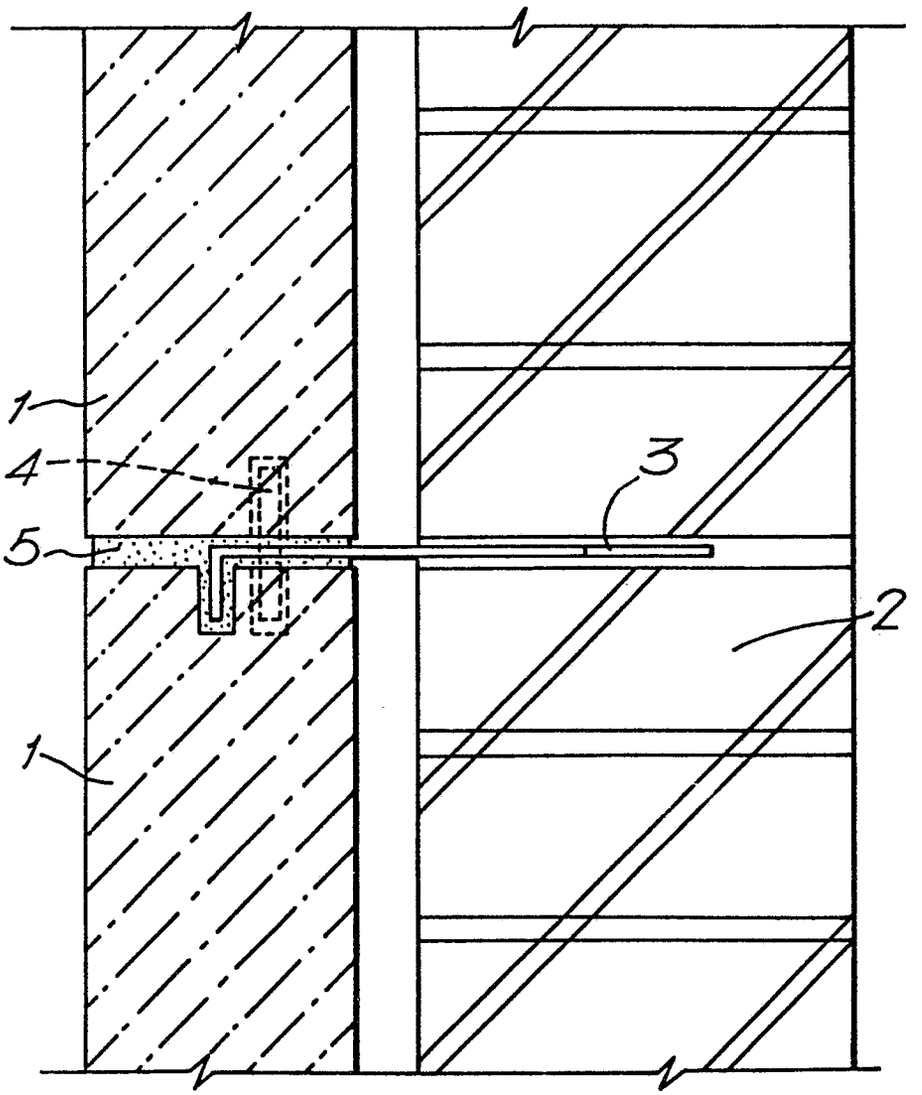


FIG. 1.

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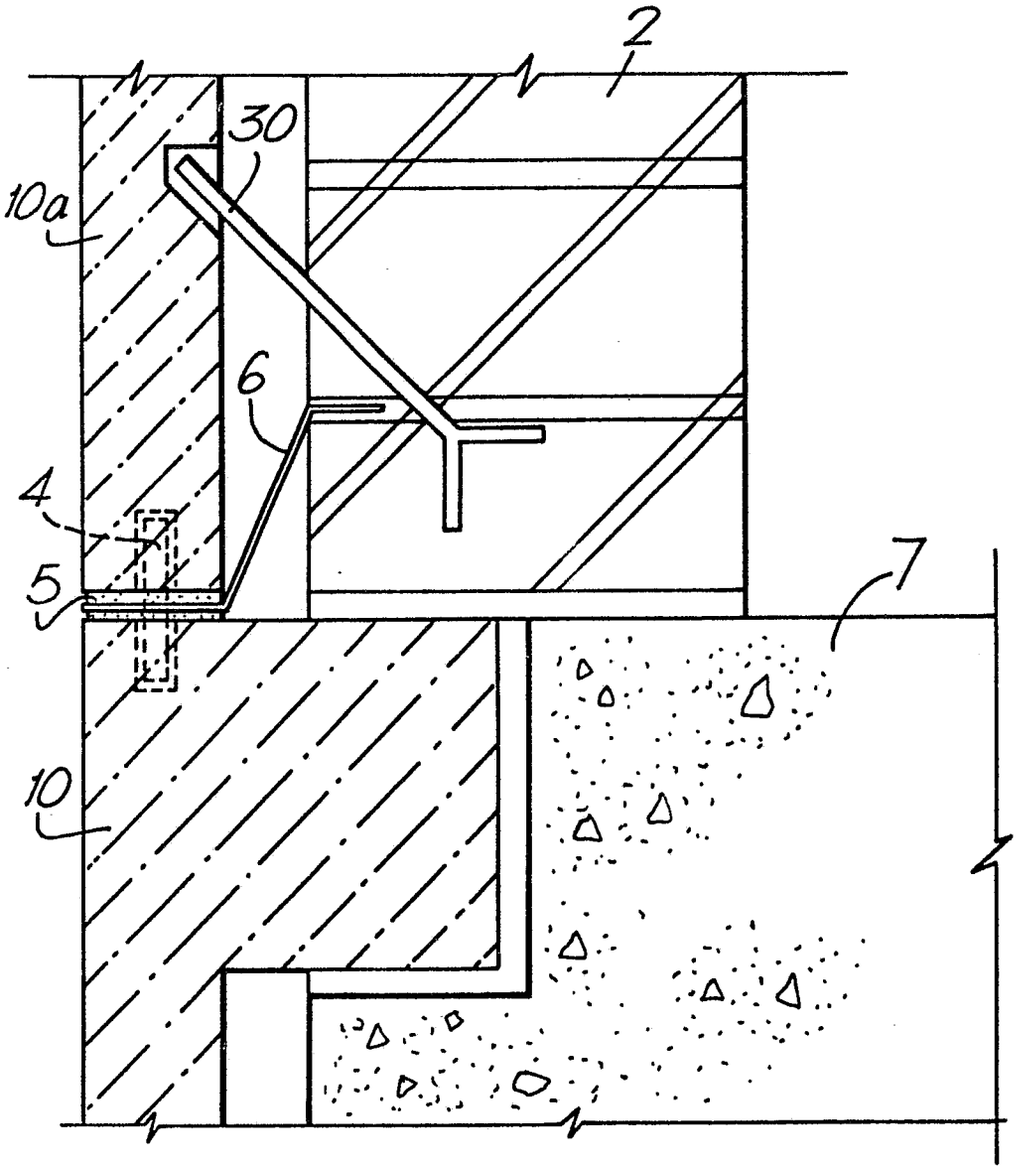
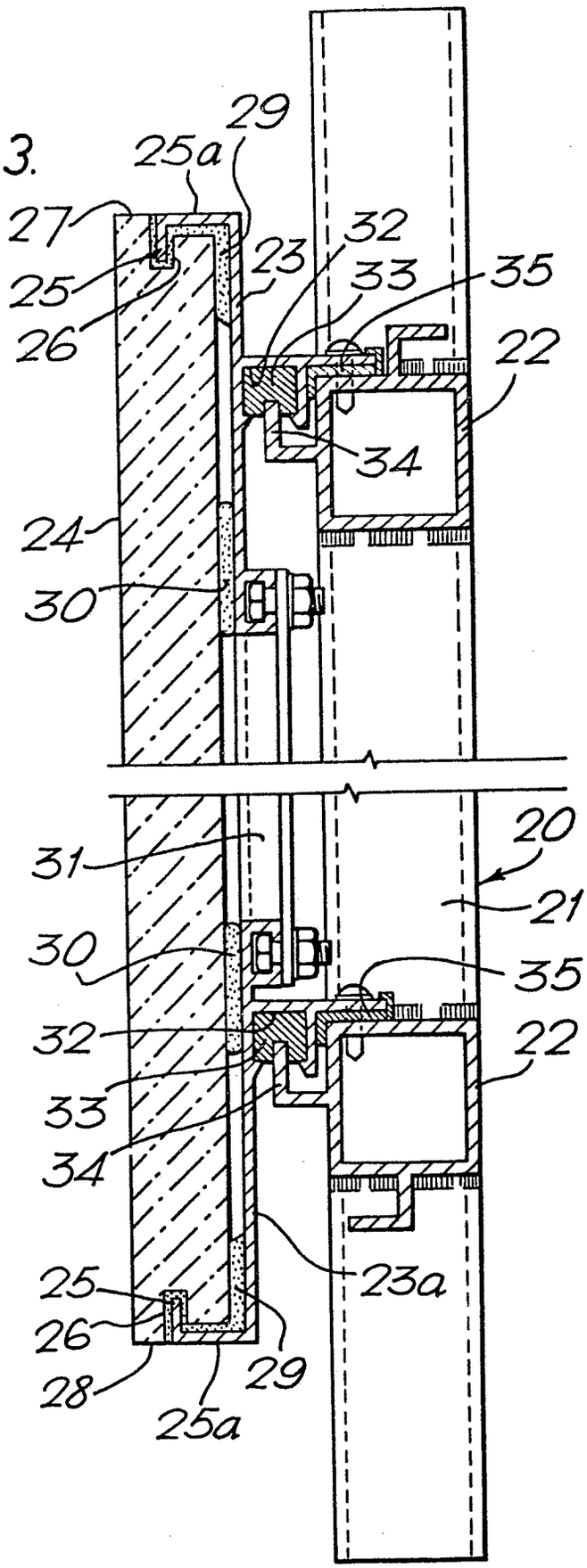


FIG. 2.

FIG.3.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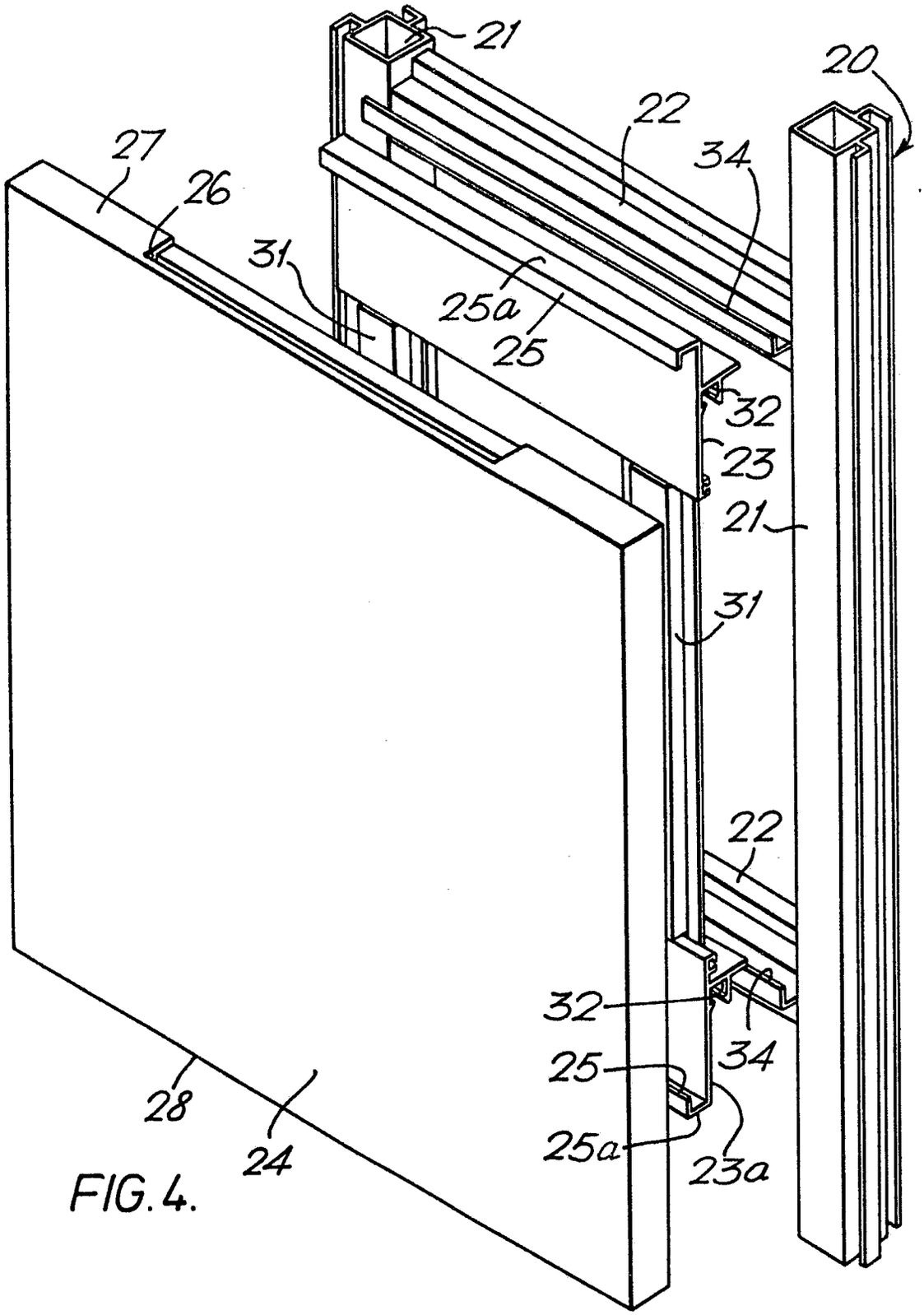

FIG. 4.

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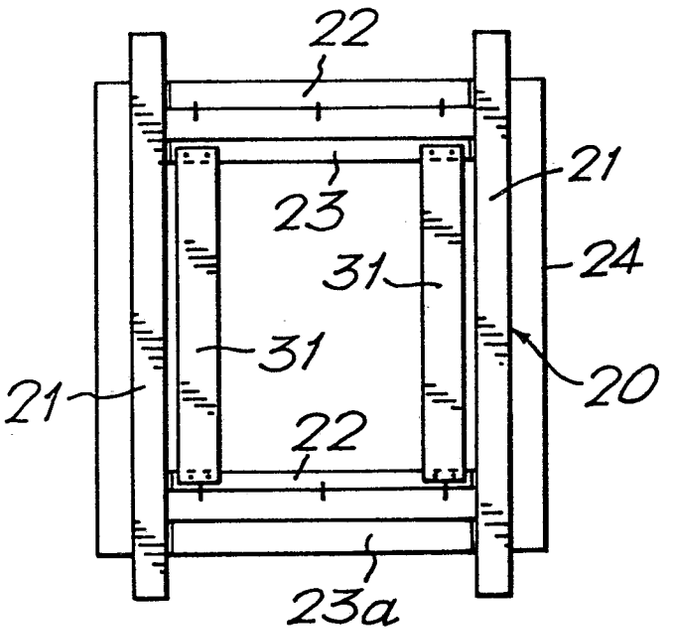

FIG.5.