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3,303,626

CONNECTING MEANS FOR FRAMED PANELS

Filed July 23, 1963

2 Sheets-Sheet 1

Fig. 1

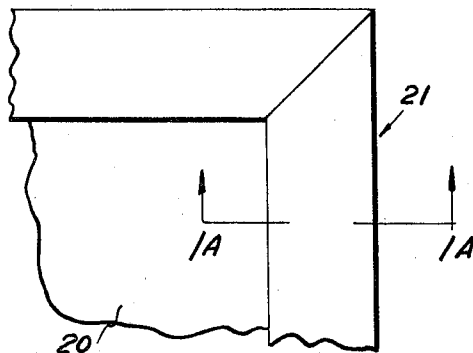


Fig. 1A

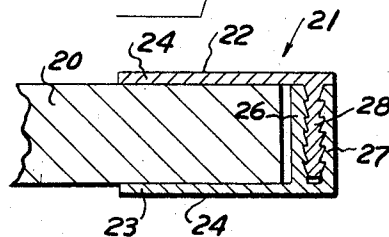


Fig. 2

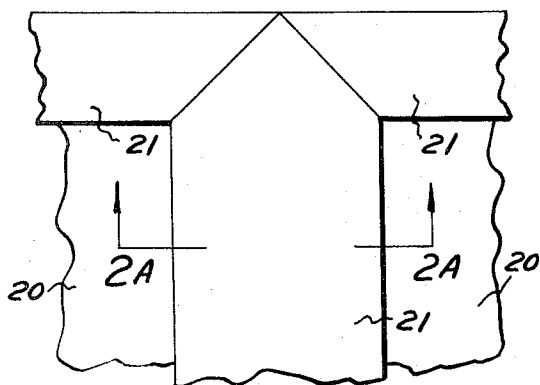


Fig. 2A

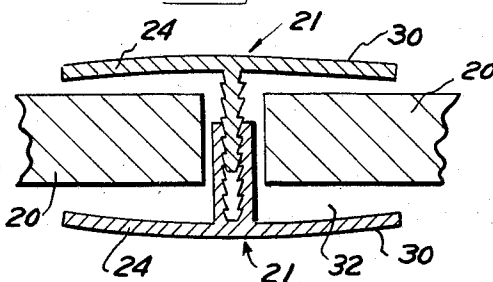
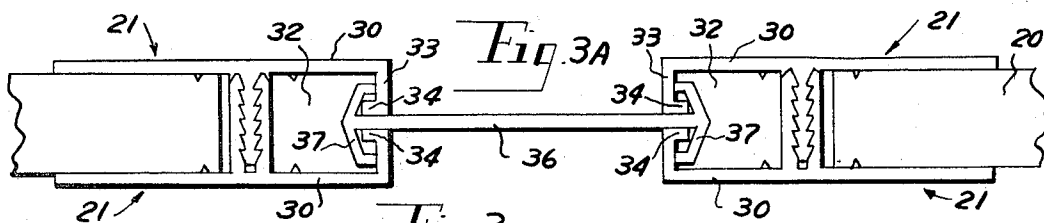
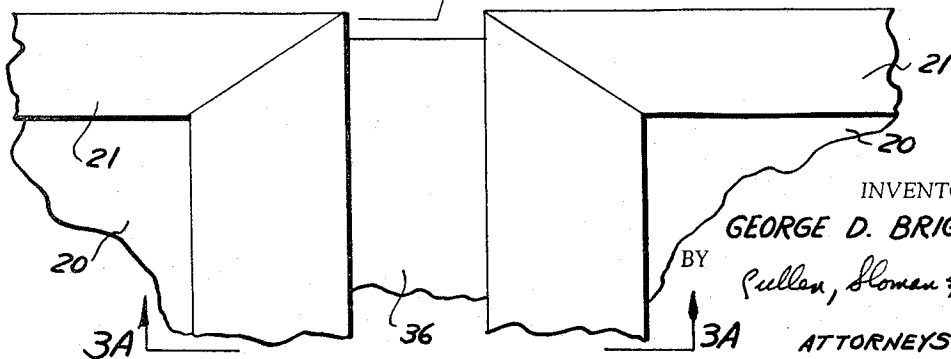


Fig. 3



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2 Sheets-Sheet 2

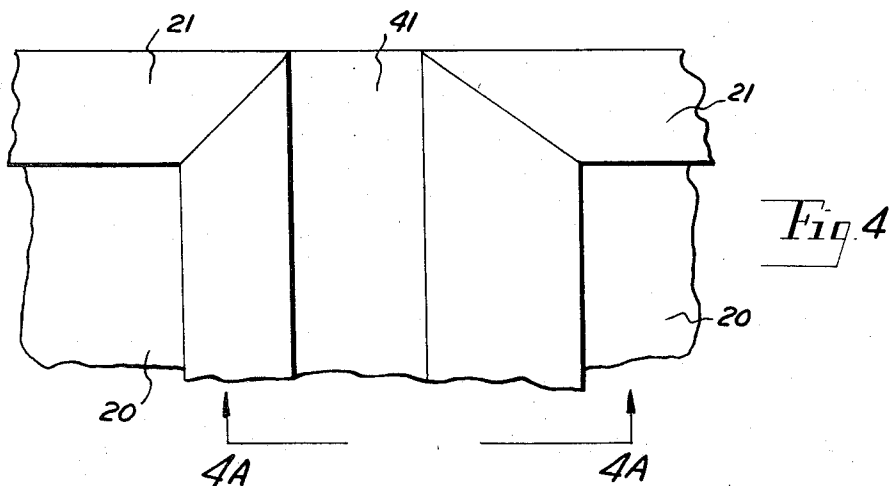
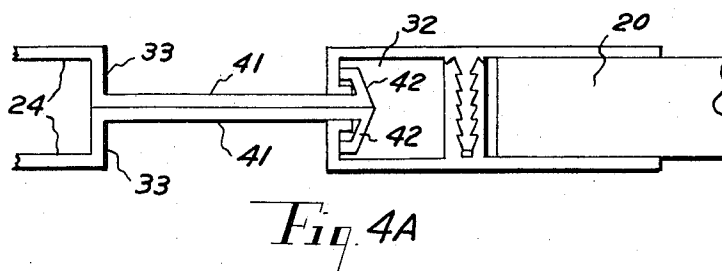


Fig. 5

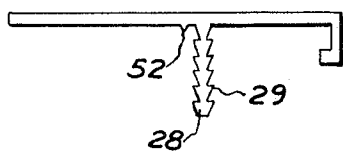
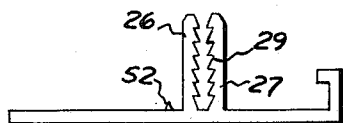
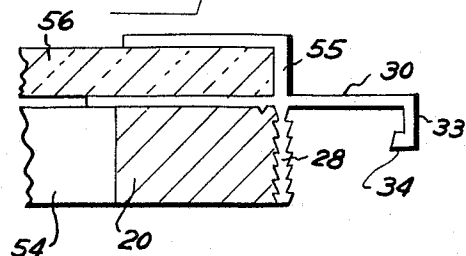


Fig. 6

Fig. 7



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CONNECTING MEANS FOR FRAMED PANELS
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This application relates to framed panels and particularly aims to disclose novel frame structures for panels and novel combinations formed of frames and panels which will be called framed panels.

Moldings or frames are used around the edges of panels formed of large sheets of board or wood or composition or the like, for trimming, masking, accurate dimensioning, color contrast, supporting, suspending, rigidifying, joining, and the like as well as for other purposes. The panels thus framed, used singly or joined one to another, have found a variety of uses such as in signs, display boards, divider walls, shelter walls, as well as other uses. For example, they may well be formed to be used as framed insect screen panels, or storm sash panels.

In this application I disclose elementary as well as more sophisticated forms of frames and framed panels, suggesting here a variety of forms as well as a variety of uses of the framed panels. For an understanding of the frames and framed panels hereof, and their functions and uses, reference should be had to the appended drawings.

In these drawings:

FIG. 1 shows a fragment of a single framed panel.

FIG. 1A is a cross-section view of an elementary form as if on lines 1A-1A of FIG. 1.

FIG. 2 is a diagrammatic showing of fragments of panels joined edge to edge by rigid connectors, as if to form a wall.

FIG. 2A is an exploded sectional view as if on line 2A-2A of FIG. 2.

FIG. 3 is a fragmentary view of panels joined by a connector.

FIG. 3A is a section view as if on line 3A-3A of FIG. 3.

FIG. 4 is a diagrammatic view of a fragment of a panel formed with a male edge to be joined to a female edge panel, edge to edge.

FIG. 4A is a section view as if on lines 4A-4A of FIG. 4.

FIGS. 5 and 6 show male and female members of a frame formed more or less according to the frame shown in FIG. 3A.

FIG. 7 shows the male member of a frame formed like the male member of FIG. 5 but with a supplemental formation for mounting a window in place as part of the panel.

The elementary form

FIGS. 1 and 1A show a framed panel where the frame is of elementary form. The framed panel includes a panel 20 of wall board or the like of any suitable material surrounded by a mitered frame 21 which frames its edge.

The frame 21 comprises snap together cooperating completed rectangular male and female members 22-23. The male member 22 is roughly L-shape in cross-section and the female member is roughly F-shape in cross-section. Each member has a face flange 24 adapted to lie against one face of the panel 20 and has a transverse flange normal to the face flange and adapted to lie parallel to the edge of the panel as shown best in FIG. 1A.

The transverse flange of the female member 23 is bifurcated into portions 26 and 27 to receive between its bifurcations the transverse flange 28 of the male member.

The outer faces of the transverse flange 28 of the male member 22 and as well the inner faces of the bifurcated

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transverse flange 26-27 of the female member 23 have cooperating interlocking rib and groove snap together formations 29 (FIGS. 5-6) extending longitudinally of these transverse flanges. In cross-section these rib and groove formations appear in the form of sawtooth lines as shown best in FIGS. 1A, 5 and 6.

The foregoing describes an elementary form of frame. It may be made of any suitable material. A preferred material is extruded polyvinyl chloride, referred to generally as plastic, which is rigid and of low flexibility but which has the advantage of being inexpensive and non-brittle and of being useful with adhesive on the inner sides of the face flanges 24 and of the cooperating faces of the panel 20 for securing the frame members to the panel.

The frame members can be heat welded at the mitered joints. Thus, two complete rectangular frame members 22 and 23, with welded mitered joints can be formed separately of each other and separately of the panel and then assembled to the panel and to each other to form a completed framed panel having the two frame members on opposite sides of the panel, and relatively interlocked, as shown.

The formation of a framed panel using the parts of FIG. 1A is as follows:

Method

Male and female frame members are separately formed to the desired shape with the proper welded mitered joints and dimensions. The inner side of face flange 24 of the female frame member is coated with suitable adhesive whereupon the panel 20 is laid down on the female frame member to secure such panel 20 to such female member 23. Thereupon adhesive is placed upon the inner surface of the face flange 24 of the male member 22, and on the outer stripe of the panel 20 and then the male member is applied to the panel 20 already framed within the female frame member 23. The transverse flange 28 of the male member 22 is snapped into the bifurcated transverse flange 26-27 of the female member 23 and the face flange 24 of the male member 22 is pressed against the panel 20 so that the adhesive coatings cause the male member 22 to adhere to the panel 20 as well as to cause the male member 22 to be snapped into and interlocked to the female member 23.

One advantage of the use of separate completed rectangular frame members which snap together to make a complete frame around the panels is that it enables heat welding at the mitered ends of the pieces forming the frame member. Such heat welding would not be possible if the frame was a one-piece channel frame dimensioned to fit over the four edges of the panel. If four frame pieces of channel cross-section with mitered ends were placed over the four edges of the panel and then an attempt was made to weld the mitered joints and complete the frame, the panel would be in the way of the welding mechanism and welding would be impossible.

Another advantage of the construction here shown is that it is much easier to assemble the panel and the frame because the panel can be laid down onto one completed frame member after which the other completed frame member can then be placed down onto the panel and locked into cooperation with the first completed frame member. This is much easier than attempting to assemble a one-piece completed frame over the edges of a panel, something which really cannot be done; or to assemble four frame pieces on a panel and then welding the mitered joints to complete the frame, also impractical and just about impossible.

In addition, the assembly method used here does not tend to push adhesive out of place as the frame members are assembled on opposite faces of a panel, as

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contrasted with what would be the case if four frame pieces of one-piece channel section were utilized.

A panel thus formed is completely and permanently framed inexpensively and quickly and with minimum of labor. A framed panel thus formed has a variety of uses which will not here be suggested.

Variations

Reference to other figures of the drawing will show more sophisticated forms of frame members and framed panels.

Solid wall

FIGS. 2-2A show how a solid wall may be formed of two panels which are joined edge to edge by rigid overlapping frames with no gap visible between the panels. In this form extensions 30 of the male and female frame members 22-23 are provided. These enable a second panel 20 to be mounted in the open socket 32 of the frame, abutting its edge against the transverse flanges 26-27-28 of the frame. In this way, two panels 20 are joined edge to edge with no gap between them and with the frame 21 serving to join the panels edge to edge but appearing only as a color contrast stripe at intervals along the solid wall formed of the panels 20.

For purposes of hugging the panel faces 20, the face flanges 24 of the frame and also the extended face flanges 30 of the frame, particularly when the frame is formed for the purposes shown in FIG. 2A, are concaved as illustrated.

Hinge connections

FIGS. 3 and 3A disclose frame members which have parts in addition to those disclosed in the frames of FIGS. 1A and 2A.

The extensions 30 have at their edges supplementary transverse flanged 33 projected towards each other to close the socket 32 and having wedging beads 34.

In combination with the foregoing parts there may be used a pre-shaped connector 36 having heads 37 of tapered T-form.

An elongated connector 36 of such form may be used for splicing together flexibly and hingedly two framed panels edge to edge. The method of assembly of the connectors with the framed panels thus formed will be obvious. If, as is preferred, the material of the connector 36 is of elastomeric polyvinyl chloride of strap form and flexible transversely, it will form a flexible hinge connector between two framed panels edge to edge which may have a variety of uses not here suggested.

Male and female panels

FIGS. 4 and 4A disclose a male panel for use with a female panel. The female panel itself may be formed exactly like the framed panel of FIG. 3A.

The male panel will be formed with its supplementary transverse flanges 33 further bent laterally away as at 41 from the first named transverse flanges 26-27-28 and headed as at 42 to form a male projection or tapered T at the edge of the framed panel for fitting in the socket 32 of the frame of a female panel for joining the male panel and the female panel edge to edge.

In this embodiment, it is preferred to form the flanges 41 rigid so that the male and female panels are rigidly connected to each other edge to edge rather than flexibly or hingedly as by means of the flexible or hinge connectors 36 of FIG. 3A. However, the flanges 41, though molded integrally with the frames, may be of a flexible elastomeric nature, if desired.

FIGS. 5 and 6 show separately the male and female frame members of FIG. 3A before being joined to each other to form a complete frame.

It will be observed that FIGS. 5 and 6 show the face flanges 24 as having barbs 52 for increasing and enhancing the grip of the frame on a panel between

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the frame members and this expedient, whether shown or otherwise, may be utilized as desired.

Window

Where a panel is to be used for example as part of a wall, and an opening is to be provided therein as for example for use as a window as shown in FIG. 7 where the panel 20 is shown in conjunction with a male frame member, and is shown as having an opening at 54, the frame member may be equipped with a supplementary formation 55 for mounting a window 56 in the frame for overlying the opening 54. This expedient may be used equally on any of the frame members, male or female, and in any of the forms illustrated, wherever desired.

Other panels

Framed panels, to be used as insect screens or as storm sash, may be made by stretching a sheet of mesh or a sheet or film of plastic in a frame made up of two frame members 22-23, with the flexible edges of the sheet clamped in the clamps formed by flanges 26-27-28.

Snap action

A very important characteristic of the frame herein disclosed is the fact that the male and female members snap together and interlock because of the longitudinally extending interlocking rib and groove formations on the outer faces of the transverse flange 28 of the male member 22 and on the inner faces of the bifurcated transverse flanges 26-27 of the female frame member 23.

The configuration of these ribs, shown best in cross-section in FIGS. 5 and 6 is such that once the frame members are snapped together, they cannot easily be separated.

The action just described is particularly true when the frame members are long extrusions (10-12 feet) of plastic of the nature of polyvinyl chloride as preferred which having the virtues of rigidity, inexpensiveness, smoothness, and other desirable virtues also has the virtue of being non-brittle and yet flexible enough to enable long extrusions of the material to be snapped together by working a male member into a female member starting at one end of the male member and working towards the opposite end.

It will also be observed that the cross-section of the frame members is uniform with the result that the frame members may be extruded in continuous strips and cut to length easily, in square or miter cuts as desired. Particularly is this applicable when the frame members are made of polyvinyl chloride which can easily be sawed cleanly and with conventional sawing tools to the desired length and end shape, square or miter cut.

The drawings show the frame members and panels to double scale. In one example in practice, the frame members are scaled to receive panels of $\frac{3}{8}$ " thickness. The frame member of FIG. 2A for example would be one and one-quarter inch wide and the material would be .050 inch thick and the transverse flanges are joined and snapped together sufficiently to receive between them the panels of $\frac{3}{8}$ " thickness. The male transverse flanges would be approximately five to six-sixteenths inches long and the female transverse flanges would be proportionately slightly longer to receive the male flanges. The overall thickness of an assembled frame with a panel between them would be slightly in excess of $\frac{3}{8}$ ".

Now having described the framed panels hereof and the frames particularly illustrated herein, reference should be had to the claims which follow.

1. In combination, two rectangular coplanar framed paneled units, each having a rectangular panel and a peripheral rectangular frame; with the frame of each unit surrounding and framing the panel thereof;

each frame comprising snap-together co-operating male and female completed rectangular frame members; each completed rectangular frame member having a face flange for one face of a panel and having a

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transverse flange normal to the face flange; the transverse flange of the female frame member being bifurcated to receive between its halves the transverse flange of the male frame member; the outer faces of the transverse flange of the male frame member and as well the inner faces of the bifurcated transverse flanges of the female frame member having co-operating interlocking rib and groove snap together formations extending longitudinally of these transverse flanges;

with the face flanges being extended beyond the transverse flanges to provide sockets surrounding the panel; with the face flanges having at their edges supplementary transverse flanges projected towards each other to close the sockets;

and means extending laterally from the supplementary transverse flanges of one unit and headed to form a T at its end fitting in the socket of the coplanar adjacent framed unit for joining the two units edge to edge.

2. A construction according to claim 1 wherein the means comprises supplementary flanges further bent laterally, away from the first named transverse flanges, and headed to form a T at their edges, fitting in the socket of the coplanar adjacent framed unit for joining the framed panel units edge to edge.

3. A construction according to claim 2 wherein said flanges are flexible enough to permit hinge like movement of such flanges and of the units relatively.

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4. A construction according to claim 1 wherein the means comprises a strap having at its ends T heads fitting in the sockets of two coplanar adjacent frames for joining two units edge to edge.

5. A construction according to claim 4 wherein said strap is flexible enough to permit hinge like movement of such strap and of the units relatively.

6. A construction according to claim 1 wherein said means is flexible sufficiently to permit hinge like movement of such means and of the units relatively.

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