United States Patent [19]

Smith

[11] **3,797,186**

[45] **Mar. 19, 1974**

[54] **FABRICATED PLASTIC PANELS**

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[73] Assignee: **H C Products Co.,** Princeville, Ill.

[22] Filed: **Feb. 24, 1970**

[21] Appl. No.: **13,387**

[52] **U.S. Cl.** **52/314,** 52/473

[51] **Int. Cl.** **E06b 7/08**

[58] **Field of Search** 52/314, 455, 475, 629, 52/630, 618, 490, 483, 731, 317, 473

[56] **References Cited**

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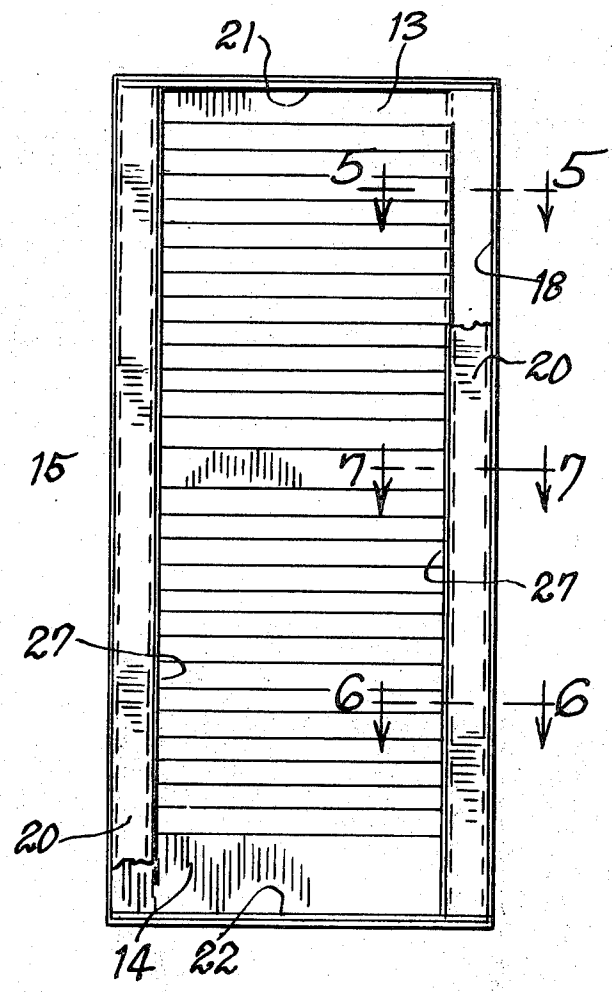
Primary Examiner—Henry C. Sutherland

[57] **ABSTRACT**

A panel fabricated from sheet plastic to resemble a wooden louvered shutter or door, one side and the four edges being made as a single sheet. Special box-like plastic extrusions disposed along the sides, in the case of the shutter, and along the sides, top and bottom, in the case of the door, are adhered to the plastic sheet to give rigidity to the sheet and finished panel. The box-like extrusions have a hollow rectangular cross section, with one or more integral webs extending across the section.

2 Claims, 11 Drawing Figures



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SHEET 1 OF 2

FIG. 1

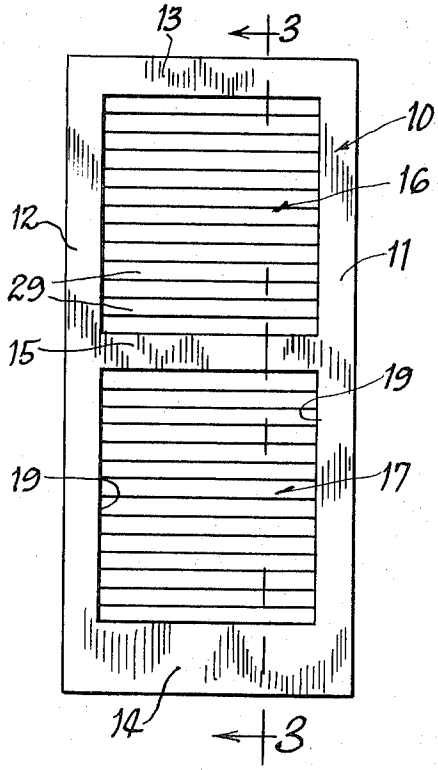

FIG. 2

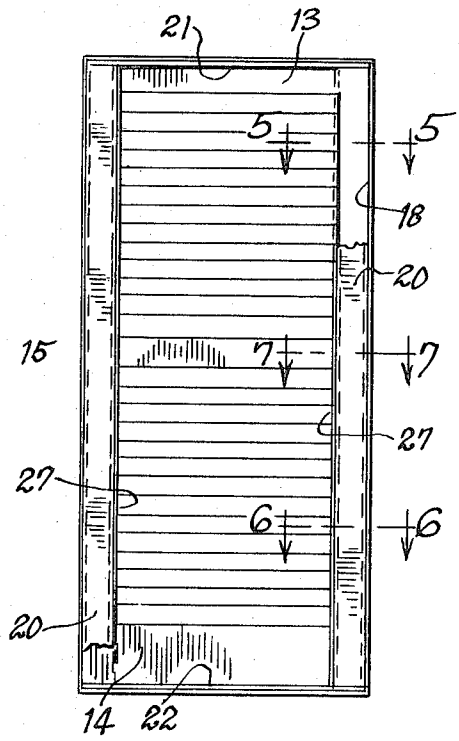

FIG. 3

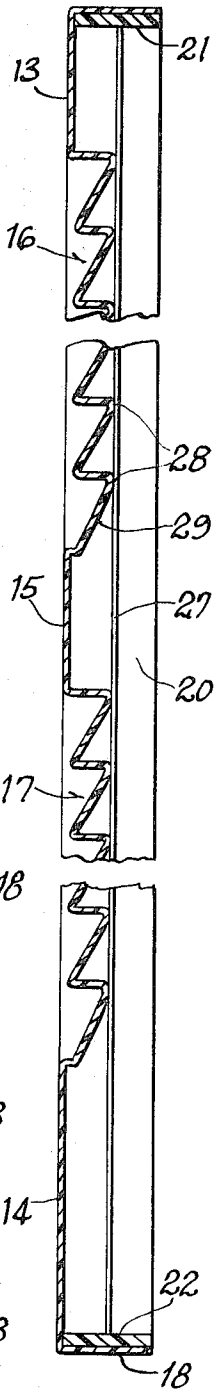

FIG. 4

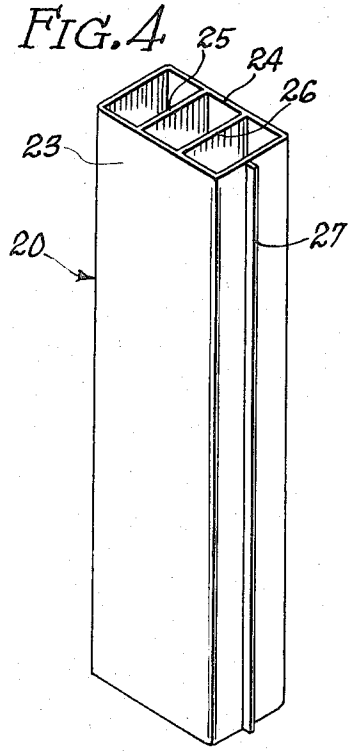

FIG. 5

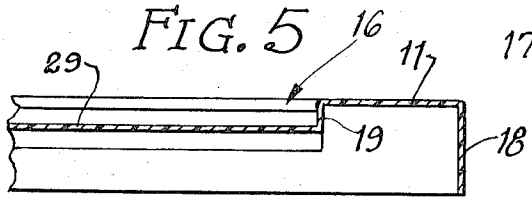

FIG. 6

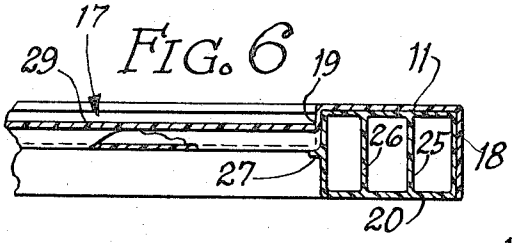

FIG. 7

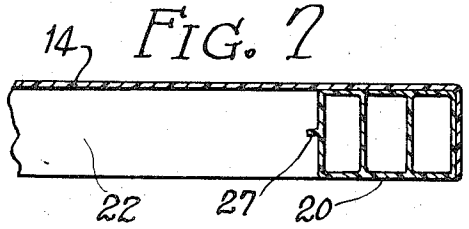

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FIG. 8

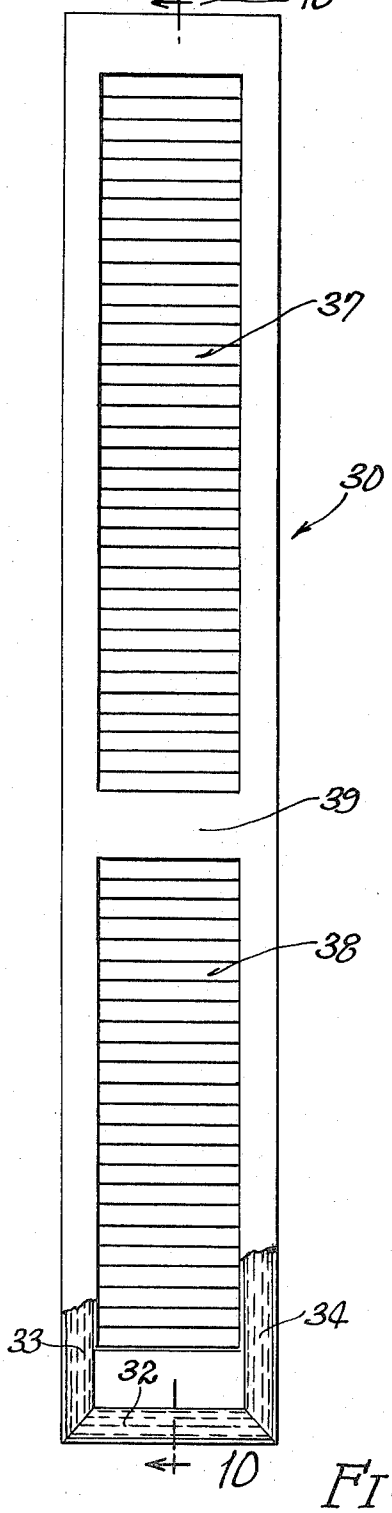


FIG. 9

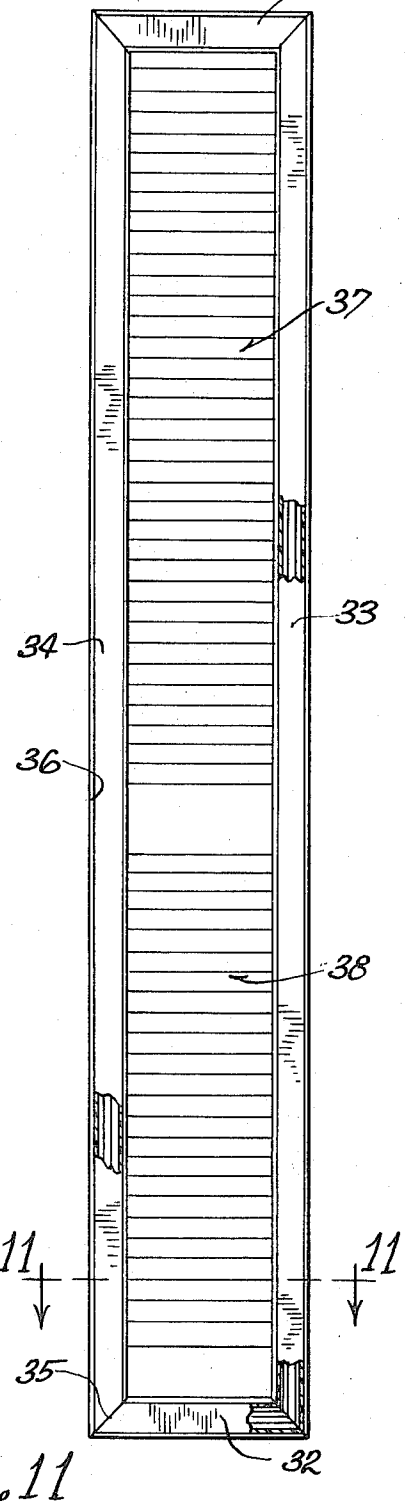


FIG. 10

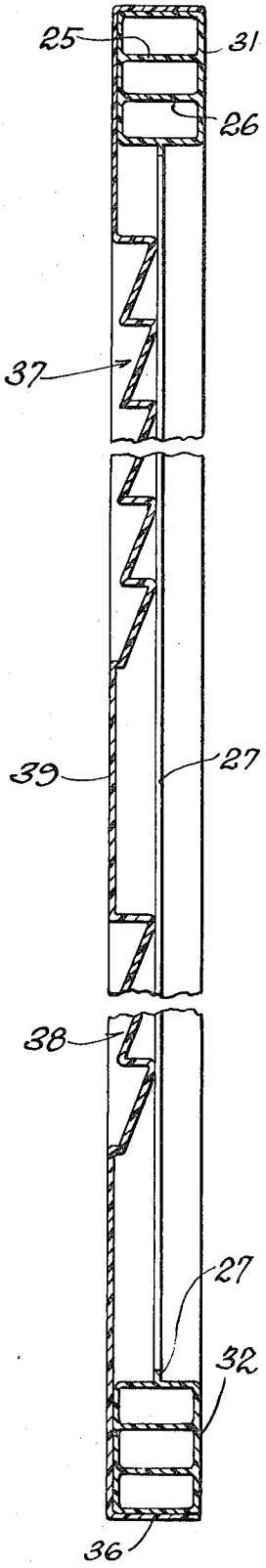
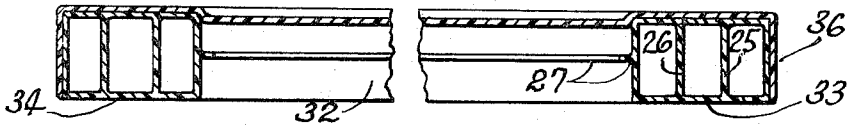


FIG. 11



FABRICATED PLASTIC PANELS

This invention relates to panels made of molded sheet plastic to be used as shutters or doors, and to a reinforcing rail therefor.

In my prior U.S. Pat. No. 3,461,629 dated Aug. 19, 1969 for Shutter Structure, there is disclosed a shutter made from sheet plastic molded to resemble a louvered shutter. The sides, top and bottom of the shutter are reinforced by channel-shaped plastic extrusions the open sides of which are adhered to the edge regions of the sheet. Said edge regions include portions of the sheet which are bent at right angles to the plane of the sheet, the reinforcing channel-shaped extrusions having their sides abutting upon the bent edge regions of the sheet. Because of the channel shape of the extrusions and the relatively wide space between the sides of the channel, it has been found to be at times somewhat weaker than desired and more difficult to assemble and therefore more costly to produce.

It is an object of this invention to provide an inexpensive shutter made of molded sheet plastic of more rigid construction than heretofore produced, but which is less expensive to make.

Since the size and proportions of a plastic shutter may readily approach those of a door, it has been proposed to make doors of sheet plastic to be used for closets where the strain on the door is considerably less than that on doors to rooms. Such closet doors may be designed to fold rather than open into a room, the folded door panels being hung from an overhead track. This requires a reinforced rail across the top of the door, or at least a rail which is sufficiently strong and rigid to support a door panel.

Another object of this invention is to provide a door panel for a folding door, or the like, which may be inexpensively made from molded sheet plastic reinforced on its sides and top to form a rigid structure capable of being suspended from an overhead rail.

As a more specific object, this invention has within its purview the provision of a plastic extrusion in the form of a rectangular section having internal webs which increase the rigidity of the extrusion, and a panel made from molded sheet plastic which is reinforced along its sides by such plastic extrusions.

Another specific object of this invention is the provision of an inexpensive shutter made from molded sheet plastic reinforced along its vertical sides by an interiorly braced rectangular section extrusion and along its top and bottom edges by a solid rail of the same plastic as the side rails.

These and other objects of this invention will become more apparent from the following detailed description of preferred embodiments thereof when taken together with the accompanying drawings in which:

FIG. 1 is a front elevational view of a shutter made in accordance with this invention;

FIG. 2 is a rear elevational view of the shutter of FIG. 1;

FIG. 3 is an enlarged fragmentary side elevational view in section of the shutter of FIG. 1 taken along line 3—3 of FIG. 1;

FIG. 4 is an elevation in perspective of the plastic extrusion used as a vertical reinforcing rail in the shutter of FIG. 1;

FIGS. 5, 6 and 7 are enlarged fragmentary sections through the shutter of FIG. 2 taken along lines 5—5, 6—6 and 7—7, respectively of FIG. 2;

FIG. 8 is a front elevational view of a modification of the shutter of FIG. 1 in the form of a door panel with portions cut away to show the construction thereof;

FIG. 9 is a rear view of the panel of FIG. 8, with portions cut away;

FIG. 10 is an enlarged fragmentary side elevational view in section of the door panel of FIG. 8, the section being taken along line 10—10 of FIG. 8; and

FIG. 11 is an enlarged fragmentary end elevational view in section of the door panel of FIG. 9, the section being taken along line 11—11 of FIG. 9.

Referring now to the drawings for a detailed description of the preferred embodiment shown therein, the finished panel, satisfactory for use as a shutter, is shown in FIG. 1. It is comprised of a single sheet of plastic material sold under the trade name of C. G. Cycolac A.B.S. Plastic, the sheet being approximately 0.055 inch thick. The sheet is molded to simulate a wooden louvered shutter and hence is formed in the shape of a wooden frame 10 having simulated side rails 11 and 12, simulated top and bottom rails 13 and 14, respectively, and a mullion 15. The portion within frame 10 is formed to resemble an upper louver 16 and a lower louver 17. The sides of the frame as well as the top and bottom are formed by bending the edge regions of the frame transversely of the general plane of the frame to form a continuous flange 18 (FIGS. 3 and 5) which provides a degree of stiffness to the edge regions. The desired thickness of the panel is attained by trimming the flange to the thickness dimension of the finished panel.

Referring now to FIGS. 5 and 6, the louvers 16 and 17 terminate at the simulated side rails 11 and 12 in aligned transverse sections 19 which are substantially equidistantly spaced from the adjacent portion of flange 18. According to the present invention, a rigid reinforcing rail 20 is placed in the space between sections 19 and flange 18 behind each simulated side rail 11 and 12. Another form of stiffening rail 21, 22 (FIG. 3) is placed behind simulated top and bottom rails 13 and 14, respectively. Stiffening rails 21 and 22 are solid relatively thick strips of plastic material which may be the same as the material of the adjacent flange 18, the strips being coextensive with said adjacent flange 18 in width and length and extending across the ends of simulated side rails 11 and 12. Said solid strips are preferably three times the thickness of flange 18 and overlie flange 18. Stiffening rails 20 extend vertically into contact with solid stiffening rails 21 and 22.

Referring to FIG. 3, stiffening rail 20 is an extrusion of a plastic sold commercially as GSE Cycolac ABS the walls of which, in the form selected to illustrate this invention, may be 0.035 inch thick. Said rail 20 is of hollow rectangular or box cross section having a width which causes it to fit snugly between flange 18 and louver sections 19. Its height is substantially equal to the transverse dimension of flange 18. The top and bottom walls 23 and 24 of rail 20 are stiffened by one or more webs 25, 26 which are integral with said side walls 23 and 24 and coextensive therewith. The inherent resistance to flexing at the corners of molded plastic shapes provides rigidity for the walls 23 and 24 against flexing transversely to the planes thereof as well as against any shearing stress that might be impressed upon one of said walls relative to the other.

Side rails 20 are formed with a flange 27 which extends laterally under the louvers 16 and 17 in contact

with the apices **28** formed by corrugations **29** which simulate the louvers. An appropriate adhesive is applied to flange **27** and to the ends of the corrugations to secure rails **20** to the louvers, and similarly, adhesive is applied to flange **18** and the adjacent solid rails. Upper and lower rails **21** and **22** are also fastened to the adjacent flange **18** by adhesive. Flange **18** is thus rigidly secured to the rails **20** and upper and lower solid rails **21** and **22,** and the entire assembly forms a rigid, lightweight panel suitable for use as a decorative shutter, door or the like.

Where the panel is to be used as a door, the construction shown in FIGS. **8–11** is preferred. A door is subject to more use than a shutter which is fixed to a wall as an ornament, and a door must be attractive to the eye on both sides whereas an ornamental shutter is seen only from one side. Furthermore, if the panel is to be used as a section of a folding door, such as is used in closets, or as a partition, or in places where there is no room for a full swinging door, it may be suspended from an overhead rail by a roller secured to the top rail of the panel at about the mid-point thereof. This requires that the top rail be rigid and strong.

Referring now to FIGS. **8–11,** the panel **30** shown therein is of long and narrow proportions, as it would appear if used as a section of a folding door. Its construction is substantially identical with that of the panel shown in FIGS. **1–7,** except for the top and bottom rails. In FIGS. **8–11,** both the top and bottom rails **31** and **32** are made from the same rectangular-sectioned extrusion as rail **20** of FIG. **4,** including the webs **25** and **26** which serve to stiffen the extrusion. The joints between side rails **33** and **34** on the one hand and the top and bottom rails **31** and **32** on the other are mitred as shown at **35** in FIG. **9** and are secured together by an adhesive to form a strong rectangular frame. The remainder of the panel is a single sheet of plastic material formed with a continuous peripheral flange **36** which is adhered to the rails **31, 32, 33, 34.** The interior regions of the sheet are molded to simulate upper and lower louvered sections **37, 38** separated by a mullion **39.**

Since upper rail **31** is a strong rectangular section, it can safely be used as a means by which the panel may be suspended from an overhead rail, and, of course, side rails **33** and **34** are sufficiently strong to accept a hinge (not shown) for connecting adjacent panels together. As shown in FIG. **9,** the continuous rectangular frame of rails **31, 33, 32** and **34** gives the panel an appearance of solidity and strength appropriate for its intended use as a section of a door.

It is understood that the foregoing embodiments of this invention are illustrative of preferred forms of this invention and that the proportions of the shutter and door panels, the thickness of the material for the sheet and rails, and the type of plastic used may be varied to suit requirements of a particular design of panel. The type of adhesive used and the way it is applied are also within the choice of the designer, although the specific adhesive and manner of applying it disclosed in my aforementioned United States Pat. No. 3,461,629 can be readily adapted to the instant shutter and door panels. The scope of this invention, therefore, is not to be limited by the foregoing description, but is to be determined by the appended claims.

I claim:

1. A panel comprising a rectangular sheet of plastic material molded to have a generally plane surface and to have a peripheral flange extending transversely of said surface to form the side, top and bottom edges of said panel, stiffening rails of extruded plastic material disposed adjacent said side edges and adhered to said side edges and plane surface, said stiffening rails having a generally rectangular hollow cross section with integral spaced webs connecting opposite walls of said hollow cross section, and top and bottom rails being of solid rectangular section and plastic material providing a wide face and a narrow edge for said top and bottom rails, said top and bottom rails also being disposed adjacent the top and bottom edges of said panel and adhered respectively and internally to said top and bottom edges of said panel, said top and bottom rails each having a face width substantially equal to the width of said peripheral flange and an edge thickness substantially less than the width of said peripheral flange but greater than the thickness of said panel sheet.

2. A panel as described in claim **1** and wherein the edge thickness of the material of said stiffening rails disposed adjacent the side edges of the panel is substantially less than the thickness of said sheet, the thickness of the top and bottom rails is approximately three times the thickness of said sheet, and the sheet, top, side and bottom rails are made of substantially the same plastic material.

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