United States Patent

Letarte

[15] **3,674,082**

[45] **July 4, 1972**

[54] STORM DOOR GLAZING BEAD

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[52] **U.S. Cl.**.....**160/371,** 160/395, 52/502

[51] **Int. Cl.**.....**E06b 3/54**

[58] **Field of Search**.....160/371, 383, 391, 392, 393, 160/394, 395, 397, 399, 403; 52/502, 401, 475

[56] **References Cited**

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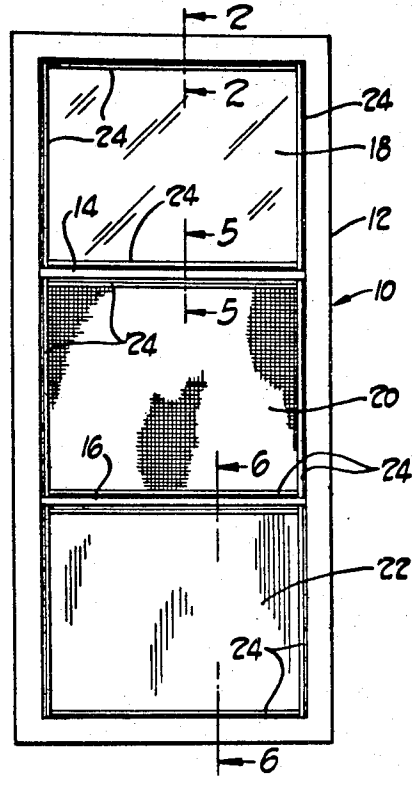
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Primary Examiner—David J. Williamowsky
Assistant Examiner—Philip C. Kannan
Attorney—McCoy, Greene & Howell

[57] **ABSTRACT**

A panel and frame assembly and method for producing same in which the frame is provided with a longitudinally extending channel facing the area to be paneled. The panel is secured by a strip extending longitudinally of the frame and engaging the channel in snap-fitting relationship. In securing solid panels in the frame, the strip is secured in the channel by a cam-lock and has double spring action in which a portion of the strip acts in compression, while another portion acts in tension. In securing fabric panels into the frame, the spring and cam action is the same. Additionally, the portion of the strip which acts as the cam-lock engages a fabric.

3 Claims, 7 Drawing Figures



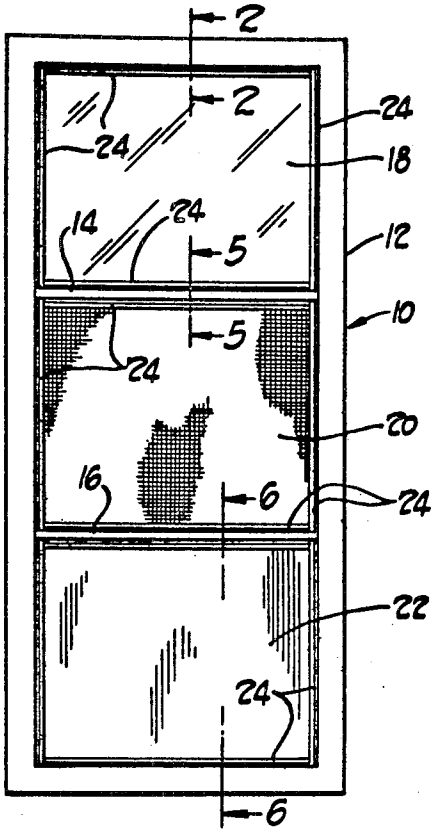


Fig. 1

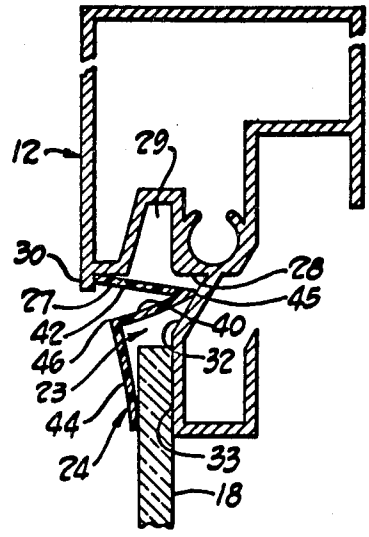


Fig. 2

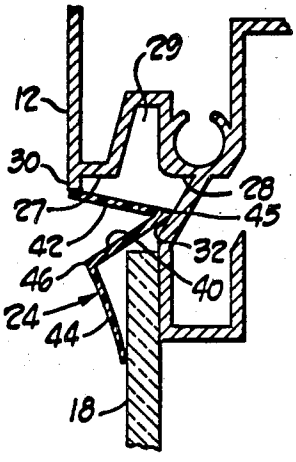


Fig. 3

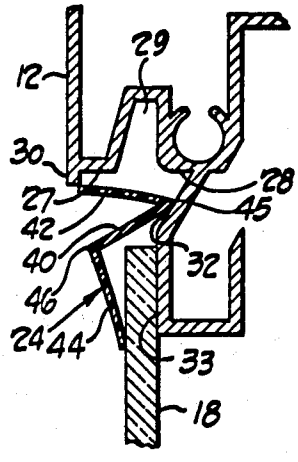


Fig. 4

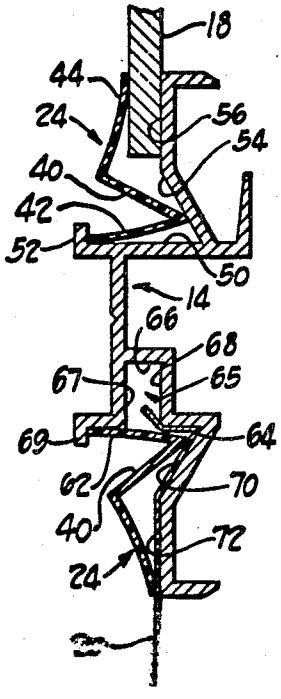


Fig. 5

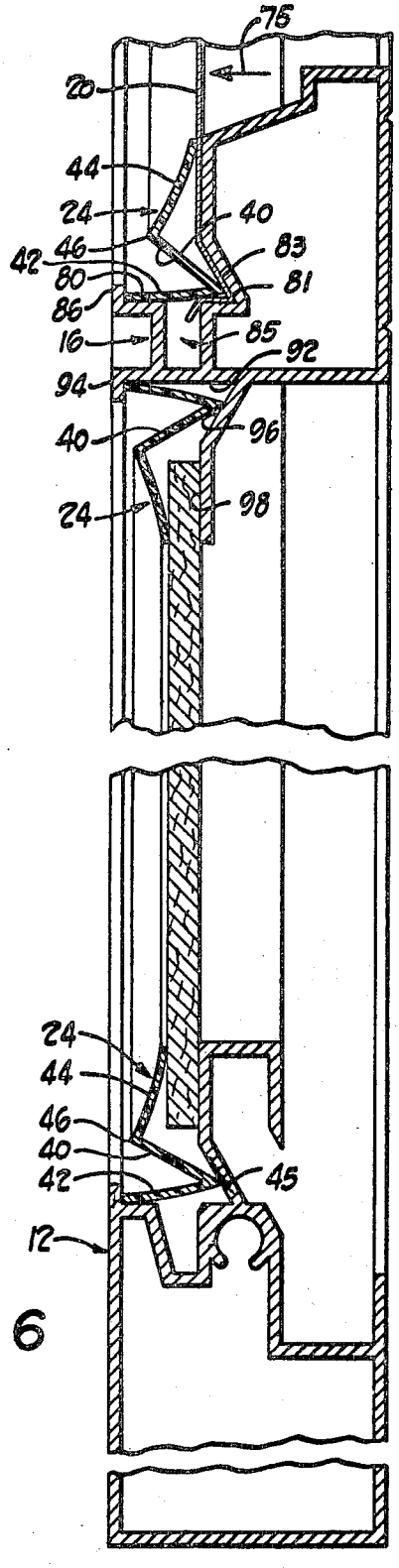

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Fig. 6

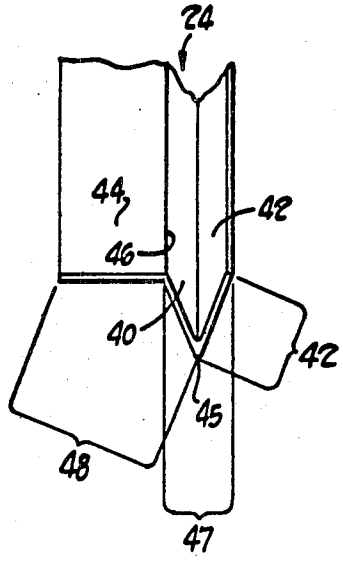

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Fig. 7

STORM DOOR GLAZING BEAD

This invention relates to a method of paneling a frame and the resulting assembly, and more particularly to a method of securing a panel in a frame by means of an elongated strip snapped into a channel facing the area to be paneled. The strip has a unique cross-sectional contour in which one cross-sectional portion of the strip snaps into the channel and cooperates with the frame to define a cam-lock securing the strip to the frame, and a portion of the strip, as viewed in cross-section, acts as a compression spring while another portion of the strip, as viewed in cross-section acts as a tension spring. When the strip is employed to secure fabric panels, the cam-lock portion additionally engages and locks the fabric between the strip and the frame. The frame is provided with a generally L-shaped channel having a base or foot portion which faces the area to be paneled. This foot portion is bounded on one edge by a stem portion including a longitudinally extending inclined surface and a terminal portion in the form of a flat surface substantially perpendicular relative to the base portion. The terminal portion provides a resting surface for the panel. The foot portion is bounded on the opposite edge by a lip portion projecting toward the area to be paneled.

In one embodiment, the channel includes a recess or slot extending longitudinally of the frame. The slot is in the foot portion of the channel and has a transverse dimension extending away from the area to be paneled. This slot aids the fastening of fabric by receiving the terminal edges or margins of the fabric. Positioning the fabric in this manner assures that the fabric will be lockingly engaged between the cam-lock portion and the frame when the strip is snapped in position. Advantageously, both frame and strip embodiments are capable of receiving and anchoring solid and fabric panels in a range of thicknesses. Also advantageously, the innermost edge of the strip resiliently engages the panel such that the plastic strip will cause the panel to exhibit a certain limited resilience to thus reduce the possibility of damage due to blows or pressures such as are produced by children and small animals. One of the particular advantages of this combination is that with fiberglass screen panels, the resilience of the strip is imparted to the fabric and obviates the principle disadvantage of fiberglass, namely, its relative inelasticity.

These and various other objects, features and advantages of the invention will be more clearly understood from the reading of the detailed description of the invention in conjunction with the drawings in which:

FIG. 1 is a view in elevation of a closure assembly according to various embodiments of this invention;

FIG. 2 is a view in section taken along the lines 2—2 of FIG. 1 and shown to an enlarged scale;

FIG. 3 is a view in section similar to FIG. 2 and drawn to an enlarged scale with the plastic strip in the unstressed state positioned to be snapped into the frame;

FIG. 4 is a view in section similar to FIG. 3 and illustrating the condition of the respective parts with pressure applied to the plastic strip but just before the strip snaps into the channel;

FIG. 5 is a fragmentary view in section to an enlarged scale taken along the lines 5—5 of FIG. 1;

FIG. 6 is a view in section to an enlarged scale taken along the lines 6—6 of FIG. 1; and

FIG. 7 is a view in perspective of the strip in an unstressed state.

Referring now to the drawings, there is depicted a closure member **10** which, in this particular instance, is a door including a master frame member **12** having a top mullion bar **14**, and a bottom mullion bar **16**. The door also includes three types of panels, namely, a glass plate **18**, a screen or fabric **20**, and a kick-plate **22**, each of which is secured in position by a plastic fastening strip **24**, extending peripherally of, and snapped into a channel in each of the panel members **18**, **20**, and **22**, and frame member **12**.

FIG. **2** shows the master frame **12**, a fragmentary portion of the glass **18** and the plastic strip **24** snapped into a generally L-shaped frame channel **23** in which strip **24** resiliently holds glass **18** in frame **12**. (In FIG. **2**, the L-shaped channel **23** is rotated 180° from the normal position of a printed L). In this particular instance, the master frame **12** is a hollow extrusion which may be quickly and economically produced from any readily extrudable metal, such as aluminum. It is not essential, however, that the master frame be formed of aluminum, for it may, in fact, be formed from wood or any other convenient construction material.

The L-shaped channel **23** in master frame **12** includes a pair of coplanar surfaces **27**, **28** separated by an intervening slot **29**. Surfaces **27**, **28** face perpendicularly relative to the area covered by glass panel **18**. The channel surfaces **27** and **28** form the base or foot of the L. Surface **27** is bounded by an outer lip **30**, projecting substantially perpendicularly inwardly toward the paneled area or glass panel **18**. The opposite edge of surface **28** is connected to the stem of the L which includes a surface **32** projecting at an acute angle relative to surface **28** and a flat terminal portion **33** positioned normally to surfaces **27**, **28** and defines a bearing surface for the solid or fabric panel.

Strip **24** is shown in perspective in its unstressed state, to an enlarged scale, in FIG. **7**. As seen in FIG. **6**, strip **24** is generally S-shaped or Z-shaped, in cross-section depending on the edge viewed, with a central or main body portion **40** connecting a first leg portion **42** and a second leg portion **44**. Stated in another manner, the strip, as viewed in cross-section, includes a pair of V-shaped portions **47**, **48**, having their openings facing in opposite directions with a common arm **40**. V-shaped portion **47** acts as a compression spring relative to its apex or vertex portion **45** when installed as will be subsequently described. The other V-shaped portion **48**, includes leg **44** and common body portion **40**, which V-shaped portion acts as a tension spring relative to its apex or vertex portion **46** when installed, as will be subsequently described. It is significant that the leg portions **42**, **44** are non-parallel and are connected to the main body portion **40** by relatively thick connecting apex or vertex sections **45** and **46**, respectively. It is the relative thickness of these connecting apex portions which controls the spring tension of the strip **24** on panels **18**, **20**, and **22**. In the instance of the screen, additional cam-locking engagement between the plastic strip, the screen and the frame member is produced to prevent the screen member from being pulled loose from the frame in a manner which will be subsequently described in detail.

FIG. **2** shows the strip **24** in its stressed condition in which leg portion **42** is snapped into the L-shaped channel defined by projections **30**, **32** and surfaces **27**, **28**. Because tension spring portion **48** is in tension and compression spring portion **47** is in compression when leg **42** is snapped beneath lip **30**, leg **42** tends to rotate in a clock-wise direction, as viewed in FIG. **2**. Under this rotational force, apex **45**, slides down and cam-locks against inclined surface **32**. Thus the inner surface of lip **30**, inclined surface **32** and leg **42** of strip **24** define cam-locking means for retaining strip **24** in the L-shaped channels of frame **12** and mullions **14**, **16**. Slot **29** is employed with fastening fabric panels in frame **12** in a manner which will be subsequently described.

FIGS. **3** and **4** are fragmentary views of FIG. **2** prior to the step of snapping strip **24** into the L-shaped channel. In FIG. **3**, the strip is positioned for insertion but is in its unstressed state. FIG. **4** shows the position of the strip with pressure applied in the region of apex **46** and just before the terminal edge of leg **42** snaps beneath lip **30**. Note that apex **45** engages and slides along inclined edge **32** in response to this pressure.

FIG. **5** is a view in section, to an enlarged scale, taken along the lines **5**—**5** of FIG. **1** and showing top mullion **14** in section with glass panel **18** and screen panel **20** shown as short fragments. Mullion **14** is preferably formed of an extrusion, such as aluminum, but might also be formed of other materials, such as wood or similar construction materials. Mullion **14** has a first L-shaped channel comprised of surface **50** facing upwardly, as viewed in FIG. **5**, a projecting lip **52** defining the lefthand terminal of the channel, and an inclined surface **54** extending upwardly to the left at an acute angle from surface

50, as viewed in FIG. 5. The inclined surface 54 connects a vertically extending terminal portion 56 which acts as a bearing surface for panel 18.

Resilient strip 24 is shown snapped into this previously described channel with apex 45 snugly engaging inclined surface 54. Any pressure against glass panel 18 from the right toward the left, as viewed in FIG. 5, will cause the glass to move against the pressure of the leg 44 and the resilience of strip 24 due to tension spring 48 and compression spring 47, will retain the glass in position while reducing the effect of the pressure on the glass. Any movement of resilient strip 24 to the left, as viewed in FIG. 5, as a result of pressure on leg 44 will cause the apex 45 of strip 24 to slide upwardly along the inclined surface 54 and thus increase the cam-locking force of compression upon leg 42 of strip 24. This increased cam-locking pressure has additional importance in the engagement of fastening strip 24 and screen 20 in a manner which will be subsequently described.

The lower portion of top mullion 14 includes an L-shaped channel closely resembling the channel in the master frame in that it comprises two surfaces 62, 64, facing the paneled area, separated by a slot 65 including outwardly facing surface 66 and connecting surfaces 67 and 68. The L-shaped channel includes longitudinally extending lip 69. The channel also includes an inclined portion 70 forming an acute angle with surface 64 and flat terminal portion 72, which terminal portion provides a bearing surface screen panel.

The method of assembly includes cutting screening material to a dimension closely approximating the area enclosed by slots 65 and 85 of the top and bottom mullions, and respectively slot 29 in the intermediate portions of the main frame. The screen is positioned to extend a substantial distance into these slots. Next, strip 24 is snapped into position as shown in FIGS. 5 and 6. Advantageously, the marginal edges of the screen are cam-locked between the strip vertices 45 and inclined surfaces 70, 88, and 32. This channel includes an inclined surface 83 securely to engage screen panel 20. Forces upon the screen in the direction of the arrow 75 in FIG. 6 cause increased pressure along apex 45 of the plastic strip thus increasing the cam-lock pressure. Tension spring portion 48 exhibits a limited amount of resiliency to minimize damage to the screen.

Bottom mullion 16, as shown in FIG. 6, has an upwardly facing, generally L-shaped channel similar in cross-section to the previously described downwardly facing channel in the lower portion of top mullion 14. This channel includes upwardly facing surfaces 80, 81 separated by slot 85.

The lower portion of the lower mullion 16 has a downwardly facing generally L-shaped channel including downwardly facing surface 92 bounded on the lefthand side by a downwardly projecting lip 94 and on the righthand side by the inclined portion 96. The inclined portion 96 connects a relatively flat bearing surface 98 with the main body portion of the lower mullion such that the surface 98 extends vertically and provides a bearing surface for kick-plate 22. Strip 24 snaps into mullion 16 and retains kick-plate 22 in the frame. In this particular instance, the kick-plate is shown as fiber board. It could however, be formed of metal, such as aluminum plate. The engagement of the master frame and kick-plate is shown in detail in the lower portion of FIG. 5 and corresponds to the engagement of the plastic strip 24, the downwardly facing channel of the lower mullion 16, and the kick-plate 22 in the top portion of FIG. 6.

While various embodiments of the invention have been shown and described in detail, it is understood that the concepts thereof could be employed in other embodiments without departing from the spirit and scope of this invention. For example, strip 24 has been referred to and cross-hatched as plastic, it may be formed of other material. The corners of frame 12 may be notched according to the method defined in my U.S. Pat. No. 3,097,684 and the frame corners may be secured according to my U.S. Pat. No. 3,202,245 or my U.S. Pat. No. 3,290,076.

What is claimed is:

1. In combination, a frame enclosing an area to be panelled, a panel, and a strip for securing said panel to said frame, said frame having a channel defined by a first surface portion facing the area to be panelled, a lip portion projecting from one edge of said first surface portion toward the area to be panelled and a second surface portion projecting at an acute angle from the other edge of said first surface portion, said channel receiving a portion of said strip, said received portion of said strip cooperating with said portions of said channel to define compression cam-lock means, said strip including a resilient portion of V-shaped cross-section defining compression spring means, and another resilient portion of V-shaped cross-section defining tension spring means, wherein said tension spring means engages said panel and compresses said compression spring means and said compression spring means urges said cam-lock means into locking condition in said frame.

2. The combination according to claim 1, wherein said panel comprises a solid panel.

3. The combination according to claim 1, wherein said panel comprises a fabric panel, and wherein said channel includes a slot in said first surface thereof, said slot extending longitudinally of said frame and having a transverse dimension extending away from the area to be panelled, the terminal edges of said fabric panel extending into said slot.

* * * * *