

Nov. 19, 1968

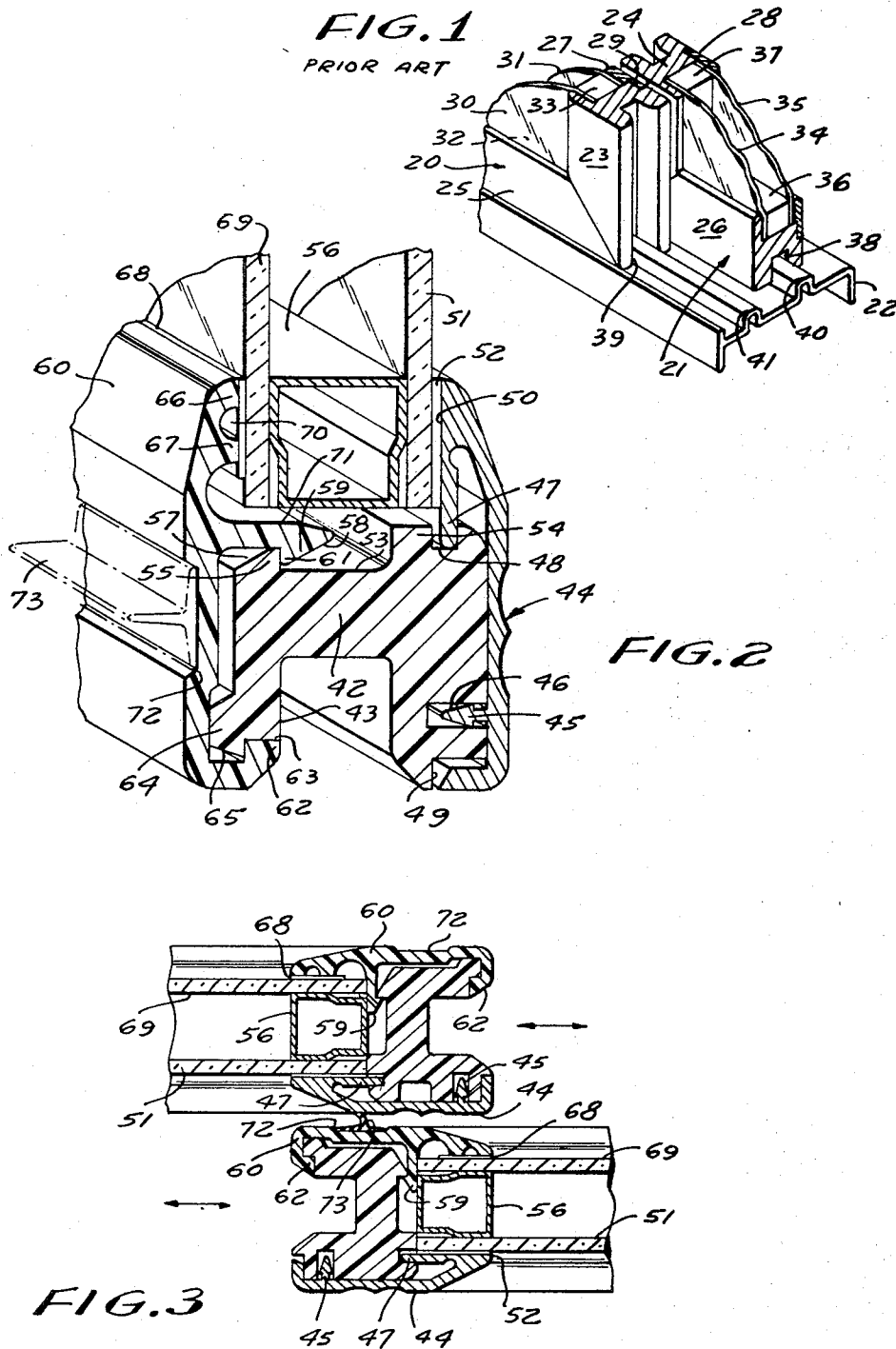
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3,411,247

REFRIGERATOR DOOR FRAME

Filed Oct. 10, 1966

2 Sheets-Sheet 1



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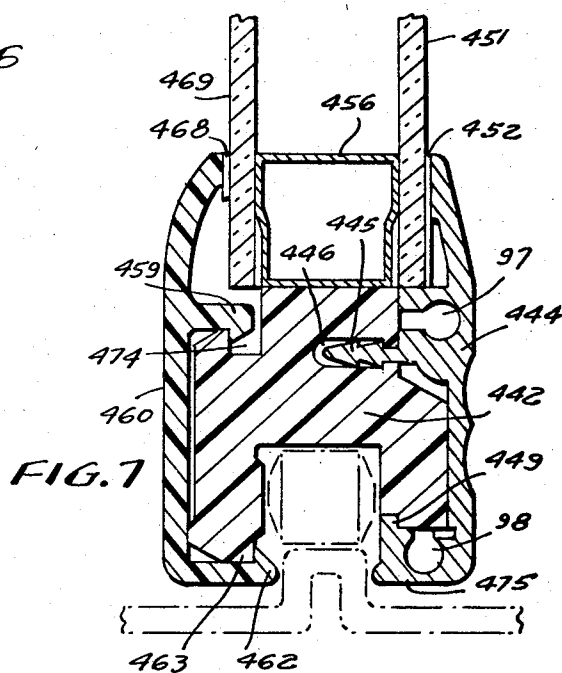
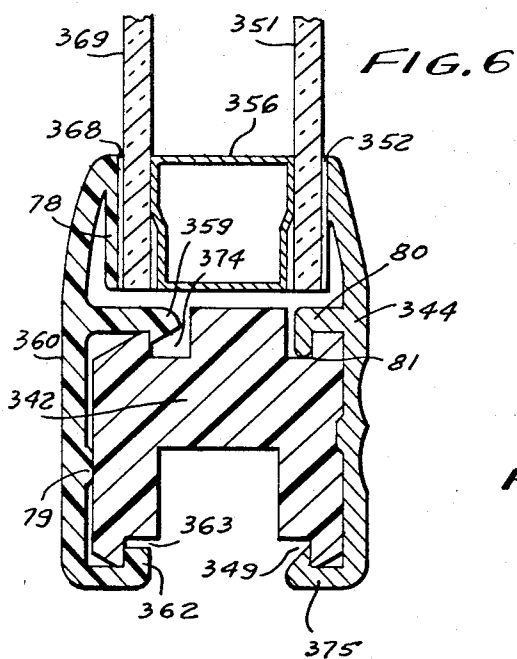
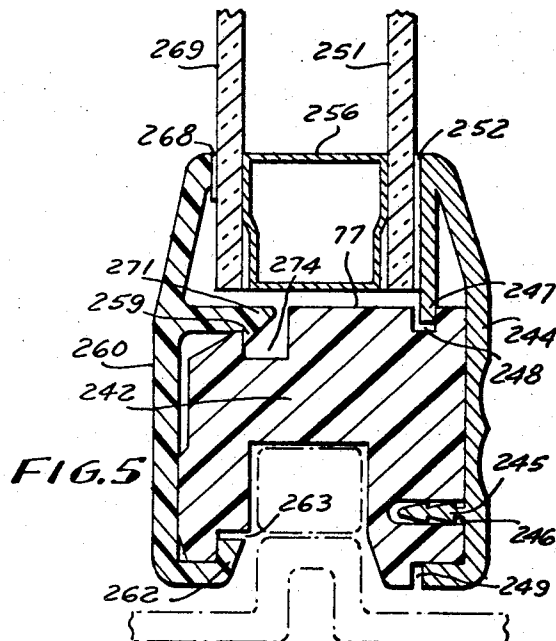
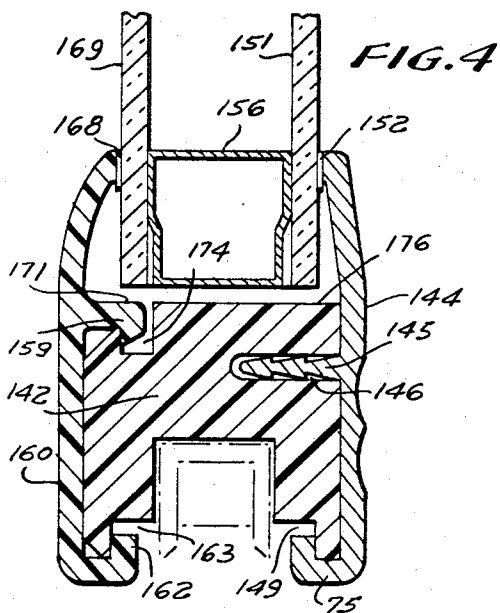
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REFRIGERATOR DOOR FRAME

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Filed Oct. 10, 1966, Ser. No. 585,402

5 Claims. (Cl. 49—501)

ABSTRACT OF THE DISCLOSURE

An outer aluminum facing member and an inner snap-on plastic glazing strip secured to a plastic main frame structure for supporting a double glass thermal unit.

Summary of the invention

A frame for supporting first and second thermal units in parallel spaced relationship having a plurality of sides fastened at ends to provide corners, each of said sides including in combination a main frame structural member having low thermal transmission properties, an outer facing member, an inwardly projecting barb of said outer facing member, an outwardly opening channel of said main member in which said barb is received in a press fit, a projecting portion of said facing member providing a first lip adjacent a portion of the outer surface of said first thermal unit, a downwardly projecting portion of said first lip, an upwardly opening channel of said main member receiving said downwardly projecting portion, a resilient glazing strip, first and second inwardly facing shoulders of said main member, first and second hook portions of said glazing strip engaging said first and second shoulders respectively, an abutment of said main member between said first and second shoulders urging said hook members in engagement with the respective shoulders and said glazing strip in a stressed condition, a projecting portion of said glazing strip providing a second lip adjacent a portion of the outer surface of said second thermal unit and support means between said first and second thermal unit.

It is the object of this invention to provide a refrigerator door frame of improved design for supporting a double glass thermal unit and having an outer metallic facing member and an inner snap-on non-metallic glazing strip.

A refrigerator door frame constructed in accordance with the teachings of this invention and the method of using the same is described herein with reference to the drawings, in which:

FIG. 1 is a segmentary perspective view of a refrigerator door frame constructed in accordance with the prior art;

FIG. 2 is a segmentary perspective view of a refrigerator door frame constructed in accordance with the teachings of this invention;

FIG. 3 is a segmentary cross-sectional view of two adjacent refrigerator doors having frames constructed in accordance with the teachings of this invention in sealing engagement to prevent air leakage between the overlapping surfaces of the two doors;

FIG. 4 is a partially sectional view of an alternate embodiment of the invention;

FIG. 5 is a partially sectional view of a further alternate embodiment of the invention;

FIG. 6 is a partially sectional view of another alternate embodiment of the invention; and

FIG. 7 is a partially sectional view of a further alternate embodiment of the invention.

In FIG. 1 there is shown a refrigerator door frame for supporting a double glass thermal window unit constructed in accordance with the teachings of the prior art. As shown therein, two doors 20 and 21 are slidably sup-

ported by bottom rail 22 adjacent to and overlapping one another. The vertical members 23 and 24 and the horizontal members 25 and 26 of the respective frames are extruded rigid plastic and are mitered and heat-welded at the corners to form the basic frame for custom sizes in the assembly. The glazing strips 27 and 28 are also rigid plastic and the sealer strip 29 fastened to door 20 is soft vinyl in the example shown, however it can be formed of any plastic or elastomeric material of suitable flexibility. Glass panels 30 and 31 of door 20 are shown separated by horizontal spacer 32 and vertical spacer 33. In door 21 the glass panels are indicated by the numerals 34 and 35 with the horizontal spacer indicated by the numeral 36 and the vertical spacer indicated by the numeral 37.

Channels 38 and 39 are provided in the outer edges of the frames to receive respectively projections 40 and 41 of the bottom rails so that the windows can be moved by sliding on the rails without dislocation.

In practice, with the frame of the prior art as shown in FIG. 1, the customer buys the welded frame and installs the glass and then miters and installs the glazing strips with metal screws not shown in FIG. 1.

An improved door frame structure constructed in accordance with the teaching of this invention is shown in FIG. 2. The improved frame utilizes a rigid plastic extruded structural member 42 provided with channel 43 in its outer edge to receive a projection of a rail not shown to allow for sliding without dislocation. The frame utilizes horizontal and vertical structural members 42 which are mitered and heat-welded at the corners.

A metal facing member 44, preferably formed of aluminum is firmly attached to the front surface of member 42 by means of barb 45 which projects therefrom and which is disposed within channel 46 formed in member 42, and by the end of glass retaining lip 47, disposed within channel 48. Edge recess 49 is provided for receipt therein of the remaining end of the facing member which also projects inwardly.

Barb 45, which can be inserted within channel 46 by a press fit, locks the facing member against movement away from member 42 and against movement longitudinally of member 42. The retaining lip 47 projects downwardly for receipt in channel 48 and the lip is spaced from the inner surface of the facing member in order to accomplish this. The inside surface 50 of retaining lip 47 is flat and formed for contact with the outside glass panel 51. In the particular embodiment shown in FIG. 2, a sealing material 52 is disposed between panel 51 and surface 50 of lip 47.

Channel 53 is formed in the upper surface of member 42 by upwardly projecting shoulders 54 and 55. Shoulder 54 has a flat upper surface upon which glass panel 51 and an edge of spacer 56 rests. Shoulder 55 is lower than shoulder 54 and formed with an outwardly facing inclined upper surface 57, which can cooperate with the surface 58 of hook 59 which projects inwardly from snap-on plastic glazing strip 60 to allow for insertion of hook 59 within channel 53. Shoulder 61 of hook 59, as seen in FIG. 2, embraces the inner surface of shoulder 55 maintaining the hook 59 within recess 53.

Glazing strip 60 is provided with a hooked end 62 which resides in recess 63 of member 42 when the glazing strip is in locked on position. Member 42 is provided with an outwardly projecting abutment 64 having a slight cam surface 65. The upper end of the glazing strip provides a glass retaining lip by means of shoulders 66 and 67. In the configuration shown in FIG. 2 a sealing material 68 is provided between the glass 69 and glazing strip. The groove 70 lying between shoulders 66 and 67 is for bead or "rope type" sealant if desired. The upper surface 71 of hook 59 lies substantially in the same plane

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as the upper surface of shoulder 54 and glass panel 69 and the adjacent edge of spacer 56 rests upon surface 71 of hook 59. The glazing strip 60 can be very easily placed into position. The end 62 is hooked into recess 63 and the glazing member is then pivoted upwardly and inwardly until shoulders 66 and 67 contact the glass surface. Inward pressure is then applied centrally at the area of the base of hook 59 until shoulder 61 has snapped over and engaged shoulder 55 on main structural member 42. The corners of abutment 64 can be relieved (not shown in the figures) to prevent interference with the inner corners of the glazing member. The abutment 64 maintains the glazing strip spaced from the main member 42 and stresses the glazing strip creating forces therein which tend to more firmly seat hooks 59 and 62 in the channel and recess, 53 and 63, respectively.

In this design the plastic main structural member 42 provides the necessary low thermal transmission properties for insulation and to prevent frost formation. The aluminum facing member 44 provides the front glass-retaining lip, contributes overall stiffness to the assembly, and presents an easily cleaned, attractive appearance. The rear-mounted glazing member 60, by virtue of its design and elastic properties, provides the rear glass-retaining lip to hold the glass snugly in place upon the upper surface of shoulder 54 and the upper surface 71 of hook 59. An additional advantage of this glazing strip over the older style is that this strip is one piece over the entire back surface of the door frame, eliminating the dirt or food-catching joint between glazing and main members. The joints are at the door's hidden, or working edges, not on potential food contact surfaces. Installation is accomplished by merely snapping the glazing strip into place rather than requiring screws or other separate mechanical fastening devices as used on present conventional assemblies.

A recess 72 is provided in the outer surface of glazing strip 60 to contain a cemented-in-place, T-shaped, flexible, sealing strip 73, which is mounted on the rear surface of the appropriate vertical member of the outer door, comes into wiping contact with the vertical front surface of the adjacent inner door, effecting a seal to prevent air leakage between the overlapping surfaces of the two doors, as shown in FIG. 3.

In the embodiment of FIG. 4, hooked end 162 of glazing strip 160 engages member 142 within recess 163 thereof and hook 159 of the glazing strip resides in channel 174. The upper end of glazing strip 160 provides a retaining lip for sealing strip 168 and glass panel 169. Aluminum facing member 144 is provided with a double barb arrangement 145 which engages member 142 within channel 146 thereof and the facing member is provided with a hooked lower end 75 which engages the member 142 within recess 149 thereof. The upper end of facing member 144 provides a retaining lip for sealing strip 152 and glass member 151 with spacer 156 between the two glass panels. The upper surface 176 of member 142 provides the bottom support for glass panel 151 and spacer 156 with glass panel 169 resting upon the upper surface 171 of hook 159, which upper surface 171 lies in substantially the same horizontal plane as does the surface 176.

In the embodiment of FIG. 5 the glazing strip 260 is identical to the glazing strip 160 in the embodiment of FIG. 4, having a hooked lower end 262 engaging member 242 within recess 263, and hook 259 engaging member 242 within recess 274. The upper end of glazing strip 260 provides the retaining lip for seal 268 and glass member 269, which rests upon the upper surface 271 of hook 259, as does the end of spacer 256. The remaining lower surface of spacer 256 and the bottom edge of glass panel 251 rest upon upper surface 77 of member 242. The facing member 244 is like the facing member 44 of the first embodiment; however, a double barb arrangement 245 within recess 246 of member 242 is utilized. The

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lower end of facing member 244 lies in recess 249 of member 242 and the end of the retaining lip of the facing member, indicated by the numeral 247, lies within recess 248 in the member 242. A sealing strip 252 appears between the retaining lip of the facing member and glass panel 251.

In the embodiment shown in FIG. 6, the glass panels are indicated by the numerals 369 and 351 with spacer 356 between them. The inner retaining lip is provided by a depending portion 78 of glazing strip 360, which is locked in position with respect to member 342 by hook 359 within recess 374, and hooked end 362 within recess 363. The glazing strip 360 is provided with an inwardly projecting abutting surface 79 which spaces a portion of the glazing strip from member 342 creating a stress within the glazing strip which aids in maintaining it in locked engagement with member 342. The facing member 344 is provided with a hooked end 375, which engages member 342 at recess 349, and a central hook 80 which engages the member 342 in recess 81. The upper end of the facing member provides the outer glass retaining lip and is in engagement with seal 352. The absence of barbs on the facing member in the embodiment of FIG. 6 allows for a snap-in assembly but the hook 80 does not anchor the facing member 344 with respect to member 342 as well as the barbs previously described and the arrangement of FIG. 6 does not insure against longitudinal movement between member 342 and facing member 344. This configuration, however, has many applications.

The embodiment of FIG. 7 is provided for screw assembly at the corners if desired. The glazing strip 460 is locked to member 442 by hooks 459 and 462 within recesses 474 and 463, respectively. The facing member 444 is attached to member 442 by barbs 445 within recess 446 and end 475 which is hooked within recess 449. The glass panels 469 and 451, spacer 456 and sealing strips 468 and 452 are maintained in position by the upper edges of glazing strip 460 and facing member 444. The openings 97 and 98 in the facing member are provided for screw assembly at the corners when desired. Self topping screws are preferred.

Hence, a number of embodiments of the invention have been described.

Each of the embodiments provides an outer aluminum facing member and an inner snap-on plastic glazing strip secured to a plastic main frame structure for supporting a double glass thermal unit although the specific configuration of the elements of the combination is varied from embodiment to embodiment.

Thus, among others, the object of the invention has been achieved. Obviously, numerous changes and rearrangement of parts might be resorted to without departing from the spirit of the invention as defined by the claims.

I claim:

1. A frame for supporting first and second thermal units in parallel spaced relationship having a plurality of sides fastened at ends to provide corners, each of said sides including in combination a main frame structural member having low thermal transmission properties, an outer facing member, an inwardly projecting barb of said outer facing member, an outwardly opening channel of said main member in which said barb is received in a press fit, a projecting portion of said facing member providing a first lip adjacent a portion of the outer surface of said first thermal unit, a downwardly projecting portion of said first lip, an upwardly opening channel of said main member receiving said downwardly projecting portion, a resilient glazing strip, first and second inwardly facing shoulders of said main member, first and second hook portions of said glazing strip engaging said first and second shoulders respectively, an abutment of said main member between said first and second shoulders urging said hook members in engagement with the respective shoulders and said glazing strip in a stressed condition,

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a projecting portion of said glazing strip providing a second lip adjacent a portion of the outer surface of said second thermal unit and support means between said first and second thermal unit.

2. A frame for supporting a thermal unit in accordance with claim 1 in which cooperating surfaces are provided on said main member and adjacent one of said hooks providing a camming action moving said hook out of a normal position during attachment, said hook returning to normal position after attachment.

3. A frame for supporting a thermal unit in accordance with claim 1 in which said first hook is on the edge of said glazing strip and said second hook is intermediate said first hook and said retaining lip, said second hook being constructed and arranged to move vertically during attachment of said glazing strip.

4. A frame for supporting a thermal unit in accordance with claim 3 in which a portion of said second hook provides a resting surface for said thermal unit, said thermal unit resting upon said surface maintaining said hook in its respective recess.

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5. A frame for supporting a thermal unit in accordance with claim 1 in which a recess is provided in the outer surface of said glazing strip and a flexible sealing strip is fastened therein and projects therefrom to engage an adjacent thermal unit in wiping contact to prevent air leakage between adjacent thermal units.

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