United States Patent

Saunders et al.

[15] 3,648,411

[45] Mar. 14, 1972

[54] REFRIGERATOR DOOR TRIM HANDLES AND MOUNTING STRIP

[72] Inventors: **Orson V. Saunders**, Dayton; **Louis D. Benasutti**, Fairborn, both of Ohio

[73] Assignee: **General Motors Corporation**, Detroit, Mich.

[22] Filed: **Nov. 13, 1970**

[21] Appl. No.: **89,412**

[52] **U.S. Cl.** **49/460**, 16/111, 16/114, 312/320

[51] **Int. Cl.** **E05b 1/04**

[58] **Field of Search** 49/460, 501; 16/114, 110, 111; 312/320

[56] **References Cited**

UNITED STATES PATENTS

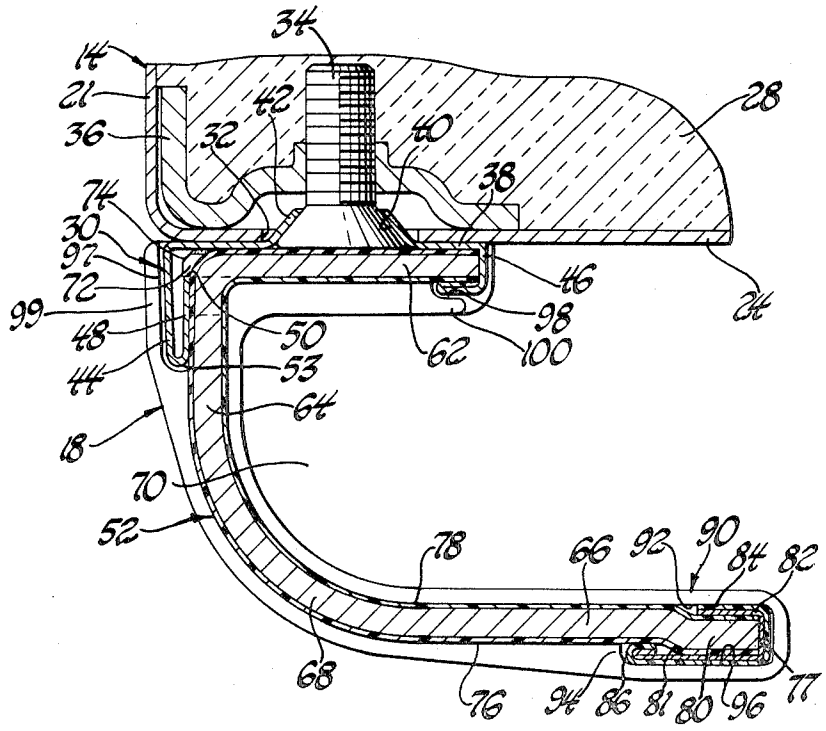
3,245,740	4/1966	Spielman	312/320 X
3,290,082	12/1966	Fritsch	49/460 X
3,514,904	6/1970	Riegelman	49/460

Primary Examiner—Reinaldo P. Machado
Assistant Examiner—Philip C. Kannan
Attorney—William S. Pettigrew, Frederick M. Ritchie and Edward P. Barthel

[57] **ABSTRACT**

An appliance door trim handle and panel mounting assembly in which a pair of trim handles are located along the inner vertical edges of each door closure of a side-by-side refrigerator freeze or the like. Each door trim handle assembly includes a channel-shaped mounting strip fixedly secured to the face of the door and a substantially J-shaped handle having its backwall seated in interlocked fashion in the mounting strip pocket. The mounting strip has a pair of legs one of which provides a recess adapted to receive the free edge of the handle backwall while the opposite leg has a resilient flange adapted to engage a plurality of lanced projections provided in the backwall of the handle allowing the resilient flange to snap back after the projections pass over the flange to thereby produce a snug fit which cannot be altered without the aid of tools.

3 Claims, 9 Drawing Figures



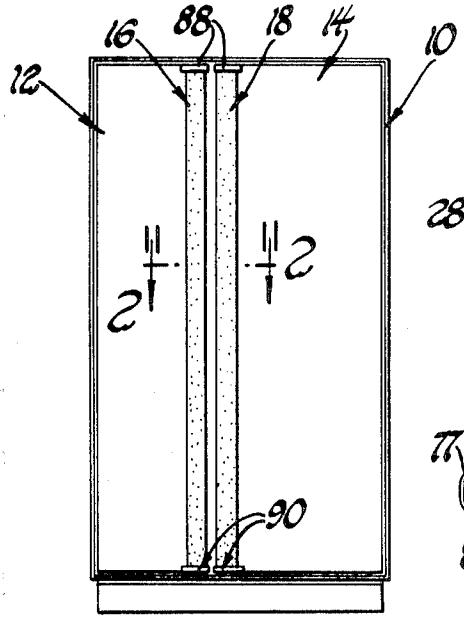


Fig. 1

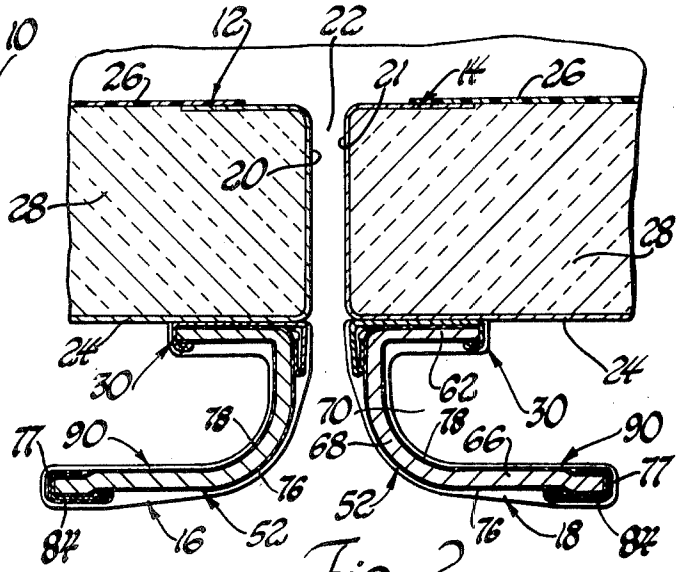


Fig. 2

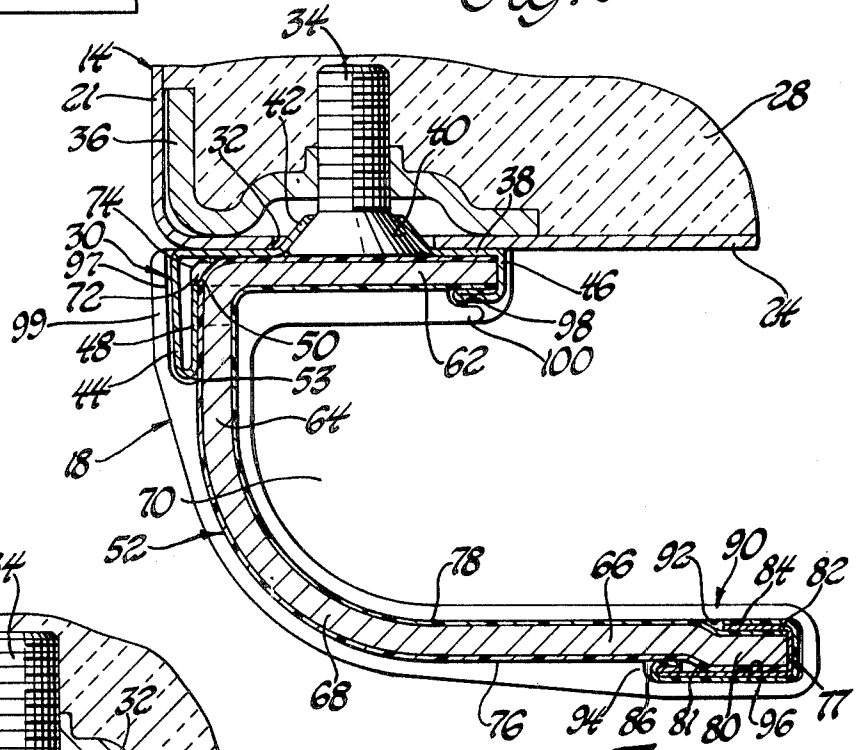


Fig. 3

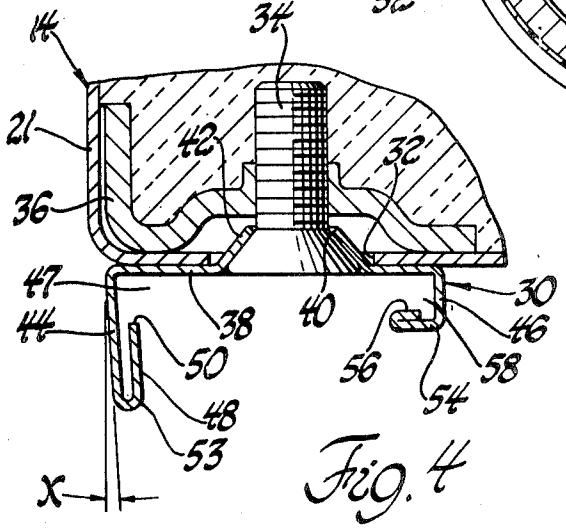


Fig. 4

INVENTORS
Orson V. Saunders &
BY Louis D. Benasutti
Edward P. Bartlet
ATTORNEY

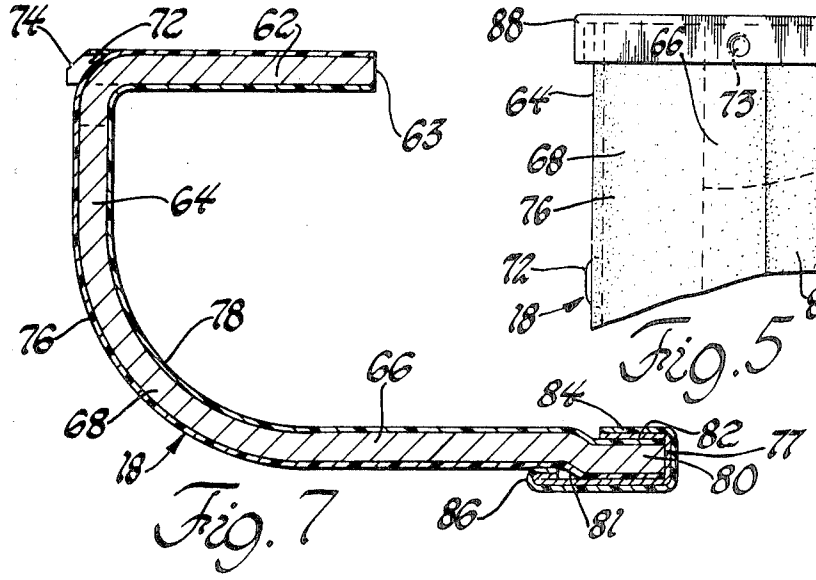


Fig. 7

Fig. 5

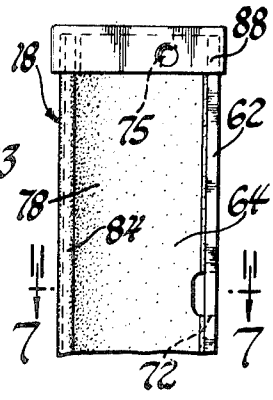


Fig. 6

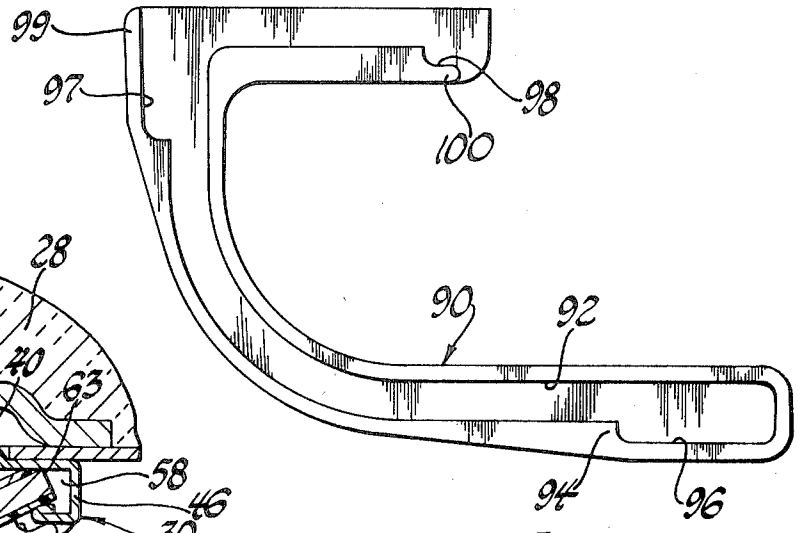


Fig. 8

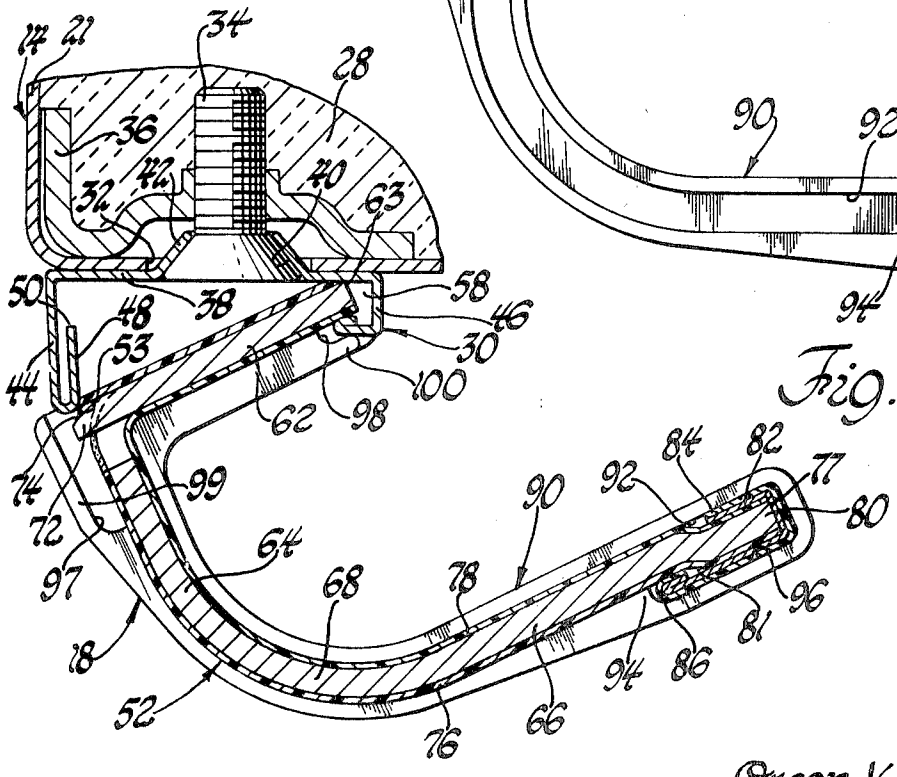


Fig. 9

INVENTORS
Orson V. Saunders &
BY Louis D. Benasutti
Edward P. Barthel
ATTORNEY

REFRIGERATOR DOOR TRIM HANDLES AND MOUNTING STRIP

This invention relates to refrigerator door constructions and more particularly to a door edge trim handle structure and means for mounting thereof to each of the inner vertical edges of side-by-side refrigerator doors.

The mounting of trim type decorative handles along the door edges of side-by-side refrigerator freezers presents a special problem in that the clearance between the mating edges of the two doors does not allow the use of standard edge type mounting arrangements as in the case of over-and-under style refrigerator freezers. Not only does the conventional use of rivets or screws for securing the handle detract from the overall appearance of the appliance but various types of decorative coatings such as vinyl laminates used on the handles may be subjected to damage during subsequent fabrication of the refrigerator after the handles have been mounted.

Accordingly, it is an object of this invention to provide new and improved means for mounting trim type handles to a refrigerator door construction.

It is another object of the invention to provide a new and improved means for attaching trim type handles adjacent the inner vertical edges of a pair of side-by-side door members for closing the access openings of an appliance which means does not adversely affect the appearance of the assembled components while not requiring attachment to the inner opposed edges of the doors.

Other objects of the present invention will become more apparent when considered in view of the following description and drawings wherein a preferred embodiment of the present invention is clearly shown.

In the drawings:

FIG. 1 is a front view of a refrigerator embodying the present invention;

FIG. 2 is a fragmentary sectional view taken substantially on the line 2—2 of FIG. 1;

FIG. 3 is an enlarged vertical section of one of the handles of FIG. 2 showing the securing means thereof;

FIG. 4 is a vertical section similar to FIG. 3 showing the handle mounting strip;

FIG. 5 is an enlarged fragmentary front view of the upper end of one of the handles;

FIG. 6 is an enlarged fragmentary side view of the upper end of the handle of FIG. 5;

FIG. 7 is an enlarged diagrammatic view taken on the line 7—7 of FIG. 6, illustrating the layers on the front and rear flanges surrounding the handle of the present invention;

FIG. 8 is a plan view of one of the end caps for the handle of the invention;

FIG. 9 is an enlarged fragmentary view illustrating a partially assembled trim style handle of the present invention.

Referring now to the drawings wherein a preferred embodiment of the invention is shown, reference numeral 10 generally designates a refrigerator freezer cabinet having a pair of doors 12 and 14 which are pivotally supported on the cabinet 10 adjacent the outer edges of the doors by means of hinges (not shown) for swinging, relative movement about their outer vertical edges. Each door is provided with a trim style handle assembly 16, 18 adjacent their inner vertical edges for selectively opening the doors 12, 14 respectively which are the subject of the present invention. Each of the doors 12, 14 supports a magnetic door seal (not shown) of the type generally disclosed in U.S. Pat. No. 3,075,258 for example, for sealing engagement with the metallic outer shell portion of the refrigerator cabinet. A magnet is provided in the portion of the seal and serves as the sole means for holding the doors closed. Magnetic door seals of this general type are old and for a more complete description reference may be had to the aforementioned patent.

In the refrigerator 10 there is provided a refrigerator cabinet having two separate insulated compartments (not shown) including a low temperature freezer compartment on the left hand side and a higher temperature above freezing storage compartment on the right hand side arranged in side-by-side relation and having a common upright insulated partition wall (not shown) separating the compartments against which each of the doors 12, 14 of the refrigerator abut thereagainst in sealed relation. The center partition serves as a vertical mullion or center post which with the cabinet outer shell portion engages the seal on the four sides of each of the doors 12, 14 to seal each of the side-by-side compartments.

One of the problems in providing trim style door handles adjacent the mating edges of doors of this side-by-side type refrigerator freezer is that it is not convenient to secure the handles to the opposed portion of the inner vertical door flanges 20, 21 defining the vertical gap 22 therebetween. The insulated wall section of each of the door structures, as shown by door 14 in FIG. 2, comprises an outer sheet metal wall 24, an inner molded plastic liner member 26, and insulation means 28 such as polyurethane foam insulation between the members 24 and 26 for detachably securing them together.

As both handle assemblies 16, 18 are identical so as to be mirror images of each other only the right hand handle assembly 18 will be described in detail with the reference numerals indicating like members in each assembly. The handle assembly 18 has a channel shaped support mounting strip 30 secured to the outer panel 24 of its associated door 14 by having the panel suitably apertured at 32 (FIG. 3) to receive screws 34 which pass through the strip 30 and into L-shaped tapping plates 36 to secure these parts together. At longitudinal spaced points the base wall 38 of the mounting strip 30 is formed with openings 40 the sides of which are tapered as at 42 to receive screws 34 that are threaded downwardly into the tapping plates 36. The securing strip base wall 38 has first and second legs 44, 46 bent from the sides thereof forming a substantially U-shaped pocket 47. The first leg 44 of the strip 30 adjacent the inner vertical edge of the door 14 has a resilient flange 48 formed integral with its end and reversely bent upon itself through an angle of 180° such that it is substantially parallel with the first leg 44 such that free end 50 thereof is spaced above the base wall 38 a defined distance which is substantially equal to the thickness of J-shaped handle portion 52 of the assembly 18.

With reference to FIG. 4 the leg 44 and its parallel resilient flange 48 are oriented at an angle X with respect to the vertical and formed yieldable to be deformed toward the vertical when the handle portion 52 is seated in the mounting strip pocket 47 in a manner to be explained. In the disclosed form the angle X is of the order of 3°. Expressed differently the flange leg 44 is bent toward base wall 38 at an acute angle with respect to a right angle relative thereto so that the outer shoulder portion 53 thereof projects laterally inwardly a slight distance beyond the free end 50 of the resilient flange 48.

The second leg 46 is located generally perpendicularly to the base wall 38 and has inwardly bent or inturned arm 54 integral with its outer end formed substantially parallel to the base wall 38 with the inturned arm 54 having its free edge 56 folded back upon itself so that the edge 56 is spaced from the bottom wall 38 a defined distance forming a recess 58 with the base wall substantially equal in width to the spacing of free end 50 of resilient flange 44 from the base wall 38 which in the instant form is between 0.100 and 0.090 inch which is the approximate thickness of the back wall 62 of the handle member 52. The mounting strip member 30 is preferably made of stainless steel stock having a thickness of the order of 0.018 inch.

As stated the elongated handle member 52 has a substantially J-shape configuration in cross section and as seen in FIG. 3 includes a back wall 62 with a bottom portion 64 joined to the inner edge of the back wall 62 and extends substantially right-angularly therefrom. A front wall 66 is joined to the outer edge of the bottom portion 64 and rises perpendicularly therefrom so as to be generally parallel to the back wall 62. The lower end of the front wall 66 is curved toward the back wall 62 providing a radiused area 68 forming smooth surfaces for comfortable gripping of the front wall 66 by the operator's hand at any location provided by the longitudinally extending space 70.

As best seen in FIGS. 5, 6 and 7, the back wall 62 has a plurality of vertically spaced lanced projections, one of which is shown at 72, struck therefrom which lie in the plane of the back wall 62 and extend slightly beyond the bottom portion 64 a defined distance which in the instant form is of the order of 0.025 inch. It will be noted in FIG. 7 that the rear edge 74 of the lanced projection 72 is chamfered at an angle of approximately 45° for ease of rotatably camming the handle 52 into the U-shaped pocket 47 of the mounting strip 30. The front wall 66 and the bottom portion 64 have holes adjacent their upper and lower edges as shown by the holes 73, 75 in FIGS. 5 and 6 for a reason to be explained.

As seen in FIG. 3 the instant handle member 52 is composed of a vinyl and rolled steel laminate with the outer exposed surface having a decorative vinyl layer 76, such as a woodgrain texture for example, while the inner surface may be provided with a black vinyl layer 78. The layers 76 and 78 preferably cover the entire inner and outer surfaces of the handle 52 except for the edges 63 and 77 to protect the same against exposure to moisture and thus minimize corrosion of the handle. To further enhance the appearance of the handle 52 it will be seen in FIG. 5 that the outer edge of the front wall 66 is formed offset at 80 and is built up by means of an underlying metal edge strip 82 and an overlying vinyl edge strip 84 having rolled edges at 86 to provide a smooth inner surface and an outer raised gripping border that protects the operator from contact with the edges of the metal portion of the handle. The offset edge 80 provides a shoulder 81 to prevent the edge strips from being worked loose from the handles.

A pair of decorative upper and lower end caps 88, 90 (FIG. 1) formed from suitable material such as die cast zinc having a bright chromium finish are provided for enclosing the upper and lower ends of the handle walls to complete the handle member 52. As best seen in FIG. 8 the lower end cap 90 is shown having a J-shape with a channel 92 formed in face 94 conforming to the cross section of handle 52 such that the lower end cap 90 may be readily press fitted on the lower end of the handle. The upper end cap 88 is a mirror image of the lower end cap and is located on the upper end of the handle walls in the same manner. The end caps 88, 90 are fixedly secured by means of staking operations wherein metal of the end caps is forced into holes such as the holes 73, 75 for example, whereby the end caps prevent sliding of the handle 52 relative to the mounting strip 30.

When attaching the handle member 52 including its end caps 88, 90 to the mounting strip 30 provided by the present invention, initially the handle member is installed by inserting the free edge 63 of back wall member 62 in the recess 58 as seen in FIG. 9 and rotating the handle member 52 so that the chamfered edge 74 of each projection 72 is cammed over the resilient flange 48 thereby flexing the flange 48 until the projections 74 are moved beyond the edge 50 to assume the position shown in FIG. 3 wherein the flange 48 has snapped back to its prestressed condition so as to provide a tight, locked engagement such that the handle is secured to mounting strip 30. By virtue of having the leg 44 bent at the acute angle X the shoulder portion 53 is deformed toward the vertical by the bottom portion 64 thereby pressure contacting the bottom portion and spring biasing the free edge 63 into the recess 58 and against leg 46 to additionally lock the handle in the mounting strip pocket in a secure, rattle-free manner.

With applicants' arrangement the trim type handle members can be mounted adjacent the vertical inner edges of the doors 12 and 14 as a final operation in the assembly of the refrigerator to insure that the decorative finish on the handle walls is not marred or scratched during the fabrication of the cabinet. While the handle member 52 is firmly affixed in interlocked relationship with the mounting strip 30 these components can be disassembled for repair or replacement. To accomplish the detaching operation, a screw driver or the like is inserted in the area between the shoulder portion 53 of arm 48 and pried against the radiused area 68 to move the edge 50 outwardly to clear each of the projections 72 so that the handle 52 may be rotated and withdrawn.

In this regard it will be noticed that the end caps, as shown by end cap 90 in FIG. 8, has its channel 92 formed with cutout portions 96, 97 and 98. The cutout portion 96 provides an enlarged space for receiving the lower end of edge strip 84. The cutout portion 97 is open at its rearward end and the cutout portion 98 is open at its rearward and outward ends to allow end cap extensions 99 and 100 to partially enclose the lower ends of the arms 44 and 46 and thereby provide a finished appearance of the attached handle member 52 in combination with the mounting strip 30 while still allowing the handle member 52 to be removed as described. The endmost lanced projections 72 are spaced from the upper and lower ends of the handle member a distance sufficient to allow the detachment of the handle member without being restricted by the extensions 99 and 100.

While the embodiment of the present invention as herein disclosed constitutes a preferred form, it is to be understood that other forms might be adopted.

What is claimed is:

1. A door trim handle assembly for domestic applicances comprising, an elongated channel-shaped mounting strip and a coextensive handle member, said mounting strip having a platelike base wall and first and second opposed legs extending forwardly from each side of said base wall forming a pocket therebetween, said first leg having a resilient flange formed on its end being reversely bent inwardly and rearwardly so as to be substantially parallel with said first leg, said resilient flange free end being spaced from said base wall a defined distance, said first leg forming an angle slightly less than ninety degrees with said base wall whereby the forward portion of said resilient flange provides an inwardly facing shoulder extending laterally inwardly beyond the free end of said resilient flange, said second leg located generally perpendicularly to said base wall and including an inturned arm formed on its forward end and being substantially parallel to said base wall to form a recess with said base wall, said inturned arm having its free end folded back upon itself and spaced above said base wall by a distance substantially equal to said defined distance, said handle member having a generally J-shaped configuration comprising a back wall for interlocked engagement with said mounting strip, a bottom wall joined to one edge of said back wall and extending substantially right angularly thereto, and a front wall joined to the front edge of said bottom wall and extending generally parallel to said back wall, said back wall having a thickness substantially equal to said defined distance and being spaced from said front wall by a distance sufficient for an operator's fingers to be received therebetween, the said one edge of said back wall having a plurality of lanced projections lying in the plane of said back wall and extending slightly beyond the surface of said bottom wall, said handle member being disposed between said opposed legs and locked in said pocket by means of the free edge of said back wall fitting into said recess, said lanced projections being sprung into the space of said defined distance between said resilient flange free end and said base wall by being cammed over the extension of said first leg shoulder, said resilient flange having sufficient flexure whereby said first leg shoulder presses against said handle bottom wall forwardly of the lanced projections of said back wall to spring biasingly lock said handle member within said mounting strip pocket.

2. The door trim handle assembly as defined in claim 1 wherein said handle member includes a pair of J-shaped end caps provided for attachment to the ends of said handle member walls, each of said end caps positioned for positive engagement with the adjacent ends of said mounting strip and said handle member walls whereby said handle member is retained against endwise sliding movement relative to said mounting strip.

3. In combination, walls forming a refrigerator cabinet having an opening therein, and a pair of doors arranged side-by-side and adapted to close said opening, said doors having respective elongated edge surfaces disposed adjacent each other when said doors close said opening, each said door in-

cluding an outer panel member forming an outer face thereof, an improved trim handle assembly on each of said doors adjacent said edge surfaces and substantially coextensive therewith, each said trim handle assembly comprising, an elongated channel-shaped mounting strip and a handle member, said mounting strip having a plate-like base wall and first and second opposed legs extending forwardly from each side of said base wall forming a U-shaped pocket therebetween, means for securing said base wall to the outer face of its associated door adjacent its elongated edge, said first leg having a resilient flange formed on its end being reversely bent inwardly and rearwardly so as to be substantially parallel with said first leg, said resilient flange free end being spaced from said base wall a defined distance, said first leg forming an acute angle of the order of eighty seven degrees with said base wall whereby the forward portion of said resilient flange provides an inwardly facing shoulder extending laterally inwardly beyond the free end of said resilient flange, said second leg located substantially ninety degrees to said base wall and including an inturned arm formed on its outward end and being substantially parallel to said base wall to form a recess with said base wall, said inturned arm having its free end folded back upon itself and spaced above said base wall by a distance substantially equal to said defined distance, said handle member including an elongated J-shaped trim portion of uniform section and a pair of upper and lower end caps, said elongated trim portion being substantially coextensive with said mounting strip and having a back wall for interlocked engagement with said mounting strip, a bottom wall joined to one edge of said back wall and extending substantially right angularly thereto, and a front wall joined to the front edge of said bottom wall and extending generally parallel to said back wall, said back wall having a thickness substantially equal to said defined distance and being spaced from said front wall by a distance sufficient for an operator's fingers to be received therebetween, the said one edge of said back wall having a plurality of lanced projections lying in the plane of said back wall and extending slightly beyond the surface of said bottom wall, said handle member being disposed between said opposed legs and locked in said pocket by means of the free edge of said back wall fitting into said recess, said lanced projections being sprung into the space of said defined distance between said resilient flange free end and said base wall by being cammed over the extension of said first leg shoulder, said resilient flange having sufficient flexure whereby said first leg shoulder presses against said handle bottom wall forwardly of said back wall lanced projections to spring biasingly lock said handle member within said mounting strip U-shaped pocket, each of said upper and lower end caps having a J-shaped configuration formed with a channel therein conforming with the cross section of said elongated J-shaped trim portion and said mounting strip, the ends of said elongated J-shaped trim portion walls and the ends of said mounting strip being received in said end cap channels, and means for fixedly securing said end caps to said elongated trim portion whereby said handle member is retained against endwise sliding movement relative to said mounting strip.

* * * * *