April 27, 1954 J. W. JACOBS ET AL 2,676,727

REFRIGERATING APPARATUS

Filed July 23, 1952 2 Sheets-Sheet 1

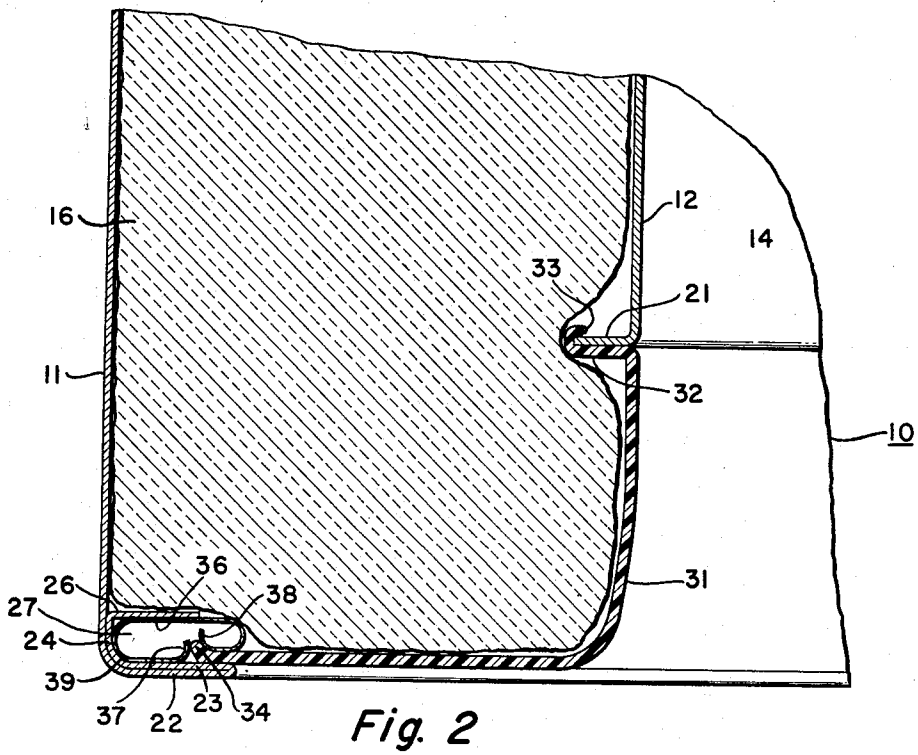


Fig. 2

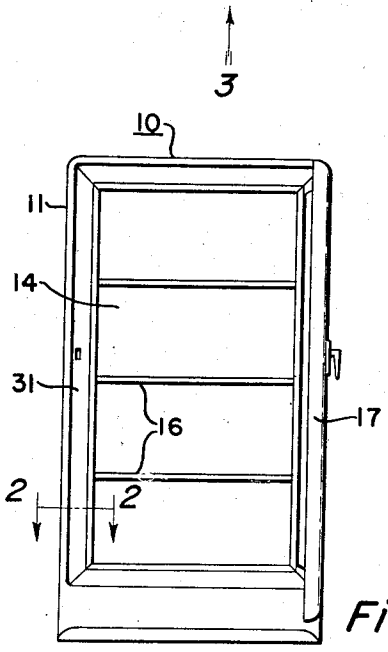


Fig. 1

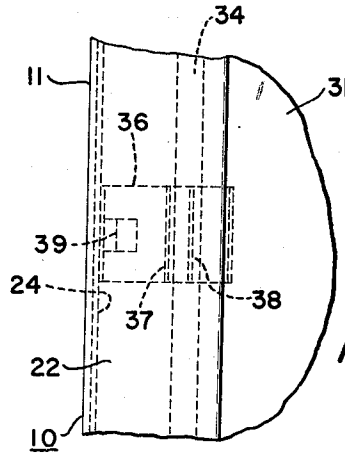


Fig. 3

INVENTOR.
James W. Jacobs
and
Keith K. Kesling
By Willits, Hardman & Fehr.

April 27, 1954 J. W. JACOBS ET AL 2,676,727

REFRIGERATING APPARATUS

Filed July 23, 1952

2 Sheets-Sheet 2

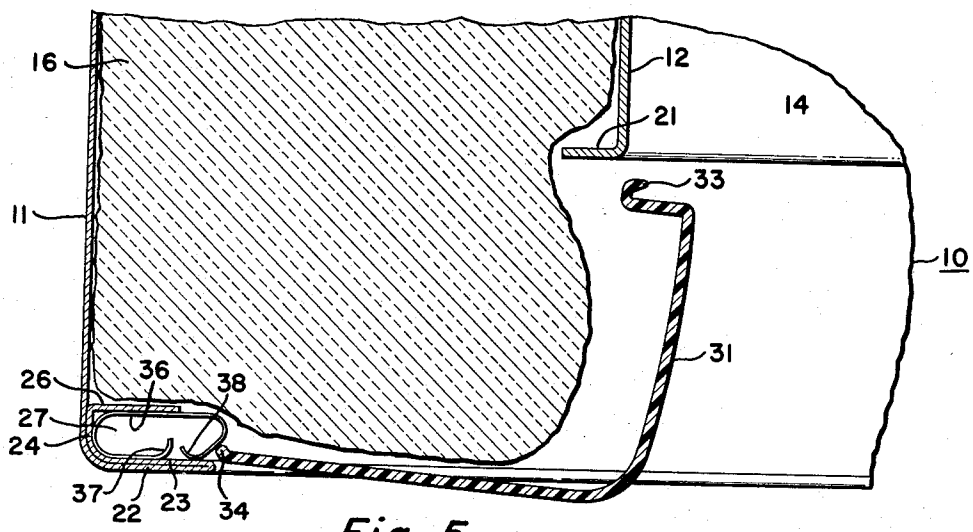


Fig. 5

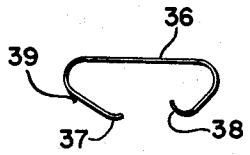


Fig. 4

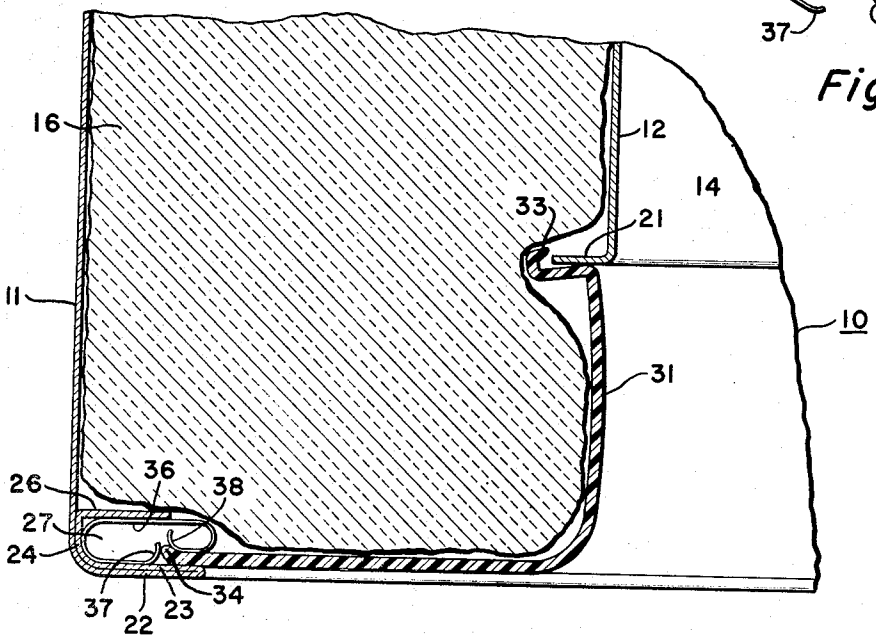


Fig. 6

INVENTOR.
James W. Jacobs
and
Keith K. Kesling
By Willits, Hardman & Fehr.

Patented Apr. 27, 1954

2,676,727

UNITED STATES PATENT OFFICE

2,676,727

REFRIGERATING APPARATUS

James W. Jacobs and Keith K. Kesling, Dayton, Ohio, assignors to General Motors Corporation, Dayton, Ohio, a corporation of Delaware

Application July 23, 1952, Serial No. 300,437

5 Claims. (Cl. 220—9)

1

This invention relates to refrigerator cabinet wall constructions and particularly to the wall structure at the door opening providing access to the interior of the cabinet.

An object of our invention is to provide an improved method of and means for locking a trim breaker strip bridging the space between inner and outer wall members of a refrigerator cabinet to these wall members.

Another object of our invention is to lock a trim breaker strip to edge portions of inner and outer wall members of a refrigerator cabinet by means located behind the strip so that the strip will conceal the locking means and thus improve the appearance of the cabinet at the access opening thereof.

A further object of our invention is to removably lock an insulating breaker trim strip in bridging relation to spaced apart edge portions of metal wall members of a refrigerator cabinet in the vicinity of the throat or access opening to a food storage compartment therein by a plurality of resilient spring clip means, which are compressed between opposed walls of a groove along the edge of the outer metal cabinet wall member and biases an edge of the strip into abutment with the wall of a groove.

In carrying out the foregoing objects, it is a still further and a more specific object of our invention to provide a breaker trim strip biased into abutment with an edge portion of the outer metal cabinet wall in the manner specified and which has a hook-like attaching edge removably interlocked with an attaching edge on the inner of the cabinet metal wall members.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings, wherein a preferred form of the present invention is clearly shown.

In the drawings:

Figure 1 is a front view of a vertical home freezer cabinet having our invention embodied therein and showing the freezing compartment door in open position;

Figure 2 is an enlarged fragmentary sectional view taken on the line 2—2 of Figure 1 showing the breaker trim strip of the present invention locked in place upon the cabinet;

Figure 3 is an enlarged front view taken in the direction of the arrow 3 in Figure 2 showing one of the resilient spring clips employed to secure the breaker trim strip to the cabinet;

Figure 4 is a view showing the form of one of the spring clips before the same is compressed into the position disclosed in Figure 2;

Figure 5 is a view similar to Figure 2 showing one step in a method of applying the breaker trim strip to the cabinet; and

Figure 6 is a view similar to Figure 4 showing another step in the method of assembling the breaker strip to cabinet

Referring to the drawings, for illustrating the invention, we show in Figure 1 thereof a refrigerator cabinet generally represented by the reference character 10. Cabinet 10 includes a metal outer wall forming member or shell 11 and an inner metal liner or wall member 12 forming a food storage compartment 14 within the cabinet. Any suitable or desirable insulating material 16 may be disposed between the wall members 11 and 12 for insulating the compartment 14 and we prefer to employ bagged or packaged glass or rock wool for this purpose. The refrigerator cabinet 10 in the present disclosure is of the vertical front opening home freezer type wherein the interior of the storage compartment 14 is maintained below freezing for the quick freezing of foods or the storage of frozen food products. A closed rerigeration system (not shown) is associated with cabinet 10 for cooling the interior of compartment 14. The reefrigerating system may include a refrigerant translating device and refrigerant evaporating conduits connecting therewith and surrounding the liner of metal member 12 as is conventional in the art. Certain portions of the refrigerant evaporating conduits may be incorporated or formed in shelves 18 within compartment 14 for supporting food products therein. A door 17, hinged to cabinet 10, of any suitable or desirable construction normally closes the access opening of compartment 14 and includes a gasket extending therearound which engages a part of the front of cabinet 10. The inner liner or metal wall member 12 of cabinet 10 may be supported from the outer metal wall member or shell 11 in any suitable or conventional manner. The metal wall member 12 is preferably supported at its corners from the metal wall member 11 by suitable gusset plates of low heat conductivity and

these wall members have spaced apart edge portions in the vicinity of the access opening to compartment 14. The space between the edges of the inner metal wall member 12 and the outer metal wall member 11 is bridged by an insulating breaker trim strip of nonmetallic material so as to break any metal-to-metal contact therebetween and prevent conduction of heat into the compartment 14. It is this breaker strip arrangement and the method of removably locking the same upon the cabinet to which our invention specifically relates.

In the present structure the inner liner or metal wall member 12 has its edge spaced inwardly from the outer metal wall member 11 and is laterally flanged as at 21 (see Figure 2) to provide the same with a hook-like attaching portion. The outer shell or metal wall member 11 of cabinet 10 has portions adjacent its edge bent laterally as at 22, then back upon itself as at 23, to provide a part 24 extending adjacent to and along the wall 11 and is thence bent inwardly of wall 11 as at 26. Bent portions 23, 24 and 26 of the outer metal wall member 11 increase the structural strength of the front part of cabinet 10 and provide or form an inwardly facing groove 27 for a purpose to be hereinafter described. The gasket of door 17 is adapted to seal against the bent portion 22 of wall member 11 to close the access opening of compartment 14. A nonmetallic trim breaker strip 31 of substantially L-shape in cross sectional contour extends between and bridges the space intermediate the spaced apart edge portions of wall members 11 and 12 to provide a trim molding at the throat or access opening of food compartment 14 over the insulating material 16. The breaker strip 31 is preferably molded from powdered styrene which is heated and forced into suitable molds. Other materials such as polyvinyl-acetate or polyvinyl-chloride may, if desired, be employed to form the breaker strip 31. In fact, any suitable material of low heat conductivity may be used to form the breaker strip 31, and due to the particular cross sectional shape of this strip it is possessed with some resiliency intermediate its edges to permit movement of these edges relative to one another. One edge of breaker strip 31 is provided with a flange or shoulder 32 normally lying against the flange 21 on wall member 12 and terminating in the form of a short hook 33 to provide the same with a hook-like attaching portion fitting over the edge of flange 21 to interlock this edge of the breaker strip to the attaching portion of wall member 12. The other edge of breaker strip 31 is provided with an inwardly directed bead or projection 34 normally positioned in the groove 27, between the opposed bent wall portions 23, 24 and 26 of wall member 11, with a part of the strip adjacent thereto held in abutment with the one opposed wall 23 of the groove. In order to maintain the interlock between the attaching portion of strip 31 and the attaching portion of flange 21 on inner metal wall member 12, we provide a resilient means which is compressed in the groove 27 and biases the part of breaker strip 31 adjacent its bead 34 against or into abutment with the one wall 23 of the groove. This means in the present disclosure comprises a spring clip 36 having ends 37 and 38 and a cut-out sharp edged short angular projection 39 (see Figures 3 and 4). Spring clip 36 abuts wall 24 of groove 27 and is compressed between the opposed walls 23 and 26 thereof. The ends 37 and 38 of clip 36 engage opposed sides of the bead or projection 34 on the one edge of breaker strip 31 and the sharp edge of the projection 39 of the clip tends to bite into the one wall 23 of groove 27 (see Figure 2) to prevent movement of the clip outwardly of the groove 27. Spring clip 36 is of a predetermined cross sectional contour before being compressed between the walls 23 and 26 of groove 27, such for example as that shown in Figure 4, and after having been compressed in groove 27 is forced into a substantially elliptical shape in cross sectional contour. The portion adjacent end 38 of clip 36 bears against the inner wall surface of breaker strip 31 adjacent the bead 34 thereof to force or bias this edge of the strip into abutment with the one opposed wall 23 of groove 27. Biasing of this edge portion of breaker strip 31 maintains the hook-like attaching portion 33 along the inner edge of strip 31 in interlocked relationship with the attaching portion or flange 21 on metal wall member 12.

Having described the assembled structure we will now, by referring to Figures 4 and 5 of the drawings, describe the method of attaching the breaker strip 31 to the cabinet walls. Three or four of the spring clips 36 are forced into the groove 27 along each edge of outer wall member 11 at spaced apart points so as to be compressed and locked between the opposed walls 23 and 26 of the groove. In forcing edge clip 36 into the groove 27 the finger projection 39 thereon is moved substantially into alignment with that portion of the clip adjacent the end 37 thereof and its sharp edge tends to bite against the wall 23 of groove 27 to prevent removal of the clip 36 from the groove. Edges of the breaker strip 31 are then positioned in proximity to the edges of the inner and outer metal cabinet wall members 11 and 12 as shown in Figure 5 of the drawings. In other words the projection or bead 34 along the one edge of breaker strip 31 is placed in contact with that part of the plurality of spaced apart spring clips 36 adjacent the curved end 38 thereof with the hooked edge of the strip 31 positioned slightly outward of flange 21 on the metal wall member 12. Thereafter a force is applied to the breaker strip 31 to move the bead 34 thereon into a position between the one wall 23 of groove 27 and that portion of spring clip 36 adjacent its end 38. Continued movement of the beaded edge of breaker strip 36 into groove 27 causes that part of spring clip 36 adjacent its end 38 to be further compressed whereupon bead 34 strikes the curved end 37 of spring clip 36 and the end 38 thereof snaps over the bead 34 (see Figure 5). That part of spring clip 36 adjacent its end 38 thereafter bears against the portion of breaker strip 31 adjacent its bead or projection 34 to bias this edge of the breaker strip tightly into abutment with the one opposed wall 23 of groove 27. The attaching edge of breaker strip 31 is now readied to be interlocked with the attaching flange 21 on the inner metal wall member 12. As before stated, breaker strip 31 is, due to its cross sectional shape, sufficiently resilient to permit a temporary deformation thereof in order that the hook 33 along its inner edge may be snapped over the flange 21 on member 12. Thus a force applied to the breaker strip 31 along its hooked edge will move the hook 33 thereon past the flange 21 and into alignment with its edge, as shown in Figure 6 of the drawings. Upon releasing this force applied to strip 31 its resiliency will cause the same to spring back to its original or normal cross sectional contour whereupon the hook 33 will move over

and engage the edge of flange 21 to thereby interlock the attaching edge portion of breaker strip 31 to the attaching edge portion of inner cabinet wall member 12 as shown in Figure 2 of the drawings. The biasing of the beaded edge of breaker strip 31 against the one wall 23 of groove 27 thereafter maintains the other edge portion of the strip interlocked to the attaching edge portion or flange 21 on wall member 12. Breaker strip 31 may, if necessary, be detached and removed from the cabinet metal wall members 11 and 12 by reversing the assembling operations described.

From the foregoing it should be apparent that we have provided an improved refrigerator cabinet wall construction and a novel method of removably locking an insulating breaker trim strip to inner and outer metal wall members of the construction about the throat or door opening providing access to a food storage compartment in the cabinet. Our invention provides insulating breaker trim strips which cover and conceal their locking on attaching means and which are sufficiently resilient to permit flexure thereof to carry out a novel method of assembling the strips to the cabinet and of removing the same therefrom.

While the form of embodiment of the invention as herein disclosed constitutes a preferred form, it is to be understood that other forms might be adopted, as may come within the scope of the claims which follow.

What is claimed is as follows:

1. A refrigerator cabinet provided with an access opening, said cabinet including inner and outer sheet metal wall members having spaced edges in the vicinity of the access opening, a non-metallic breaker strip bridging the space between the edges of said wall members, the metal at the edge of said inner wall member being bent to provide a hook-like attaching portion therealong, the metal adjacent the edge of said outer wall member being bent to form opposed walls of a groove therealong, said breaker strip having a hook-like attaching edge fitting over and being interlocked with the hook-like attaching edge portion of said inner wall member, the other edge of said breaker strip having a bead thereon and extending into the groove along the edge of said outer wall member, resilient means for securing the beaded edge of said breaker strip to the edge of said outer wall member, said resilient means comprising a spring clip having ends engaging opposed sides of the bead on said breaker strip and having other portions compressed between the opposed walls of said groove, and said spring clip having a part thereof engaging and biasing a portion of said breaker strip adjacent said bead thereon into abutment with one of the opposed walls of said groove.

2. A refrigerator cabinet provided with an access opening, said cabinet including inner and outer sheet metal wall members having spaced edges in the vicinity of the access opening, a non-metallic breaker strip bridging the space between the edges of said wall members, the metal at the edge of said inner wall member being bent to provide a hook-like attaching portion therealong, the metal adjacent the edge of said outer wall member being bent to form opposed walls of a groove therealong, said breaker strip having a hook-like attaching edge fitting over and being interlocked with the hook-like attaching edge portion of said inner wall member, the other edge of said breaker strip having a bead thereon and extending into the groove along the edge of said outer wall member, resilient means compressed between the opposed walls of said groove for securing the beaded edge of said breaker strip to the edge of said outer wall member, said resilient means comprising a spring clip of substantially elliptical shape in horizontal cross-section when compressed between the opposed walls of said groove, said spring clip having ends engaging opposed sides of the bead on said breaker strip, said spring clip having a part thereof adjacent one of its ends engaging and biasing a portion of said breaker strip adjacent said bead thereon into abutment with one of the opposed walls of said groove, and said spring clip also having a sharp edged projection contacting and tightly bearing against said one wall of the opposed walls of said groove.

3. A refrigerator cabinet provided with an access opening, said cabinet including inner and outer sheet metal wall members having spaced edges in the vicinity of the access opening, a non-metallic breaker strip bridging the space between the edges of said wall members, the metal at the edge of said inner wall member being bent to provide a hook-like attaching portion therealong, the metal adjacent the edge of the said outer wall member being bent to form opposed walls of a groove therealong, said breaker strip having a hook-like attaching edge fitting over and being interlocked with the hook-like attaching edge portion of said inner wall member, the other edge of said breaker strip having a bead thereon and extending into the groove along the edge of said outer wall member, resilient means compressed between the opposed walls of said groove for securing the beaded edge of said breaker strip to the edge of said outer wall member, said resilient means comprising a spring clip of substantially elliptical shape in horizontal cross-section when compressed between the opposed walls of said groove, said spring clip having ends engaging opposed sides of the bead on said breaker strip, said spring clip having a part thereof adjacent one of its ends engaging and biasing a portion of said breaker strip adjacent said bead thereon into abutment with one of the opposed walls of said groove, said spring clip having a part thereof adjacent its other end bearing against said one wall of the opposed walls of said groove, and said spring clip also having a sharp edged projection contacting and tightly bearing against said one groove wall.

4. A refrigerator cabinet provided with an access opening, said cabinet including inner and outer metal wall members having spaced edges in the vicinity of the access opening, a non-metallic breaker strip bridging the space between the edges of said wall members, the metal adjacent the edge of one of said wall members being bent to provide a hook-like portion therealong, the metal adjacent the edge of the other of said wall members being bent to form inner and outer opposed walls of a groove therealong, said breaker strip having a hook attaching edge fitting over and being interlocked with the hook-like portion of said one wall member, the other edge of said breaker strip extending into the groove along the edge of said other wall member, said other edge of said breaker strip having a surface adjacent thereto engaging the outer opposed wall of said groove and having a bead extending inwardly toward the inner opposed wall of said groove, resilient means for securing said breaker strip between the edges of said metal wall members, said

resilient means comprising a spring clip having ends each engaging one of the sides of said bead on said breaker strip and having other portions compressed between the opposed walls of said groove, and said spring clip having another portion thereof engaging a part of said breaker strip adjacent one side of the bead thereon and biasing said surface on said breaker strip adjacent said other edge thereof into abutment with the outer opposed wall of said groove.

5. A structure as defined in claim 4 wherein a sharp edged projection on the spring clip contacts and tightly bears against one of the opposed walls of the groove.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
Re. 21,864	White	July 22, 1941
2,349,420	Goulooze	May 23, 1944
2,375,880	Yoxsimer	May 15, 1945
2,613,509	Philipp	Oct. 14, 1952