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BREAKER STRIP CONSTRUCTION

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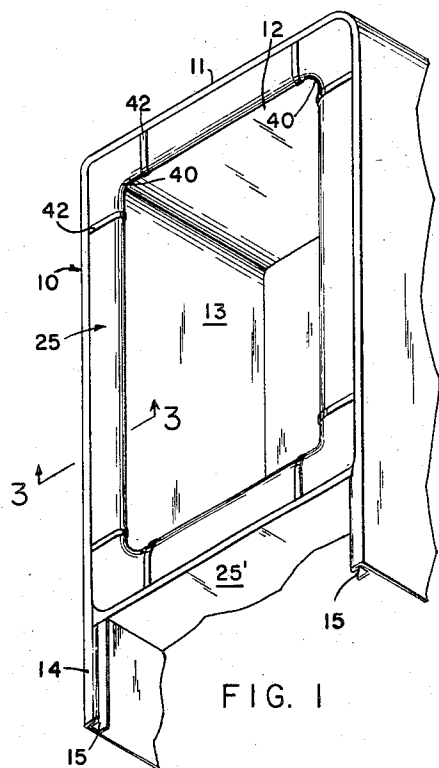


FIG. 1

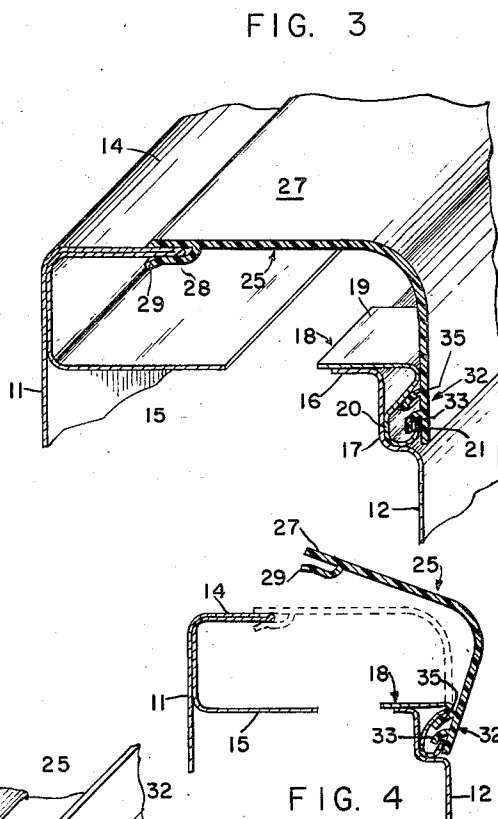


FIG. 3

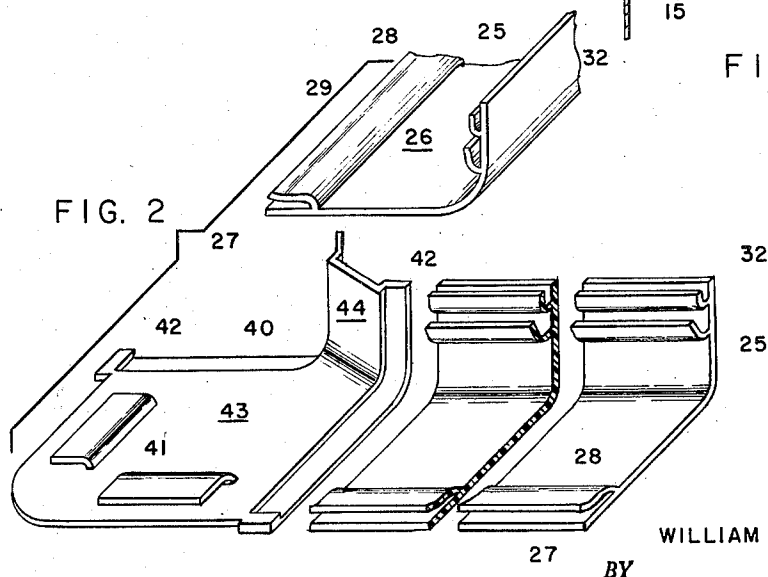


FIG. 2

FIG. 4

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BREAKER STRIP CONSTRUCTION

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1 Claim. (Cl. 220-9)

This invention relates to heat insulating structures, more particularly to refrigerator cabinets, and the means employed for interconnecting the conventionally employed inner and outer shells of refrigerators.

Conventional refrigerator cabinets comprise an outer shell within which is positioned a so-called liner at a spaced distance from said shell. A heat insulating material is interposed between the shell and the liner to minimize the transmission of heat there between. As is apparent, some connection is necessary between the edges of the outer shell and those of the inner liner for achieving structural unity. It is desirable that this connection have rigidity, and be of a relatively non-heat transmitting nature, so that there will be no heat transfer between the shell and the liner. To this end, so-called breaker strips have been evolved, formed of a resilient material of plastic or the like. Where this breaker strip is rigidly secured to the shell and the liner, as by means of a series of spaced screws or clips, accurate alignment of the components is necessary by relatively skilled workmen, and it is often found that the securing elements tend to damage the breaker strip. The assembly procedure is also fairly time consuming and costly, usually requiring special tools and skills. With time, it is found that the breaker strip tends to deteriorate due to the fact that stresses are placed on the strip by the liner and the shell as they undergo relative movement resulting from normal use of the refrigerator, as by opening and closing of doors, and shifting of the refrigerator cabinet. Conventional refrigerator cabinets are generally constructed so that the metal edges of the shell and liner are exposed, thus posing a danger to the user. An additional problem arises in conventional breaker strips in positioning of the breaker strip at the corners of the box.

It is with the above problems in mind that the present construction has been evolved, a construction providing a breaker strip which functions to join the outer shell and the inner liner of a refrigerator cabinet at the same time insulating same, with said breaker strip mounted in a relatively free-floating position with respect to said shell-liner, whereby the breaker strip is subject to little or no stress or strain and all exposed metal edges of the shell and liner are hidden. Assembly of the shell, liner, and breaker strip is of a simple nature which permits minimizing of manufacturing costs, and a simple inexpensive corner transition piece is provided.

It is accordingly a primary object of this invention to provide an improved breaker strip for joining and heat insulating the outer shell and inner liner of a refrigerator cabinet.

A further object of the invention is to provide a breaker strip construction which will be subject to a minimum of destructive stresses and resultant damage during assembly of the refrigerator cabinet.

An additional object of this invention is to provide a breaker strip subject to minimum wear during normal usage of the refrigerator.

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It is also an object of this invention to provide a breaker strip structure which eliminates any dangers inherent in exposed metal edges of the shell or liner.

Another object of the invention is to provide a breaker strip of a simple nature, which requires minimal skills in assembling with the shell and liner of a refrigerator cabinet.

A still further object of the invention is to provide an improved corner piece structure.

These and other objects of the invention are achieved by forming a breaker strip of nonheat transmitting material of uniform cross section facilitating formation by extrusion. Undue stresses during fabrication and use are eliminated by making the strip of uniform thickness throughout its cross-section, thus producing a structure of uniform strength and heat transfer quality. Engaging portions are provided on the edges of the strip secured to and hiding the exposed sharp edges of the refrigerator shell and liner. In assembled position the breaker strip is relatively free floating with respect to the refrigerator cabinet. The shape of the strip permits assembly with the shell and liner by "rotating" the strip into position as will become hereinafter more apparent. Corner pieces are provided to join the shell, liner, and breaker strip.

A primary feature of the invention resides in provision of a breaker strip formed of heat insulating material of uniform thickness whereby no part will serve as a stress concentration point.

An additional feature of the invention resides in the fact that the breaker strip is held by clips on one edge and engages the shell at its outer edge thus hiding all exposed metal edges, and at the same time presenting no alinement problems.

Another feature of the invention resides in the fact that the breaker strip, in assembled position is relatively "free floating" with respect to the shell and liner thus eliminating the stresses resulting from relative movement between shell and liner.

The constructional details of the invention and their mode of functioning will be made most manifest and particularly pointed out in conjunction with the accompanying drawings wherein:

Figure 1 is a perspective front elevational partial view of a conventional refrigerator cabinet with the front door removed to reveal the positioning of the novel breaker strip;

Figure 2 is an exploded perspective detail view of a typical corner arrangement of the breaker strip, showing the corner panel as positioned with respect to the vertical and horizontal strip portions, and viewed from the normally hidden side to reveal the attaching portions of the strips and corner piece;

Figure 3 is an enlarged cross-sectional view taken on line 3-3 of Figure 1 through the breaker strip, illustrating how it engages the shell and liner of the refrigerator cabinet; and

Figure 4 is a cross sectional detail view illustrating how the novel construction facilitates assembly of the refrigerator cabinet.

Referring now more particularly to the drawings, like numerals in the various figures will be taken to designate like parts.

As best seen in Figure 1, a conventional refrigerator cabinet 10 is provided comprising an outer shell 11 and an inner liner 12 positioned within the shell at a spaced distance therefrom. A heat insulating material (not shown) is interposed between the shell 11 and liner 12 to minimize heat transfer between the interior of the liner, which forms a storage compartment 13 for the articles to be refrigerated, and the exterior of the shell. In the illustrated embodiment of the invention the storage

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compartment 13 is shown arranged in the upper portion of the cabinet, but is obviously not limited to this arrangement.

Shell 11 is fabricated of sheet metal or a like relatively rigid sheet material, and is formed at its front edge with an inwardly extending flange 14, extending at right angles to the shell 11, as best seen in Figure 3. Flange 14 is bent back on itself, along the flange, down along the shell 11, and inwardly at a spaced parallel distance from flange 14 to form a reinforcing channel 15. As is apparent, reinforcing channel 15 may be formed as an independent member, but is preferably formed integrally with the shell to insure a smooth exterior surface and to economize in manufacturing costs.

Liner 12 as best seen in Figure 3 is provided with a flange 16, extending outwardly at right angles to the liner. Flange 16 is offset from liner 12 by a step 17.

Secured at spaced points along flange 16 are clips 18, as best seen in Figure 3. Clip 18 comprises: a flat portion 19 adapted to lie flush along flange 16, a hook shaped portion 20 resting on step 17, and an engaging tip 21.

In the illustrated refrigerator cabinet construction, a pan 25' is provided, spaced from the bottom wall of liner 12 to permit insulation of the storage compartment 13 from the condenser coils and compressor of the conventional refrigeration systems employed, and which are positioned at the lowermost part of the cabinet (not illustrated). Pan 25' is formed at its forward edge with a flange 14 and reinforcing channel 15 as shown in the shell detail in Figure 1.

A breaker strip 25 as best seen in Figures 2, 3 and 4, is provided for joining the exposed edges of shell 11 and liner 12. Breaker strip 25 is designed to engage and conceal the exposed edges of shell 11 and liner 12.

The breaker strip 25 comprises a body portion 26, and shell engaging portion 27, and a liner engaging portion 32. Shell engaging portion 27 is fabricated integrally with the body portion 26 and is of a thickness equal to that of body portion 26. This shell engaging portion 27 comprises an overlying lip 28, joined at one end to body portion 26 and extending at a spaced distance from the body portion to its marginal edge where it is formed with a slightly raised guide ledge 29.

The liner engaging portion 32 is provided with a hook-tip engaging lip 33 secured at one end of the body portion and extending outwardly thereover at a spaced distance therefrom as best seen in Figures 3 and 4. The hook-tip engaging lip 33 forms a parallel walled pocket between the lip 33 and the liner engaging portion 32. Within this parallel walled pocket, the tip 21 of hook 20 may be securely retained. An additional biasing lip 35 is arranged adjacent said hook-tip engaging lip for biasing the breaker strip into its normal position. As is apparent in the drawings, the aforementioned lips are of a thickness equal to that of the body portion of the liner, and the transition between the lips and the breaker strip body portion is of a gradual nature, whereby no stress concentration points are present.

Corner pieces 40, as best seen in Figures 1 and 2, facilitate joining the breaker strip at the corners of the refrigerator cabinet. Corner piece 40 comprises a rectangular shaped body portion 43 having an upstanding piece 44 at substantially right angles thereto. Extending along the body portion 43 and upstanding portion 44 are recessed flanges 42 whose function will become hereinafter more apparent. Also provided on body portion 43 are flange engaging lips 41 arranged as best seen in Figure 2.

Operation

The above disclosed breaker strip structure may be most readily employed to provide an interconnection between the conventional shell and liner of a refrigerator cabinet.

When employed in a conventional cabinet such as illus-

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trated in Figure 1, it is merely necessary to provide the liner 12 with a series of spaced clips 18 arranged along flange 16 of the liner as best seen in Figure 3. The securing of these clips to the liner requires no precise adjustments, nor any special tools. Once these clips are in position and arranged with hook 20 resting on step 17, it is a simple matter to install the breaker strip 25.

As best seen in Figure 4, this is done by "rotating" the strip into position. Hook-tip engaging portion 32 is engaged with hook-tip 21. Thereafter rotation of the breaker strip to bring it into a position such as shown in dotted lines in Figure 4 is a simple matter. Engagement of flange 14 of the shell is achieved by slightly bending the breaker strip whereby guide ledge 29 facilitates entry of the flange beneath lip 28 of shell engaging portion 27.

Thereafter, corner pieces 40 as best seen in Figures 1 and 2, are positioned at the corners of the cabinet. Shell engaging lips 41 grip the flange 14 of the shell and thereby securely retain the corner piece in position. Recessed flanges 42 overlie the adjacent breaker strip, and form a smooth secure joint.

When breaker strip 25 is in assembled position in the cabinet it is relatively free floating, thus movement of the cabinet sets up no stresses in the strip. It will be observed that the entire breaker strip structure above disclosed and illustrated is formed with no section of greater thickness than any other, whereby no stress concentration points are present, thus producing a stronger structure. The uniformity of thickness also provides for a uniformity of heat transfer quality. All sharp edges are hidden, and a relatively smooth, highly efficient breaker strip results.

The above disclosure has been given by way of illustration and elucidation and not by way of limitation, and it is desired to protect all embodiments of the hereindisclosed inventive concept, within the scope of the appended claim.

I claim:

Refrigerated cabinet construction comprising an outer shell having top, rear and side walls and an open side, an inwardly extending flange formed on the front edge of said shell, a liner having top, side and rear walls mounted within said shell in spaced relation to the top, side and rear walls thereof, a flange extending outwardly from the forward edge of said liner, a step interposed between said flange and said liner wall; clips spacedly arranged along said step and secured to said liner flange, said clips being formed with a hook-shaped portion with an engaging tip and a portion overhanging said engaging tip; a breaker strip arranged between the forward edges of said liner and said shell to close off the opening therebetween, said breaker strip comprising: a body portion extending between said flange on said shell and the step on said liner, a first lip arranged along a marginal edge of said body portion and overlying same to form a pocket therewith, a second lip formed on the opposite marginal edge of said body portion and overlying same to form a pocket therewith, and a biasing lip contacting the lower face of said overlying portion spaced adjacent said second lip, said biasing lip being operative to afford relative sliding engagement between the clip and the biasing lip after the pocket formed by the second lip engages the tip of the clip, as the breaker strip is rotated to effect connection between the shell flange and the pocket formed by the first lip on the breaker strip.

References Cited in the file of this patent

UNITED STATES PATENTS

70	2,329,755	Gouloze	Sept. 21, 1943
	2,582,862	Frykdahl	Jan. 15, 1952
	2,662,660	Frykdahl	Dec. 15, 1953
	2,679,944	Morton	June 1, 1954
	2,708,529	Lander et al.	May 17, 1955
75	2,758,741	Saunders	Aug. 14, 1956