Jan. 12, 1954

E. T. MORTON

REFRIGERATOR DOOR

2,665,456

Filed May 12, 1950

2 Sheets-Sheet 1

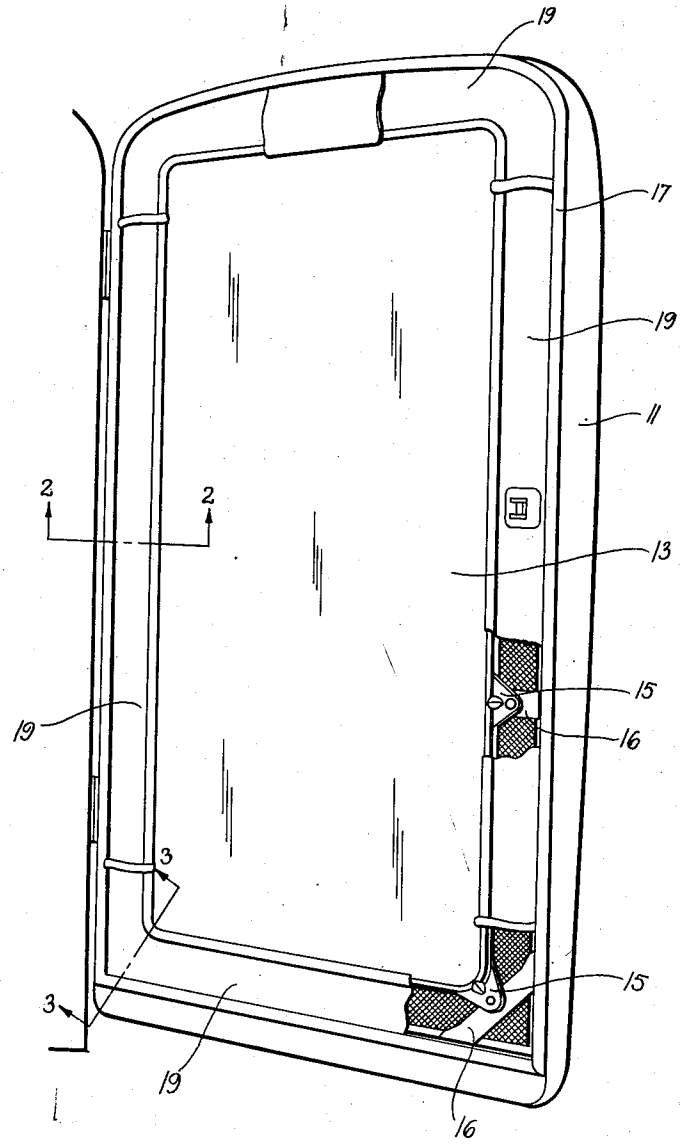


FIG. 1

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2 Sheets-Sheet 2

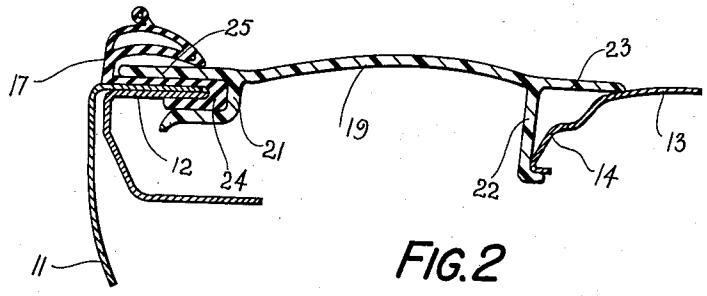


FIG. 2

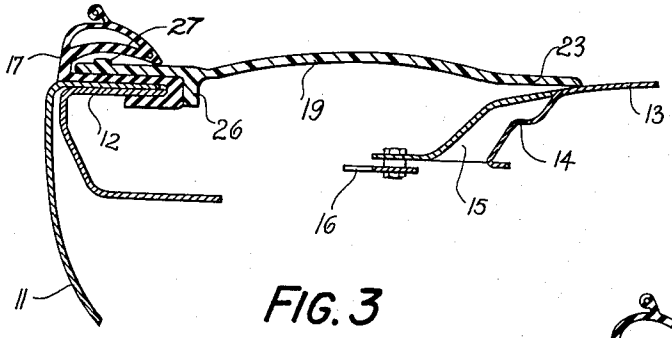


FIG. 3

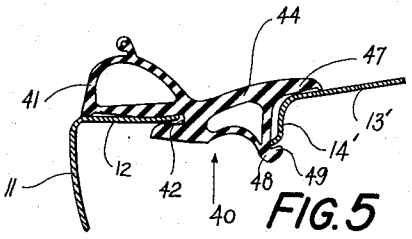


FIG. 5

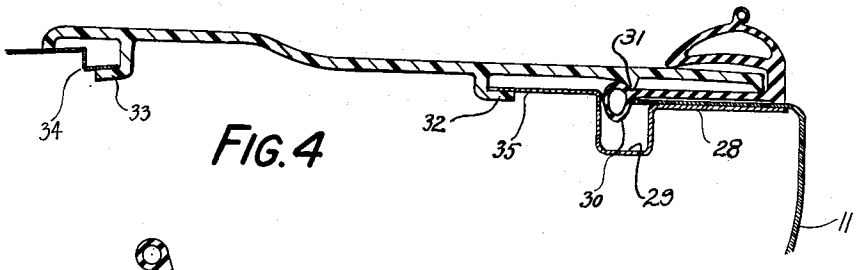


FIG. 4

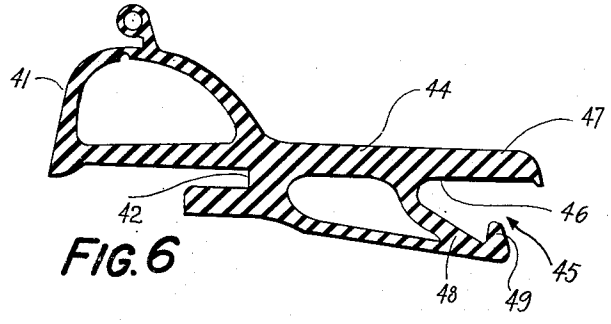


FIG. 6

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UNITED STATES PATENT OFFICE

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REFRIGERATOR DOOR

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Application May 12, 1950, Serial No. 161,663

1 Claim. (Cl. 20—35)

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This invention relates to doors for household refrigerators, and more particularly to a refrigerator door having a breaker frame.

In the ordinary household refrigerator, the door is commonly made of a shell stamped from sheet metal into a dish shape. This shell is braced, and sufficient insulation is provided, and the shell is then closed with an inner wall. This inner wall customarily comprises a sheet of plastic material with a low degree of heat conductivity. Such material, particularly in large sheets, is subject to considerable flexure and not infrequently cracks at the points of such flexure. In addition, the material is expensive.

By my invention I provide a means which makes possible the use of a relatively cheaper sheet metal inner wall without sacrificing the insulation qualities of the plastic material. The wall, therefore, is not subject to the cracking which characterized prior plastic material walls and the refrigerator will perform, fully as efficiently, its task of keeping the food chamber at a cool temperature.

A more complete understanding of my invention may be had from reference to the following figures and description which form a part of this specification.

In the figures:

Fig. 1 is a perspective view of the inside surface of a refrigerator door embodying my invention;

Fig. 2 is a sectional view along line 2—2 of Fig. 1;

Fig. 3 is a sectional view along line 3—3 of Fig. 1;

Fig. 4 is a view similar to Fig. 2, showing an alternative form of strip;

Fig. 5 is a view similar to Fig. 2 showing a second alternative form; and

Fig. 6 is a view of the strip of Fig. 5 in an unstressed state.

With reference to the figures throughout which like parts are designated by like reference characters, my invention comprises a refrigerator door having an outer shell 11 formed from sheet metal in the usual manner and having a stiffening flange 12 around its periphery. A sheet metal inner wall 13, also having a stiffening flange 14, is supported in spaced relationship to the shell 11 by means of ears 15 formed or welded onto the inner wall, which in turn are bolted or otherwise attached to strap means 16 fixed to the outer shell. The volume between the shell 11 and the inner wall 13 is customarily filled with an insulating material. A gasket 17

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of any conventional type, or which may be of the type disclosed in my copending application, Ser. No. 110,927, filed August 18, 1949, Patent No. 2,636,228, issued April 28, 1953, is disposed around the shell 11 and may engage the flange as in Fig. 2.

The gap between the flanges on the shell and the inner wall is closed by a breaker strip 19 formed of some material having a low heat conductivity such as a plastic material or a stainless steel. Several formations are shown at the edges of the strips. It will be realized that these may be interchanged somewhat, and that my invention is not limited to any particular formation.

My preferred embodiment, as shown in Fig. 2, has a cross section having a pair of hook formations 21 and 22 extending from it to engage the flanges 12 and 14 on the shell 11 and the wall 13. This embodiment is especially suited to a plastic formation rather than sheet metal. The strip extends beyond the inner wall-engaging hook 22 to form a wall engaging leg 23. The strip also extends outward from the shell engaging hook 21 over the gasket 17 which may have a portion 24 embracing the flange 12. The gasket 17 lies flat on the flange 12 and is pressed in place by the extension 25. The flange 14 is formed so that the leg 23 is somewhat displaced by engagement therewith, and, therefore, the hook 22 is pulled inward holding the leg 23 firmly against the inner wall 13.

The strip may be assembled by first engaging the hook 21 with the gasket portion 24 which engages the flange 12 as shown. Then the strip is pressed downward near the inner wall 13 until the hook 22 snaps into place on the flange 14.

Because of the supporting ears 15 and strips 16 spaced about the door, it is necessary at these points to form the cross section as shown in Fig. 3. It will be noted that the hooks 21 and 22 are removed leaving only a ridge 26 which may engage the gasket part 24 at the outer flange 12 above the strap. The breaker strip 19 is stiff enough, however, to hold itself firmly pressed against the sheet metal parts despite this gap in the hooked engagement and there is, therefore, no apparent difference in the external formation at these points. This stiffness is somewhat augmented by a stiffening rib 27 around the corner which is hidden beneath the door gasket and serves also to assure proper sealing of the gasket at the corner.

An alternative form of strip having different formations at the edges adapted to engage flanges of somewhat different formation is shown

in Fig. 4. The shell flange 28 here has a channel 29 in which a tubular portion 30 of the gasket is disposed, and is held therein by the engagement of the foot 31 of the breaker strip with the gasket. The pressed engagement is maintained by the hook 32 on the strip. At its other edge, the strip has a hook 33 adapted to engage a flange 34 on the inner wall.

This strip is assembled by engaging the hook 32 with the portion 35 of the flange inward of the channel 29 and pressing the strip outward (to the right in Fig. 4) collapsing the channel somewhat until the hook 33 can be engaged with the flange 34. The strip if then released will engage both flanges, and the expansion again of the channel 29 to its full size will serve to hold the strip firmly in place.

It will be recognized that these several described formations for the edges of the strip may be used alternately, and that they are not to be limited to the particular forms or combinations of forms shown. Each of the strips shown is adapted to be snapped into place and is capable of holding itself there as described.

Another alternative form for use with a door outer shell 11 and inner wall 13', similar to the embodiment of Fig. 2, is shown in Figs. 5 and 6. In this form, the gasket and insulating strip are formed in a single composite piece 40. The gasket portion 44 may be of any form which has a flange engaging channel 42 formed in it. This channel embraces the flange 12 on the outer shell 11 and holds the gasket in place at that edge of the strip. The space between the flange 12 and the flange 14' on the inner wall 13' is preferably somewhat less with this type strip than with the previously described strips because of the lesser rigidity. The portion 44 of the strip between flanges is hollow, both for the purpose of stiffening that part and for economy of manufacture.

As best shown in Fig. 6, when the gasket is not in place on the door, the end 45 opposite the gasket portion 41 is also formed with a channel 46. When the strip is mounted in place, this channel is opened as shown in Fig. 5 to embrace the flange 14. This causes the deformation of the portion 44 between the flanges and particularly of the inside wall, as shown in that figure (Fig. 5), and results in one side 47 of the channel engaging the surface of the wall 13.

The outer wall of the portion 44 is heavier than the inner wall and remains substantially undeformed save for a slight bend near the gasket part 41. The other side 48 of the channel is formed with a rim 49 at its outer edge which is caused to hook beneath the edge of the flange 14 to hold the strip in place. It will be recognized by those skilled in the art that, if the flange 14 were rounded, or of tubular formation having a diameter somewhat less than the width of the flange 14', the same type of channelled edge could be used to embrace such a flange. In the latter event, the rim 49 would not be necessary.

Thus it is apparent that I have provided a refrigerator door not only fully as efficient, insofar as heat transfer characteristics are concerned, but also less expensive and having a longer useful life than prior doors. This is made possible by the use of the breaker strip which insulates the inner wall from the outer surfaces of the door and is itself of novel formation being capable of holding itself in place without the use of any external agencies.

Having thus described my invention, I am aware that numerous and extensive departures may be made therefrom without departing from the spirit or scope of my invention.

I claim:

In a refrigerator door having an outer shell and an inner panel, said shell having marginal portions provided with a stiffening flange extending towards the inner panel and having a free side edge, said inner panel having marginal portions provided with a stiffening flange extending inwardly of the door in spaced relation to the free side edge of the stiffening flange of said shell at an abrupt angle thereto, and a breaker strip formed as a unit of elastic material and comprising an elongated outer side portion constituting a cushion member and having an inner surface bearing against the outer surface of the stiffening flange of the shell, a flat strip integral with the said side portion and projecting laterally therefrom substantially in horizontal alignment therewith for extending across the space between said flanges and with its outer side edge portion bearing against the outer surface of the inner panel beyond the stiffening flange of the panel and constituting an outer gripping jaw, a rib extending along the rear surface of said strip at the junction of the inner side edge thereof with the said cushion member and carrying a flange spaced rearwardly from the inner surface of the cushion member and together therewith defining a channel into which the free side edge portion of the stiffening flange of said shell fits, and a hollow panel-engaging member back of said strip extending the full length thereof and including a rear wall having an inner side edge integral with said rib and along its outer side edge being formed with a lip constituting a jaw for engaging across the rear edge of the stiffening flange of said inner panel, and an outer side wall for the hollow panel-engaging member integral with the strip and extending rearwardly from the said strip and integrally united with the rear wall adjacent said lip, said outer side wall being spaced from the rib a distance greater than the width of the space between the stiffening flanges of the shell and the inner panel, the outer side wall and the rear wall of the panel-engaging member being flexed away from the stiffening flange of the panel in the direction of the stiffening flange of the shell and placing the said side wall and the said rear wall under tension and exerting gripping action upon the said flanges when the breaker strip is between the said flanges.

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