Oct. 1, 1957 K. K. KESLING 2,807,837

REFRIGERATOR CABINET DOOR

Filed July 14, 1955 2 Sheets-Sheet 1

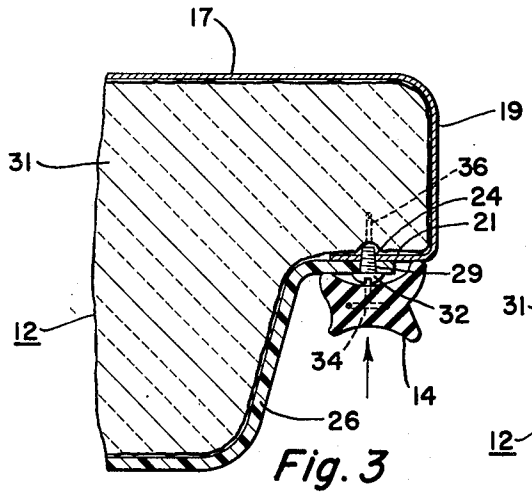


Fig. 3

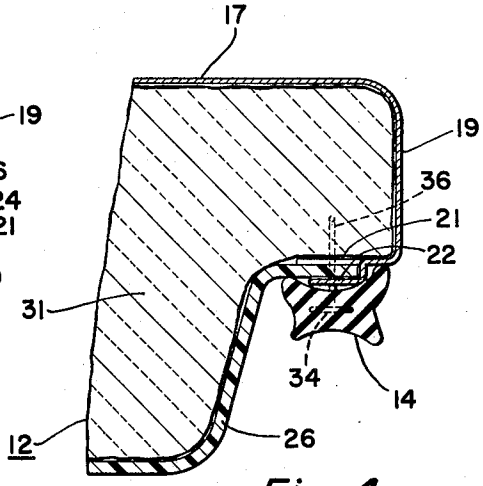


Fig. 4

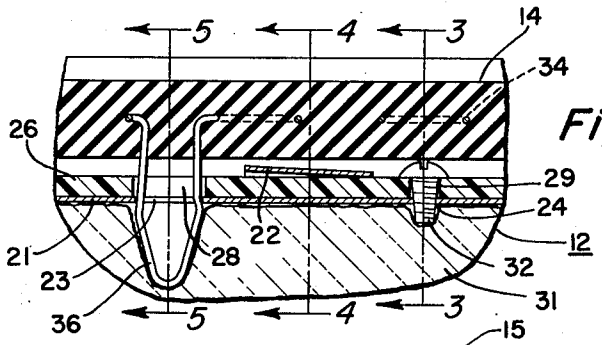


Fig. 2

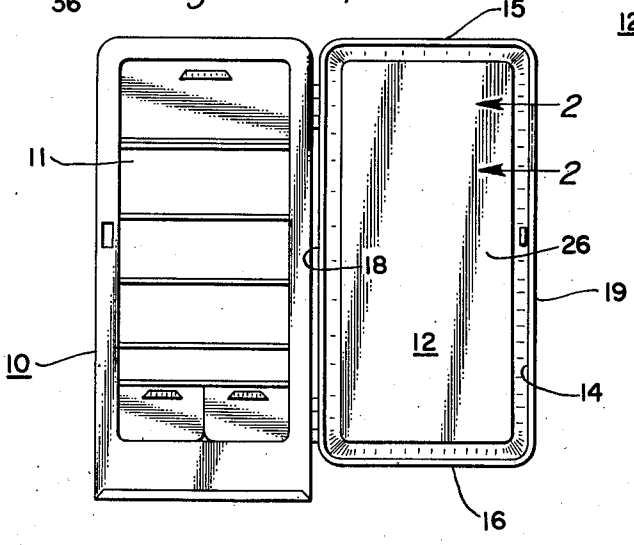


Fig. 1

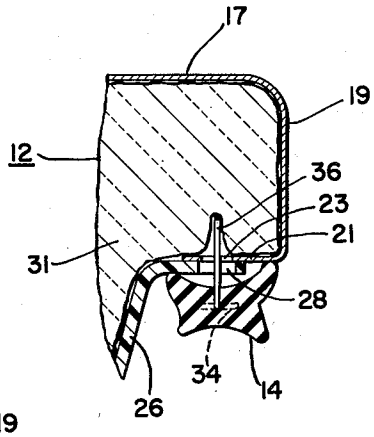


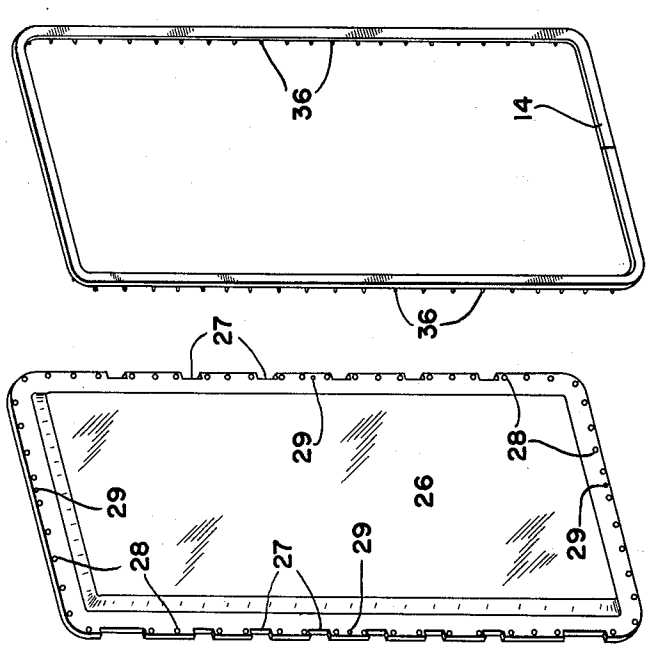
Fig. 5

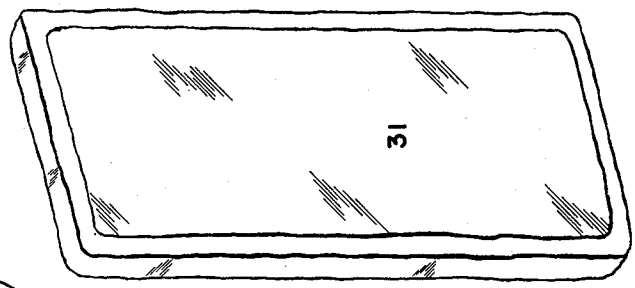
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REFRIGERATOR CABINET DOOR

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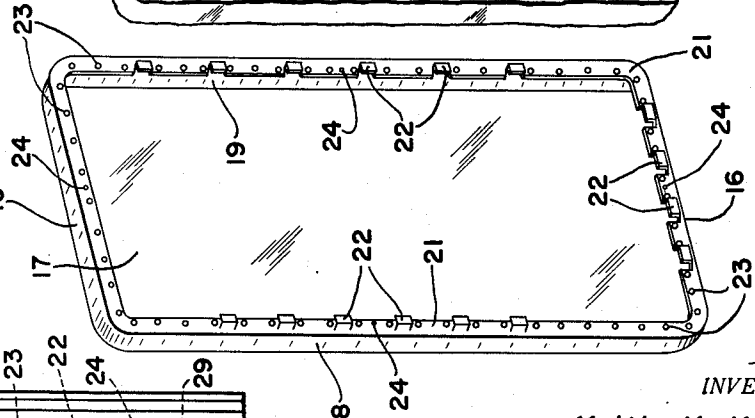
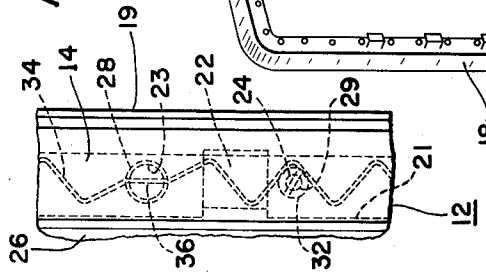


Fig. 7

Fig. 6



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REFRIGERATOR CABINET DOOR

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Application July 14, 1955, Serial No. 522,053

2 Claims. (Cl. 20—35)

This invention relates to refrigerator cabinets and particularly to an insulated door structure having a gasket thereon adapted to engage a wall of a refrigerator to seal an access opening leading to a refrigerated compartment or chamber therein.

In prior refrigerator cabinet door constructions it has been the practice to interlock a portion of a resilient gasket seal between the edges of an outer panel and an inner panel with a plurality of screws which also secure the panels to one another. In such door constructions of the average size it has been necessary to employ some thirty to forty screws thus requiring a considerable amount of time to place the screws in position and to drive them and, consequently, assembling of refrigerator cabinet doors has been slow and expensive. I contemplate the construction of an insulated refrigerator cabinet door including inner and outer panels which can be readily assembled in interlocked engagement with one another by means formed integrally therewith and thereafter quickly applying a sealing gasket about the perimeter of the door.

An object of my invention is to provide a simplified and improved means for mounting an inner panel upon an outer panel of an insulated refrigerator cabinet door and a novel manner of independently securing a gasket seal to the door.

Another object of my invention is to provide means formed integrally with an outer panel of a refrigerator cabinet door for interlocking an inner panel thereto and to secure a sealing gasket about the perimeter of the door by means which also prevents shifting of the inner panel relative to the outer panel whereby to minimize parts and simplify the joint structure between the door panels.

A further and more specific object of my invention is to slidably move an inner door panel into interlocking engagement with a plurality of hooks or wedge shaped tabs formed integrally on an outer panel of a refrigerator cabinet door, to provide rigid means for locking the panels together, to secure a gasket seal upon the door with means independent of the rigid panel locking means and to conceal the panel locking means and seal securing means by the gasket.

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 refrigerator cabinet with the food storage chamber door having my invention embodied therein shown in open position;

Figure 2 is an enlarged fragmentary sectional view taken on the line 2—2 of Figure 1 showing a joint between inner and outer panels of the refrigerator cabinet door and the mounting of a gasket thereon;

Figure 3 is a fragmentary sectional view taken on the line 3—3 of Figure 2 showing rigid means preventing sliding movement of the door panels relative to one another;

Figure 4 is a fragmentary sectional view taken on the line 4—4 of Figure 2 showing means formed on the outer door panel interlocking an inner panel thereto;

Figure 5 is a fragmentary sectional view taken on the line 5—5 of Figure 2 showing clips securing a sealing gasket to the door;

Figure 6 is a fragmentary plan view taken in the direction of the arrow in Figure 3 showing the position of elements disclosed in Figure 2 in dotted lines; and

Figure 7 is an exploded view of elements of the refrigerator cabinet door to which this invention is directed.

Referring to the drawings, for illustrating my invention, and throughout the several views of which like reference numerals designate same parts, I show in Figure 1 a conventional refrigerator cabinet **10** having a refrigerated food storage compartment **11** therein. Cabinet **10** is provided with an insulated door structure, generally represented by the reference character **12**, pivotally mounted thereon for swinging movement relative thereto in order to open and/or close an access opening to the food compartment **11**. Door structure **12** carries a gasket **14** thereon, in a manner to be hereinafter described, for engaging the front wall of cabinet **10** and sealing the food storage compartment **11**. Door structure **12** includes an outer metal pan or panel which is formed with portions of the metal thereof providing a top **15**, bottom **16**, front **17** and opposed side walls **18** and **19** (see Figures 1 and 7). The edge portion of the metal pan or panel about the walls **15**, **16**, **18** and **19** is bent or turned inwardly to provide an integral flange **21** (see Figures 2, 3, and 7) extending continuously around door **12**. The edge of flange **21** along the bottom **16** and opposed side walls **18** and **19** of door **12** is provided with a plurality of spaced apart sets of slits and the metal thereof intermediate each set of slits is bent outwardly of and thence parallel to the flange **21** to form a plurality of hooks or retaining tabs **22** thereon about three sides of the door (see Figure 7). It will be noted by reference to Figure 2 of the drawings that the portion of hooks or tabs **22** substantially paralleling flange **21** on at least the opposed sides **18** and **19** of the outer door panel are preferably inclined outwardly relative to the flange in a direction from the bottom to the top of door **12** to form the tabs **22** into a wedge-like shape. Flange **21** on the outer metal door panel has a plurality of spaced apart apertures **23** therein (see Figures 2, 5, and 7) about all four sides or walls **15**, **16**, **18**, and **19** of door **12**. The flange **21** of the outer door panel also has four tapped holes **24** therein (see Figures 2, 3, and 7) one of which is located centrally along the sides or walls **15**, **16**, **18**, and **19** of door **12**. The door structure **12** also includes an inner preferably molded plastic pan or panel **26**. Panel **26** is provided with a plurality of spaced apart notches **27** in its two long marginal side edges (see Figure 7). Wider notches may be cut in one marginal edge of panel **26** for clearing hinge butts employed to hingedly mount door **12** upon the cabinet **10**. All four marginal edges of inner door panel **26** are provided with spaced apart apertures **28** at points to correspond to or align with the apertures **23** in the outer door panel (see Figures 2, 5, and 7). Panel **26** is also provided with four holes **29** one of which is located centrally along each marginal side edge thereof to align with the holes **24** in the outer door panel. The marginal side edges and the bottom edge of panel **26** fit or are disposed under the inclined tabs **22** on the outer panel of door **12** to interlock these panels to one another (see Figures 2 and 4). A wrapped slab, bag or package of suitable insulating material **31** is located in the space between the outer metal door panel and the inner molded plastic panel **26**. Rigid means such as four metal screws **32** are projected through the holes **29** in panel **26** and threaded into the tapped

holes 24 of the outer door panel (see Figures 2, 3, and 6) to lock the panels together against sliding movement. The sealing gasket 14 on door 12 is formed of resilient rubber-like material and has a zig-zag shaped strip of wire 34 imbedded in its body portion (see Figures 2 and 6). This wire 34 is provided with a plurality of laterally bent loops 36 which form spaced apart shouldered spring mounting clips projecting through the apertures 23 and 28 and having the shouldered portions thereof engaging the wall of aperture 23 in the outer door panel to secure the gasket on door 12 about its perimeter (see Figures 2, 5, and 6) and to supplement or aid the screws 32 in preventing shifting of the door panels relative to one another. Gasket 14 is preferably of the general type disclosed in the patent to E. P. Harris No. 2,579,072, dated December 18, 1951, and assigned to the assignee of the present application. While I have employed both the screws 32 and the spring clips 36 interlocking the pans or panels of door 12 together, because of the fact that the four screws 32 provide a definite advantage in the specific door structure herein disclosed, it is within the realm of the present invention to omit these screws. For example, in the present showing the outer door panel is formed of thin metal and may buckle or twist from one corner to a diagonally opposite corner and the screws 32 rigidly securing the panels together at a point intermediate the corners of door 12 prevent such twisting. However, in a structure wherein the outer door panel is formed of thicker metal or in a structure wherein the inner door panel is also formed of metal there is little likelihood that such twisting will occur. Thus, in this case the screws 32 may be dispensed with and the spring clips 36 relied upon to serve the sole means of locking the door panels to one another against shifting and of securing the gasket 14 to the door.

Assembly

Referring to Figure 7 of the drawings, the manner in which parts of the door 12 are assembled together will now be described. The flexible package or bag of insulating material 31 is pressed into the outer door pan or panel against its front 17 and the edges thereof are tucked in under flange 21 against side walls 15, 16, 18, and 19. Inner door pan or panel 26 is moved against flange 21 on the outer door panel with the notches 27 along its two side edges only registering with and clearing the wedge-like tabs 22 on the outer panel. In this position of panel 26 its bottom marginal edge is located or disposed above the tabs 22 along the bottom of the outer door panel so that panel 26 abuts against flange 21. The molded plastic panel 26 is then slid or slipped downwardly along flange 21 toward the bottom wall 16 of the outer metal door panel in a direction paralleling the panel front wall 17. The bottom edge and portions of the two side edges of inner panel 26 adjacent the notches 27 are, in this manner, shifted beneath the tabs 22. Thus, the bottom and both side edges of panel 26 are brought into interlocking engagement with the outer metal door pan or panel and the apertures 28 and holes 29 in panel 26 are aligned with the apertures 23 and tapped holes 24 respectively in flange 21 of the outer panel. The four screws 32 are now projected through the holes 29 in panel 26 and driven or threaded into the tapped holes 24 in flange 21. Anchoring tab 22 being inclined as described, facilitates the act of sliding panel 26 into place and serves to wedge the marginal side edges of this panel against flange 21 on the outer door panel. A proper length of gasket 14 together with the spring wire strip 34 and clips 36 is cut from a roll thereof and bent or formed into the rectangular shape of the door 12 as shown in Figure 7 of the drawings to substantially correspond to the dimension and shape of flange 21. This gasket is now applied to the door by pressing its cabinet engaging base or sealing face at points opposite the looped clips 36 so that the end portion of the spring clips 36 are forced through the apertures 28 and 23 in panel 26 and flange 21 respectively. The bag containing the insulating material 31 is preferably of sufficient flexibility and toughness to permit the clips 36 to deform same together with the insulating material therein without puncturing the bag as they are projected through the apertures 28 and 23. Thereafter a part adjacent the shoulder on the clips 36 expands against the wall of the apertures 23 in flange 21 and secures the gasket 14 to door 12 about the perimeter thereof inwardly of its sides for engagement with the cabinet 10. It will be appreciated that the act of applying gasket 14 to a door as described can be performed in much less time than driving a plurality of screws around sides of the door. Gasket 14 overlaps the marginal edges of panel 26 to conceal these edges and flange 21 and lies over the tabs 22 and screws 32 to also conceal these elements as well as the clips 36. It is to be understood that if the screws 32 are omitted from a structure of the character disclosed then the clips 36 will be relied upon to both interlock the door panels together and to secure the gasket 14 on the door. In such case the holes 24 and 29 will obviously be omitted from the door panels.

From the foregoing it should be apparent that I have provided a simple and improved yet effective means for mounting an inner panel to an outer panel of a refrigerator door construction. My invention particularly lends itself to quantity production in a less expensive manner than has heretofore been accomplished. The number of screws employed in my door structure has been materially reduced thus resulting in a considerable saving of time required in driving screws. Sliding of the inner door panel into interlocking engagement with the outer door panel is done without necessity of simultaneously locking a gasket or other fastening means between edges of the panels whereby portions of the panels alone form the locking means therebetween. The gasket covers and conceals the joint and parts thereof between the door panels and this gasket is readily detachable from the door for replacement without removing the door from the refrigerator cabinet and without dismantling the door. This latter feature permits a gasket on the present door structure to be replaced in a minimum of time, thus eliminating the necessity of shutting down a refrigerating system associated with the refrigerator cabinet.

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 door including an outer panel and an inner panel separate from said outer panel with insulating material disposed therebetween, one of said panels being formed to provide top, bottom, side walls and a face of said door, said top, bottom, and side walls of said one panel having an inwardly turned flange thereon, the edge of said flange being provided with spaced apart sets of slits and the material of said flange intermediate said slits of each set thereof being bent outwardly of the flange with respect to said door face to form anchoring tabs along at least two sides of said one panel, said flange also being provided with a plurality of apertures therein spaced apart therealong, the other of said panels being provided with spaced apart notches along at least two side marginal edges thereof, said other panel also being provided with a plurality of apertures spaced apart along its edges inwardly thereof, the marginal side edges of said other panel being placed against said flange with the notches therein registering with and fitting over said tabs on the sides of said one panel, said other panel being slid relative to and in a direction paralleling said face of said door to position its marginal side edges under said tabs on said one panel, said tabs being inclined inwardly toward the flange on said one panel in the direction of

sliding said panels for wedging the side marginal edges of said other panel against the inturned flange on said one panel to clamp said panels together with the apertures therein aligned and to prevent movement thereof with respect to one another in a direction perpendicular to the direction of sliding said other panel, and means inserted into the aligned apertures of said panels for preventing parallel shifting thereof relative to one another.

2. A door including an outer panel and an inner panel separate from said outer panel with insulating material disposed therebetween, one of said panels being formed to provide top, bottom, side walls and a face of said door, said top, bottom, and side walls of said one panel having an inwardly turned flange thereon, the edge of said flange being provided with spaced apart sets of slits and the material of said flange intermediate said slits of each set thereof being bent outwardly of the flange with respect to said door face to form anchoring tabs along at least two sides of said one panel, said flange also being provided with a plurality of apertures therein spaced apart therealong, the other of said panels being provided with spaced apart notches along at least two side marginal edges thereof, said other panel also being provided with a plurality of apertures spaced apart along its edges inwardly thereof, the marginal side edges of said other panel being placed against said flange with the notches

therein registering with and fitting over said tabs on the sides of said one panel, said other panel being slid relative to and in a direction paralleling said face of said door to position its marginal side edges under said tabs on said one panel, said tabs being inclined inwardly toward the flange on said one panel in the direction of sliding said panels for wedging the side marginal edges of said other panel against the inturned flange on said one panel to clamp said panels together with the apertures therein aligned and to prevent movement thereof with respect to one another in a direction perpendicular to the direction of sliding said other panel, and a sealing gasket carrying a member provided with a plurality of spaced apart spring clips which are inserted into the aligned apertures of said panels to prevent parallel shifting thereof relative to one another and to secure said gasket to the door.

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