

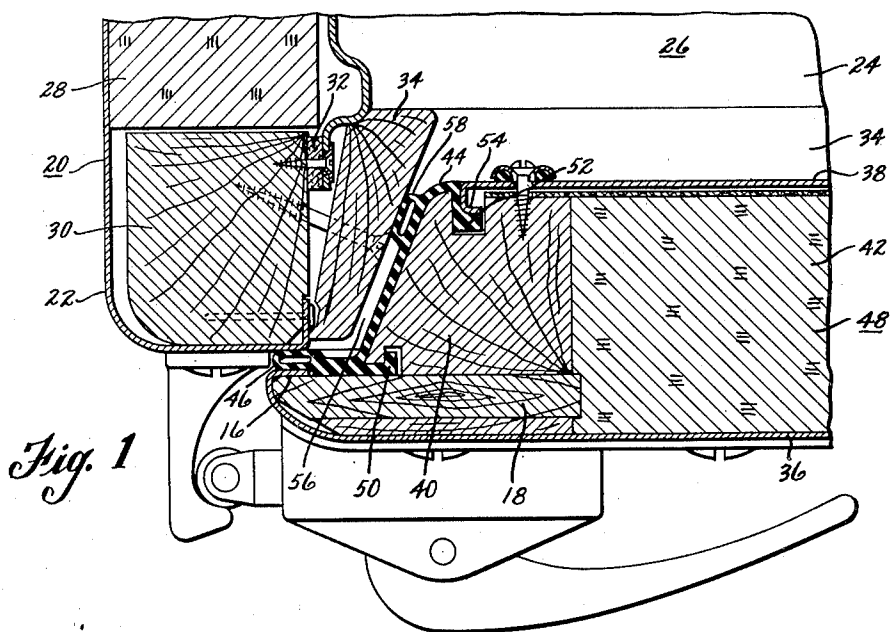
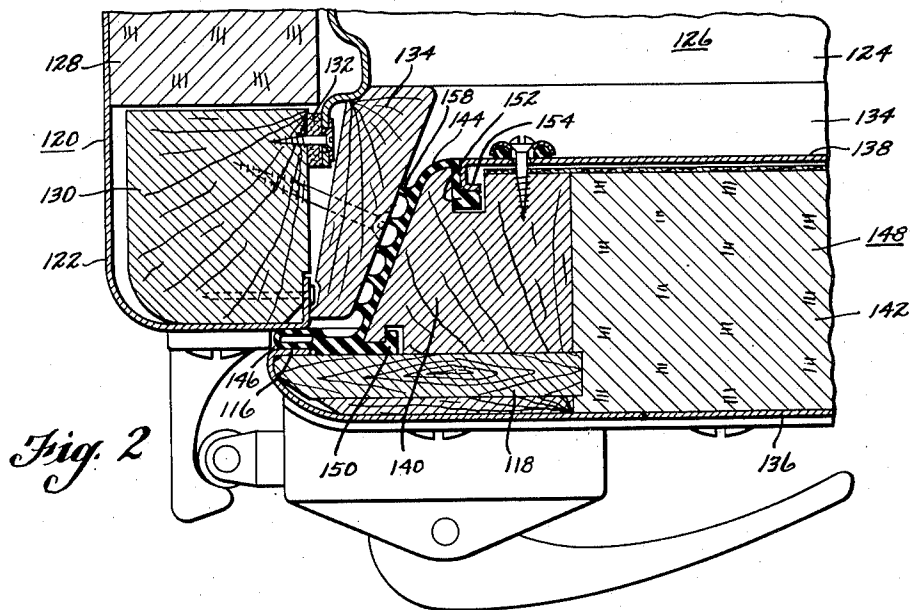
Feb. 20, 1940.

C. A. STICKEL
REFRIGERATING APPARATUS

2,190,954

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2 Sheets-Sheet 1



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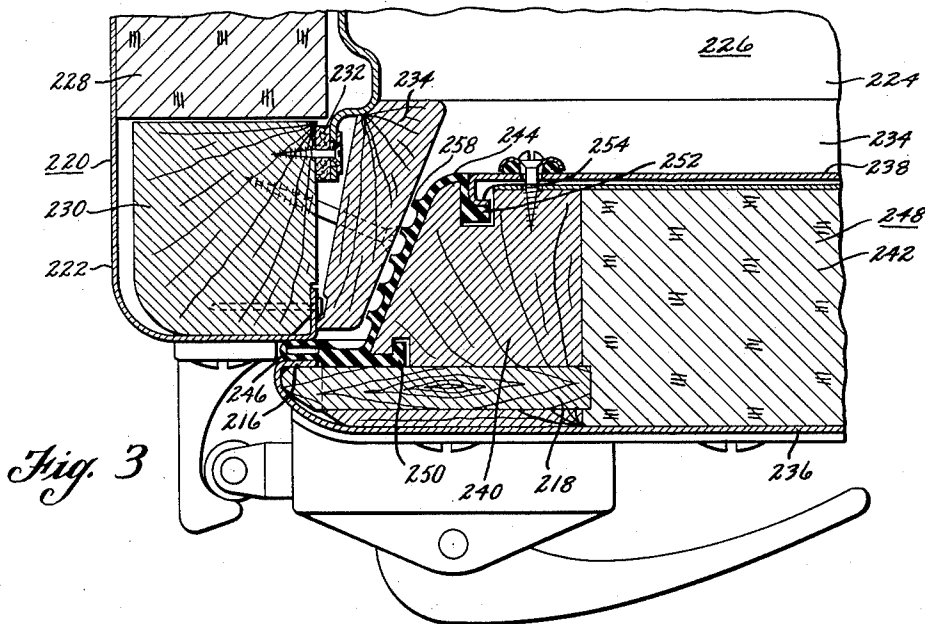
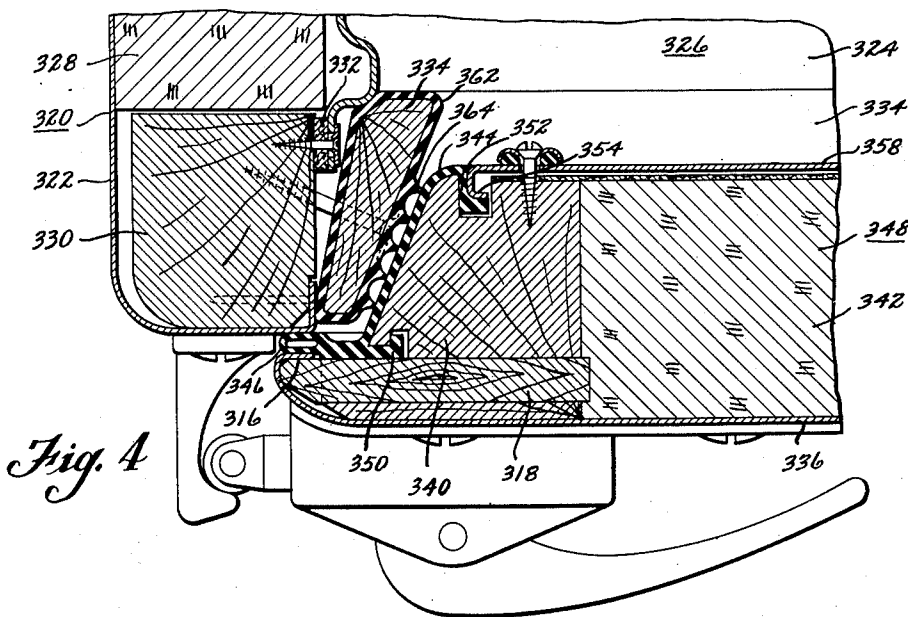
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REFRIGERATING APPARATUS

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3 Claims. (Cl. 220-9)

This invention relates to refrigerating apparatus and more particularly to refrigerator cabinets.

Refrigerator cabinets are ordinarily provided with an insulated door which extends into the door opening. A molding ordinarily surrounds the door opening and an air space is left between the adjacent portion of the door and the door molding. The door also is ordinarily provided with a flange portion which overlies the face of the cabinet wall immediately surrounding the door opening. A gasket seal is usually provided between this flange and the adjacent face of the door.

This construction has been considered standard practice in refrigerator construction for a number of years. However, careful consideration of such a structure will disclose the fact that air has access from the cold interior of the cabinet between the door molding and the adjacent portion of the door to the gasket seal where it may have access to the outer sheet metal covering of the refrigerator. This permits a considerable amount of heat leakage which of course reduces the insulating efficiency of the cabinet and requires more refrigeration to keep the cabinet cool.

In some of the older types of refrigerator cabinets, especially those involving a stepped door construction, two door sealing gaskets have been provided for the door or door jamb, so that a sealed air space is provided which will reduce this heat leakage. However, such an arrangement is unsightly and requires considerable additional expense and labor.

It is an object of my invention to reduce the heat leak in the above mentioned standard door construction by means which will add to the appearance of the door construction without involving any substantial additional material or labor cost.

Recently it has been proposed to make the outer peripheral surface of the refrigerator door of an elastic rubber-like material which will serve as a breaker strip between the inner and outer metal sheets as well as to provide the customary sealing gasket. Such a construction embodies a material advance in simplified low cost refrigerator construction. It, however, does not prevent the cold air from the interior of the cabinet from circulating in the space between the door molding and the adjacent portion of the refrigerator cabinet so that this air has access to the outer sheet metal walls of the cabinet and is separated from the outside air only

by the gasket seal. This rubber-like material, although it has a smooth black appearance, does not have as attractive and rich looking an appearance as that possessed by some of the lustrous materials formerly used.

It is, therefore, an object of my invention to provide a refrigerator door construction embodying such a rubber-like material which will have an improved and pleasing appearance.

It is another object of my invention to form the rubber-like peripheral surface of the door with an ornamental surface capable of improving the appearance as well as reducing the air circulation between the door molding and the door.

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 invention is clearly shown.

In the drawings:

Fig. 1 is a fragmentary horizontal sectional view of a portion of an insulated domestic refrigerator cabinet showing one form of my improved door and cabinet construction;

Fig. 2 is a view similar to Fig. 1 showing another form of my improved door and cabinet construction;

Fig. 3 is a view similar to Figs. 1 and 2 showing a slightly modified form of my invention; and

Fig. 4 is a view similar to Figs. 1, 2 and 3 showing an alternative form of my invention.

Briefly, I have disclosed an insulated refrigerator cabinet generally of standard construction which is provided with a flanged pan-shaped door having a peripheral portion of an extruded elastic rubber-like material which serves as a breaker strip between the inner and outer metal sheets of the door as well as a hollow beaded portion which serves as a resilient gasket between the flange of the door and the adjacent outer surface of the cabinet. This extruded elastic rubber-like periphery is in one form provided with a second hollow bead extending entirely around the outer periphery of the door which when the door is closed makes contact with the door molding to provide a sealed air space between it and the gasket seal.

In a second form, the periphery of the extruded elastic rubber-like material is provided with flutes extending entirely around the periphery of the door which make contact with the door molding to provide a plurality of sealed air spaces. In a third form the door is similarly provided with flutes but the fillets between

the flutes do not extend entirely into contact with the door molding but permit a small amount of air flow which will act as a sort of labyrinth seal. In a fourth form the door molding is provided with flutes extending around its inner periphery which extend into contact with the door so as to provide sealed air spaces.

Referring now to the drawings and more particularly to Fig. 1, there is shown a refrigerator cabinet generally designated by the reference character 20 having outer metal walls 22 and an inner metal liner 24 enclosing food compartment 26. The inner liner 24 and the outer sheet metal walls 22 are separated by an insulating means 28 but are connected by a door jamb frame 30 of wood or other material having low heat conductivity. In order to further reduce the heat conductivity, the inner liner is separated from the door jamb frame by an insulating strip material 32. A beveled door opening is provided in one face of the cabinet which is lined with a beveled door molding 34 of wood or other suitable material.

A flanged beveled pan-shaped door 48 is provided for the door opening which has a beveled pan-shaped portion which extends into the door opening and a flange portion which overlies the outer face of the cabinet immediately surrounding the door opening. The door is constructed over a beveled wooden frame 40 which is first provided with an extruded elastic rubber-like breaker strip 44 stretched over a portion of its outer surface to provide the outer periphery of the pan portion of the door. This wooden frame 40 is provided with interlocking grooves to receive the integral locking flanges 50 and 52 which hold this elastic rubber-like breaker strip 44 in a stretched condition in place so that it forms an outer peripheral surface of smooth neat appearance. The inner face of the door is provided with an inner sheet metal panel 38 provided with a flanged edge 54 which locks the flange 52 of the elastic rubber-like breaker strip 44 in place. The door is also provided with an outer sheet metal panel 36 which has its edges curled to provide a flange portion 16 for the door which overlies the face of the cabinet immediately surrounding the door opening. This outer sheet metal panel is fastened to the wooden frame 40 by a wooden wedge 18 extending through a slot in the frame into engagement with the curled flange portion 16. The rubber-like peripheral breaker strip 44 has an integral projection which is provided with a hollow bead 46 which forms a sealing gasket between the in-turned flange of the outer sheet metal panel 36 of the door and the adjacent outer sheet metal wall 22 of the cabinet. The breaker strip 44 is preferably formed of a suitable natural rubber compound by an extruding process which forms it into the shape desired. However, other elastic rubber-like materials may be used, if desired.

Ordinarily, cold air from the interior of the cabinet is permitted to have free access to the space between the rubber-like periphery of the door and the door molding 34 which air space is designated by the reference character 56. It will be seen upon inspection of this construction, that the cold air will be permitted to come into contact with the outer sheet metal walls of the cabinet and so have direct metallic conduction to the outside air and will also be separated only from the outside air by the hollow beaded rubber gasket portion 46. In order to seal this air space 56, I have provided a second hollow bead 58

extending entirely around the periphery of the door and formed directly as an integral part of the rubber-like breaker strip 44 which forms the peripheral surface of the door. This hollow bead makes a tight elastic contact with the adjacent portion of the door molding so that an excellent seal is provided for the sealed air space 56.

The construction of the portion of the refrigerator cabinet shown in Fig. 2 is exactly the same as that shown in Fig. 1 with the exception of the elastic rubber-like peripheral breaker strip of the door. The detailed description of Fig. 1 applies to the corresponding parts of Fig. 2 with the exception of the specific form of this breaker strip. The reference characters applied to this figure are the same as those applied to corresponding parts of Fig. 1 with one hundred added to each.

In this figure, the rubber-like breaker strip 144 is held in place by the locked projections 152 and 150 as in Fig. 1 and is similarly provided with a hollow bead 146 forming a gasket seal. The surface of the elastic rubber-like breaker strip 144 however, is provided with ornamental beads 158 extending entirely around the periphery of the door which are shaped like flutes of Ionic and Corinthian columns, the fillets between these flutes extend into contact with the beveled door molding 134 so as to provide four sealed air spaces between the flutes and one sealed air space between the outer-most flute and the hollow bead 146. These elastic beads in the form of flutes not only provide five sealed air spaces which clearly reduce the heat conduction, but also provide a pleasing ornamental appearance to the periphery of the door and avoid the plain appearance of the ordinary breaker strip.

In Fig. 3 the construction is substantially identical to that shown in Fig. 2 with the exception that the ornamental beads or fillets 258 upon the surface of the rubber-like breaker strip 244 which are located between flutes like flutes of Ionic and Corinthian columns and do not extend quite into contact with the door molding 234 but leave a small space therebetween so as to form a sort of labyrinth seal which will hinder the air circulation sufficiently to greatly reduce the heat conduction. Should any sweating take place or moisture collect in the space between the door molding and the door, this construction will permit this sweat to be removed by greatly restricted air circulation. This figure has its parts numbered two hundred higher than the corresponding parts of Fig. 1.

An alternative form is shown in Fig. 4. In this form, the door may be of a conventional or standard construction with a smooth beveled periphery. As shown in this figure, the door is provided with a beveled wooden frame 340 provided with an extruded rubber breaker strip 344 provided with an interlocking flange 352 held by the flange 354 of the inner sheet metal face 358 of the door. The outer sheet metal face 336 of the door is held in place by a wooden wedge or pin 318 which extends through a slot in the wooden frame 340 and engages the curled flange of this outer sheet metal panel 336. The other edge of the rubber breaker strip 344 is provided with a hollow bead 346 and an interlocking flange 350 which together with the flange 352 hold the breaker strip in a stretched condition over the beveled face of the wooden frame 340. This breaker strip, differing from the breaker strip shown in Figs. 1, 2 and 3, has a smooth surface.

The beveled door molding 334 on the other

hand is encased or sheathed in an extruded casing 362 of an elastic rubber-like material. This rubber-like casing provides a finished surface for the door molding which is practically indestructible.

However, if this casing of rubber-like material were provided with a smooth finished surface and the rubber breaker strip 344 be likewise provided with a smooth finish, air would have access from the food compartment 326 as far as bead 346 which serves as the sealing gasket. Therefore, this door molding casing of rubber-like material 362 is provided with five parallel beads 364 shaped like the fillets which are formed between the flutes of Ionic and Corinthian columns which cooperate with the adjacent surface of the breaker strip 344 to provide sealed air spaces between the food compartment 326 and the hollow bead 346. These beads extend into resilient contact with the rubber breaker 344 but because of the bevel of the adjacent surfaces of the door and door molding, there is little or no drag when the door is open. When sufficient bevel is provided, there will be no drag. These flutes provided on the door molding improve its appearance as well as increase the insulating efficiency of the cabinet. If desired, the flutes need not extend entirely into contact with the door, but may be slightly spaced from the door to provide a labyrinth construction analogous to Fig. 3. The remaining construction is identical to that shown in Figs. 1, 2 and 3 and has its parts numbered three hundred higher than the corresponding parts of Fig. 1.

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

What is claimed is as follows:

1. An insulated cabinet including a plurality of insulated walls forming an insulated enclosure, one of said walls being provided with a door opening therein for access to the enclosure, a door for said door opening, said door having a portion fitting into said door opening and a marginal portion overlapping the outer face of the wall immediately surrounding the door opening, and sealing means of rubber-like material extending around the periphery of the door, said sealing means comprising an outer sealing portion extending between the overlapping portion of the door and the outer face of the wall immediately surrounding the door opening, an inner sealing portion extending between the fitted-in portion of the door and the door opening in said one wall, said inner sealing portion being integral with said outer sealing portion and extending substantially

entirely across the fitted-in portion of the door, and a plurality of flexible ribs extending between said inner sealing portion and said door opening and having free projecting edges which effect a wiping action between said inner sealing portion and said door opening when the door is closed.

2. An insulated cabinet including a plurality of insulated walls forming an insulated enclosure, one of said walls being formed with a door opening therein for access to the enclosure, a door for said door opening, said door having a portion fitting into said door opening and a marginal portion overlapping the outer face of the wall immediately surrounding the door opening, and a member of rubber-like material extending around the periphery of the door and having an outer sealing portion extending between the overlapping portion of the door and the outer face of the wall immediately surrounding the door opening, said member also having an inner fluted portion with large fillets extending around the periphery of the door and located between the fitted-in portion of the door and the door opening in the wall, said fluted portion also forming a finish and breaker strip for the fitted-in portion of the door, said fluted portion extending substantially across the entire fitted-in portion of the door so as to substantially prevent the air from the compartment from entering the space between the fitted-in portion of the door and the adjacent portions of the door opening.

3. An insulated cabinet including a plurality of insulated walls forming an insulated enclosure, one of said walls being formed with a door opening therein for access to the enclosure, a door for said door opening, said door having a portion fitting into said door opening and a marginal portion overlapping the outer face of the wall immediately surrounding the door opening, and sealing means of rubber-like material extending around the periphery of the door, said sealing means comprising an outer sealing portion extending between the overlapping portion of the door and the outer face of the wall immediately surrounding the door opening and an inner sealing portion integral with said outer sealing portion and having a flexible rib extending between the fitted-in portion of the door and the door opening in the wall, said inner sealing portion forming a finish breaker strip for the fitted-in portion of the door and extending substantially entirely across the fitted-in portion of the door, and said rib projecting from said inner sealing portion so that its free edge comes into wiping contact with the door opening when the door is closed.

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