Jan. 5, 1943. T. W. RUNDELL 2,307,159

REFRIGERATOR DOOR AND GASKET CONSTRUCTION

Filed July 1, 1940

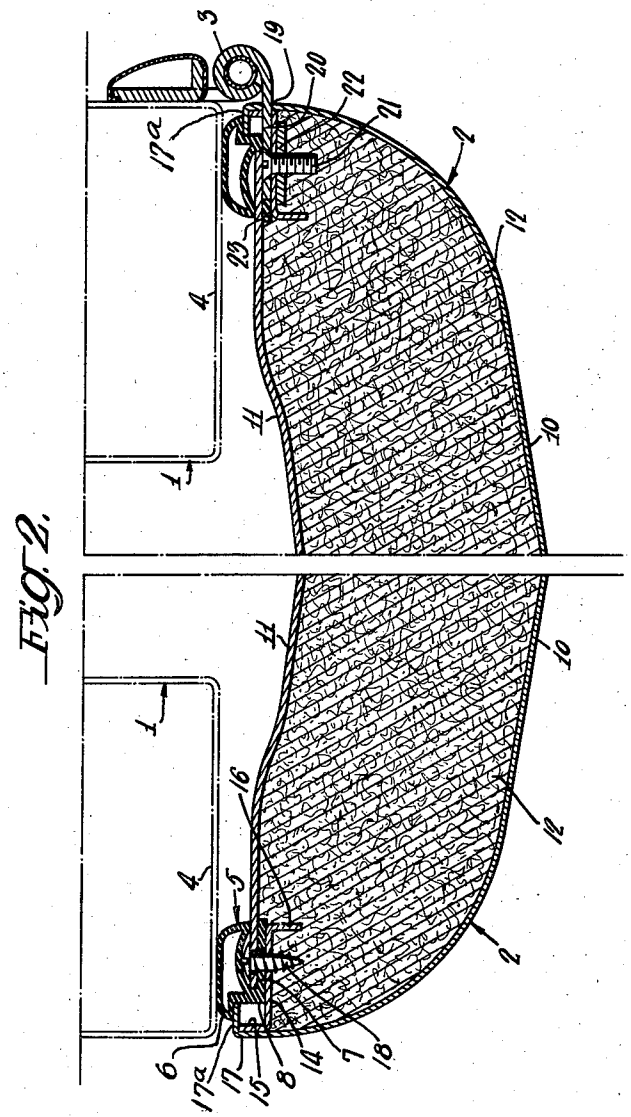

Fig. 2.

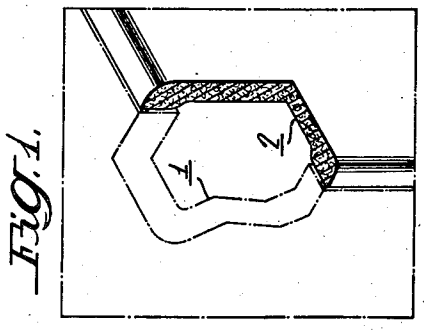

Fig. 1.

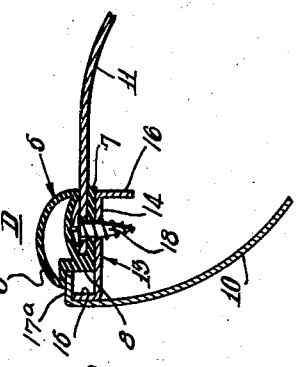

Fig. 6.

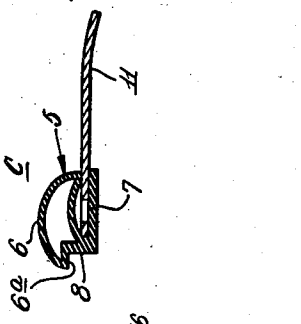

Fig. 5.

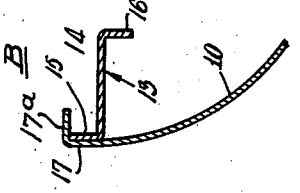

Fig. 4.

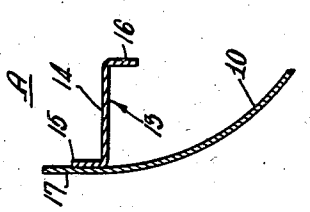

Fig. 3.

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2,307,159

REFRIGERATOR DOOR AND GASKET CONSTRUCTION

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3 Claims. (Cl. 20—35)

This invention relates to new and useful improvements in domestic refrigerator cabinets and more particularly to the construction and arrangement of the doors and sealing gaskets therefor.

It is, of course, well understood that gasket members have heretofore been employed at the door openings of refrigerator cabinets for sealing the door openings against the circulation of air between the interior and exterior of the cabinet. These gaskets are usually of rubber or other suitable resilient material, and, to properly seal the refrigerator, it is necessary that such a gasket be compressed sufficiently to form an air-tight seal between the door and cabinet of the refrigerator. To accomplish this compression of the door gasket without placing a substantially large strain upon the door hinges, and to eliminate binding of the door when closing, it is desirable, and has become more or less customary, to employ gaskets which have a thin-walled hollow bead of relatively large diameter which is easily compressed or flattened between the cabinet and its door when the latter is closed.

From the standpoint of function these gaskets are entirely satisfactory and effectively seal the door opening against the passage of air without placing undue strain upon the door hinges. However, it is well known that the bead portion of gaskets of this type are clearly visible even when the refrigerator door is closed and, in order to detract as little as possible from the external appearance of the refrigerator, it is desirable that this bead portion be relatively small.

Further, it is desirable that the door and sealing gasket be so arranged that no flanges of the door panels are visible when the door is open. The appearance of a product of this type is second in importance only to the proper functioning of the product.

Accordingly and with the foregoing objects in mind, the principal object of the present invention is to provide a refrigerator door and gasket construction affording proper sealing of the refrigerator cabinet against the circulation of air without the introduction of unnecessary strains on the door hinges and without detracting from the external appearance of the refrigerator cabinet.

More specifically it is an object of the invention wherein the construction and arrangement of the refrigerator door and gasket is such that a relatively large gasket may be employed and partially concealed by the flanges of the door shell thereby improving both the operation and appearance of the refrigerator.

Another object of the invention is to provide a refrigerator door and gasket construction of the character described which is unusually neat and appealing in appearance.

A further object of the invention is to provide a novel refrigerator door and gasket construction of the type described wherein the door has no exposed flanges.

These and other objects of the invention and the various features and details of the construction and arrangement thereof are hereinafter fully set forth and described and shown in the accompanying drawing, in which:

Figure 1 is a diagrammatic fragmentary view in perspective of a refrigerator cabinet, a portion thereof being shown in section to indicate the general environment and subject matter of the invention.

Figure 2 is an enlarged view in section taken horizontally through a refrigerator door and gasket constructed in accordance with the present invention, the central portion of the door having been cut-away or removed; and

Figures 3, 4, 5 and 6 comprise a group of fragmentary sectional views diagrammatically illustrating the several steps in the fabrication and assembly of the novel refrigerator door and gasket construction.

Referring now more particularly to the drawing, reference numeral 1 designates, generally, a refrigerator cabinet having a door 2 pivotally secured thereto by hinges 3.

As illustrated in Figure 2, the cabinet 1 of the particular refrigerator there shown has the marginal portions 4 thereof surrounding the door opening arranged in a flat plane for engagement by and compression of a door gasket 5 when the door 2 is closed, the said door when closed overlapping said marginal portion 4 of the cabinet 1 as shown.

The gasket 5 is formed of rubber or other flexible or resilient heat-insulating material and comprises a thin-walled bead portion 6 having an arcuate or convex outer sealing face of relatively large diameter and a lip portion 7 which is offset and extends horizontally at the inner side of said bead portion 6 and is connected thereto by a shank portion 8. Thus there is provided a slot or recess between said lip portion 7 and the bead 6 and preferably the latter has an outwardly offset portion 6a arranged to seat on the flange of the door for a purpose that will hereinafter appear.

The refrigerator door 2 comprises outer and inner sheet members or panels 10 and 11, respectively, the former being of sheet metal material and the latter preferably of fibrous material or other similar heat-insulating composition. These panels 10 and 11 are arranged in the relation shown in the drawing with the aforesaid gasket 5 interposed between their adjacent edge portions and the space between them filled with suitable insulating material 12 such as mineral or glass wool, or the like.

A bracket or member 13 is provided interiorly about the periphery of the door panel 10 comprising an intermediate flat body portion 14 and leg portions 15 and 16 which project in opposite directions at right angles from the respective sides of said body portion 14. This bracket or member 13 extends continuously and is permanently secured about the internal periphery of the door outer panel 10 by welding the leg portion 15 thereof to the inner surface of the flange portion 17 of said outer panel in such manner that the intermediate body portion 14 of said bracket 13 projects inwardly of the door 2 in a plane perpendicular to the said flange portion 17 of the outer door member 10, as shown in Figure 3. The edge portion of this flange 17 is then turned or bent inwardly as indicated at 17a (see Figure 4) to a position parallel to and spaced outwardly from the bracket body portion 14.

The gasket 5 is next placed or mounted upon the inner door panel 11 by stretching said gasket 5 thereover so that the peripheral edge portions of said panel 11 are engaged in the slot or recess provided between the bead 6 and lip 7 of the gasket 5 in the relation shown in Figure 5, the inherent resilience of said gasket functioning to retain the latter on the inner panel 11.

This inner door panel 11 with its peripherally mounted gasket 5 is now placed within the outer panel 10 of the door so that the underside of the gasket lip 7 rests upon the outer surface of the bracket body portion 14 with the outwardly offset portion 6a of the gasket bead 6 lapped over the outwardly facing surface of the inwardly turned flange portion 17a of said outer panel 10, all as shown in Figure 6 of the drawing.

With the several parts of the door thus assembled the bead portion 6 of the gasket may be lifted away from the inner door panel 11 and the latter and said gasket secured by means of screws 18 to the outer door panel 10 through the body portion 14 of its bracket 13 at suitably spaced intervals thereabout.

The foregoing construction and assembly of the refrigerator door and gasket is the same all the way about the door and this construction is well suited to the mounting of hinges. It is only necessary to notch out a portion from the lip portion 7 and shank 8 of the gasket for a short length and provide an opening 19 in the door flange 17 and bracket leg 15 through which a hinge tongue 20 can be inserted between the inner door panel 11 and the bracket body portion 14, as shown in Figure 2 of the drawing. The hinge tongue 20 is secured to the bracket body 14 by means of a screw 21, and, as shown, a reinforcing or strengthening plate 22 is preferably disposed at the opposite side of said bracket body portion 14 for the purpose of providing a stronger, more rigid support for the hinge. To provide a moisture-proof seal about the tongue 20 it is preferred that the portion 23 of the gasket lip 7 be retained when the same is notched for reception of said hinge tongue so that the gasket will be continuous and unbroken and will surround the hinge tongue and be compressed into engagement with the latter when the inner panel 11 is tightened against the bracket body 14.

Another important advantage to be gained from this door and hinge construction is that a standard type hinge plate may be employed at the same time enabling the hinge axis to be disposed forwardly of the plane of the front face of the cabinet and thus permit relatively easy closing of the door without binding and without setting up any shearing forces on the gasket 5. This is made possible by the recessing of the bracket 13 inwardly of the inturned flange portion 17a of the door shell and the securing of the hinge tongue 20 to said bracket.

From the foregoing construction it will be seen that the provision of the inwardly offset bracket body portion 14 affords a recessed structure or support to which the gasket 5 and inner door panel 11 may be secured, with the result that the adjacent outwardly projecting flange portion 17 of the outer door panel 10 acts to conceal a substantial portion of said gasket 5 so that only the small offset portion 6a of the bead portion 6 is visible when the completed refrigerator door 2 is closed against the cabinet 1. Also, by turning the edge portion of flange 17 inwardly, as 17a, a seat is provided for the offset portion of the gasket bead 6 and at the same time a refrigerator door is produced which is entirely free from exposed flanges or other raw edges.

Thus the refrigerator door and gasket construction of the present invention makes possible the use of a gasket having a relatively large diameter bead thereby affording proper sealing of the door against the circulation of air without unnecessarily straining the door hinges, and at the same time effectively conceals a good part of the gasket so that when the door is closed only a small part of the bead is visible with the result that the refrigerator is afforded an unusually neat, and finished external appearance eminently appealing to the eye.

While a particular embodiment of the present invention has been herein illustrated and described, it is not intended that said invention be limited to such disclosure but that changes and modifications may be made and embodied therein within the scope of the annexed claims.

I claim:

1. In a domestic refrigerator door comprising an outer shell having an inturned marginal flange, and an inner panel member, a bracket member secured to said outer shell and having a body portion offset inwardly of and parallel to said inturned marginal flange of the shell and underlying the edge portions of the inner panel member, and a resilient gasket member comprising a lip portion interposed between the lapping portions of the bracket and inner panel members, a bead portion outwardly overlying both the inturned marginal flange of the outer shell and the edge portions of said inner panel, and a shank portion joining said lip and said bead and extending outwardly between the edges of the outer shell inturned marginal flange and the inner panel member.

2. In a domestic refrigerator door comprising a dished-out outer shell having an inturned marginal flange extending substantially continuously thereabout, and an inner panel member, a bracket member secured within said outer shell and having a body portion extending continuously about the shell and offset inwardly of and par-

allel to said inturned marginal flange of the shell and underlying the edge portions of the inner panel member, and a resilient gasket member comprising a lip portion interposed between the lapping portions of the bracket and inner panel members, a bead portion outwardly overlying both the inturned marginal flange of the outer shell and the edge portions of said inner panel, and a shank portion joining said lip and said bead and extending outwardly between the edges of the outer shell inturned marginal flange and the inner panel member.

3. In a domestic refrigerator door comprising a dished-out outer shell having an inturned marginal flange extending substantially continuously thereabout, and an inner panel member, a bracket member secured within said outer shell and having a body portion extending continuously about the shell and offset inwardly of and parallel to said inturned marginal flange of the shell and underlying the edge portions of the inner panel member, and a resilient gasket member comprising a lip portion interposed between the lapping portions of the bracket and the inner panel members, a bead portion outwardly overlying both the inturned marginal flange of the outer shell and the edge portions of said inner panel, a shank portion joining said lip and said bead and extending outwardly between the edges of the outer shell inturned marginal flange and the inner panel member, and means securing the inner panel member and said gasket to the body portion of the bracket member, said means extending through said lip portion of the gasket and the inner panel member and underlying and concealed by the bead portion of the gasket.

THEODORE W. RUNDELL.