Feb. 18, 1958 E. T. MORTON 2,823,430

REFRIGERATOR DOOR GASKET

Filed March 25, 1955

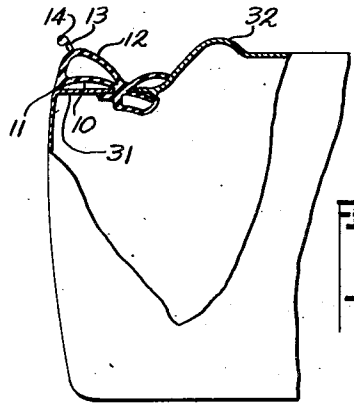


Fig. 3

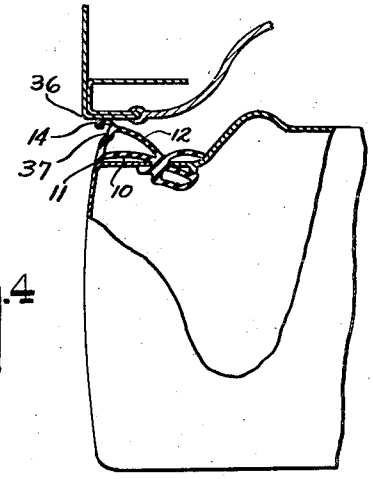


Fig. 4

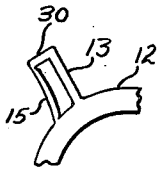


Fig. 5

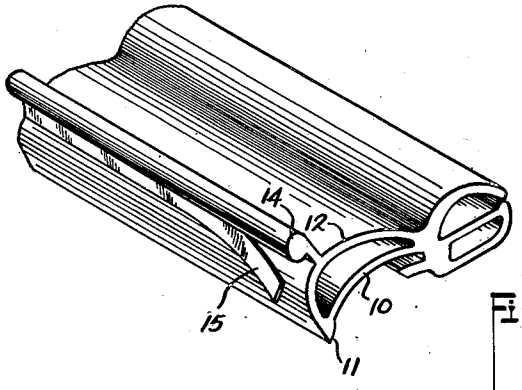


Fig. 1

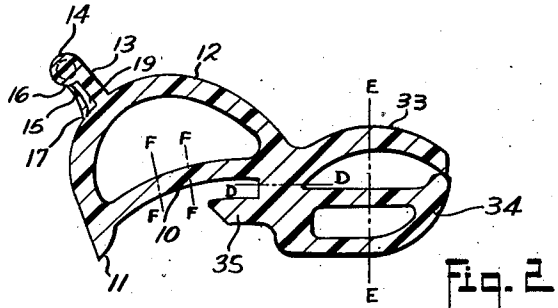


Fig. 2

INVENTOR.
EVANS T. MORTON

BY

J. D. Douglas
HIS ATTORNEY

United States Patent Office 2,823,430 Patented Feb. 18, 1958

2,823,430

REFRIGERATOR DOOR GASKET

Evans T. Morton, Knoxville, Ill., assignor to Midwest Manufacturing Corporation, Galesburg, Ill., a corporation of Illinois

Application March 25, 1955, Serial No. 496,800

9 Claims. (Cl. 20—69)

This invention relates to improvements in door seals and more particularly to an improved door gasket such as is useful in providing a seal between a refrigerator door and a cabinet.

As is well known to those versed in the art, it is customary in the construction of refrigerator cabinets to provide a highly compressible, flexible member between the door and the frame defining the door opening, which member effectively seals the door to the cabinet against the ingress and egress of air.

One of the principal desirable features in such a device is to provide a structure which will compress to different degrees at different portions to cause an effective and efficient seal in the presence of unequal spacing between the opposing parts of the door and the cabinet with a minimum of force.

Heretofore, various attempts have been made to provide gaskets to effect the sealing and among the more successful attempts are those shown in my Patent No. 2,636,228 of April 28, 1953, where the gasket is provided with a convex portion that carries a rib to the end of which a bead is secured.

It will be noted, in the foregoing patent, that the rib which carries the bead is relatively short, and although it would be desirable to have a somewhat longer rib, it is difficult to manufacture such a device by efficient production methods and still have a rib and bead which will stand out from the body of the gasket in the proper manner to provide the more effective operation and maintain predetermined tolerances.

It is customary to form these articles of a resilient rubber or rubber-like material where the form is extruded through a die and subsequently cured. It is extremely difficult to keep the rib and its bead at the proper angularity in relation to the body and to make it stand away from the body, since it has a tendency to collapse toward the body during curing. When these devices are stored there is also a tendency for the rib to bend over and take a permanent set which destroys its effectiveness.

By my present invention, I am able to make a gasket having a convex body from which there extends an oblique rib, the end of which carries a bead, and wherein this rib is longer than is customary and wherein it still extends away from the body in an exact position to perform its proposed operation more efficiently.

Briefly, I am able to provide this longer rib and hold it in its exact position during the curing process by providing an auxiliary support which engages the bead and the body in spaced relation from the rib and which support may be easily removed, if desired, after the curing has been completed.

Fig. 1 is a perspective view of a gasket illustrating how the supporting strip may be removed;

Fig. 2 is an enlarged cross-sectional view thereof;

Fig. 3 is a view of the gasket in place on a door;

Fig. 4 shows the different contours taken when the door is closed; and

Fig. 5 is a fragmentary section illustrating a modification of my invention.

As best seen in Fig. 2 where the gasket is shown in cross-section and in the formation that it takes before being applied to the refrigerator door.

Referring to the drawings, there is provided a base **10** which is slightly curved but which takes a flat configuration when applied to the door. (Fig. 3). It is provided with a downwardly extending lip **11**, for better sealing properties with the door.

Attached to opposite sides of the base portion and integral therewith is a rounded or convex wall **12**, which, together with the base, define a hollow interior. This wall may be semicircular or it may be curved, as shown, after the form of an air foil section. In either event, at the highest point of the curved section there is provided a rib **13** which extends outwardly therefrom at an angle. It may be appreciated that the angle may vary within wide limits, depending upon the particular application of the gasket.

At the end of the rib there is preferably provided a circular bead, which may vary in size and in one form may have a radius of 1/16". The periphery of the bead **14** is tangent to one side of the rib, thus allowing the main body of the bead **14** to overhang the convex surface in the direction of inclination of the rib. It will be noted that the rib, in this instance, is considerably wider than in the embodiment of the above-mentioned patents and may be as much as 1/8" from the top of the curved surface **12** to the underside of the bead.

Although I have shown a solid bead, it is within the purview of my invention to make a hollow bead as shown by the dotted lines in Fig. 2. It is also possible that in place of the bead a lip **30** or T-shaped end could be substituted as shown in Fig. 5.

A web **15** extends between the overhanding portion of the bead and the surface **12**. Preferably, it is secured to the bead at a point spaced from the junction of the rib with the bead, by a narrow section **16**, and, to the convex surface **12** by a narrow section **17**. The spacing at its point of connection to the convex surface **12**, from the rib **13**, is greater at this point than at its point of connection to the bead. The width of the point of connection **17** is also slightly greater. The web may be curved or substantially straight in transverse cross-section.

It will be appreciated that this described structure is a preferred form but that this web could be varied within wide limits and that it could be of uniform thickness from the base to the top and also have a wider attachment at the base and the top without departing from the spirit of the invention.

With a structure as described, the raw material may be extruded through a die and the web **15** will support the bead **14** at the proper angle while the gasket is being cured.

Preferably, when the gasket is installed the web or strip **15** is grasped by the fingers or a suitable tool and pulled away from the structure which now leaves the bead without the auxiliary support, thus increasing its flexibility and enabling it to conform to sharper irregularities in the surface which it is to seal.

Under certain circumstances, however, it may be desirable to leave the web in place. Under these conditions, due to the shape illustrated, when pressure is applied to the periphery of the bead at its highest point, as it will be when it contacts a surface, the web will collapse more readily than the rib, bowing inwardly into the hollow space **19** defined by the rib on one side, the web on the other side, and the bead and concave surface **12** at the other extremities. Both the weakened points of attachment and the concave surface assist in effecting this action.

It will therefore be seen that I have provided a gasket having a highly flexible rib and bead which may be readily manufactured with a much wider rib than is customary, and still maintain exact dimensions between the outermost surface of the bead and the base. It will also be apparent that a more flexible bead may be provided by merely removing the web, as stated, thus enabling an effective seal for doors under relatively light pressure, or that the web may remain in place and still provide an effective seal for doors where a much greater pressure is exercised upon the closing.

In the rib of my prior patent I have found that it commonly requires approximately five pounds of pressure per linear foot to deform or bend the rib, to seal properly against the door jamb. Since it is common for a refrigerator to require fifteen or more feet of gasket it will be apparent that a total of seventy-five pounds is required to provide an effective seal. The entire effect applied, i. e. seventy-five pounds, is therefore exerted on the door latch. With a rib constructed according to the present invention I have found that it only requires one and one-half pounds per foot and that therefore a fifteen foot gasket only requires a total pressure of twenty-two and one-half pounds to provide an effective seal. Thus a latch of a much lighter construction may be used and the door may be opened and closed much more easily with considerably less noise.

As shown in Figs. 3 and 4 where the gasket is applied to a door structure it will be noted that the base **10** becomes flatter and in some instances may be substantially flat where it engages the intwined flange **31** on the door.

In the gasket shown the gasket also acts as a breaker strip between the inturned flange **31** and the inner panel **32** of the door. In this particular instance the gasket is provided with a tail which comprises a curved projection **33** and extending from the base an opposing projection **34** of substantially the form shown. A tongue **35** in spaced relation from the base **10** provides a notch which engages the edge of the flange.

In Fig. 4 it will be noted that when the gasket is bent over by engagement with the door jamb indicated at **36** the curved portion takes an inward bend as indicated at **37**.

Another advantage of the present construction resides in the fact that it may be tailored by cutting to enable it to conform to curved portions or sharp angle bends of the door without destroying its ability to seal. In this connection at the place where the door strike enters the door the gasket may be cut as indicated at E—E in Fig. 2, removing the extremity of the tail **34** and the part **33** to thus provide room for the door latch to operate.

At the places where the gasket bends around sharp corners the gasket may be cut in the tail portion as indicated by the line D—D and between the two lines F—F on the base to remove these parts which permit the gasket to be readily bent in the corner portions.

Having thus described my invention, it will be appreciated that the structures shown have been selected merely for the purpose of illustration, and that various changes in the parts may be made without departing from the spirit or scope of the invention, as defined in the appended claims.

I claim:

1. A door sealing gasket comprising a body having a base portion adapted to be connected to a door or the like, a curved section extending away from the base portion toward a frame of an opening to be sealed and providing a space therebetween, a rib on the exterior surface of said curved section extending at an angle from said curved section, a bead on said rib connected to the rib and having a portion overhanging said curved section, and a thin web connected between the overhanging portion of said bead and said curved section at an angle inclined opposite to the angle of said rib.

2. A door sealing gasket comprising a body having a base portion adapted to be connected to a door or the like, a curved section extending away from the base portion toward a frame of an opening to be sealed and providing a space therebetween, a rib on the exterior surface of said curved section extending at an oblique angle from said curved section, a circular bead on said rib connected tangentially to the rib on one side and having the other side overhanging said curved section, and a thin web connected between the overhanging portion of said bead and said curved section at an angle inclined opposite to the angle of said rib.

3. A door sealing gasket comprising a body having a base portion adapted to rest against a door or the like, a curved section extending away from said base portion toward the opening to be sealed and providing a space therebetween, a rib on the exterior surface of said curved section extending at an oblique angle from said curved section, a circular bead on said rib connected tangentially to the rib on one side and having the other side overhanging said curved section, and a thin web between the overhanging portion of said bead and said curved section at an angle inclined opposite to the angle of said rib, said web being connected to the bead by a narrow section easily serverable from the bead.

4. A door sealing gasket comprising a body having a base portion adapted to rest against a door or the like, a curved section extending away from said base portion toward the opening to be sealed and providing a space therebetween, a rib on the exterior surface of said curved section, a curved portion carried on the end of said rib and having one portion overhanging said curved section, and a thin web extending between the overhanging portion of said curved portion and said curved section at an angle inclined opposite to the angle of said rib, said web being connected to said overhanging portion and said curved section by narrow sections easily serverable from the overhanging portion and the curved section.

5. A door sealing gasket comprising a body having a base portion adapted to rest against a door or the like, a curved section extending away from said base portion toward the opening to be sealed and providing a space therebetween, a rib on the exterior surface of said curved section, a curved portion carried on the end of said rib and having one portion overhanging said curved section, and a thin web extending between the overhanging portion of said curved portion and said curved section at an angle inclined opposite to the angle of said rib and formed to provide a transverse cross section that is convex toward the rib, said web being connected to said overhanging portion and said curved section by narrow sections easily severable from the overhanging portion and the curved section.

6. A door sealing gasket comprising a body having a base portion adapted to rest against a door or the like, a curved section extending away from said base portion toward the opening to be sealed and providing a space therebetween, a rib on the exterior surface of said curved section, a curved portion carried on the end of said rib and having one portion overhanging said curved section, and a thin web extending between the overhanging portion of said curved portion and said curved section at an angle inclined opposite to the angle of said rib and formed to provide a transverse cross section that is convex toward the rib and that is concave on the side facing away from the rib, said web being connected to said overhanging portion and said curved section by narrow sections easily severable from the overhanging portion and the curved section.

7. A door sealing gasket comprising a body having a base portion adapted to rest against a door or the like, a curved section extending away from said base portion toward the opening to be sealed and providing a space therebetween, a rib on the exterior surface of said curved section, a curved portion carried on the end of

said rib and having one portion overhanging said curved section, a web extending between the overhanging portion of said curved portion and said curved section at an angle inclined opposite to the angle of said rib, said web having a thickened mid section and being connected to said overhanging portion by a narrow portion and to said curved section by a section narrower than the mid section and wider than the connection to said overhanging portion whereby it is easily severable from the overhanging portion and the curved section.

8. A door sealing gasket comprising a body having a base portion adapted to be connected to a door or the like, a curved section connected at its opposite ends to said base portion and between its ends extending away from the base portion toward a frame of an opening to be sealed and providing a hollow space between itself and the base portion, a rib on the exterior surface of said curved section extending at an angle from said curved section, said rib terminating in a portion overhanging said curved section, and a thin web connected between the overhanging portion of said rib and said curved section in spaced relation to said rib, said web being connected to said curved section at a location thereon spaced from said ends of the curved section.

9. A door sealing gasket comprising a body having a

base portion adapted to be connected to a door or the like, a curved section connected at its opposite ends to said base portion and between its ends extending away from the base portion toward a frame of an opening to be sealed and providing a hollow space between itself and the base portion, a rib on the exterior surface of said curved section extending at an angle from said curved section, said rib terminating in a portion overhanging said curved section, and a thin web extending between the overhanging portion of said rib and said curved section in spaced relation to said rib, said web being connected by sections of reduced thickness to said overhanging portion and to said curved section at a location thereon spaced from said ends of the curved section.

References Cited in the file of this patent

UNITED STATES PATENTS

2,180,886	Thomas	Nov. 21, 1939
2,198,838	Peltier	Apr. 30, 1940
2,368,837	Hubacker	Feb. 6, 1945
2,700,194	Rasmussen	Jan. 25, 1955

FOREIGN PATENTS

702,743	Great Britain	Jan. 20, 1954