A refrigerator cabinet including a door gasket comprising an arched base portion spanning the joint between the outer and inner door panels and secured to the door only along the outer edge thereof includes an auxiliary flap extending from the bottom face thereof for continuous engagement with the inner panel in the event the unsecured inner edge of the base portion separates from the door surface.

The present invention relates to refrigerator and freezer cabinets and is more particularly concerned with a cabinet including an improved magnetic gasket construction for preventing sweating of the cabinet door in the vicinity of the sealing gasket. A well known type of magnet gasket designed not only to seal the space between the door and the cabinet face but also to maintain the door in a closed position by attraction of a magnetic means carried by the gasket with a magnetic metallic area on the face of the cabinet comprises a base portion including means for securing the gasket to the base portion of the door and a tubular portion containing the magnetic means. The gasket is an extruded resilient material such as rubber, polyvinylchloride or the like. The flexibility or resiliency of various portions of the gasket is controlled by varying the cross-sectional thicknesses thereof in order that each portion may perform the desired function or functions. For example, the base portion which overlaps or masks the joint between the inner and outer door panels and is secured along its outer edge to the door assembly, must be sufficiently thick and rigid so that its inner free edge is normally in engagement with the door surface and maintains an insulating dead air space beneath the gasket base portion when the door is in a closed position. However, it must be sufficiently flexible so that it can be folded back during assembly of the door and gasket to provide access to the fastening or anchoring means employed to secure the one edge of the gasket to the door. Within the range of manufacturing tolerances, it is possible to design the base portion so that the inner or free edge will maintain contact with the inner door panel. However, in certain applications involving either a relatively large door or large differences between the cabinet interior and ambient temperatures, the door may bow to such an extent that the free or unanchored edge of the gasket pulls away from the adjacent portion of the inner door panel thereby permitting the free circulation of the refrigerated air into the space beneath the gasket where it contacts the gasket retaining means. The resultant heat transfer through this area to the outer door panel results in sweating on the outer surface of the door.

The present invention has as its primary object the provision of a new and improved magnetic gasket including means for assuring gasket sealing action under such conditions.

Further objects and advantages of the invention will become apparent as the following description proceeds and the features of novelty which characterize the invention will be pointed out with particularity in the claims appended and forming part of this specification.

In carrying out the objects of the present invention, there is provided a refrigerator cabinet comprising a magnetic gasket of the above-described construction and including, as the improvement of the present invention, an auxiliary flap or foot extending from the bottom surface of the gasket base portion and of such construction, flexibility and length that at least the tip or edge portion thereof maintains contact with the inner door panel inwardly from the gasket fastening means over the entire length of the gasket including any portion thereof regardless of any bowing of the door.

For a better understanding of the invention reference may be had to the accompanying drawing in which:

FIGURE 1 is a horizontal sectional view through a portion of a refrigerator cabinet embodying the improved magnetic gasket seal of the present invention;

FIGURE 2 is a sectional view similar to FIGURE 1 illustrating the operation of the present invention in a bowed door area; and

FIGURE 3 is a sectional view of the magnetic gasket of the present invention in its free or "as extruded" configuration.

Referring to FIGURES 1 and 2 of the drawing, there is shown a refrigerator including a cabinet member 1 comprising an outer metal shell 2 and a liner 3, the liner 3 forming a storage compartment within the cabinet. A door 4 for closing the access opening to the storage compartment is hingedly supported along one vertical edge thereof by means of hinges (not shown). The door comprises an outer panel 5 of sheet metal and an inner panel 6 of insulating material, such as a plastic sheet material, having a peripheral edge portion 7 which overlaps an inwardly extending flange 8 on the outer panel 5. The space between the face of the cabinet as represented by an inwardly extending flange 9 on the cabinet shell 2 and the door is sealed and held in a closed position by means of a magnetic gasket generally indicated by the numeral 10.

The gasket 10 comprising a resilient material such as rubber, polyvinylchloride or the like includes a base portion 14 of generally arched or concave configuration having along the outer edge thereof an anchoring section or portion 15 secured to the flange 8 by means of a retainer strip 16 extending substantially the full length of the gasket. The retainer strip 16 is secured directly to the flange 8 by means of a plurality of screws 17 extending through the retainer strip and the peripheral edge of the inner panel 6 and serving to join both the retainer strip and the inner panel 6 to the outer panel 5. The anchoring section 15 comprises the sole means for securing the gasket to the door. The base portion 14 is of generally arcuate cross-section in order to provide space for the retaining strip 16 and to maintain the inner edge thereof in engagement with the inner door panel 6. It is also sufficiently flexible so that it can be folded or flexed away from the inner surface of the door during assembly of the refrigerator door and gasket in order to provide access for driving the screws 17.

The gasket 10 also includes a tubular portion 21 secured to the base portion 14 by a bellows structure 22 which provides limited movement between the tubular portion 21 and the base 14. A magnet 25 of the well known type comprising metallic magnetic particles embedded in the strip of plastic material is contained within the tubular portion 21 which registers with the magnetic metal face portion or flange 9 of the cabinet, the magnetic attraction between the magnet 25 and the flange 9 serving as the sole means for holding the door in the closed position.

The various portions of the gasket 10 as well as the components of the door are so constructed and arranged that the door assembly when initially assembled provides a continuous contact between the inner or free edge 20 of the gasket and the adjacent portion of the inner panel.
3,359,053

6. However, when the door is placed on the cabinet and the refrigerator put into use, the inner surface of the door as represented primarily by the inner door panel is subjected to the refrigerating temperatures within the cabinet which are substantially below the ambient temperatures. The resultant contraction of the inner panel results in a bowing action which, for example, may cause the door structure to bow outwardly between its upper and lower edges. Since the magnet maintains gasket contact with flange 9, this bowing action plus the shrinkage of the gasket base portion 14 which is exposed to and cooled by the same refrigerating temperatures has been found to result in a separation of the inner edge 20 of the gasket from the door particularly in the drastically bowed areas. This permits the relatively cold air from within the compartment to circulate freely beneath the gasket base portion 14 and into contact with the retainer 16 and the screw 17 thereby cooling these components as well as the adjacent portion of the outer door panel 5 so that moisture from the ambient atmosphere condenses on the cooled portions of the metal outer panel 5 causing undesirable "sweating" thereof.

In accordance with the present invention and in order to assure the continued existence of a dead air space beneath the concave base portion 14 of the gasket or in other words to prevent the circulation of cabinet air into the space, there is provided an auxiliary flap 28 extending at an angle from the bottom surface of the base portion 14 in such a manner that the inner or free edge 29 thereof will maintain engagement with the inner panel 6 of the door inwardly from the retainer strip 16 regardless of any bowing action of the door. More specifically, this flap 28 is relatively thin as compared with the thickness of the base portion 14 so that it is sufficiently flexible that it does not affect the normal configuration of the base portion or in other words does not prevent normal contact of the edge 20 with the inner panel 6. In addition to its "as formed" or extruded initial shape, this flap extends inwardly from the inner surface of the base portion 14 a greater distance than the edge 20 of the base portion and is connected to the inner surface of the base portion 14 at such a point and is of such length that when the edge 28 of the base portion is in contact with the inner panel 6 as illustrated in FIGURE 1 of the drawing, the flap is contained completely within the area between the inner and outer edges of the gasket. However, in the event that there is a bowed condition in the door as illustrated in FIGURE 2 of the drawing such that the inner edge 20 of the base portion tends to pull away from the inner panel 6, the flap maintains contact with the inner door surface so that the cold or refrigerated air from within the storage compartment cannot circulate into engagement with the retainer 16.

It will be understood that, while in accordance with the patent statutes, I have described what at present is considered to be the preferred embodiment of my invention, it will be obvious to those skilled in the art that various changes and modifications may be made therein without departing from my invention, and it is therefore aimed in the appended claims to cover all such changes and modifications as fall within the true spirit and scope of my invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. A refrigerator cabinet comprising:
   a storage compartment having an access opening surrounded by a face portion comprising an area composed of magnetic material,
   a door hingedly mounted on said cabinet along one edge thereof for closing said access opening, said door comprising an outer metal panel having an inwardly turned flange extending about the periphery thereof and a plastic inner panel having a peripheral edge overlapping and joined to said flange,
   a sealing gasket of resilient material mounted on said door adjacent the peripheral edges thereof and including a base portion overlapping said peripheral edge of said inner panel and a cabinet engaging portion integrally joined to said base portion and comprising a magnet means attracted to said area of magnetic material and providing the sole means for holding the door in a closed position,
   said base portion being of an arched cross-section and including an outer edge engaging said flange and an inner edge overlapping said inner panel,
   means positioned between the inner and outer edges of said gasket securing only said outer edge to said door,
   said base portion being sufficiently rigid to normally maintain said inner edge thereof in contact with said inner panel about substantially the entire periphery of said door when said door is held in a closed position by said magnet thereby forming a dead air space beneath said base portion,
   and a flap thinner than said base position and extending at an angle from the bottom surface of said base portion of a length and flexibility such that it engages said inner panel without affecting the normal contact of said inner edge of said base portion with said inner panel and contacts said inner panel at all points about the periphery thereof along a line between the edges of said base portion under all conditions including temperature conditions causing sections of said inner edge of said base portion to pull away from said inner panel.

2. The cabinet of claim 1 wherein said flap is of a relatively thin cross-section as compared with said base portion.

References Cited

UNITED STATES PATENTS

2,647,792 8/1953 Fleming 49—496 X
2,737,412 8/1956 Smith et al. 49—489 X
2,880,476 4/1956 Wahlfeld 49—489 X
2,883,420 4/1956 Timlou 49—489 X
3,294,462 12/1966 Kesling 312—296 X

JAMES T. McCall, Primary Examiner,