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BREAKER STRIP CONSTRUCTION

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2 Sheets-Sheet 1

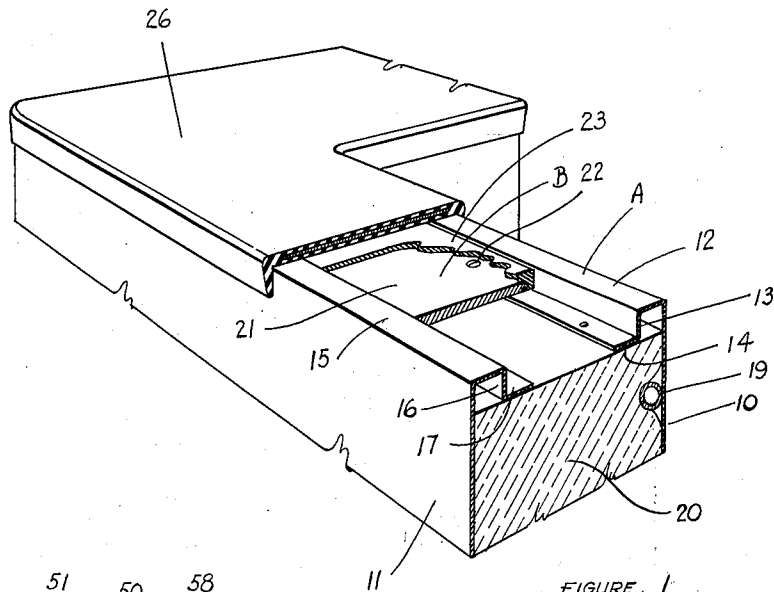


FIGURE 1

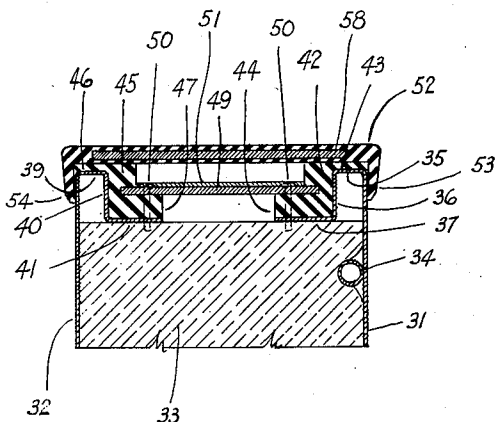


FIGURE 3

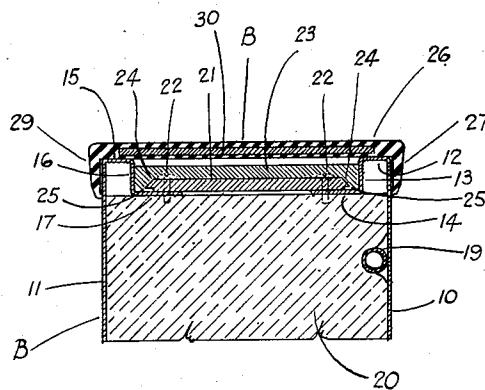


FIGURE 2

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BREAKER STRIP CONSTRUCTION

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5 Claims. (Cl. 220—9)

1

My invention relates to an improvement in breaker strip construction particularly useful on flat top freezers and the like.

In the manufacture of flat top freezers and the like for containing frozen foods and other products it is necessary to provide an efficient seal between the inner and outer metallic cabinet coverings. Freezer cabinets of the type described are usually cooled by means of refrigerant coils secured to the outer surface of the cabinet liner. It is essential that a tight seal be provided between the liner and the outer refrigerator shell to prevent moisture from collecting within the wall of the refrigerator on the coils and outer liner surface. Furthermore, as the cabinets are usually maintained at a low interior temperature, an effective seal is necessary between the inner and outer metallic coverings of the cabinet to prevent the leakage of heat into the refrigerator.

In providing a connection between the inner and other shells of the refrigerator several facts must be borne in mind. A definite supporting connection between the inner and outer shells is desirable so as to prevent any shifting of the liner relative to the outside shell and to hold the two shells in proper relationship. The structure necessary to accomplish the desired result depends to some extent on the insulation used, as the insulation may be of use in holding the shells in the proper relationship. However, a definite non-metallic connection is desirable in order to prevent relative movement between these elements.

In view of the necessity of preventing moisture from entering the wall between the two refrigerator shells it is desirable to provide a sealing compound for closing the cracks between the inner and outer coverings. This sealing compound or composition is preferably employed in a plastic state so as to thoroughly seal the wall at the junction between the two shells. This sealing medium is a poor conductor of heat and therefore does not transmit heat from the outer to the inner shell.

In order to provide a finished appearance to the joint between the shells, a cap overlies the seal and is provided with flanges holding the cap in sealing position.

These and other objects and novel features of my invention will be more clearly and fully set forth in the following specification and claims.

In the drawings forming a part of my specification:

Figure 1 is a perspective view of a corner of

2

a flat top cabinet showing the construction of the seal between the inner and outer refrigerator shells.

Figure 2 is a sectional view through the breaker connection shown in Figure 1.

Figure 3 is a sectional view through a modified form of construction.

Figure 4 is a view similar to Figure 1 showing a construction in which the rigid connection between the shells is not continuous.

Figure 5 is a sectional view through a modified form of breaker construction.

Figure 6 is a sectional view showing still another form of breaker construction.

The flat top freezer A, illustrated in Figure 1 of the drawings, is preferably designed for containing frozen foods and other products. In preferred form it includes an inner shell 10 and an outer shell 11 having a breaker construction 20 illustrated in general by the letter B connecting the inner and outer shells. It is this breaker which is of importance in the present invention.

In the construction illustrated in Figure 1 of the drawings the inner liner 10 is provided with an outwardly turned horizontal flange 12 at the upper extremity thereof which is integrally connected to a downwardly extending flange 13 substantially parallel to the liner 10. The edge of the liner is then bent outwardly to form a substantially horizontal flange 14.

The outer covering or outer shell 11 is similarly constructed. This outer shell 11 is provided with an inwardly turned flange 15 having a downwardly extending flange 16 integral therewith which is parallel to the outer covering. The outer covering edge terminates in an intumed flanged edge 17 which is substantially coplanar with the flange 14 and in spaced relation thereto.

In actual practice refrigerant coils such as 19 are usually secured to the outside surface of the liner 10 so as to remove heat therefrom. The coil 19 preferably contacts the surface of the liner so as to provide a heat conductive connection therewith to render more effective the withdrawal of heat from the liner and thus form the interior of the freezer.

Between the inner and outer refrigerator shells 10 and 11 I provide insulation 20 of any desired type. As this insulation is of block form it is obviously more effective in holding the inner liner in place. The insulation may, however, be of any desired material to fill the area between the coverings 10 and 11.

In order to hold the inner and outer shells in proper relationship I provide a strip of non-

metallic material 21 such as Masonite, or other fibrous material, which rests upon the flanges 14 and 17 and is secured thereto by any suitable means such as the screws or bolts 22. These screws or bolts are of any desired type and may if desired be of the thread forming variety which may operate to thread the material of the flanges 14 and 17 so as to hold the breaker strip 21 in place.

While the breaker strip 21 may provide a good support and spacer between the liner 10 and the outer shell 11 the joint formed thereby may not be moisture-proof or moisture vapor proof. If material enters the wall between the inner and outer refrigerator shells this moisture will cool on the coils 19 not only affecting the efficiency of the refrigerator, but also creating the likelihood of condensation which would in time have a serious effect upon the refrigerator. In order to seal the joint between the inner and outer shells I prefer to employ a sealing composition indicated in the sketches by the numeral 23, which will form a tight seal between the flanges 13 and 16. This sealing medium 23 is usually applied in molten or dissolved state so that it will fill any cracks and crevices which might otherwise be open. As an example of such a filler I may use an asphalt or an asphalt containing composition which is normally hard at room temperatures, but which will not readily crack or break even at relatively low temperatures.

As will be best noted in Figure 2 of the drawings the ends of the breaker strip are beveled as indicated at 24 and are cut or mortised at 25 so that the sealer 23 may extend partially beneath the edges of the sealer. As a result the breaker strip is strongly anchored in place and has no tendency to separate from the breaker strip.

In order to conceal the joint between the inner and outer refrigerator coverings I provide a breaker collar 26 which encloses this joint. This breaker collar is preferably formed of hard rubber having a substantially flat upper surface and being provided with downwardly extending parallel flanges 27 and 29 which overlie the upper edges of the inner and outer shells 10 and 11 respectively. The breaker collar is preferably held in place only by friction, although cement may be used if necessary. This breaker strip 26 may be reinforced if desired by use of a reinforcing strip 30 embedded within the top of the strip or inserted longitudinally in an aperture therein. The reinforcing strip may also be secured to the undersurface of the collar if it is so desired.

In Figure 3 of the drawings I disclose a modified form of breaker construction. In this construction the freezer is provided with an inner shell 31 and an outer shell 32 in spaced relation thereto. Insulation 33 is provided between the inner and outer shells and coils 34 and refrigerant may be secured to the outer wall of the liner to conduct heat therefrom.

The inner shell 31 is provided at its upper edge with an outwardly turned flange 35 which is bent downwardly to provide an integral flange 36 substantially parallel to the inner shell wall 31. The edge of the liner terminates in an outwardly extending flange 37 which is substantially horizontal.

The outer shell is likewise provided with an inturned flange 39 which supports a downwardly extending flange 40 parallel to the outer shell 32. A substantially horizontal flange 41 is integral

with the flange 40 and is coplanar with and opposed to the flange 37 on the liner. Overlying the flange structure of the liner I provide a sponge rubber block 42 which is provided with a horizontal flange 43 overlying the top flange 35 and the horizontal flange 44 overlying the horizontal flange 37. Thus substantially the entire area of the flanges 35, 36 and 37 are covered by the sponge rubber block which cushions the support of the breaker strip.

A similar sponge rubber block 45 is secured to overlie the flange structure of the outer shell 32, this block 45 having a flange 46 overlying the flange 39 and a second flange 47 overlying the edge flange 41. Thus substantially the entire flange structure of the outer shell 32 is covered by the sponge rubber block 45.

A breaker strip 49 of non-metallic material is secured to the flanges 37 and 41 by any suitable means such as by the screws or bolts 50. These screws or bolts extend through the flanges 44 and 47 of the sponge rubber blocks 42 and 45 and anchor the breaker strip 49 to the flanges. The edges of the breaker strip 49 are embedded in the body of the sponge rubber blocks 42 and 45, merely compressing the sponge rubber at these points or being inserted into the slots in the sponge rubber blocks provided for this purpose. Thus while the breaker strip 49 serves as a connection between the flanges 37 and 41, this connection is cushioned through the sponge rubber blocks and the sponge rubber also provides a tight seal between the inner and outer shells for the breaker strip 49.

In order to assist in the sealing operation a layer of sealing material 51 overlies the breaker strip and seals the connection between this breaker strip and the sponge rubber blocks 42 and 45. Thus an effective moisture and moisture vapor proof seal is provided between the inner and outer refrigerator shells.

In order to enclose the connection and to form a base against which the hinged top of the flat top freezer may engage I provide a breaker collar 52 which extends over the entire fold. This collar 52 is formed of hard rubber or similar material and is provided with edge flanges 53 and 54 which extend downwardly over the inner and outer shells 31 and 32 and is frictionally engaged thereupon. This collar 52 may be reinforced by suitable means such as by the reinforcing strip 54 embedded or inserted within the breaker strip or by suitable reinforcing means secured to the undersurface of this strip.

In Figure 4 of the drawings I disclose a modified form of construction which is similar to that shown in Figures 1 and 2 of the drawings. In Figure 4 I disclose a refrigerator having an inner liner 55 and an outer shell 56 enclosing insulation 57 therebetween. Refrigerant coils such as 59 may if desired encircle the liner 55 and may be secured in contacting relation to the outer surface thereof.

An outwardly turned flange 60 is provided on the inner liner 55 and an opposed inturned flange 61 is provided on the outer liner 56. Downwardly extending integral flanges 62 and 63 are provided on the flanges 60 and 61, respectively. An outwardly turned edge flange 64 may extend in coplanar relation with an inturned flange 65 on the flange 63. The flanges 64 and 65 need not be continuous and may if desired be only at spaced intervals along the length of the flanges 62 and 63.

5

In order to hold the inner and outer liners in their proper relationship, I provide spaced breaker strip elements 66 secured to the flanges 64 and 65 by any suitable means such as the screws or bolts 67. The strips 66 are preferably of some cross sectional shape similar to that shown in Figures 1 and 2 so as to provide undercuts 69 at each end of these strips. The undercuts permit the sealing medium to extend partially beneath the breaker strips to anchor the sealing medium in position.

As shown in Figure 4 the sealing medium 70 overlies the strips 66 and overlies the insulation between these strips. The sealing medium 70 is preferably applied in molten or dissolved state and thus provides an effective seal between the inner and outer liners. This breaker construction requires considerably more of the sealing medium and considerably less of the breaker strip which is formed of a non-metallic material such as Masonite or the like.

A breaker collar 71 overlies the connection between the liners and is provided with an inner flange 72 and an outer flange 73 to frictionally engage the refrigerator coils. If desired the collar 71 may be reinforced by an insert 74 or by a reinforcing strip extending beneath the collar and secured thereto.

In Figure 5 of the drawings I disclose another form of construction which simplifies the construction of the breaker strip used. In this construction I provide an inner liner 75 and an outer shell 76, having insulation 77 therebetween. A refrigerant coil 79 may be secured in any desired way to the outer surface of the liner 75.

An outwardly turned flange 80 extends coplanar and in opposed relation to an inturned flange 81 on the outer shell 76. Parallel downwardly extending flanges 82 and 83 depend from the flanges 80 and 81. An outwardly turned flange 84 extends in opposed coplanar relation with an inturned flange 85 on the flange 83. The extreme edge 86 of the flange 84 is turned upwardly and the extreme edge 87 of the flange 85 is likewise turned upwardly. This upturned edge on each of the opposed flanges 84 and 85 acts to support a breaker strip 89 in spaced relation to the bodies of the flanges 84 and 85. Thus when the breaker strip 87 is secured to these flanges by any suitable means such as by the screws or bolts 90, a space is provided between the breaker strip for the major portion of each flange 84 and 85. As a result when the sealing medium or sealing compound 91 is poured into place in a molten or dissolved state, this sealing medium will extend between the ends of the breaker strip 89 and the bodies of the flanges 84 and 85, thus providing a more effective seal for anchoring the sealing medium in place.

A breaker collar 92 similar to the breaker collars previously described may be used to conceal the joint and to increase the appearance thereof.

In Figure 6 of the drawings another modified form of construction is illustrated. In this construction the refrigerator is provided with an inner liner or shell 93 and an outer shell 94 having insulation 95 therebetween. Refrigerator coils such as 96 may if desired be secured to the outer surface of the liner 93.

The liner 93 is provided with an outwardly turned flange 97 thereupon which lies in coplanar relation with an inturned flange 99 on the outer shell 94. A downwardly extending flange 100 is provided integrally with the flange 97 and a rela-

6

tively short downwardly turned flange 101 is provided on the flange 99. An outwardly turned edge flange 102 is provided on the flange 100.

A breaker strip 103 is secured to the flange 102 by any suitable means such as by the screws or bolts 104. The strip 103 is similarly secured to the flange 99 by any suitable means such as by screws or bolts 105. The bolts or screws 105 draw the breaker strip 103 against the flange 101 to provide a seal therebetween. The screws or bolts 104 tend to clamp the breaker strip 103 against the flange 102 to serve as a seal therebetween.

In completing the sealing operation a sealing medium in a molten or dissolved state and indicated by the numeral 106 is placed over the breaker strip 103 between the flanges 100 and 101. This sealing medium acts to seal any cracks or crevices between these two flanges forming a tight seal between the opposite sides of the refrigerator.

In order to conceal the joint between the inner and outer shells I provide a breaker collar 107 which may be of a type previously described. This breaker collar serves as a non-conductive connection between the inner and outer liners and conceals the sealing medium.

In accordance with the patent statutes, I have described the principles of construction and operation of my breaker strip construction, and while I have endeavored to set forth the best embodiments thereof, I desire to have it understood that obvious changes may be made within the scope of the following claims without departing from the spirit of my invention.

I claim:

1. A breaker construction for a refrigerator having inner and outer metallic coverings, said coverings having flanged edges extending in spaced relationship, a non-metallic rigid connecting member connecting said flanges and contacting the same to form a rigid connection between the flanges, marginal edge portions on said connecting member in spaced relation to said flanges, and a sealing compound overlying said connecting member and sealing the joint between said inner and outer coverings, said sealing compound extending into the space between said marginal edges of said connecting member and said flanges to anchor the sealing compound in place.

2. The structure described in claim 1 in which the flanges of said inner and outer metallic coverings are in co-planar relation.

3. The structure described in claim 1 in which the inner and outer coverings extend to form shoulders projecting above said flanges to position said flanges below the level of said shoulders and forming a recess between said shoulders into which said sealing compound is placed.

4. A breaker for a well type refrigerator having inner and outer metallic coverings, said coverings having opposed inturned ledges, flanges extending downwardly from said ledges and opposed marginal flanges in co-planar spaced relation substantially parallel to said ledges and below the level thereof, a non-metallic rigid connecting member between said marginal flanges in contacting relation thereto, and means securing said connecting member to said marginal flanges to form a rigid connection between said inner and outer coverings, marginal edge portions on said rigid connector spaced from the surface of said marginal edge flanges and sealing compound overlying said rigid connector for enclosing and embedding the marginal edges of

said connector and forming a seal between said inner and outer coverings.

5. The structure described in claim 4 and including a non-metallic collar overlying said seal and said ledges to conceal the joint between the inner and outer coverings.

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