Oct. 17, 1950 W. L. MORRISON 2,526,036

INSULATED SHIPPING CONTAINER

Filed April 28, 1947 2 Sheets-Sheet 1

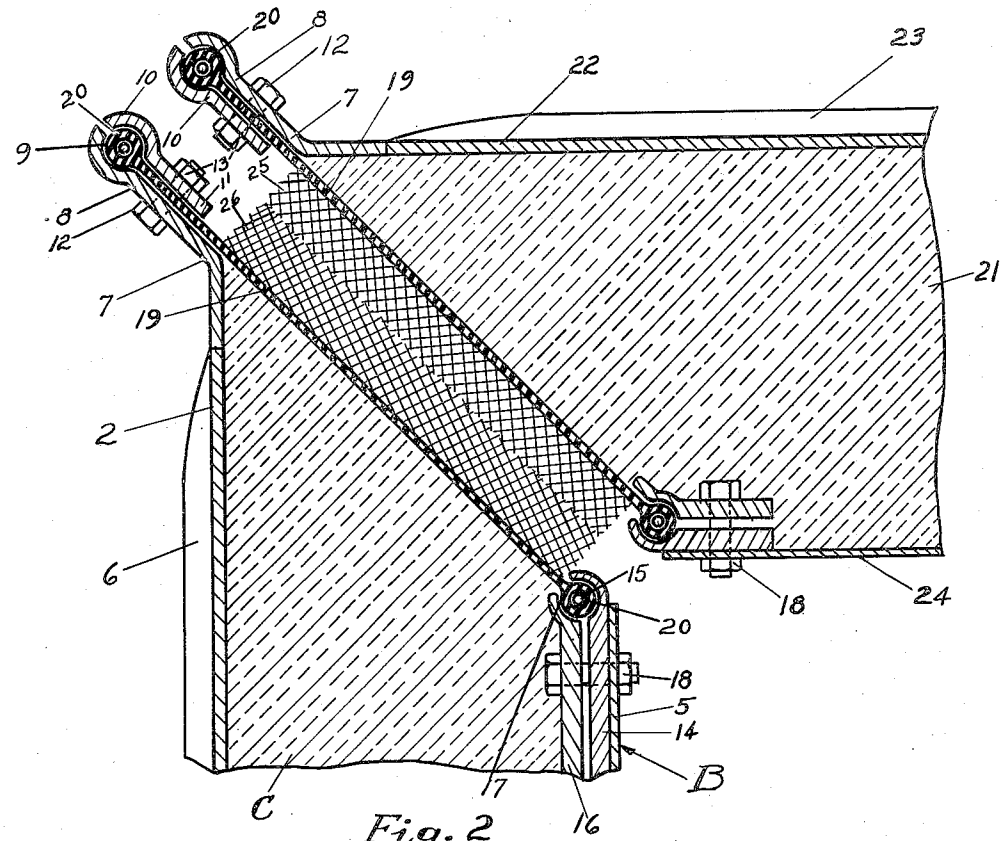


Fig. 2

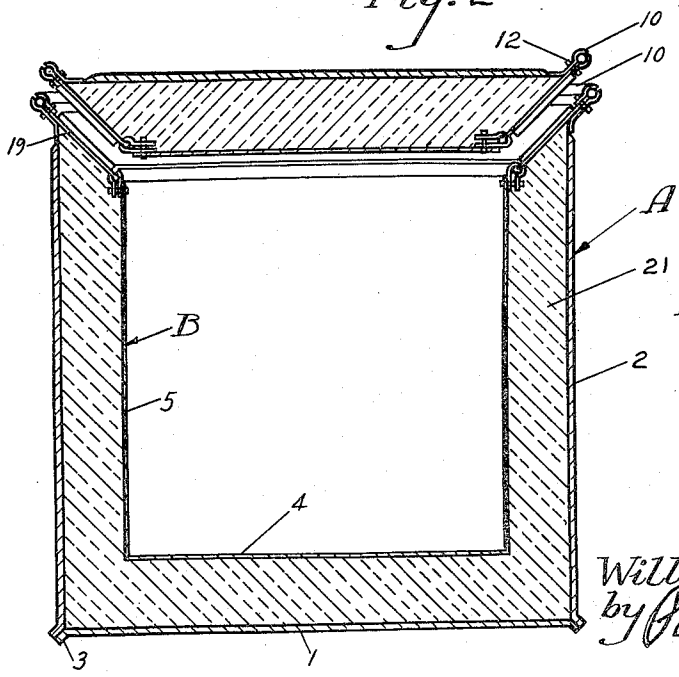


Fig. 1

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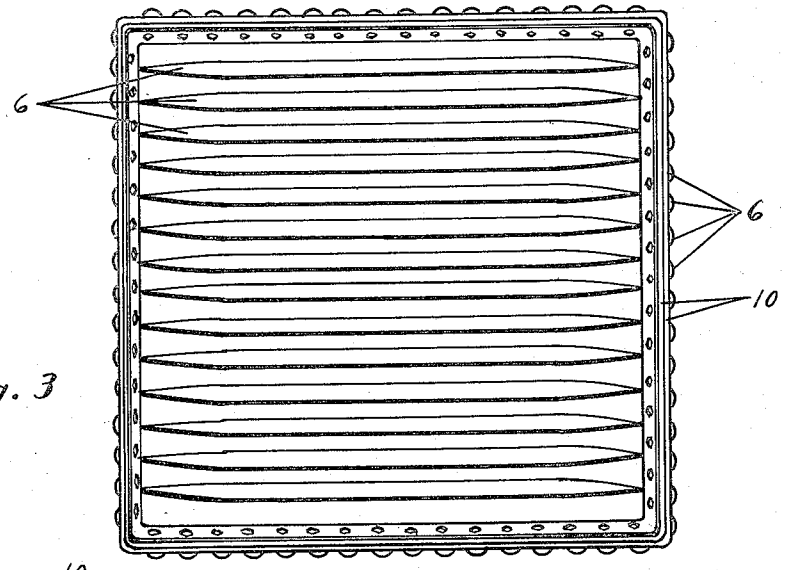


Fig. 3

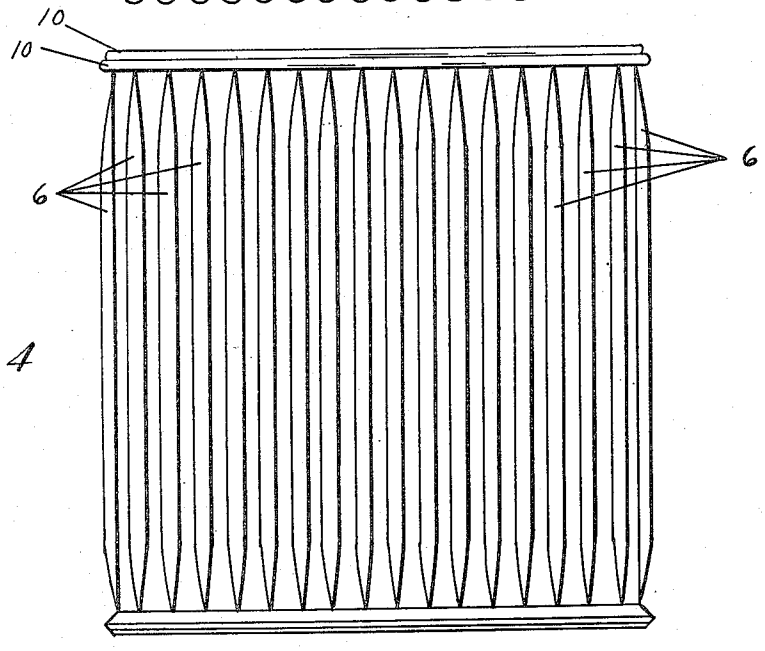


Fig. 4

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UNITED STATES PATENT OFFICE

2,526,036

INSULATED SHIPPING CONTAINER

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Application April 28, 1947, Serial No. 744,481

2 Claims. (Cl. 220—15)

1

My invention relates to improvements in insulated shipping containers, especially for use in connection with the shipment of foods in fairly large quantities but smaller than carload lots.

It is of the utmost importance that shipping containers of this type, especially those used for the shipping of frozen food, be light and durable, take up a minimum of space, be easily opened and shut, easily loaded and unloaded, and require to a minimum extent servicing, repair, adjustment and the like.

Such containers require an outer, stiff, rigid, self-supporting housing, an inner, relatively stiff lining or box in which frozen food may be packed, and a light, preferably friable, insulating packing between the inner liner and the outer housing wall.

If the insulating packing is sufficiently light and filled with sufficient air spaces to afford adequate insulation, it will have little, if any, strength. So, it cannot well be used as a structural member to support the inner lining in the outer box or housing.

Many different schemes have been tried in the art in an effort to properly position the lining spaced from the outer shell. Such proper and permanent positioning is of the utmost importance, as otherwise the insulation would be damaged and the effectiveness of the box materially reduced. This is especially true in connection with boxes which are transshipped from warehouse, to truck, to rail car, etc.

Structural elements having sufficient structural strength to support the load of the lining from the walls of the housing, if of metal serve as conducting elements to conduct and encourage heat flow between the lining of the housing, if of wood they are expensive and difficult to install, subject to decay and breakage, and always heavy and cumbersome.

I propose to support the lining in the box by nonmetallic tension members only, which tension members are strong in tension but have no compression-resisting strength, and propose to use these tension members in the form of continuous sheets of rubber-impregnated fabric which join the upper edges of the housing and the lining. The housing and the lining being stiff, these tension sheets will insure proper positioning of the lining within the housing, will avoid interference with or damage to the insulating lining, and since they are of rubber- or plastic-impregnated fabric, they will be inert to food contamination and can be used as a part of the structure without other coverage. The lid or cover for the container will be built on the same principle.

My invention is illustrated more or less diagrammatically in the accompanying drawings, wherein:

Figure 1 is a vertical section through the container and the cover, the cover about to be seated in the container;

2

Figure 2 is a sectional view on a larger scale showing abutting edges of cover and container; and

Figure 3 is a plan view of the box.

Figure 4 is an elevation view of the box.

Like parts are indicated by like characters in the specification and claims.

A is an outer, preferably rectangular, box or housing. It has a bottom wall 1, side walls 2, preferably joined as at 3 to provide a stiffening or reinforcing rib about the bottom of the box. B is a liner for the box. It has a bottom 4 and side walls 5. The bottom wall 1 is parallel with the bottom 4. The side walls 2 are parallel with the liner side walls 5. Both boxes A and B are open at the top. C is a mass of insulation interposed between the boxes A and B, which mass of insulation preferably lacks any structural strength sufficient to support or position the box B with respect to the box A. The box A must be stiff enough to protect the lining, insulation and the contents, so I have shown stiffening corrugations 6, which, of course, are filled with insulation just as the rest of the box.

Extending along the upper edge of each of the walls 2 is an angle plate 7. That angle plate will preferably be welded to the upper edge of each of the walls 2, being parallel therewith, and will have an outwardly flaring angular flange 8, this flange extending entirely about the periphery of the box A, being associated with each of the four walls 2. Of course, this flange could be made integral with the wall 6, if desired, and the process by which the particular wall is assembled and shaped forms no part of my invention. Suffice it to say that the flange 8 terminates in a semicircular pocket 9. In opposition to the semicircular pocket 9 is a clamp member, including an opposed semicircular pocket 10 and a flange member 11. This flange member 11 may be bolted to the flange member 8 by a series of nuts and bolts 12, 13.

The upper edge of each of the walls 5 defining the liner B is provided with strips 14 having flanges defining semicylindrical pockets 15 in opposition to clamping strips 16, and flanges defining semicylindrical pockets 17 in opposition to the pockets 15. These members 14 and 16 are held together by nuts and bolts 18. The flanges 14 may be welded or otherwise attached to the upper edge of the walls 5.

Extending along each of the opposed walls 2 and 5 is a tension strip, preferably of rubber- or plastic-impregnated fabric 19. This strip is enlarged along each edge as at 20 as indicated, and each enlarged bead 20 is gripped within the cylindrical pockets on the outer upper edge of the casing on one side, and the upper boundary of the liner on the other side, the bead being clamped between the elements 9 and 10 or 15 and 16, as the case may be, by the nut and bolt 13 and 18. Thus, the only con-

nection between the liner B and the housing A is by means of the flat, thin, nonconducting, plastic-coated fabric strips, and since those fabric strips join each of the four walls and are under tension by the weight of the lining B and its contents, whatever they may be, the lining B is kept properly positioned and centered in the housing or casing A.

Since these strips 19 are flat and continuous and under tension at all times, they do not change in position, and so the insulating mass 21 located between the lining B and the casing A in the area bounded at the top by the strips 19 is not subject to compression, distortion or other deleterious effect as a result of the presence of the heavy-laden lining B within the casing A.

The bolts 12 arranged about the outer upper peripheries of the walls 2 pass through any suitable apertures in the strips 19. It will be noted that the upper outer edges of the strips 19 are held in one way, the lower inner edges are held in another way by slightly different clamping mechanisms, the principles of which are of course the same, and each one of these clamping mechanisms might, if desired, be used interchangeably with respect to the other.

The cover for the box comprises a horizontal plate 22 corrugated at 23 and having exactly the same kind of flange 7 and 8 and cylindrical clamping pocket as described in connection with the walls 2. The liner for the cover is a flat, horizontal plate 24 which terminates in the same general type of clamping means as illustrated in connection with the walls 5, except that, owing to difference in angles, the contour or relative dimensions of the flanges defining the cylindrical pocket are slightly different. The lining 24 is thus supported from the cover 22 by exactly the same kind of beaded tension strips 19, and the insulation 21 is contained within the area defined by the plates 22, 24 and strips 19.

When the cover is put in place to close the container, the strips 19 associated with each side of the receptacle are parallel and approach one another. Air leakage between the cover and box is prevented by packing means 25, 26. Preferably such packing means take the form of layers of thick, stiff, long-pile carpeting cemented or otherwise attached one to each of the tension members 19. This carpeting, when the cover is put in place, is compressed. The fibers or long piles interlock with one another and furnish a most effective resistance to air flow, thus making it unnecessary to have any immediate and definite contact between the tension strips 19, which of course would be very difficult because that would require a change in the contour of the clamping means. The clamping means can project inwardly without interference, because when the cover seats, even though the clamping means prevent actual contact with the fabric plastic-impregnated strips 19, the carpeting furnishes a complete seal.

The cover may be hinged or may merely be lifted out or dropped in place. The cover may be held in place by gravity, or clamping means may be provided to hold it. The supporting and locking of the cover forms no part of the present invention and is not further illustrated.

The use and operation of my invention are as follows:

Since the receptacle is always intended to be used standing on its bottom on a substantially horizontal base, and since the liner, even empty, always has substantial weight, and since the four tension strips joining the four sides of the box are always under tension, never under compression, the liner will always remain in place, and thus an insulating medium may be selected which has maximum insulating effect and only needs sufficient mechanical strength to carry itself. When the cover is put in place, the fibrous carpet-like air seal means on the opposed strips on cover and box interlock to make a tight covering. There is no structural material known which has less heat-conducting characteristics, even wood itself, than the plastic- or rubber-impregnated fabric of which such tension strips are made. Hence, there is no conducting path whatever by which heat may flow between the liner and the outer housing, and thus there is nothing to interrupt the insulating effect of the insulating means used between the cover and the liner.

It will be realized that whereas I have illustrated and described an operative device, still many changes may be made without departing materially from the spirit of my invention, and I wish, therefore, that my showing be taken as in a broad sense illustrative and diagrammatic rather than limiting me to my precise showing.

I claim:

1. A container including an outer, self-supporting, open topped housing, a flange upwardly and outwardly inclined and extending about the open top of the housing, an open top liner within the housing out of contact with the walls thereof, a strip of flexible, non-metallic, plastic impregnated, fabric material having a bead along each edge, the flange being grooved to engage the bead, clamp means in opposition to the flange and groove to hold the bead in the groove, clamp means extending about the periphery of the open top of the liner adapted to engage the opposed bead and hold it in fixed relation to the liner, the strip being throughout its entire width parallel with the flange on the housing.

2. A container including a rectangular, outer, self-supporting housing, a rectangular inner liner concentric therewith, the walls of the two being out of contact, the liner and housing being open at the top, the openings being bounded by the rectangular walls, the walls of the liner terminating below the walls of the housing, clamp members encircling the open mouths of housing and liner, a flexible, non-metallic, plastic impregnated, fabric sheet beaded on both edges, one bead engaging the clamp means on the housing, the other bead engaging the clamp means on the liner, to hold the liner and housing in fixed relationship and suspend the liner in the housing, the sheet being located in a single plane throughout its entire area whereby the sheet is throughout its entire area in direct straight line tension.

WILLARD L. MORRISON.

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