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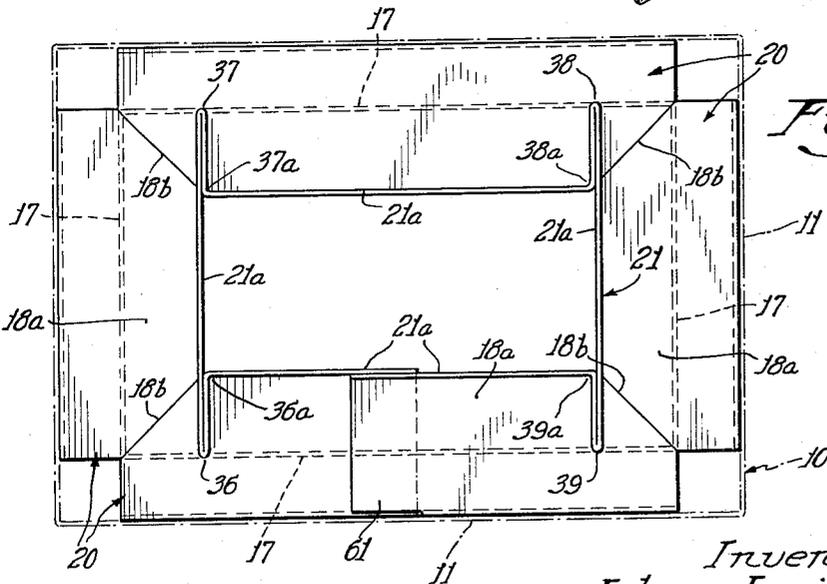
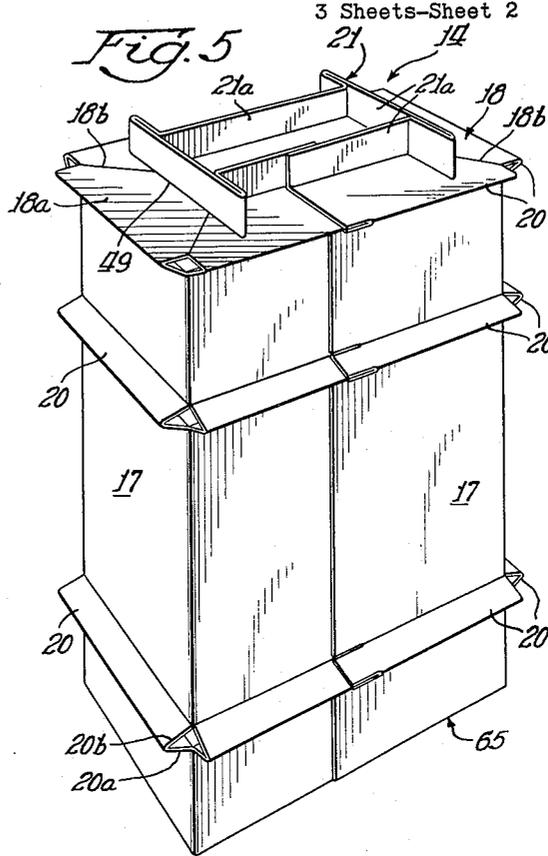
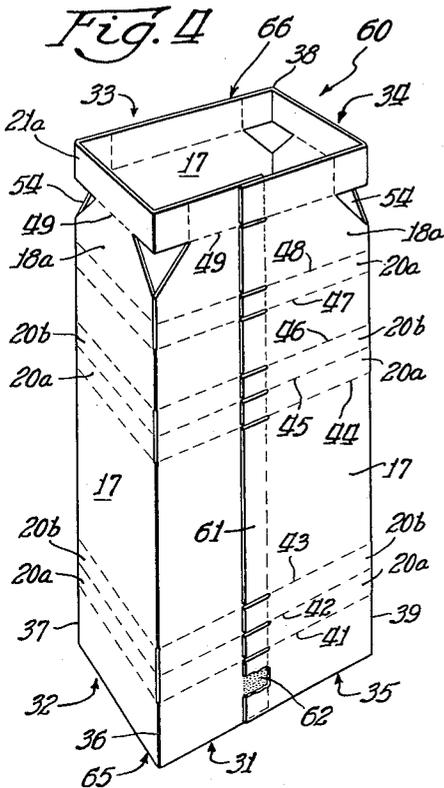
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2,995,288

SHIPPING CONTAINER WITH LINER

Filed Nov. 10, 1958

3 Sheets-Sheet 2



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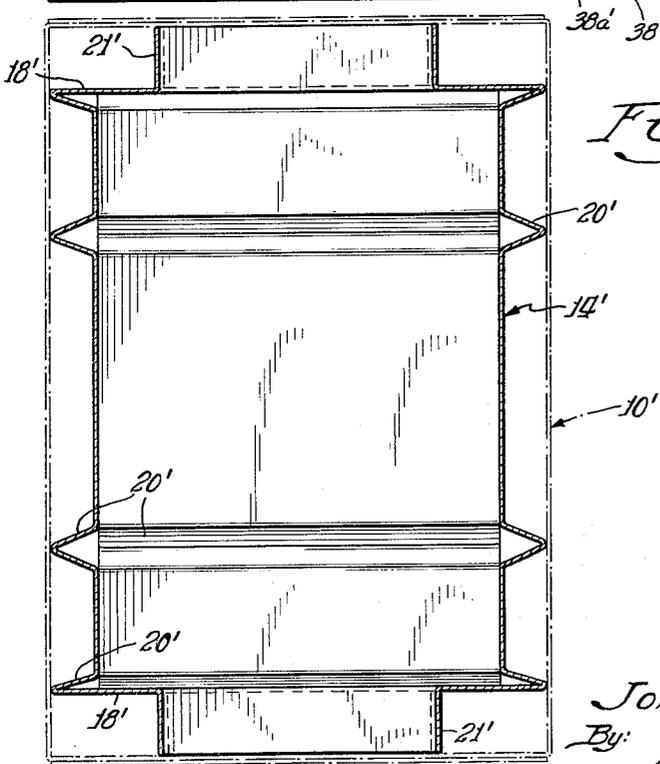
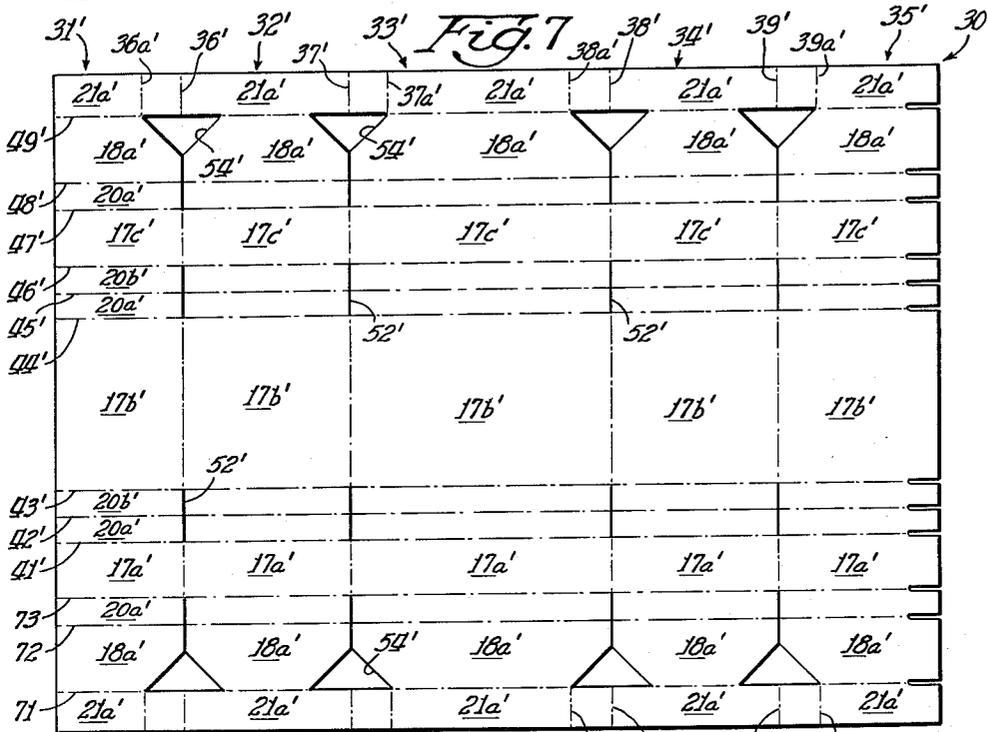
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SHIPPING CONTAINER WITH LINER

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3 Sheets-Sheet 3



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2,995,288

**SHIPPING CONTAINER WITH LINER**

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1 Claim. (Cl. 229—14)

This invention relates to shipping containers, and more particularly has to do with the innerpacking or liner members for use with a shipping container.

It is the general object of this invention to provide an improved shipping container having inner liner construction adapted to support and position an article packed therein in a manner to permit severe and rough handling of the container without injury to the article.

An important object of the invention is to provide a container having inner liner construction effective to support an article packed therein spaced from the container walls so that the article is not subject to shock from external blows.

Another object of this invention is to provide container inner liner construction arranged substantially in spaced apart relation to the container walls, and which is displaceable in part in a direction parallel to said walls whereby external forces transmitted from the walls to the liner will be directed along the liner rather than from the liner to the article.

A further object is the provision of a container inner liner construction formed from a planar member manipulated to provide portions extending therefrom to contact with the container walls, maintaining portions of the planar member in spaced apart relation to the container walls.

According to the general features of the present invention it is contemplated that a liner member disposed within a multi-sided shipping container, having planar portions disposed in planes parallel to the container walls and spaced therefrom, can be manipulated or collapsed to form ribs extending from said planar portions to said container walls, whereby an article disposed within the liner member is supported thereby in spaced relation from the container walls. The ribs formed from the liner member are more or less of a V shape and forces directed at the container walls will be transmitted through the V shaped rib to the liner portions connected thereto. Also, the V shaped ribs permit movement of the connected liner portions parallel to the adjacent container walls directing the force of external blows or shocks along the liner rather than from the liner to the article.

These and other objects, features, and advantages will appear or be apparent to one skilled in the art from the following description, reference being made to the accompanying drawings in which:

FIG. 1 is a perspective view of a shipping container constructed according to the teachings of the present invention.

FIG. 2 is a vertical sectional view, on enlarged scale, taken substantially on line 2—2 of FIG. 1.

FIG. 3 is a plan view of the blank from which an inner liner member is formed.

FIG. 4 is a perspective view of the liner member formed from the blank of FIG. 3, shown in partial set up condition.

FIG. 5 is a perspective view of the liner member similar to that of FIG. 4, on an enlarged scale, showing the liner member completely set up.

FIG. 6 is a plan view of the set up liner member of FIG. 5 showing an outer container in dot-dash lines.

FIG. 7 is a plan view of a blank from which a modified form of liner member may be formed.

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FIG. 8 is an enlarged vertical sectional view of the modified liner member in complete set-up condition, an outer container being indicated by dot-dash lines.

Referring now to the drawings and particularly FIGS. 1 and 2, the reference numeral 10 indicates a tubular shipping container made from paperboard or like material having vertical side walls 11 and top and bottom closures 12. Disposed within the container, in a manner to be more fully described later, is a liner member or innerpacking 14 and an article 15. As shown, the article 15, which is of rectangular cross-section, rests on the container bottom closure 12, but is otherwise enclosed by the liner member 14 through side walls 17 and top wall 18 thereof. Liner member side walls 17 have V shaped rib portions 20 formed integral therewith and extending therefrom whereby to maintain said liner member side walls 17 spaced from the container side walls 11, and liner member top wall 18 has flange portion 21 formed integral therewith and extending therefrom whereby to maintain said top wall spaced from the container top closure 12. It is obvious that spacing of the liner member 14 from the container side walls and top closure also maintains the article 15 enclosed by said liner member in a position spaced apart from said side walls and top closure of the container. The article being so displaced from the container walls is insulated from the direct force of external blows to the container walls.

The blank from which the liner member is formed is illustrated in FIG. 3, and indicated generally by the reference numeral 30. The blank, formed from paperboard or like material, is cut and scored to provide five sections 31, 32, 33, 34, and 35 serially connected horizontally, at vertical scorelines 36, 37, 38, and 39, respectively. Also, the blank is provided with a plurality of spaced horizontal score lines 41, 42, 43, 44, 45, 46, 47, 48, and 49, whereby each section has panels 17a, 20a, 20b, 17b, 20a, 20b, 17c, 20a, 18a, and 21a, serially connected vertically, in that order reading from the bottom of the blank upwardly as viewed in FIG. 3. It is noted that the vertical scorelines 36, 37, 38, and 39 connecting the said five sections 31, 32, 33, 34, and 35 are effective only at adjacent panels 17a, 17b, 17c, and 21a, respectively, the panels 20a and 20b horizontally adjacent being unconnected by virtue of slits 52, and the adjacent panels 18a being unconnected by reason of slits 52 and triangular cut out portions 54, all for a purpose to be described later.

The blank 30 is folded about vertical scorelines 36, 37, 38, and 39 to form a tubular member 60, see FIG. 4, having four sidewalls, indicated at 17. As shown, section 35 overlaps section 31, indicated at 61, and is secured thereto in any suitable manner, as by an adhesive 62. In this condition and with the bottom edge 65 of the member 60 supported in any suitable manner, pressure directed downwardly on the upper edge 66 will cause collapse of the tubular member along the aforementioned horizontal scorelines 41, 42, 43, 44, 45, 46, 47, 48 and 49. Such collapse forms the completed liner member illustrated in FIG. 5, indicated by reference numeral 14.

As shown, adjacent panels 20a and 20b are displaced outwardly from their original planar disposition to form V-shaped ribs 20, while the panels 18a cooperate with their respective adjacent panels 20a also to form V shaped ribs 20. Panels 18a are shown displaced to a position normal to their original planar disposition whereby to collectively form a top wall 18, infolded relative to the side walls 17. It is noted that the triangular cut-out portions 54, see FIGS. 3 and 4, permit the infolding of panels 18a to said wall forming position, the angulate edges of adjacent panels abutting as indicated at 18b, see FIG. 5. Panels 21a hingedly connected to panels 18a

along scorelines 49 are manipulated about scorelines 36, 37, 38, and 39, and spaced apart scorelines 36a, 37a, 38a, and 39a, respectively, to form a flange member 21 upstanding from top wall 13. As seen in FIG. 6, the manipulation of serially connected panels 21a, forms a more or less H shaped flange member, which includes double thickness, reversely folded flange portions arranged to bear edgewise upon oppositely disposed, in-folded panels 18a.

As previously pointed out the panels 20a and 20b horizontally adjacent are unconnected by virtue of slits 52, and the adjacent panels 18a are unconnected by reason of slits 52 and triangular cut out portions 54. This construction permits displacement of the various panels as before described, and permits vertical movement of panels 17a, 17b, and 17c relative to one another while maintaining them aligned as in their original tubular disposition.

Due to this construction, it is obvious that tubular member 60 can be placed about the article to be packed and then collapsed to the condition illustrated in FIG. 5. In practice this would permit placing article 15 in container 10, resting on bottom closure 12, sliding a tubular member 60 down and about the article, collapsing the tubular member to form the side ribs 20 and top flange 21, and effecting the top closure 12. The plan view of FIG. 6, showing a container 10 in dot-dash line, and the vertical sectional view of FIG. 2, illustrate clearly the cooperation between the liner member 14 and the container. External blows received by a container wall 11 would be transmitted through V shaped ribs 20 to the liner wall 17, the V shaped ribs 20 dissipating the force of such external blows by spreading the force to adjacent liner wall panels. In addition, the liner wall panels can be displaced vertically, and a severe blow deforming one rib member would cause same vertical movement of an adjacent wall panel, resulting in deformation of another rib member. Thus, squashing or depressing one rib member which spreads the legs of that V shaped rib further apart, will be reflected in a vertically adjacent rib member through vertical displacement of the intermediate wall panel, by moving the legs thereof one toward the other. The tendency to thus extend the adjacent rib member further outwardly will be resisted by the container wall 11, and through the flexible nature of paperboard produce a somewhat resilient action in the liner member. Thus, the liner member in the condition shown maintains the article packed therein spaced from the container walls, the V shaped ribs spreading the force of external blows to the liner member, thereby protecting the article; also, the liner member is somewhat deformable, and sufficiently so, as to absorb the severest blows and yet maintain the article undamaged, such deformation being accommodated by vertical displacement of liner wall panels. It is noted that vertical displacement of the liner wall panels will not disturb the lateral disposition of said wall panels relative to the article enclosed thereby.

Referring now to FIG. 7, there is shown a blank 30' of paperboard or like material, foldable to provide a modified form of liner member 14', as shown in FIG. 8. The modification involves providing an H shaped flange member at both the top and bottom of the liner member whereby to maintain an article spaced from all container walls. Thus, blank 30' is cut and scored to provide five sections 31', 32', 33', 34', and 35' serially connected horizontally, at vertical scorelines 36', 37', 38', and 39', respectively. The blank is provided with a plurality of spaced horizontal scorelines 71, 72, 73, 41', 42', 43', 44', 45', 46', 47', 48', and 49', whereby each section has panels 21a', 18a', 20a', 17a', 20a', 20b', 17b', 20a', 20b', 17c', 20a', 18a', and 21a', serially connected vertically, in that order reading from the bottom of the blank upwardly, as viewed in FIG. 7. The vertical scorelines 36', 37', 38', and 39' connecting the said five sections 31', 32', 33', 34',

and 35' are effective only at adjacent panels 17a', 17b', 17c', and 21a'; the panels 20a' and 20b' horizontally adjacent being unconnected by virtue of slits 52', and the adjacent panels 18a' being unconnected by reason of slits 52' and triangular cut out portions 54'.

In a manner similar to that described for blank 30, the blank 30' is folded about scorelines 36', 37', 38', and 39' to form a tubular member, section 35' overlapping section 31' and being secured thereto. Pressure directed at the open ends of the tubular member to collapse said member, will cause formation of V shaped rib members 20' and H shaped flange members 21', see FIG. 8. The article may be placed in the tubular member, then the tubular member collapsed to liner form, and the article and liner as a unit then enclosed by an outer wrap or container.

While the modified liner spaces an article packed therein from all container walls, thereby finding suitable application for extremely delicate or fragile articles, the preferred embodiment wherein the article rests directly on the container bottom closure is normally adequate. This is so since most articles of manufacture usually have a sturdy base portion and only the sides and top of the article need or require protection beyond that provided by the container walls.

It should be obvious from the foregoing description that a liner member constructed according to the teaching of this invention, not only provides excellent protection of the packed article from external blows or shocks, but also maintains the article firmly in position preventing shifting of the article within the container. The liner member may be shipped and stored in flat condition, yet it can be assembled quickly and easily. It can accommodate articles of various cross-sectional shapes, and depending on the article to be encased can be used with containers of different lateral dimensions. It has sufficient rigidity to maintain the integrity of the article enclosed thereby and yet is deformable to an extent adequate to cushion or relieve lateral pressures directed at the container walls. Such pressures are dissipated in the liner member and not transmitted to the packed article.

While the foregoing specification sets forth the invention in specific terms, it is to be understood that many variations and modifications may be resorted to without departing from the broad aspects of the invention as defined in the following claim.

Having now described the invention, what is claimed is:

A container for packing and shipping fragile articles comprising, in combination: a rectilinear outer body including a plurality of hingedly interconnected side walls and a pair of end walls; and a unitary liner, formed of a one piece blank of foldable paperboard, disposed within said body for holding said articles, said liner including a plurality of side panels, equal in number to the number of outer body side walls, hingedly interconnected in open ended tubular form; each of said side panels including a plurality of flat co-planar sections spaced from each other longitudinally of the panel and interconnected by a plurality of bellows sections, each of said bellows sections including a pair of relatively narrow strips, of substantially the same length as the width of the panel sections, hingedly attached at their side edges to each other and to the respective interconnected side panel sections, and having free unattached end edges permitting the strips to be folded out of the plane of the side panel sections and into outwardly converging planes, the outer edges of the bellows sections being the only contacts between the side panels of the liner and the side walls of the outer body to maintain said side panels and said side walls in spaced relation and thereby cushion the contents of the container; said liner side panels at one end of the liner each having an extended end section, said extended end sections each having two closely spaced parallel fold lines defining the main body of the liner from the end section to provide aligned outwardly foldable rib elements of uniform width

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at the ends of the main body of the liner panels, the liner panel end sections being foldable inward to lie in the same plane and being of such dimension only partially to close the tubular end of the liner, the inwardly disposed edge portions of the end sections each being formed with aligned fold lines parallel to and closely spaced from its end edges to provide flange portions of uniform width, foldable axially outward of the tubular liner to engage edgewise against the inside surface of the adjacent end wall of the container.

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