

Dec. 17, 1963

P. WASYLUKA

3,114,494

CONTAINER

Filed March 27, 1961

2 Sheets-Sheet 1

FIG. 1

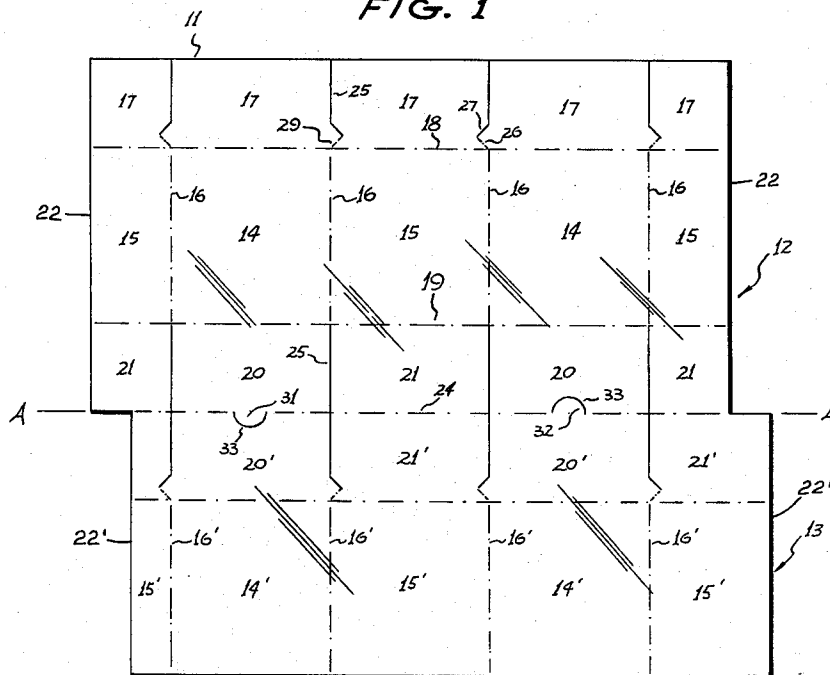
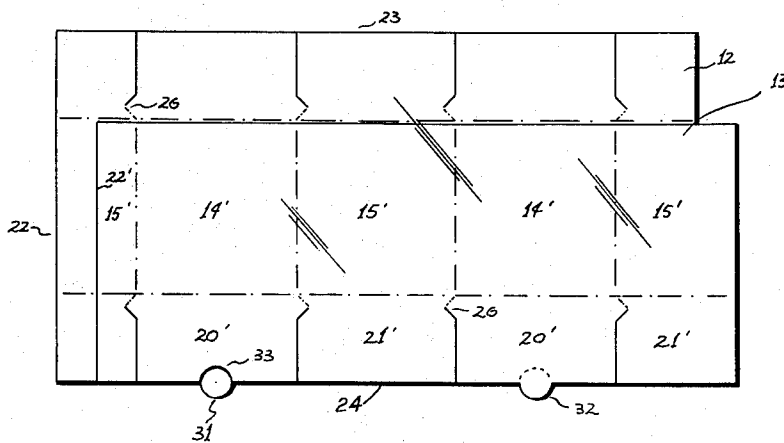


FIG. 2



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FIG. 3

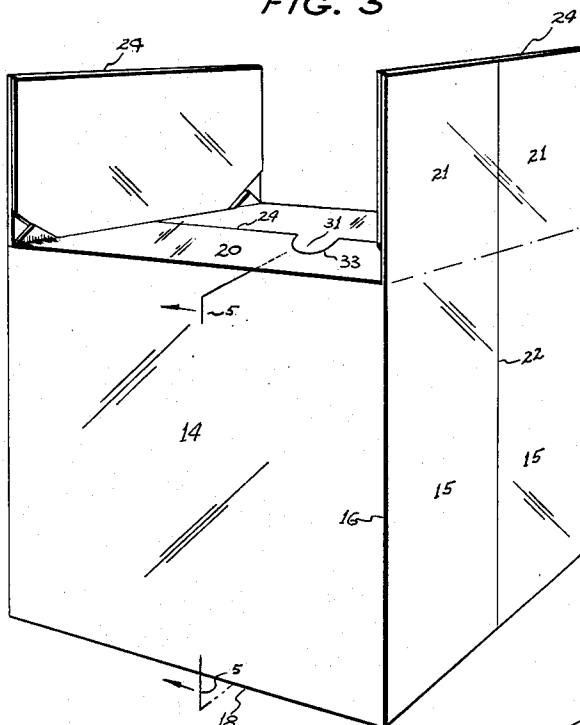


FIG. 4

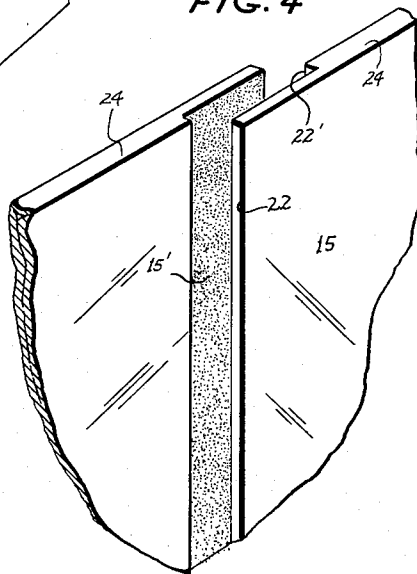
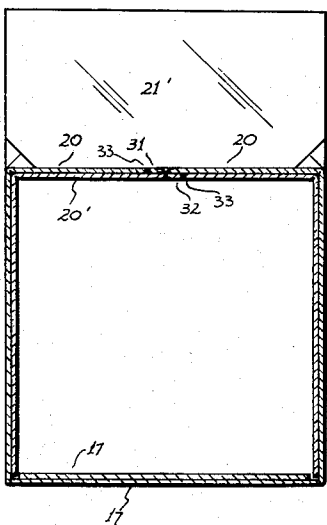


FIG. 5



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3,114,494
CONTAINER

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4 Claims. (Cl. 229—37)

The invention relates to a container formed from a foldable blank, and more particularly to a corrugated or fiberboard container, of a reinforced construction and exhibiting siftproof properties.

The container in which the invention resides is basically of a slotted carton type construction having vertical walls foldably connected together along their side edges and infolded discrete top and bottom closure flaps connected to the respective vertical walls. In this type of construction it is usual, for purposes of economy and facility, to so proportion the closure flaps that at least a pair of opposed flaps are in edgewise abutment at the mid-width of the container to complete the respective closures. This type of construction is, however, inadequate for certain classes of goods to be packaged as there are necessarily small openings or cracks at the extreme corners of the closures resulting from the separation between adjacent flaps and additional possible communication between the container contents and the exterior of the container at the aforementioned abutment of the flaps.

In addition, the slotted carton type of construction must be reinforced to provide the required stacking and handling characteristics when the contents to be placed therein are of substantial weights or of a nature that they might penetrate or otherwise injure the walls of the box.

Various solutions directed toward the several problems are well known in the art. However, these are generally of a complex nature and require excessive manipulation in the packaging operation in that various types of extraneous packaging materials, such as liners, bottom pads and the like, must be introduced in properly aligned or secured relation during the manufacture or erection of the container. These additional manipulations are particularly troublesome in view of the present-day trends to highly automated, high-speed packaging operations. In addition to the complicated manufacture or erection of prior art containers, never before has it been possible in a container formed from a one-piece blank to encompass the solution to these several problems in a simple and economical manner.

By way of example, the container herein disclosed is eminently satisfactory for the packaging of nails and the like, which provide a severe test of a container's capabilities. In particular, nails have a high weight per cubic volume which results in heavy loads on the vertical walls of the container when vertically stacked, and severe stress on the bottom flaps when the loaded containers are lifted or handled. This is particularly true when, as they often are, the containers for nails are subjected to weathering and exposure to moisture, which has often resulted in failure of the container bottoms. To solve the problems of stacking rigidity and resistance to rupture, the present invention provides a container having a double thickness, bottom closure flaps, and vertical walls and this double ply construction is continuous at the fold lines defining the bottom flaps, the most usual point of failure.

In this connection it is well to note that nails are advantageously arranged in compact relation in suitable containers by means of a magnetic loading method, wherein the nails are fed through a metal chute conforming to the interior dimensions of the container

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while being subjected to magnetic forces stemming from oppositely disposed electromagnets. This provides a very advantageous compact arrangement of the nails but tends to scuff and mar interior portions of the container.

However, in the multi-ply construction of containers made in accordance with this invention, such damage is localized on the interior surface, the remaining plies being unaffected and capable of withstanding the stresses of stacking and lifting.

The container is advantageously constructed from a one-piece blank having side by side foldably connected wall forming panels with closure flaps hingedly connected to the top and bottom edges thereof forming an outer container portion of the blank. An integral liner portion of the blank is hingedly connected along the free end edges of the closure flaps on one end of the container. The liner portion is comprised of interior flaps and wall panels corresponding substantially to the equivalent structures in the container portion of the blank. A spaced apart pair of closure flaps and attendant interior ply flaps are provided with protruding sealing tabs oppositely disposed from the hinge line therebetween.

In erected form the improved containers present opposed pairs of double ply side and end walls in tubular form with double ply closure flaps on one end. The beforementioned spaced apart pair of closure flaps with sealing tabs are in abutting relation along the mid-width of the container with the counterpart sealing tabs in overlapping cooperating relation so that the tabs struck from the interior ply of one closure flap are disposed in the aligned opening in the opposite closure flap outer ply. The opposed sealing tab is disposed in like cooperating relationship in the opening provided in the one closure flap interior ply to reinforce the bottom closure and seal the opening between the paired opposed flaps.

In a more specific embodiment of the invention adapted to the packaging of very fine granular materials, such as soap powders, the container is additionally provided with corner webs at the base of paired side by side flaps to seal the small openings normally occurring thereat, and thereby providing a completely siftproof container of one-piece reinforced construction. In this most specific embodiment of the siftproof container the marginal side edges of the container blank may be joined at the mid-width of a wall panel to permit the incorporation of the corner webs at each corner of the container.

Other objects and advantages of this invention will be apparent to those skilled in the art upon a full and complete understanding of the construction, and operation of the invention by reference to the accompanying drawings and detailed description, in which are set forth an illustrative embodiment of the invention.

In the drawings:

FIG. 1 is a plan view of a blank for forming the container, the broken lines representing scores or lines of fold and the solid lines being slits or cut edges;

FIG. 2 is the first stage of the assembly of the blank shown in FIG. 1 showing the liner portion folded flatwise against the container portion of the blank;

FIG. 3 is a perspective view of an inverted container with the end flaps infolded and side flaps in original vertical disposition, just prior to the completion of the bottom closure;

FIG. 4 is a detailed perspective view on an enlarged scale of a portion of the manufacturer's joint in the process of being secured together;

FIG. 5 is a vertical section through line 5—5 of FIG. 3 showing the interleaving of the end flaps by means of the overlapping sealing tabs.

Referring in detail to the drawings wherein like nu-

merals designate like parts throughout the several views, the blank 11 from which the container is formed is shown in FIG. 1. For purposes of description the blank may be conveniently divided along line A—A into container portion 12 and liner portion 13. The container portion is comprised of vertical wall forming panels in side by side relation including end wall panels 14 and side wall forming panels 15. The wall panels are joined at the corner scores 16. Top closure flaps 17 are hingedly connected to the top edges of the respective wall panels along flap score 18. Bottom flap score 19 defines the hinge connection of the bottom end flaps 20 and side flaps 21. The extremities of the container portion are determined by side edges 22, the free end portions 23 of the top closure flaps and the end edges of the bottom flaps 20 and 21 defined by connecting score 24.

The liner portion 13 of the blank is similarly formed being comprised of inner end wall forming panels 14' and side wall panels 15', with said wall panels foldably connected at corner scores 16' in aligned relation with the container portion corner scores 16. The liner portion bottom end flaps 20' and side flaps 21' are foldably connected to their respective wall panels by the flap score 19' and to the container portion flaps along connecting score 24.

In the specific embodiment of the invention as shown in blank 11, the liner portion 13 and side edges 22' are laterally offset from the side edges 22 of the blank container portion 12.

The various closure flaps are separated at their side edges by slits or slots 25 which, however, in the container portion top flaps 17 and liner portion flaps 20' and 21' are terminated short of the respective flap scores by the intervention of the corner sealing webs 26. The webs are defined by a cut edge 27 angularly disposed from the terminated ends of the slits 25, outwardly in respect to the end flaps to a juncture with the line of fold 28. The fold lines 28 substantially bisect the angle between the respective flap scores and extensions 29 of corner scores 16 in alignment with the slits 25. A sealing tab 31 integral with a container bottom end closure flap 20 is struck from the attendant liner flap 20' and is defined by a cut edge 33. A counterpart sealing tab 32 is struck from the other container bottom end flap 20 and is integral with its attendant liner flap 20'. Thus the sealing tabs 31 and 32 are disposed oppositely in respect to the connecting score 24.

To form the reinforced siftproof container of the invention the liner portion 13 is folded about the connecting score 24 into flatwise relation with the interior surface of the container portion 12 of the blank 11 as shown in FIG. 2. The liner is preferably adhesively secured to the container inner surface and there is thus provided an assembly of two ply construction having an outer container ply and inner liner ply extending substantially over the entire vertical wall forming panels and bottom closure flaps in the resulting container. It will be noted that the sealing tabs 31 and 32 extend outwardly from the edge of the assembly as defined by connecting score 24, and each lies in the plane of its respective ply.

When the blank 11 is erected in tubular form preparatory to forming the container, the container side edges 22—22 are brought into edgewise abutment as are the side edges of the liner 13. In the embodiment of the invention shown the juncture is within a side panel 15, as shown in FIG. 3 and the protruding marginal edges of the outer container 12 and liner 13 are brought into overlapping relation, as shown in FIG. 4, and secured together preferably by adhesive or by any other conventional means.

In completing the erection of the container, preparatory to usage thereof, the bottom end flaps are first infolded into endwise abutting relation as best shown in FIG. 3. In this position the sealing tabs 31 and 32 come into cooperating overlapping relationship with the sealing tab 31 integral with the outer container ply occupying

the void in the opposed end flap outer ply. In the same manner the sealing tab 32 integral with the inner liner ply is disposed in the counterpart aligned opening in its opposed flap inner ply. This is best shown in the cross sectional view in FIG. 5.

The bottom closure is completed by infolding the container bottom side flaps 21 with their attendant inner plies or liners 21' in overlapping flatwise relation to the before-mentioned end flaps. It will be apparent that in this closed secured position of the flaps the sealing tabs extend over the juncture of the abutting edges of the inner and outer closure flaps and thereby insures against possible leakage or penetration of the container bottom at this critical point. In this respect it will be evident that the sealing tabs may be of various forms and in particular in a rectangular container having side walls of greater horizontal dimension than the end walls, the sealing tabs should be positioned in the flaps having the greatest width dimensions so that they would at least extend between the end edges of the spaced apart opposed flaps. In this manner they would serve to seal the line of abutment of the opposed flaps to markedly increase the strength of the container bottom, serving to integrate the pair of opposed flaps. In the rectangularly proportioned container it is desirable that the closure flaps bearing the sealing tabs be the last infolded as the inner and outer flaps may be advantageously secured together by a single line of stitches, or staples straddling the line of abutment of the sealing tab bearing flaps and extending through the other pair of flaps in juxtaposition therewith.

In certain commercial embodiments of the invention, as for nails and the like, the sealing webs 26 are not an essential feature of the container. In these embodiments it has been found convenient to make the corner seam or manufacturer's joint at one corner of the container by the provision of a protruding sealing tab along one side edge 22 of the container portion 12, the sealing tab being generally coextensive in length with the vertical wall panel to which it is foldably attached. In this embodiment it is convenient to align the liner portion 13, side edges 22' with the side edges 22 of the container portion. In this embodiment the panels and flaps of the liner are substantial counterparts of the equivalent panels of the container portion 12.

To obtain maximum strength and rigidity of the container, the liner portion 13 is adhesively secured to the container portion 12 throughout substantially its entire area, with the exception that the sealing tabs 31 and 32 and sealing webs 26 must be capable of movement out of the plane of the flaps in which they are formed. The adhesive thus may be applied to a band in the container portion 12 extending between the side edges 22 and intervening the top flap score 18 but stopping short of the connecting score 24 to avoid adhesive application on the sealing tab 32, or in the alternative the adhesive application may be applied in a band extending between the side edges 22' of the liner portion 13 and extending from the free edge thereof to a line just short of the connecting score 24 by the dimension of the inward projection of the sealing tab 31. It has been found that when the container is constructed of corrugated fibreboard that the sealing webs 26 located in the liner portion flaps 21' do not tend to become significantly bonded by the glue application due to the compression of the flute structure in the webs during the die cutting operation. However, it may be desirable in certain instances, or when materials other than corrugated fibreboard are used, to avoid application of adhesive to a band coextensive with the width of the sealing webs adjacent the liner flap score 19'.

Containers constructed in accordance with this invention are normally shipped by the manufacturer in knocked down flat condition to the customer, that is, with the liner portion 13 folded over and secured to the container portion 12 and the vertical side edges of the container secured together by the manufacturer's joint. The container when received by the customer in this form is

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capable of being erected on conventional high speed automatic equipment as ordinarily used for slotted cartons. Thus we have a container that is conventional in form but has incorporated therein the several advantageous features that provide notable advantages in the way of strength and siftproof characteristics without the addition of supplementary packaging materials or the use of extraneous packaging materials.

It is to be understood that the embodiments herein described are illustrative and not restrictive, and it is also to be understood that the invention may be susceptible of embodiment in other modified forms, and that all such modifications which are similar or equivalent hereto come equally within the scope of the claims next appearing.

I claim:

1. In a container having upright side walls and infolded closure flaps on one end of the container, means for closing the opposite end of the container, the closure flaps including at least one pair of opposed flaps in edge-wise abutment; the improvement comprising, in combination, an integral liner, flap sealing tabs and corner sealing webs, said liner having inner upright walls and closure flaps corresponding to the respective container walls and flaps and integrally connected thereto at said opposed flaps abutting edges, the flap sealing tabs each integral with the abutting edges of the at least one pair of flaps, one of such sealing tabs projecting from a container closure flap and the other such sealing tab projecting from the opposed closure flap integral liner flap, said flap sealing tabs disposed in overlapping relation to the opposed inner closure flap and closure flap respectively, the corner sealing webs connecting the integral liner closure flaps adjacent the fold connection of said flaps to the respective inner wall forming panels, the infolded closure flaps in flatwise secured together relation.

2. A one piece heavy duty container formed from a foldable blank and adapted to package nails, other hardware and granular materials requiring positive sift-proof protection, said container having vertical side walls in tubular form and pairs of opposed bottom closure flaps hingedly connected to said side walls and having free inner end edges opposite said side wall connections, the closure flaps comprised of an inner ply and an outer ply

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in flatwise relation to each other and integrally foldably connected at their inner end edges, means for providing a sift proof seal of said bottom closure with smooth unobstructed surfaces, said means comprising sealing tabs each integral with one of said plies at the end edges of at least one pair of opposed double ply bottom flaps and in aligned relation to each other, said sealing tabs in overlapping relation to the opposed bottom closure flap, said at least one pair of opposed flaps infolded with their inner edge end edges in abutting relation and the other pair of opposed bottom flaps being infolded in flatwise relation thereto, said pairs of bottom flaps secured together in sift proof relation.

3. The container claimed in claim 2, wherein the sealing tabs are integral with the end edges of alternate plies of one pair of opposed bottom flaps and are each struck from the adjacent end margin of the companion ply of the respective flap and defined by a cut edge, said cut edge defining a void in the flap adjacent the inner end edge, the sealing tabs each being disposed in the void in the opposed flap locking the end edges in sift proof abutting relation.

4. The container set forth and claimed in claim 2, wherein corner sealing webs comprising triangular portions of the inner plies of the bottom closure flaps adjacent the fold connection of said flaps to the side walls connect adjacent said flaps together and form sift proof bellows folds.

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