Sept. 26, 1967 E. L. BAILEY 3,343,660

BOX CLOSURE

Filed Jan. 14, 1966 2 Sheets-Sheet 1

FIG. 1

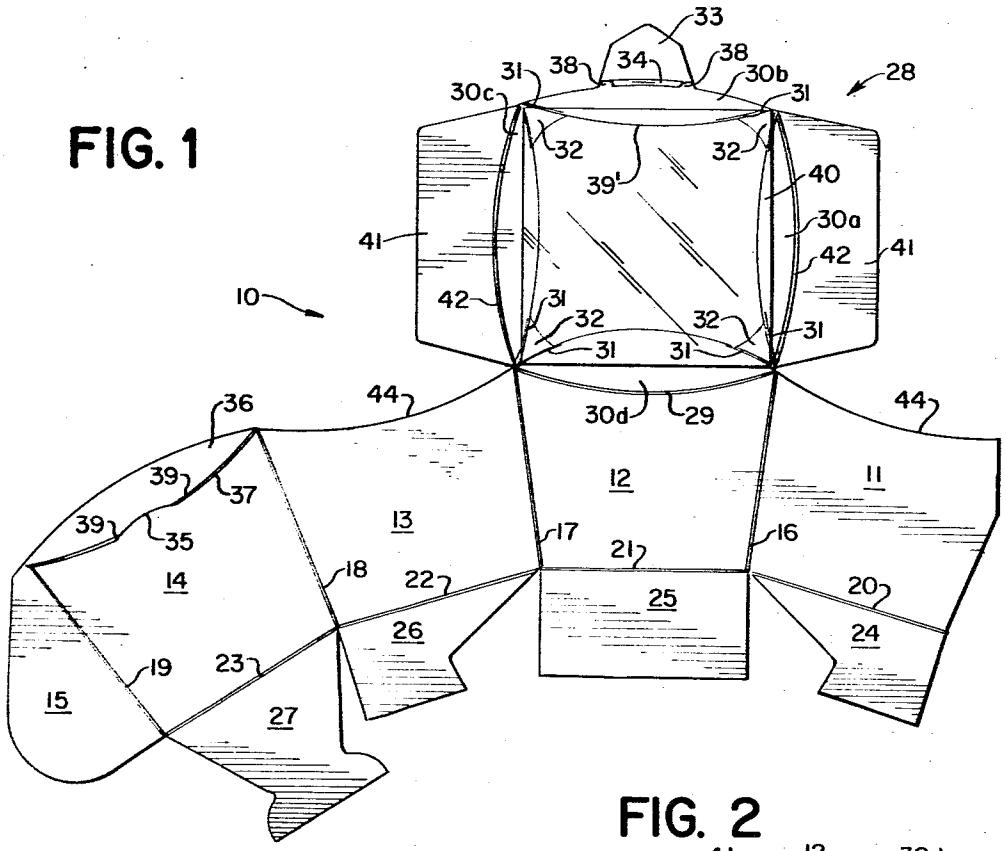


FIG. 2

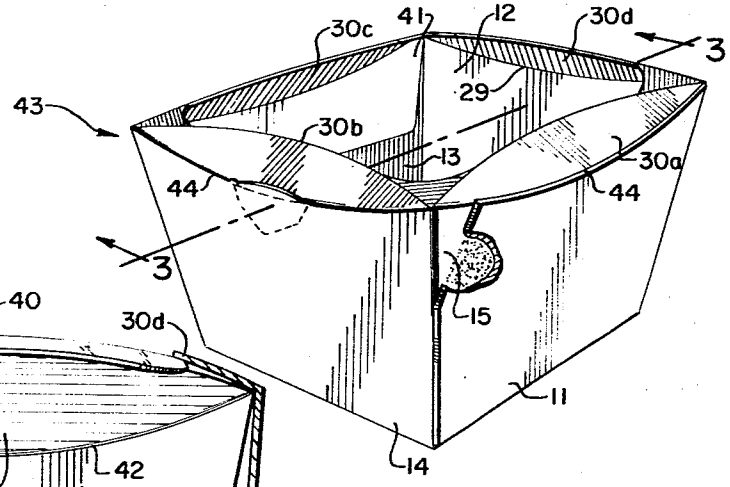
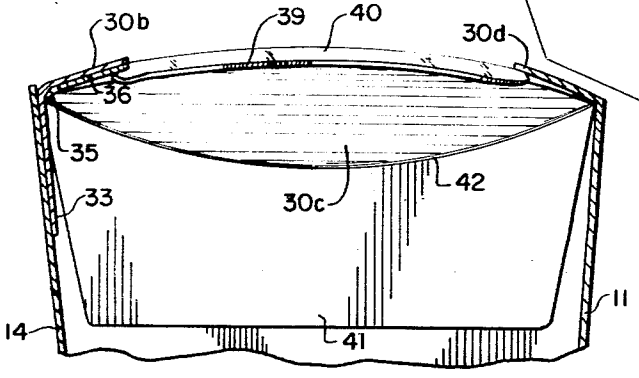


FIG. 3



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BOX CLOSURE

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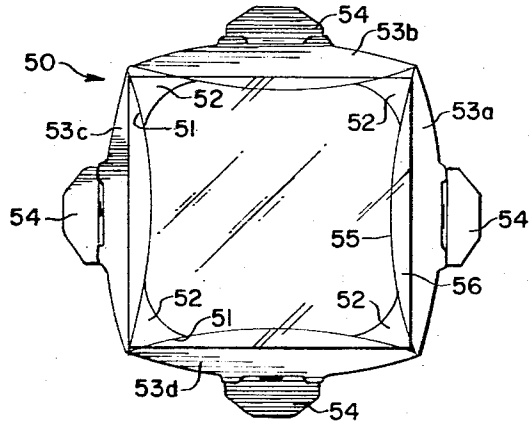

FIG. 4

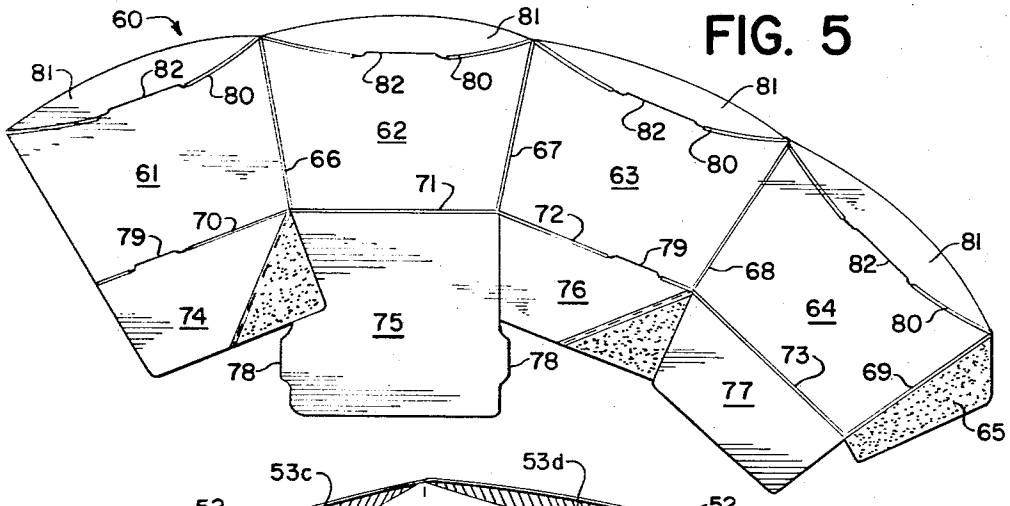

FIG. 5

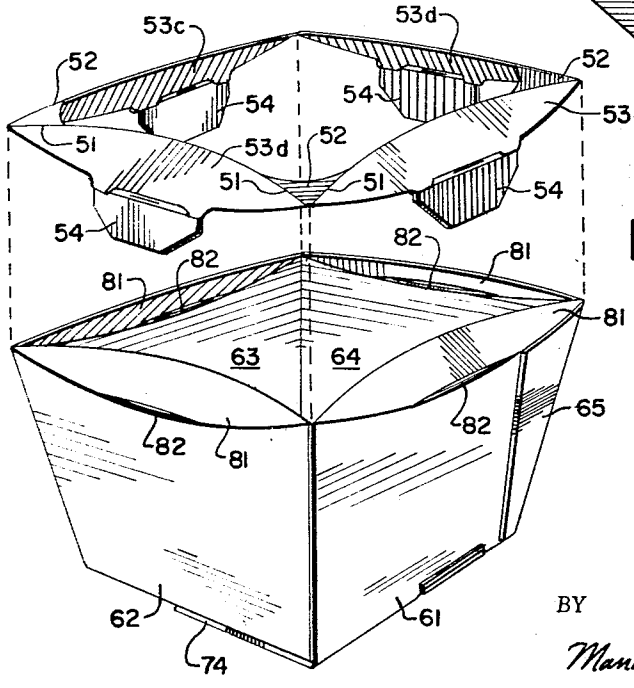

FIG. 6

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BOX CLOSURE

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Filed Jan. 14, 1966, Ser. No. 520,684
15 Claims. (Cl. 206—45.31)

The present invention relates to closed paperboard boxes, cartons, trays, and the like and, more particularly, to new and improved closure constructions for "bulging top" containers of the type commonly employed in the packaging of commodities such as fruit, vegetables, candy, and the like.

In accordance with the principles of the present invention, a paperboard box or tray member may be provided with an attractive and stiffened top closure by bowing the upper portions of the side walls outwardly in a generally convex fashion and securing thereto a bulged cover having convex outer edges in conformity with the convex shape of the upper side wall edges. Specifically, and as an important aspect of the invention, the cover member itself is formed from a plurality of elliptical bulge panels, which bulge panels are integrally connected along arcuate score lines by interposed tapered web members. At least one and as many as all of the free edges of the cover may be provided with locking tabs to lock the cover to the tray through locking slits formed therein. More specifically, at least one of the walls of the tray has an elliptical or substantially elliptical cover support flap articulated thereto with a locking slit formed in the area of articulation to receive the cover locking tab. In accordance with the invention, the novel shape of the cover panels and the nature of their interconnection accommodates bulging of the cover, contributes to the bowing of the side walls, and tends to stiffen the completed top closure.

The inventive construction lends itself to incorporation in a variety of containers. Thus, as will be understood, the cover may be constructed independently of or integral with a tray member, as desired or found necessary. Moreover, the tray member may have three or more walls, which may be vertical or sloped. Furthermore, and as will be appreciated, containers embodying the inventive principles may be produced in a variety of sizes to accommodate the particular commodity being packaged.

For a more complete understanding of the invention reference should be made to the following detailed description taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a plan view of a paperboard blank from which a carton having a tray and an integral cover and embodying one form of the invention may be erected;

FIG. 2 is a perspective view of a carton erected from the blank of FIG. 1;

FIG. 3 is a fragmentary, cross-sectional view of the carton of FIG. 2 taken along line 3—3 thereof;

FIGS. 4 and 5 are plan views of blanks for a cover and tray, respectively, for an alternate form of the invention in which the cover and tray of the completed carton are independently formed; and

FIG. 6 is an exploded perspective view of a cover and tray erected from the blanks of FIGS. 4 and 5, respectively.

Referring to FIG. 1, the blank 10, from which the box of the present invention may be erected, includes four similarly shaped side walls 11–14 and a glue flap 15, consecutively articulated along score lines 16–19. As shown, the side walls are convergently tapered from top to bottom to provide sloped walls when erected. However, if desired, the walls may be vertical when erected, in which case the score lines 16–19 would be parallel.

Articulated to the side walls along score lines 20–23 are bottom panels 24–27 appropriately shaped to be formed into a flat, interlocked bottom upon being infolded during carton erection. However, the specific configurations of the bottom-closing panels illustrated in FIG. 1 are not part of the present invention, and any suitable bottom closing structure ("automatic" glued, or the like) may be employed to advantage. Furthermore, where desired, a so-called "locked corner" tray may be substituted for the above-described construction. A "locked corner" tray has a one-piece bottom with a plurality of walls articulated thereto, which walls may be lockingly connected together.

As an important aspect of the invention, the upper edges of each of the side walls 11–14 are arcuate, having a predetermined curvature to accommodate outward bowing thereof in the finally erected carton. As shown in FIG. 1, the side wall 12 has a new and improved bulgeable cover structure 28 articulated thereto along a curved score line 29, while the opposite side wall 14 has an elliptical support panel 36 articulated thereto along an arcuate score line 37, which score line is interrupted by a shallow U-shaped locking slit 35.

In accordance with the invention, the cover 28 includes four substantially elliptical bulge panels 30*a*–30*d* which are interconnected at the corners of the cover along arcuate score lines 31 by tapered web portions 32, as shown. A wedge-shaped locking tab 33 of conventional configuration is hinged to the cover along a score line 34 and is adapted to cooperate with the locking slit 35. As will be understood, the undercut edges 38 of the locking tab 33 may be lockingly engaged under locking portions 39 formed in the support panel 36 adjacent the slit 35. Advantageously and as shown in FIG. 1, the widths of the locking tab 33 and the locking slit 35 are approximately one-fourth to one-third of the arcuate upper carton edge to increase the efficacy of the completed top closure.

As shown in FIGS. 1 and 2, the major portion of the cover will be in the form of an opening or window 39 which is framed by the web-connected elliptical bulge panels 30*a*–30*d*. Advantageously, the window is closed off by scrim, plastic or fabric netting, or a transparent, resilient thermoplastic sheet material 40, such as cellophane or the like, all of which materials are, themselves, bulgeable. However, in certain applications, where a solid cover is deemed advantageous, the window is eliminated from the carton. In such a case, the score lines 31 would extend continuously from corner to corner, as should be understood. The cover structure also includes tuck flaps 41 articulated thereto along arcuate score lines 42 at the outer edges of the bulge panels 30*a*, 30*c*.

The blank 10 of FIG. 1 is quickly and easily formed into a complete carton 43 by first forming a flattened tube by adhering the glue flap 15 to the wall panel 11 after folding the blank along the score line 16, 18. Thereafter, an open tray is formed by squaring the tube while appropriately infolding the bottom panels, which, by virtue of their specific configurations, may be interlocked into a closed bottom. At this point, the tray may be filled with the commodity to be packaged.

In accordance with the invention, a substantially stiffened and very attractive closure of the tray is effected by infolding the cover 28 along the arcuate score line 29, thereby outwardly bowing the wall 12, and downwardly folding the flaps 41 along arcuate score lines 42 to form a bulging cover. The infolding of the elliptical support panel 36 will bow the opposite side wall 14 and will also open the locking slit 35 to receive the locking tab 33. In accordance with the invention, bulging is effected from the upper edges 44 of the tray by the folding of each of the elliptical bulge panels 30*a*–30*d* along the

curved score lines 31, 34, 42, and 29. The carton may then be finally and securely closed by tucking the flaps 41 into the tray and inserting the locking tab 33 into the opened slit 35.

In some cases, it may be desirable or necessary in the packaging of goods to provide independently formed trays and covers. Accordingly, an alternate preferred embodiment of the invention includes a separate cover formed from a blank 50 which has a series of elliptical bulge panels 53*a*–53*d* interconnected along arcuate score lines 51 to webs 52 to define a cover similar in shape to the cover 28 shown in FIGS. 1–3 and described hereinabove. However, all of the free edges of the elliptical cover panels have articulated thereto wedge-shaped locking tabs 54 similar in function and configuration to the locking tab 33 articulated to only one edge of the above-described cover 28. A window 55 similar in shape to the window 39, is defined by the free concave edges of the web portions 52 and the inner convex edges of the elliptical bulge panels 53*a*–53*d*. The window 55 may be closed off by a transparent thermoplastic sheet material 56, such as cellophane, scrim, or suitable plastic or fabric netting. Where a solid cover is desired, the window forming opening is omitted and, as will be understood, the score lines 51 extend arcuately from corner to corner.

The independent tray of the alternate preferred embodiment which may be fabricated from a blank 60 includes four side walls 61–64 and a glue flap 65 consecutively articulated along score lines 66–69, respectively. Hinged along bottom score lines 70–73 are automatic bottom panels 74–77 which are suitably cut and scored to form a so-called automatic bottom upon being appropriately interconnected and subsequently squared during tube and carton formation, respectively. As indicated hereinabove, the details of construction of the tray wall and the bottom structure are a matter of choice and by themselves represent no part of the present invention. Thus, a separate tray of "locked corner" construction may be employed to advantage in lieu of the illustrated tray.

In accordance with an important aspect of the invention, the upper edges of each of the tray walls 61–64 are defined by arcuate score lines 80 along which elliptical support panels 81 are articulated. The arcuate score lines are interrupted in the area of their mid-points by cuts 82 definitive of locking slits adapted to engage and hold the locking tabs 54.

The carton of the alternate preferred form of the invention may be erected by forming a tray tube through the folding of the panels 61, 64 along score lines 66, 68 and adhering the glue flap 65 to the panel 61 while forming the automatic bottom by appropriately folding and interconnecting the panels 74–77. The tray of the carton may be simply formed by squaring the thus formed carton tube to automatically form the bottom (which may be locked by including bottom locking tabs 78 and bottom locking slits 79 in the bottom structure). Thereafter, the commodity to be packaged, berries, for example, may be introduced into the open tray before infolding the elliptical support panels to open the locking slits 82 and to bow outwardly each of the side panels 61–64.

Advantageously, the cover 50 may be pre-formed or bulged before assembly with the tray by infolding each of the elliptical bulge panels 53*a*–53*d* along the score lines 51 to form a bulging configuration as shown in FIG. 6. Thereafter, the locking tabs 54 are inserted into the opened locking slits 82 to lock the bulging cover to the carton with the elliptical cover panels and elliptical support panels in face-to-face contact. As will be understood, the locking tabs 54 may be folded downwardly therefrom prior to or at the time of their insertion into the slits 82.

As should be appreciated, the folded elliptical bulge panels of the cover cooperating with the arcuate upper edges of the tray contribute added strength and rigidity to the carton structure as well as providing an extremely pleasant and attractive appearance to the finished container. Furthermore, it should be understood that the specific structure herein illustrated and described is intended to be representative only, as certain changes may be made therein without departing from the clear teachings of the disclosure. For example, in some cases the bottom of the tray and cover may not have the same number of sides, i.e., the bottom of the tray may be octagonal (having sides of equal lengths or having alternating long and short sides) while the cover therefor may be four-sided. Accordingly, reference should be made to the following appended claims in determining the full scope of the invention.

I claim:

1. A carton construction comprising
(a) a tray portion having a closed bottom and a plurality of upstanding side walls extending therefrom;
(b) the upper edges of said tray side walls being arcuate in configuration;
(c) at least one substantially elliptical support panel articulated to an upper edge of said side walls along an arcuate score line;
(d) locking slit means defined at at least one of the upper edges of said side walls by a cut intersecting said wall and said support panel;
(e) a cover comprising a plurality of elliptical bulge panels substantially identical in shape to said elliptical support panel and being arrayed in a manner whereby their major axes define a polygon similar in configuration to that defined by the closed bottom;
(f) said elliptical bulge panels being integrally interconnected by web portions articulated thereto along inner terminal edge portions of said elliptical panels;
(g) whereby upon the infolding of said elliptical panels and the engagement of said bulge panels with said upper tray edges, said side walls will be outwardly bowed and said cover will be bulged; and
(h) locking tab means articulated to at least one outer free edge of said elliptical cover panels and adapted to be lockingly engaged in said locking slit to maintain said cover in a predetermined bulging relation and to effect a stiffened closure of said tray portion.

2. A container in accordance with claim 1, in which
(a) said web portions have arcuate free edge portions which along with the inner free edge portion of the elliptical bulge panels define a window opening.

3. A container in accordance with claim 2, in which
(a) bulgeable substantially transparent means are adhered to said cover and close off said window.

4. A container in accordance with claim 1, in which
(a) said cover includes locking tabs articulated to at least two free edges.

5. A container in accordance with claim 1, in which
(a) said cover includes tuck flaps articulated to outer edges of selected ones of said bulge panels along arcuate score lines.

6. A container in accordance with claim 1, in which
(a) said cover is integral with said tray portion and is articulated thereto along an arcuate score line.

7. A container in accordance with claim 1, in which
(a) said cover is independent of said tray portion.

8. A container in accordance with claim 7, in which
(a) an elliptical support panel is articulated to each of the upper edges of said tray portion;
(b) a plurality of locking slits are formed at said upper edges of said side walls;
(c) a plurality of locking tabs are articulated to the free edges of said bulge panels.

9. A container in accordance with claim 1, in which
(a) the width of said locking tab means is approximately one-fourth to one-third that of the upper edge to which it is articulated.

10. A container in accordance with claim 1, in which
(a) the walls of the tray portion are sloped outwardly from the closed bottom.

11. A carton construction comprising
(a) a tray portion including a bottom and a plurality of interconnected side walls;
(b) each of said walls having an elliptical support flap articulated thereto along arcuate score lines of predetermined curvature;
(c) locking slit means formed at each of said score lines at central portions thereof;
(d) whereby the partial inward folding of said elliptical flaps outwardly flexes said bottom walls and opens said locking slit means;
(e) cover means having a shape generally similar to said bottom structure and including a plurality of elliptical bulge panels;
(f) web means interconnecting said bulge panels along arcuate score lines of similar curvature to that of said first-mentioned lines;
(g) locking tab means articulated to the free edges of each of said bulge panels and adapted to be inserted into said locking slit means to hold said cover on said tray portion with said elliptical panels in a predetermined bulged relation.

12. A container in accordance with claim 11, in which
(a) the walls of said tray portion are sloped outwardly from the closed bottom structure.

13. A carton construction formed of paperboard or the like and comprising
(a) a tray portion having a plurality of interconnected side walls; and
(b) cover means comprising a plurality of interconnected bulge panels corresponding to the interconnected side walls of said tray portion;
(c) said cover including elements connected to said bulge panels along arcuate score lines and operative when folded with respect to said bulge panels to impart a bulging curvature thereto.

14. A carton construction according to claim 13, further characterized by
(a) said tray portion including along the upper edge of one or more of its side walls a tray bulge panel corresponding to a bulge panel of said cover;
(b) said tray bulge panel being foldable with respect to its associated side wall along an arcuate score line and being operative when so folded to cause said side wall to bulge outwardly.

15. A carton construction comprising
(a) a tray portion formed of paperboard or the like having a plurality of interconnected, normally flat planar side walls;
(b) bulge panels articulated along substantially arcuate score lines to upper edges of said side walls;
(c) said tray bulge panels being infolded toward the center of said tray and out of the normally flat planes of the side walls to impart an outwardly bulging curvature thereto;
(d) cover means cooperating with and maintaining said bulge panels in said infolded, side wall bulging positions.

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