June 19, 1956 C. R. ALDEN 2,751,137

DISPENSING CONTAINER

Filed Jan. 20, 1950 4 Sheets-Sheet 1

Fig. 1

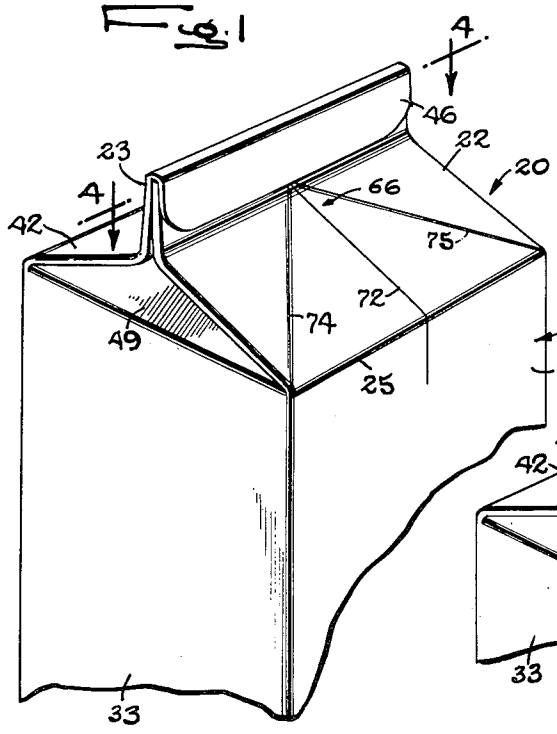
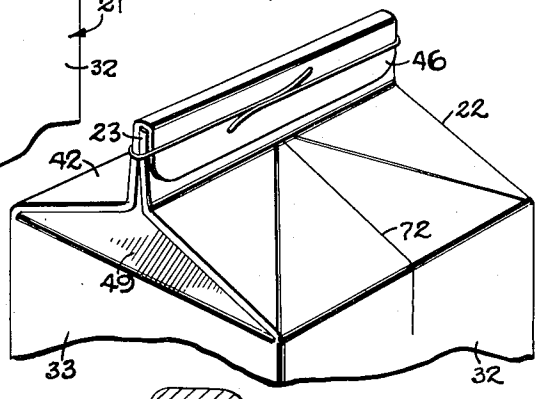


Fig. 2



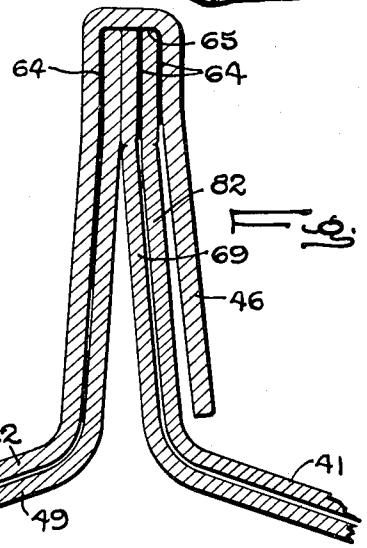
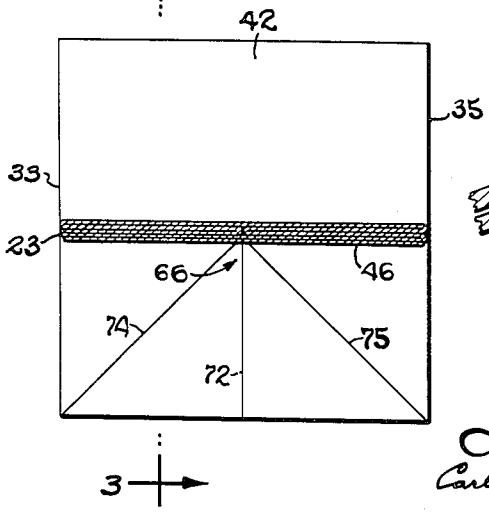


Fig. 3

3 Fig. 4



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Fig. 5

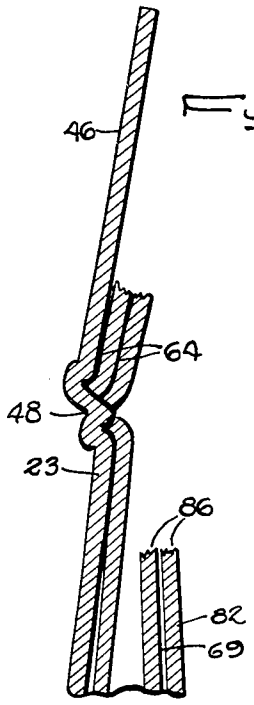


Fig. 6

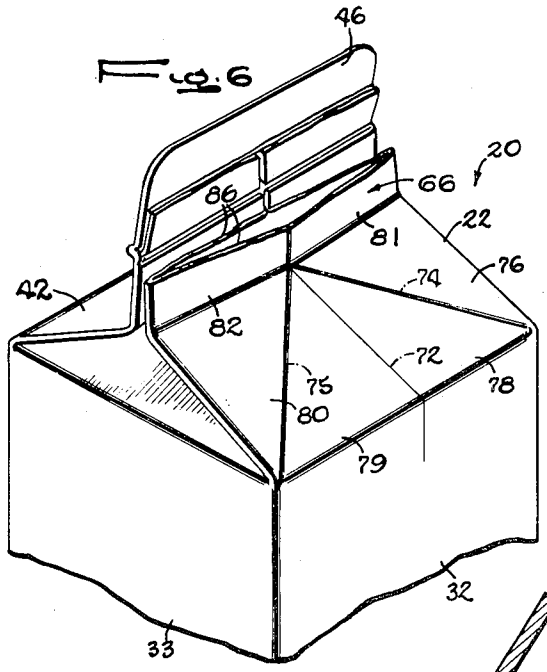
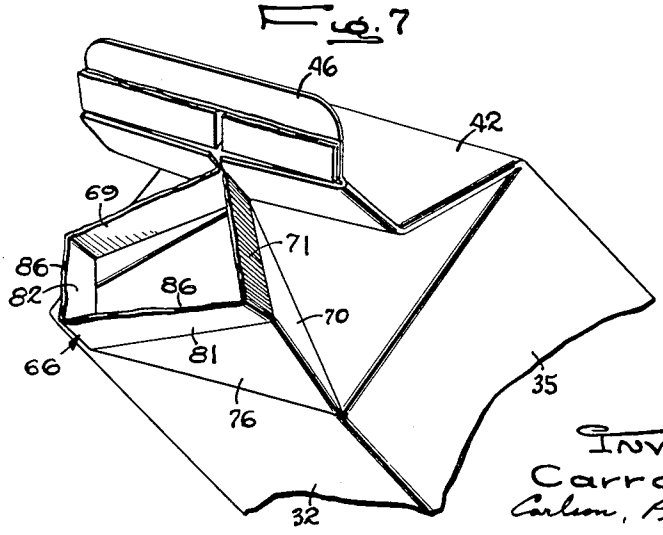


Fig. 7



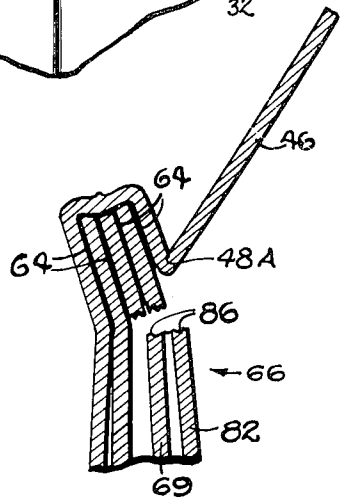


Fig. 8

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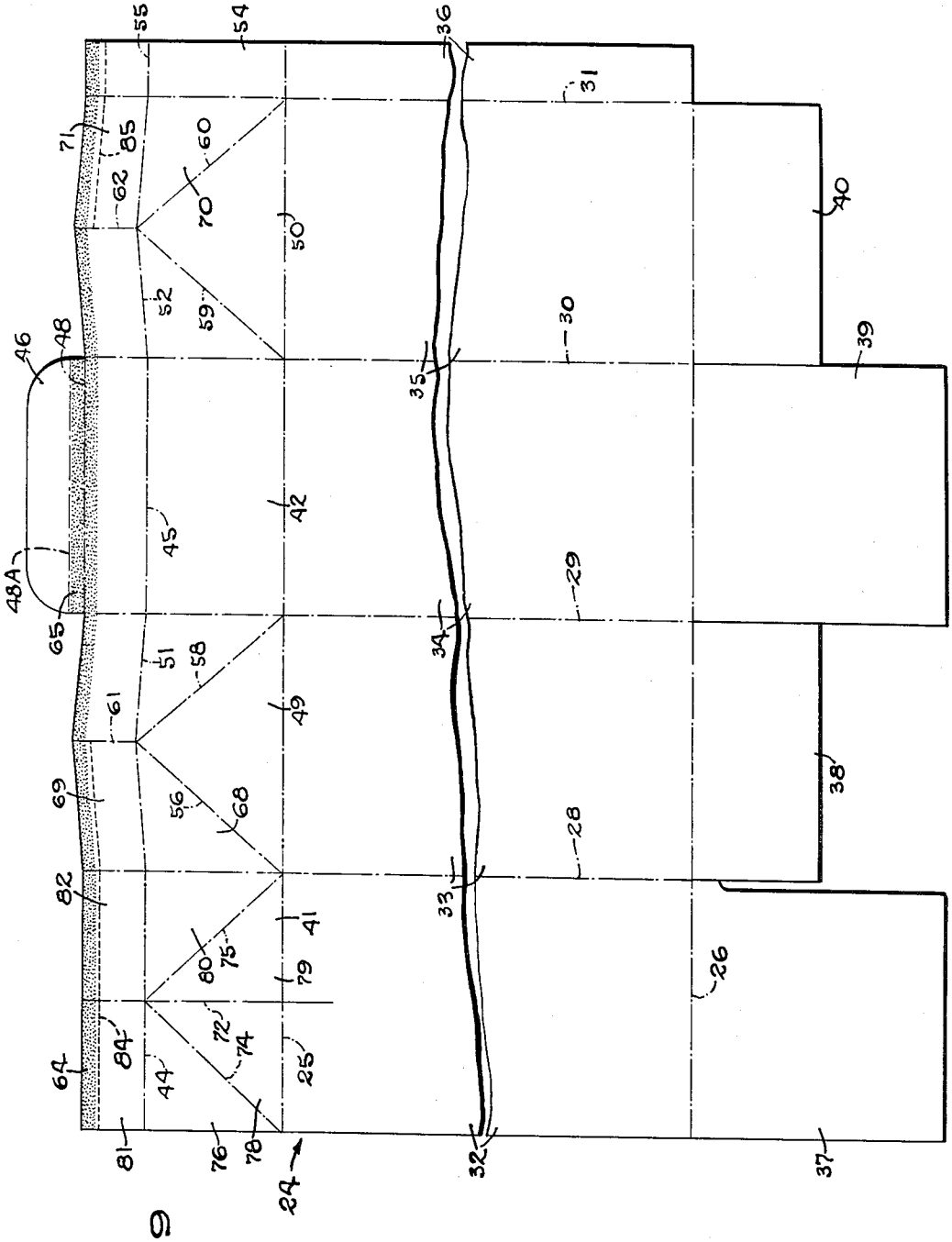


Fig. 9

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DISPENSING CONTAINER

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Fig. 10

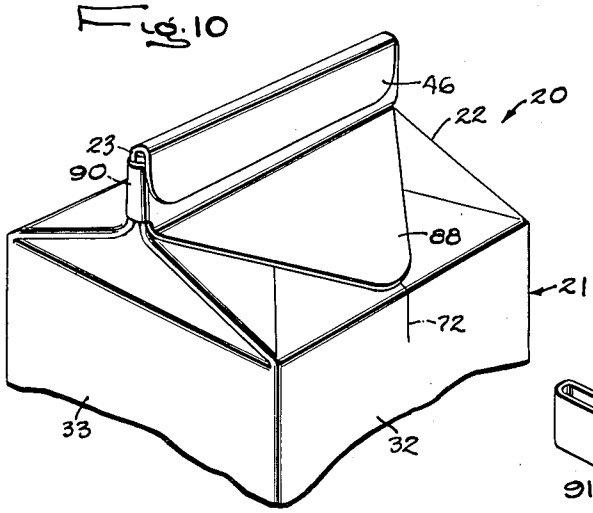
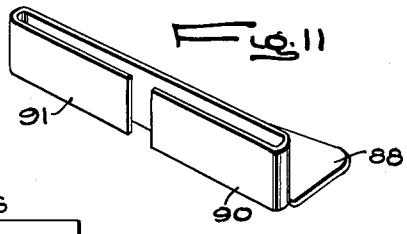


Fig. 11



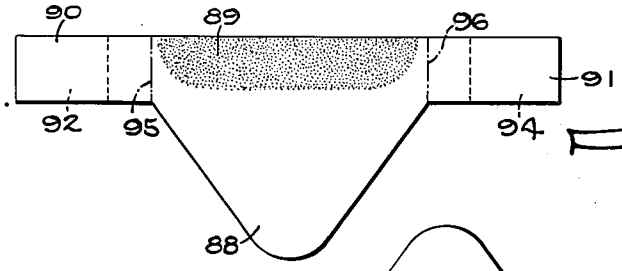
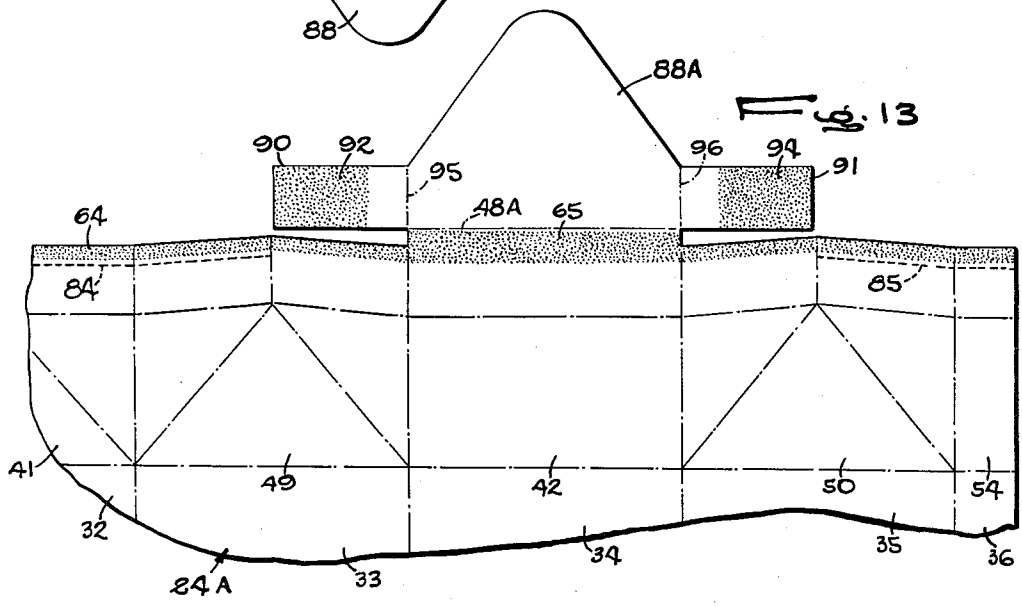


Fig. 12

Fig. 13



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2,751,137

DISPENSING CONTAINER

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Application January 20, 1950, Serial No. 139,628

6 Claims. (Cl. 229—17)

The present invention pertains generally to containers and more specifically to disposable self-sustaining containers of paper or the like of the general type disclosed in U. S. Patent Nos. 2,025,477, issued December 24, 1935, to Henry T. Scott and 2,360,439, issued October 17, 1944, to Charles Z. Monroe, and also in copending U. S. application Serial No. 139,565 filed January 20, 1950, by Charles H. Dixon. The invention finds particular, but by no means exclusive, utility in containers adapted for distributing milk and other dairy products.

A container of the foregoing character is customarily erected from a flat blank of sheet stock which has been given an appropriate pattern of score lines, the latter serving to define a plurality of side panels together with corresponding upper and lower panel extension flaps or closure members. The usual procedure in setting up such a container is to form the blank into a polygonal tube open at both ends and then to close the lower or bottom panel extensions, retaining them in place by means of a suitable adhesive. The exposed surfaces of the container may then be coated or impregnated with a leakproof film by immersion in a paraffin bath, for example. Following this operation, the carton can be filled and its top sealed in any desired manner.

One object of the present invention is to provide a container of the character set forth and having incorporated into its top end closure an extensible, sanitarily protected pouring spout which may be opened with ease for precise, dripless dispensing of the contents of the container.

Another object is to provide a container of the above type wherein the pouring spout recloses readily and requires no outside closure retention means, the associated parts of the top closure serving such purpose.

A further object is to provide a container of the type set forth which permits partial disintegration of a portion of the top end closure as an incident to initial opening of the same and reformation of the disintegrated portion into an extensible pouring spout.

Another object is to provide a container of the above character and having a gable top end closure which possesses sufficient strength to permit normal handling of the container, both before and after initial opening.

Other objects and advantages will become apparent as the following detailed description proceeds, taken in connection with the accompanying drawings, wherein:

Figure 1 is a fragmentary perspective view showing the upper end portion of an illustrative container embodying the present invention.

Fig. 2 is a view similar to Fig. 1 but showing the illustrative container with a modified fastening means on the central rib of its top closure.

Fig. 3 is an enlarged fragmentary sectional view taken vertically through the top end closure of the container and in the plane of the line 3—3 in Fig. 4.

Fig. 4 is a transverse sectional view taken horizontally through the central rib of the top closure and in the plane of the line 4—4 in Fig. 1.

Fig. 5 is an enlarged fragmentary vertical sectional view similar to Fig. 3 but illustrating the partial disintegration of the central rib during initial opening of the container.

Fig. 6 is a fragmentary perspective view of the container of Fig. 1 immediately after initial opening of the same and with the pouring spout substantially in its collapsed position.

Fig. 7 is a fragmentary perspective view of the container of Fig. 1 in opened condition with its pouring spout in fully extended position.

Fig. 8 is an enlarged fragmentary vertical sectional view through the top closure of a container similar to that shown in Fig. 1 but having a slightly modified central rib structure, such container being in an opened condition with its pouring spout partially extended.

Fig. 9 is a plan view detailing the inside face of a blank from which the illustrative container of Fig. 1 may be constructed.

Fig. 10 is a fragmentary perspective view similar to Fig. 1 but showing a modified form of the container having a special lift tab.

Figs. 11 and 12 are views detailing the lift tab of the container of Fig. 10.

Fig. 13 is a fragmentary plan view detailing the inside face of a blank wherein the special lift tab of Figs. 11 and 12 is integral therewith.

While the invention is susceptible of various modifications and alternative constructions, certain preferred embodiments have been shown in the drawings and will be described below in considerable detail. It should be understood, however, that there is no intention to limit the invention to the specific forms disclosed, but on the contrary, the intention is to cover all modifications and alternative constructions falling within the spirit and scope of the invention as expressed in the appended claims.

Referring more specifically to the drawings, there is shown in Figure 1 an exemplary container **20** embodying the present invention. The container **20** is self-sustaining in shape and disposable, being formed from paper or other suitable sheet material and being coated or impregnated with a suitable substance to render it fluidtight and capable of holding liquids such as milk. The container **20** comprises a tubular body **21** which, in the present instance, happens to be of substantially square cross section. At its base, the body **21** is provided with a suitable bottom closure (not shown), the details of which are unimportant for present purposes. The upper end of the body **21** terminates in what will be recognized as the familiar gable top end closure **22** which is surmounted by a central laminar rib **23**. The top end closure **22** also has incorporated therein suitable means for dispensing the contents of the container.

Preferably, the container **20** is fashioned from a flat blank **24** of heavy paper stock or other suitable sheet material, the inside face of such blank being illustrated in Fig. 9. By means of an appropriate pattern of score lines, the blank **24** is divided into a plurality of panels and areas which are utilized for the walls of the container and the closure parts when the container is erected. The central and major area of the blank **24** becomes the body **21** of the container and is defined by spaced apart transverse score lines **25, 26** running in substantially parallel relation from edge to edge of the blank. Intersecting the lines **25, 26** at spaced intervals therealong are a series of perpendicular score lines **28, 29, 30** and **31** which define, in the central and major area of the blank, side panels **32, 33, 34, 35** together with a fractional side panel or glue flap **36**. When the carton is erected, the latter is adhesively secured in overlying relation with the inside face of the side panel **32**. Connected to the lower edges of the side panels along the line **26** are a plurality of panel exten-

sions or bottom closure flaps 37, 38, 39, and 40 which may be of the usual type and warrant no further description.

Integral with the upper ends of the side panels but separated therefrom by the score line 25 are a plurality of rectangular and triangular panel extensions which serve to give the top of the container its characteristic gable shape. Thus alternate side panels 32, 34 have respectively connected therewith rectangular panel extensions 41, 42 lying between the score line 25 and the upper edge of the blank as viewed in Fig. 9. The extensions 41, 42 are respectively subdivided by score lines 44 and 45 which are substantially parallel to the line 25. The stock above the lines 44, 45 becomes incorporated into the central rib 23 upon erection of the container while the stock below these lines but above the line 25 defines the inclined panels of the top end closure 22. The upper end of the panel extension 42 terminates in a foldable flap 46 hinged thereto about a score line 48 even with the top edges of the other panel extensions. Alternate body panels 33, 35, on the other hand, have extensions 49, 50 lying between the score line 25 and the upper edge of the blank. Those portions of such edge which are common to the extensions 49, 50 each happen to be of shallow inverted V-shape. The stock in the panel extensions 49, 50 which is utilized in the rib 23 is separated from the remaining stock in these panels by score lines 51, 52 which follow the upper edge of the blank but are in substantial alinement with the score lines 44 and 45. The glue flap 36, of course, has a corresponding panel extension 54 which overlies one marginal edge portion of the inside face of the panel extension 41 when the container is erected. Running through the extension 54 is a score line 55 which is in reality a continuation of the score lines 44 and 52.

To permit infolding of the panel extensions 49, 50 as an incident to completing the top closure of the container, each of such extensions is provided with converging score lines. In the panel extension 49, score lines 56, 58 start at the intersections between the corner score lines and the line 25, converging upwardly and intersecting at the center of the line 51. In the panel extension 50, similar converging score lines 59, 60 intersect at the center of the line 52. Starting at the center of each of the lines 51, 52 and running parallel to the corner score lines but terminating at the upper edge of the blank is a score line 61 in the panel extension 49 and a similar score line 62 in the panel extension 50.

For the purpose of securing the top end closure parts in assembled relation, a suitable adhesive, preferably of the thermoplastic type, is applied in a band 64 to the upper marginal edge portions of the panel extensions 41, 42, 49 and 50. The band 64 may, if desired, be widened out as at 65 to include a portion of the flap 46, in which event it is desirable to locate the score line 48 in a position 48A farther out on the flap 46. Thus upon infolding of the panel extensions 41, 42, 49 and 50 incident to erecting the container, the stock above the score lines 44, 51, 45 and 52 is folded into four thicknesses and constitutes the backbone of the rib 23. Doubling over the flap 46 on the outside gives the rib 23 a thickness of five plies of stock. With the parts in this position, the adhesive band 64 can be activated by the application of heat and pressure to the opposite planar faces of the rib 23, producing a cross section in the latter such as that shown in Fig. 3. Where the band of adhesive 64 is not widened as at 65 to cover a portion of the inside face of the flap 46, an additional means may be provided to hold the flap in closed position, one such means being illustrated in Fig. 2 and consisting of a tie wire having lightly soldered ends.

Provision is made for allowing partial disintegration of the central rib 23 upon initial opening of the container and for utilizing such disintegrated portion to define an extensible, sanitarily protected pouring spout 66 for dispensing the contents of the container. In achieving such objective, advantage is taken of the angular pattern of the score lines on the panel extensions 49, 50. Upon more specific reference to Fig. 9, it will be noted that the score lines 51, 56, 61 and the corner score line 28 define in the panel extension 49 a triangular subpanel 68 together with a substantially rectangular subpanel 69, the latter constituting a portion of the central rib 23. Similarly, in the panel extension 50, the score lines 52, 60, 62 and 31 define therein a triangular subpanel 70, together with a substantially rectangular panel 71, the latter also constituting a portion of the central rib 23. Turning now to the extension 41, it will be noted that the latter is provided with a central score line 72 running substantially parallel to the lateral edges thereof and extending from the upper edge of the blank to a point located somewhat below the score line 25 in the side panel 32. Running from the intersection of the score line 25 with the lateral edges of the panel extension 41 and converging at the intersection between the score line 44 and the score line 72 are diagonal score lines 74, 75. Thus the scoring on the panel extension 41 defines therein triangular subpanels 76, 78, 79 and 80, together with substantially rectangular subpanels 81 and 82. The subpanels 80, 82 lie opposite the subpanels 68, 69 of the panel extension 49, being separated therefrom by the corner score line 28. By the same token, after the blank has been erected into a tube but before the top closure has been made, the subpanels 76, 81 lie opposite the subpanels 70, 71 of the panel extension 50, being separated therefrom along the corner score line 31. As those skilled in the art will appreciate, these subpanels, being hingedly connected to each other and also to the remaining portions of the top end closure, are utilized to define the side walls of the collapsible pouring spout 66.

For the purpose of insuring sufficient strength in the top end closure 22 to permit normal handling of the container both before and after initial opening of the same, means is provided for maintaining a relatively high degree of mechanical strength in the central rib 23. This is accomplished by limiting the disintegration of the rib 23 to only a predetermined portion having a length substantially coextensive therewith so as to leave a remaining portion also coextensive in length with the rib. With this end in view, the illustrative container 20 has in the present instance a severance line 84 of perforations or the like running across the subpanels 81, 82 and 69, and terminating at the score line 61. The severance line 84 runs substantially parallel to but is spaced from the adhesive band 64, dividing each of these subpanels into a stationary, adhesive coated portion and a movable portion which is free of adhesive material, the band 64 being of limited width for this purpose. A similar but shorter severance line 85 runs across the subpanel 71 of panel extension 50, starting at the score line 62 and terminating at the right-hand edge of the blank as viewed in Fig. 9, traversing a portion of the glue flap extension 54. Assuming the container to be in the initially closed position as shown in Fig. 3, an upward pull on the flap 46 will subject the stock of subpanels 81, 82, 69 and 71 to a combination of tension and bending forces along the severance lines 84 and 85. This results in rupture of the stock along these lines as the flap 46 is swung from the position of Fig. 3 to that of Figs. 5 and 6. Such action also frees the pouring spout which occupies its initial or collapsed position and permits the same to be readily extended, as illustrated sequentially in Figs. 6 and 7, simply by the application of squeezing pressure to its diagonally opposed lateral edges. Continued application of such squeezing pressure serves to open the spout 66 to its fully extended position (illustrated in Fig. 7) wherein it occupies approximately one-fourth of the cross-sectional area of the container. Due to the fact that the line 72 projects into the upper portion of side panel 32, such portion tends to bulge out as the spout reaches its fully extended position. This action

tends to hold the spout in extended position until a collapsing force is applied to the front of it. Adequate sanitary protection is afforded the spout **66** by the freshly severed edge **86** defined by the severance lines **84, 85**, the stock through which such lines extend having been completely enclosed within the rib structure prior to initial opening of the container. The sanitary protection of the spout **66** is also enhanced by the presence of paraffin or equivalent coating material upon the plies of the rib structure **23**. This material melts upon the application of heat and pressure to the rib **23** for activation of the thermoplastic adhesive and upon cooling forms a seal against contamination from the exterior of the container.

Upon return of the pouring spout **66** to its collapsed position, the flap **46** may be bent down over it to serve as a reclosure latch, the stiffness of the stock along the score line **48** facilitating such action.

Should it be desired to reinforce further the central rib structure **23**, it might be found desirable to apply an adhesive band to the reverse sides of the subpanels **69** and **71** adjacent their marginal edges, the band being of comparable width to the band **64**. By the use of this expedient, raising of the flap **46** as indicated in Fig. 8 does not delaminate the upper portion of the rib **23** as occurs in the structure of Fig. 5. On the contrary, in the structure of Fig. 8 the upper portion of the rib retains its full five-ply thickness.

To facilitate the opening of the container **20** and to render the pouring spout **66** more readily accessible without the need for using special opening instruments, the flap **46** may have fixed thereto a lift tab **88** which overlies the pouring spout prior to initial opening, being temporarily fixed to the top of the container by reason of the paraffin coating. The lift tab **88** may be adhesively joined as at **89** to the underlying portion of the flap **46**. To increase the extent of sanitary protection afforded the pouring spout and also to help retain the top closure in tightly sealed condition prior to initial opening, the lift tab **88** is formed with lateral extensions **90, 91** which are wrapped around the ends of the rib **23** and are adhesively secured to the rear planar face of the latter, the extensions **90, 91** having adhesive applied as at **92, 94** on their reverse sides for this purpose. Each of the lateral extensions **90, 91** has a score or severance line **95, 96** respectively separating it from the main portion of the lift tab **88**. Upon initial opening of the container due to raising of the lift tab, the main body of the latter simply parts from the lateral extensions along the severance lines **95, 96** and raises with the flap **46**, leaving the lateral extensions stationary. As an incident to the backward bending of the tab **88** which causes such parting, severance also takes place along the lines **84, 85** exposing the sanitarily protected pouring edge **86**.

While it is preferable and economical to fabricate the lift tab **88** as a separate piece of sheet stock, to be slipped into place as the top closure of the container is being folded into position, it is also possible to make the lift tab as an integral extension of the flap **46**. Referring to Fig. 13, wherein like numbers represent like parts already described above, there is shown a modified blank **24A** similar in all respects to the blank **24** except for the flap and lift tab construction. Thus in the blank **24A** there is shown a lift tab **88A** which is merely an extension of the flap **46** and which is provided with the lateral extensions **90, 91** in the same manner as the tab **88**. Each of the lateral extensions has an adhesive coated area **92, 94** and is separated from the body of the lift tab by score or severance lines **95, 96**. Running transversely of the lift tab **88** and spaced close to the widened adhesive band **65** is a score line **48A** which serves as a hinge line for the tab **88**.

I claim as my invention:

1. In a tubular container of paperboard or the like having four side panels of equal width, an end closure comprising the combination of three side panel extensions each having converging score lines defining therein triangular subpanels surmounted by a pair of substantially rectangular subpanels, the longer dimension of each such rectangular subpanel being equal to half the lateral dimension of one of said side panels, a fourth side panel extension having score lines defining therein a substantially rectangular subpanel terminating in a foldable flap, the common dimension of said rectangular subpanel and said flap being equal to the lateral dimension of one of said side panels, permanent adhesive junctures between said full width rectangular subpanel and said half width rectangular subpanels adjacent thereto, each of the remaining ones of said half width rectangular subpanels having a severance line dividing the same into an upper fixed portion and a lower separable portion, permanent adhesive junctures between the upper fixed portions of the remaining ones of said half width rectangular, subpanels, said separable lower portions of said remaining half width rectangular subpanels and the triangular subpanels associated therewith defining an extensible pouring spout, the latter when in extended position having a mouth in the shape of an equilateral parallelogram and when in collapsed position having a width substantially equal to that of said full width rectangular subpanel, and means for releasably securing said spout in collapsed position with said foldable flap overlying the same prior to initial opening of said container.

2. A blank for a tubular container of paperboard or the like and comprising, in combination, four side panels of equal width, three side panel extensions each having converging score lines defining therein triangular subpanels surmounted by a pair of substantially rectangular subpanels, the longer dimension of each such rectangular subpanel being equal to half the lateral dimension of one of said side panels, a fourth side panel extension having score lines defining therein a substantially rectangular subpanel terminating in a foldable flap, the common dimension of said rectangular subpanel and said flap being equal to the lateral dimension of one of said side panels, means for forming permanent adhesive junctures between said full width rectangular subpanel and said half width rectangular subpanels adjacent thereto, each of the remaining ones of said half width rectangular subpanels having a severance line dividing the same into an upper fixed portion and a lower separable portion, means for forming permanent adhesive junctures between the upper fixed portions of the remaining ones of said half width rectangular subpanels, means for forming permanent adhesive junctures between the inner pair of said upper fixed portions and said adjacent half width rectangular subpanels, said separable lower portions of said remaining ones of said half width rectangular subpanels and the triangular subpanels associated therewith being susceptible of defining an extensible pouring spout in the shape of an equilateral parallelogram when extended, and means for forming a permanent adhesive juncture between said flap and said adjacent half width rectangular subpanels and the upper fixed portions of said remaining half width rectangular subpanels.

3. In a tubular container of the character set forth and and having an extensible pouring spout defined in part by a laminar rib integral with the top end closure, a hinged flap being foldably disposed over said rib, the combination of a lift tab connected to said flap and releasably secured to said end closure, said lift tab having lateral extensions adapted for wrapping about the longitudinal ends of said rib and entering into overlying relation with the face of said rib remote from said lift tab, adhesive junctures between said lateral extensions and said remote face, each of said lateral extensions having a transverse severance line thereon coinciding approximately with the medial plane of said rib.

4. For use in a tubular container of the character set forth having an extensible pouring spout defined in part

by a laminar rib integral with the top end closure, said container also having a hinged flap foldably disposed over said rib, a lift tab susceptible of attachment to said flap and adapted to be releasably secured to said end closure, said lift tab having lateral extensions adapted for wrapping about the longitudinal ends of said rib and entering into overlying relation with the face of said rib remote from said lift tab, said lateral extensions having transverse severance lines, and adhesive areas on said lateral extensions located outboard of said severance lines.

5. In a gable top container of paperboard or the like, a top end closure comprising, in combination, a pair of opposed inclined roof panels, one of the same having upwardly converging score lines, a pair of opposed triangular end panels infolded between said roof panels, an outside top rib panel attached to the upper edge of the other of said roof panels and terminating in an over-folded flap, a first pair of fractional top rib panels foldably attached and adhesively bonded to the inside face of said outside top rib panel in a permanent juncture, a second pair of fractional top rib panels foldably attached to respective ones of said first pair, and a third pair of fractional top rib panels surmounting said one inclined roof panel and foldably attached to each other and to respective ones of said second pair, said closure having substantially coinciding weakened lines of severance extending transversely across only said second and third pairs of fractional top rib panels and dividing each into an upper fixed portion and a lower extensible portion, said lines of severance being substantially parallel to the top rib and coextensive in length therewith, means defining a permanent adhesive juncture between the upper fixed portions of said second and third pairs of fractional top rib panels, and means defining a permanent adhesive juncture between said over-folded flap and the upper fixed portions of said third pair of fractional top rib panels.

6. In a gable top container of paperboard or the like, a top end closure comprising, in combination, a pair of opposed inclined front and back roof panels, the front panel having upwardly converging score lines, opposed infolded substantially triangular panels tucked between said front and back panels, said infolded panels comprising a front pair of substantially triangular panels in face contact with the front panel and a back pair of substantially triangular panels in face contact with the back panel, said substantially triangular panels having upper portions clamped between upper portions of said front and back panels, the upper portions of said substantially triangular panels terminating in a coinciding straight edge, said closure having substantially coinciding weakened lines of severance extending substantially paralled to said straight edge transversely entirely across the upper portion of only the front pair of substantially triangular panels and front panel; permanent adhesive joining the clamped contacting faces of the upper portions of the back panel, back substantially triangular panels and the upper portions of the front substantially triangular panels and front panel only above the said weakened lines of severance whereby those portions of said front substantially triangular panels and front panel, below said weakened lines, becomes an extensible portion upon the severance of said weakened lines.

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