Jan. 10, 1956 C. H. DIXON 2,730,289

CONTAINER OF PAPERBOARD OR THE LIKE

Filed June 2, 1951

3 Sheets-Sheet 1

Fig. 1

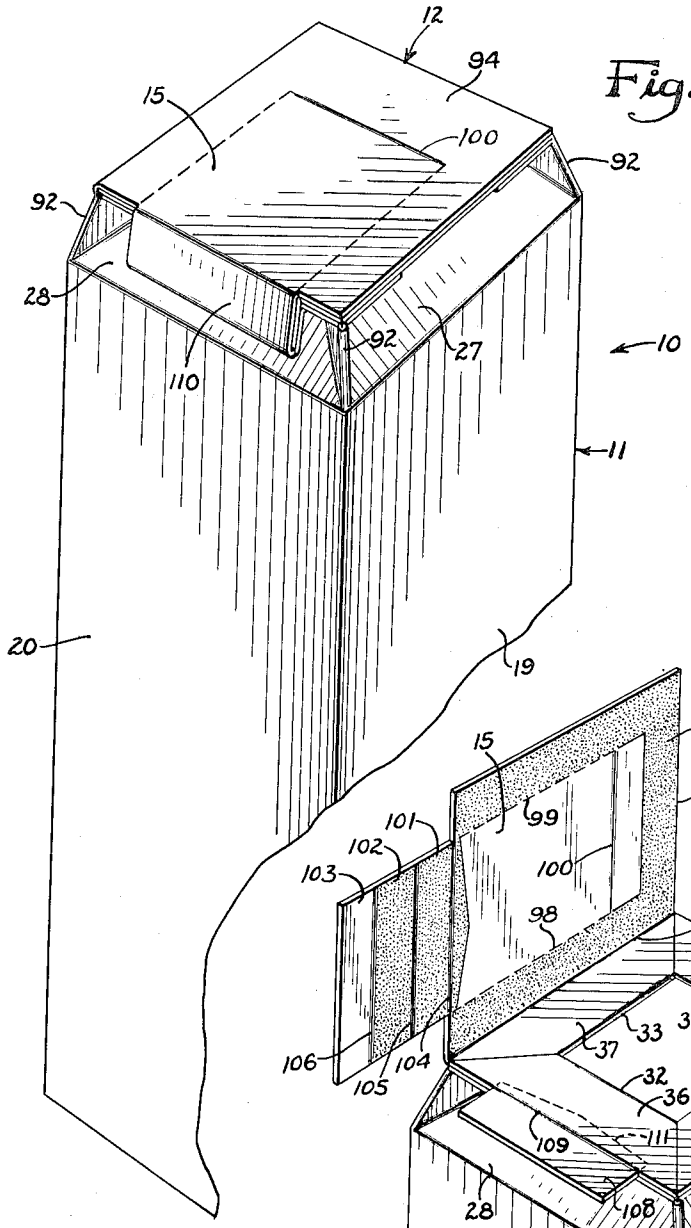
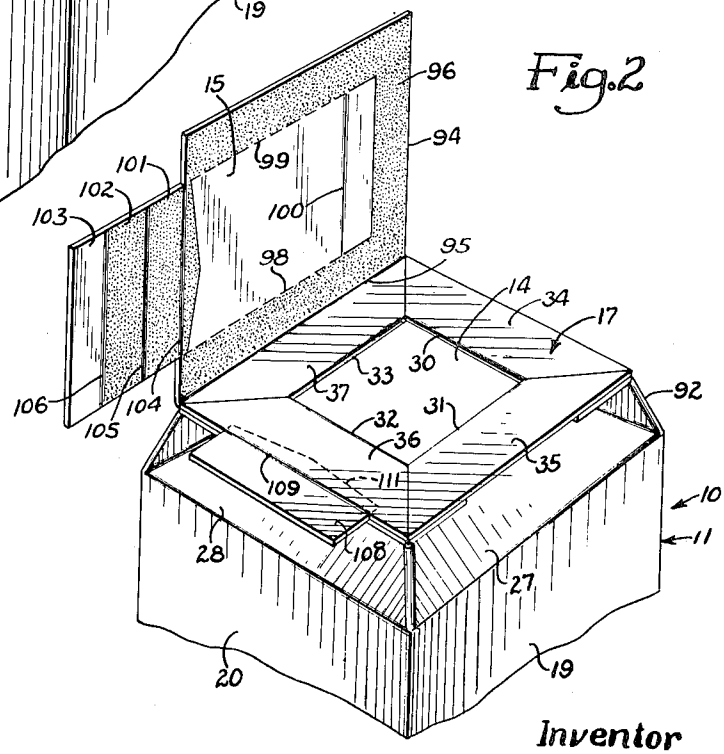


Fig. 2



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Fig. 3

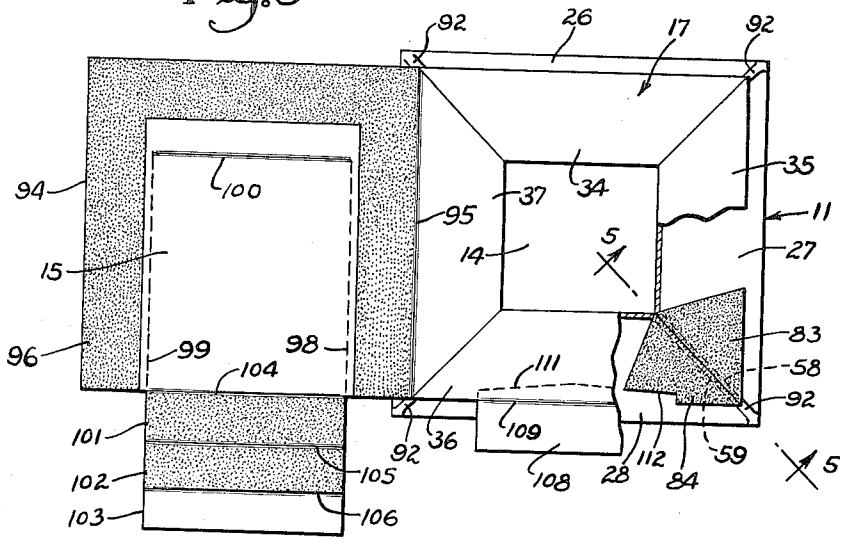


Fig. 5

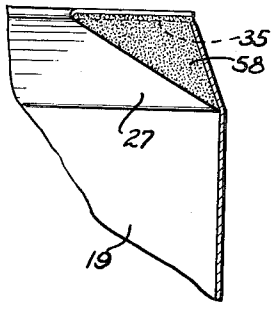
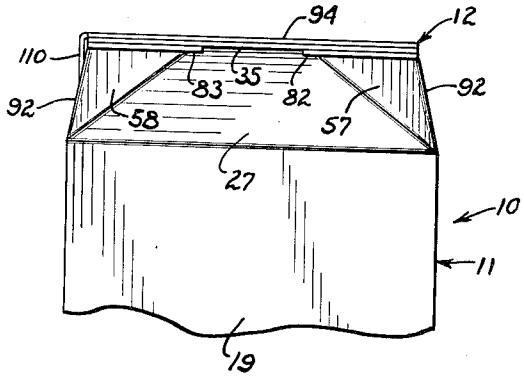


Fig. 4



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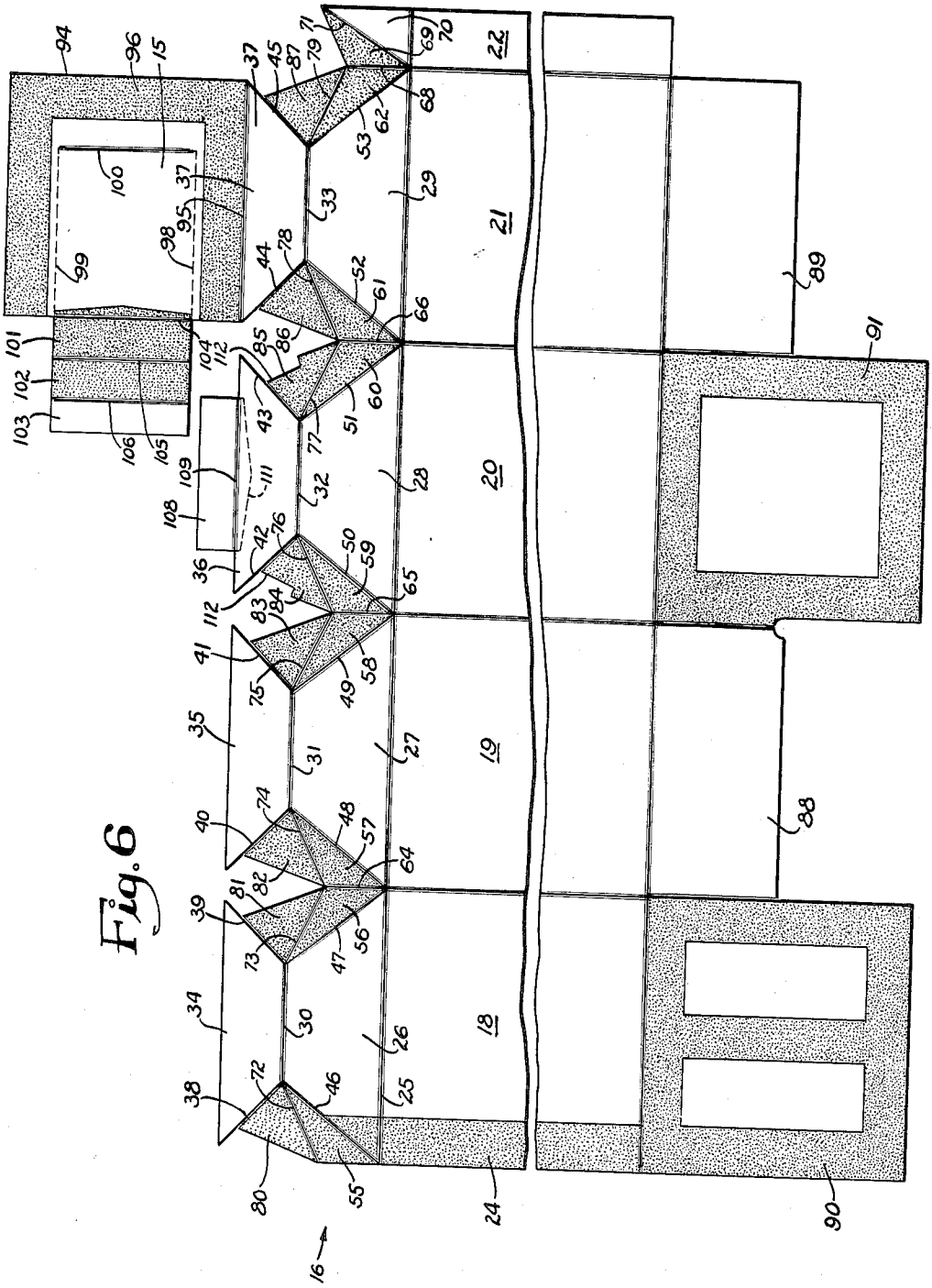


Fig. 6

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2,730,289

CONTAINER OF PAPERBOARD OR THE LIKE

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Application June 2, 1951, Serial No. 229,551

7 Claims. (Cl. 229—17)

The present invention pertains in general to containers and more specifically to a disposable, tubular container of paperboard or other sheet stock such as the one disclosed in my copending U. S. application Serial No. 135,430, filed December 28, 1949.

One object of the invention is to provide a container of the foregoing type and wherein all the double folds or 180° bends in the sheet stock are adequately protected by an adhesive bond between their contacting surfaces, thus precluding leakage due to crushing or cracking of the stock at the outer arc of the bend.

Another object of the invention is to provide a container of the character set forth and which may readily be formed from a single thickness of flat sheet stock such as paperboard, thus leading to economical manufacture, packing, and shipment of containers in blank form.

A further object of the invention is to provide a container of the type set forth and having a relatively flat end closure including a pouring opening with a liftable member initially overlying the same in fluidtight relation therewith.

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

Figure 1 is a fragmentary perspective view of an illustrative container embodying the present invention and showing the end closure in an initially sealed condition.

Fig. 2 is a fragmentary perspective view of the upper portion of the container illustrated in Fig. 1 but showing the end closure during an intermediate stage in its assembly.

Fig. 3 is a plan view of the container in the condition illustrated in Fig. 2 but with the outside flap of the end closure extending outwardly in a horizontal direction.

Fig. 4 is a fragmentary elevational view of the upper portion of the right-hand side of the container as viewed in Fig. 1.

Fig. 5 is an enlarged fragmentary vertical sectional view through the end closure of the illustrative container, such view being taken in the plane of the line 5—5 in Fig. 3.

Fig. 6 is a broken plan view detailing the inside face of the blank from which the illustrative container of Fig. 1 may be constructed.

While the invention is susceptible of various modifications and alternative constructions, a preferred embodiment has 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 form 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, the invention is there exemplified in an illustrative container **10** as shown in Fig. 1. The container **10** is formed from a suitable impervious sheet material such as paperboard which may ultimately be coated or impregnated with a substance to render it fluidtight and capable of holding

milk or other liquids. The container **10** comprises a tubular main body **11** which in the present instance happens to be of generally rectangular cross section. At its base, the body **11** may be provided with an appropriate bottom closure, the present invention not being particularly concerned with the details of the latter. At its upper end, the body **11** is provided with a compact and exceptionally sturdy top end closure **12**. Included within the structure of the closure **12** is a pouring opening **14** (Fig. 2) which may also be utilized for filling the container **10**. The pouring opening **14** is, of course, covered by an outer thickness of stock and has a liftable member in the form of a lift tab **15** disposed in initially sealed and overlying relation therewith.

In order to facilitate economical manufacture, packaging and shipment, the container **10** is fashioned from a single thickness of sheet stock in the form of the cut and scored blank **16** illustrated in Fig. 6. Referring more particularly to Fig. 6, which illustrates the inside face of the blank **16**, it will be perceived that the latter is divided by an appropriate pattern of score lines, cuts and perforations into a plurality of panels and areas which are utilized as the walls of the container and the closure parts when the container **10** is erected.

Accordingly, the central and major area of the blank **16** is scored to define side panels **18**, **19**, **20** and **21**, together with a fractional side panel or glue flap **22**. All of these side panels together define the main body **11** of the erected container, the fractional side panel **22** being lapped over the inside face of the side panel **18** and secured thereto as by means of an adhesive layer **24**. Connected to the side panels along a common score line **25** defining the upper edges of the latter are a plurality of substantially trapezoidal extension panels **26**, **27**, **28** and **29**. These extension panels are joined along their larger bases to their respective side panels.

Integrally connected to respective ones of the panel extensions **26**, **27**, **28** and **29** along score lines **30**, **31**, **32** and **33** are a plurality of corresponding flange panels **34**, **35**, **36** and **37**. The flange panels **34**, **35**, **36** and **37** are also of generally trapezoidal shape, being connected along their shorter bases to the shorter bases of the trapezoidal extension panels **26**, **27**, **28** and **29**. The respective flange panels have angular sides **38**, **39**, **40**, **41**, **42**, **43**, **44**, and **45**. The latter are disposed at an appropriate angle to form mitered corner joints between adjacent ones of the flange panels **34**, **35**, **36** and **37** when the latter are outturned and abutted together to define a common bearing flange **17** in the container end closure (see Figs. 2 and 3). As indicated clearly in the drawings, the bearing flange **17** is of hollow rectangular shape and encircles the pouring opening **14**, the edges of the latter being defined by the score lines **30**, **31**, **32** and **33**.

Provision is made for connecting the adjacent sides of the trapezoidal extension panels **26**, **27**, **28** and **29** in fluidtight relation by stiffener members composed of at least two thicknesses of adhesively bonded sheet stock. Accordingly, each of the trapezoidal extension panels is flanked on its sides along respective score lines **46**, **47**, **48**, **49**, **50**, **51**, **52** and **53** by a plurality of triangular corner rib panels **55**, **56**, **57**, **58**, **59**, **60**, **61** and **62**. With one exception, the corner rib panels of adjacent extension panels are adhesively coated and hinged together along corresponding extensions of the main score lines which separate the main body side panels of the container **10**. Thus the corner rib panels **56**, **57** are hinged together along score line **64**, the rib panels **58** and **59** are hinged together along score line **65**, while the rib panels **60**, **61** are hinged together along score line **66**. The corner rib panel **62** is hinged along score line **68** to a rib panel **69** defined in quadrilateral extension panel **70** of the glue flap **22** by an angular score line **71**. When the blank **16**

is erected into tubular form, the glue flap 22 and its extension panel 70 respectively overlie the inside faces of the main side panel 18, the corner rib panel 55 and the adhesive coated portion of the trapezoidal extension panel 26. Thus from a structural standpoint, the corner rib panel 55 is hinged to the corner rib panel 62 which is ultimately located adjacent thereto with the rib panel 69 sandwiched therebetween.

Provision is made for retaining the trapezoidal flange panels 34, 35, 36 and 37 in outturned, coplanar relation with their adjacent sides disposed in abutment with each other so as to define the rectangular bearing flange 17. In furtherance of this purpose, all of the corner rib panels with the exception of the rib panel 69 have hinged thereto along respective score lines 72, 73, 74, 75, 76, 77, 78 and 79 a corresponding plurality of triangular flange reinforcement panels 80, 81, 82, 83, 84, 85, 86 and 87. As indicated in Fig. 6, the flange reinforcement panels are initially located in flanking relation with the mitered sides of the flange panels but are completely severed therefrom. Thus as the flange panels are outturned incident to assembly of the end closure, the flange reinforcement panels are adapted to be slid into underlying relation with the side extremities of the flange panels and to be bonded adhesively thereto as by activating an adhesive layer on each of the flange reinforcement panels.

Having in mind the structure thus far described, consideration may now be given to the mode of erecting the container 10, starting with the flat blank 16. This may be accomplished readily either by machine or manual means. The first step consists of making an open-ended tube by folding adjacent ones of the main side panels 18, 19, 20 and 21 into perpendicular relation along the main score lines defining their lateral edges. The tube is then completed by adhesively securing the glue flap 22 and its extension panel 70 to the inside face of the side panel 18, the panel extension 26, and the corner rib panel 55.

The next step, preferably, is the formation of the bottom end closure of the open-ended tube. While any suitable closure may be utilized in the container 10, it has been found convenient to use a well-known arrangement comprising two opposed minor flaps 88, 89 which are initially infolded and adhesively secured to an underlying major flap 90, the flaps 88, 89 being backed up by a suitable inside mandrel. After this has been done, an outer major flap 91 is adhesively secured in underlying relation to the major flap 90.

Turning now to the opposite or top end closure of the erected container tube, the preferred procedure is to infold the trapezoidal extension panels 26, 27, 28 and 29 to an inclined position along their common score line 25. This causes the shorter base ends of the trapezoidal panels 26, 27, 28 and 29 to converge inwardly. At the same time, adjacent pairs of the corner rib panels 55, 56, 57, 58, 59, 60, 61, 62 and 69 fold together about respective ones of the score lines 64, 65, 66 and 68. The next step, which may occur substantially simultaneously with the preceding one, is to fold the trapezoidal flange panels 34, 35, 36 and 37 down onto the adhesive coated surfaces of flange reinforcement panels 80, 81, 82, 83, 84, 85, 86 and 87. This brings the flange panels 34, 35, 36 and 37 into outturned, coplanar relation so that their adjacent mitered side edges abut one another and lie in alinement with corresponding ones of the corner ribs 92 defined by the corner rib panels. Taking one corner purely by way of example, it will be noted upon reference to Fig. 3 that the lower right-hand corner of the bearing flange 17 would be defined by the adjacent side edge portions of the trapezoidal flange panels 35, 36, such portions being broken away to illustrate the underlying structure. The flange reinforcement panels 83, 84 are also outturned and underlie their respective flange panels 35, 36, the reinforcement panels 83, 84 abutting each other along the score lines 75, 76. The corner rib 92 associated with this corner is defined by the corner rib panels 58, 59, the faces of which are adhesively secured together so as to protect the 180 degree bend of stock about the score line 65.

As an incident to manipulation of the parts of the top end closure, the adhesively coated surfaces are suitably activated when the parts are in assembled position. This is achieved preferably by the use of a thermal setting material which can be activated by means of heat and pressure. Other adhesives may, of course, be utilized satisfactorily.

For the purpose of covering the pouring opening 14, there is adhesively secured to the bearing flange 17 a closure flap 94 (see Figs. 2, 3 and 6). In the present instance, the flap 94 happens to be an extension of the trapezoidal flange panel 37, being hinged thereto along a score line 95 which defines the outer or longer base edge of the flange panel 37. To effect an adhesive juncture between the flap 94 and the bearing flange 17, either or both of these areas may be coated with a layer of adhesive and in this case the flap 94 has a relatively wide adhesive band 96 adjacent its outer edges.

The top end closure of the container 10 may include a variety of initially sealed members which can be broken open by the user to expose the pouring opening 14 and resort may be had conveniently to an arrangement such as the one disclosed in my copending application Serial No. 135,430, supra. Adapting such arrangement to the illustrative container 10, it will be noted that the closure flap 94 includes the lift tab 15 which is defined therein by means of a pair of laterally spaced perforation or severance lines 98, 99, together with a transverse score line 100. The lift tab 15 is formed with three panel extensions 101, 102, 103 defined by transverse score lines 104, 105, 106. The extensions 101 and 102 are adapted to be reversely bent about the score line 105 and to be adhesively bonded to a holding tab 108 sandwiched therebetween, the holding tab 108 projecting outwardly from the trapezoidal flange panel 36. These elements are then adapted to be bent downwardly about the score line 104 and a score line 109 so as to form a depending gripping tab 110. The extension 103 is adapted to be bent reversely about the score line 106 and thus serve as a reclosure latch for the lift tab 15 by engagement with the underside of the flange panel 36. The holding tab 108, while integral with the flange panel 36, is designed to be severed progressively therefrom when the gripping tab 110 is lifted. For this purpose, there is located adjacent the score line 109 but slightly inwardly therefrom a perforation or severance line 111. The latter is nonparallel with the outer or larger base edge of the trapezoidal flange panel 36 and preferably is of shallow V-shape when viewed in plan.

To avoid interference with the pouring and cutoff characteristics of the container 10, the flange reinforcement panels 84, 85 underlying the flange panel 36 are provided with relief notches 112 which underlie and substantially coincide with the end portions of the severance line 111.

I claim as my invention:

1. A tubular container of paperboard or the like having a body and a relatively flat end closure thereon, said container comprising the combination of a plurality of inclined and substantially trapezoidal extension panels connected at their larger base ends to the container body, a plurality of outturned and substantially trapezoidal flange panels connected at their shorter base ends to the shorter base ends of said inclined trapezoidal panels, the side edges of adjacent ones of said flange panels being disposed in abutment with each other, a plurality of corner ribs connecting in fluidtight relation the sides of said inclined trapezoidal panels, a plurality of substantially triangular flange reinforcement panels hingedly connected to respective ones of said corner ribs, said reinforcement panels being disposed in underlying and adhesively secured relation with the side portions of said flange panels, the hinge lines between said reinforcement panels and said

corner ribs substantially underlying the abutting side edges of said outturned flange panels, and a closure flap adhesively secured to said flange panels.

2. In a tubular container of paperboard or the like having a body portion with a relatively flat end closure thereon, the combination comprising a plurality of inclined and substantially trapezoidal extension panels having adjoining larger base ends connected to the body portion, a plurality of outturned and substantially trapezoidal flange panels connected at their shorter base ends to the shorter base ends of said inclined trapezoidal panels, a plurality of multiple thickness corner ribs connecting in fluidtight relation the adjacent sides of adjoining ones of said inclined trapezoidal panels, a plurality of substantially triangular flange reinforcement panels each connected to one thickness of a respective one of said corner ribs, said reinforcement panels being disposed in underlying and adhesively secured relation with the side portions of said trapezoidal flange panels.

3. A blank for a tubular container of paperboard or the like comprising the combination of laterally adjoining main side panels, a plurality of adjacent generally trapezoidal extension panels joined along their larger bases to respective ones of said main side panels, a corresponding plurality of generally trapezoidal flange panels joined along their shorter bases to the shorter bases of respective ones of said trapezoidal extension panels, a plurality of generally triangular corner rib panels each having one edge connected to an adjacent side of one of said extension panels and another edge connected to a corresponding adjacent one of said corner rib panels, a plurality of generally triangular flange reinforcement panels connected to respective ones of said corner rib panels along the remaining edges thereof, and an outer closure flap connected to the larger base edge of one of said trapezoidal flange panels.

4. In a four section blank for a rectangular tubular container of paperboard or the like, the combination comprising for each section a rectangular main body side panel, a substantially trapezoidal extension panel integral with said side panel but separated therefrom by a score line defining the longer base of said extension panel, a pair of substantially triangular corner rib panels integral with said trapezoidal extension panel but each separated therefrom along a score line defining one of the sides of said extension panel, a substantially trapezoidal flange panel integral with said extension panel but separated therefrom along a score line defining the common shorter base of both said trapezoidal panels, and a pair of substantially triangular flange reinforcement panels with each one integral with each one of said corner rib panels but separated therefrom along a score line which coincides approximately with one of the side edges of said trapezoidal flange panel when said blank is folded into a four sided container.

5. In a container of paperboard or the like having a tubular main body and a relatively flat end closure thereon, the combination comprising a plurality of inclined extension panels integrally connected along their side edges by means of corner ribs, a plurality of coplanar trapezoidal flange panels connected with said inclined extension panels and having mitered side edges disposed in abutting relation and defining a bearing flange with a central pouring opening therein, a plurality of substantially triangular flange reinforcement panels, hingedly connected to respective ones of said corner ribs underlying portions of said flange panels and secured thereto, and a sealed closure flap for said pouring opening.

6. In a tubular container of paperboard or the like and having a relatively flat end closure, the combination of a plurality of generally trapezoidal flange panels disposed in coplanar relation with their adjacent sides abutting each other so as to define a rectangular bearing flange with a central pouring opening therein, a holding tab projecting outwardly from the longer base edge of one of said trapezoidal flange panels but being joined to the latter along a severance line non-parallel with said longer base edge of said one flange panel, a hinged lift tab initially disposable in overlying relation with the dispensing opening, and panel extensions on said lift tab, certain ones of said panel extensions being adhesively secured to said holding tab and defining therewith a gripping tab, the remaining one of said panel extensions being disposed in underlying relation with said one trapezoidal flange panel for coaction therewith as a reclosure latch for said lift tab.

7. In a tubular container of paperboard or the like having a relatively flat top end closure, the combination comprising a plurality of generally trapezoidal flange panels disposed in outturned coplanar relation with their adjacent side edges abutting each other so as to define a bearing flange surrounding a central pouring opening, a closure flap secured to said bearing flange by direct adhesive juncture with a major portion of the face area of all but one of said trapezoidal flange panels, a hinged lift tab in said closure flap overlying said pouring opening, a severable holding tab projecting outward from the larger base edge of the remaining one of said trapezoidal flange panels, said lift tab being adhesively secured to said holding tab to complete the seal between said closure flap and said bearing flange.

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