May 25, 1965 G. A. MOORE 3,185,377

CONTAINER AND BLANK THEREFOR

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FIG. 1

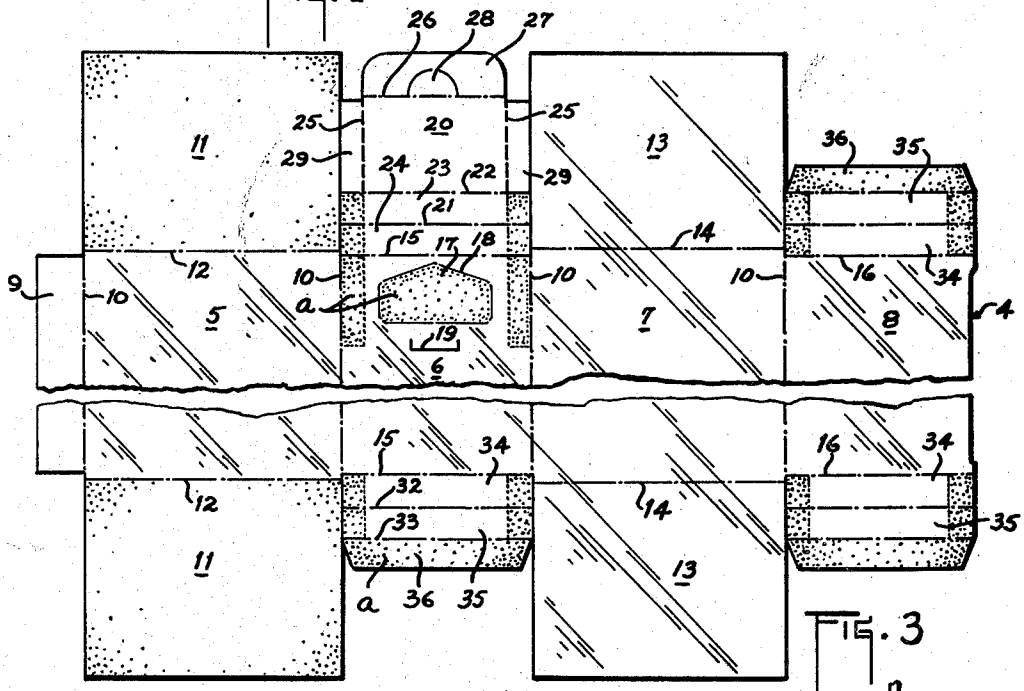


FIG. 2

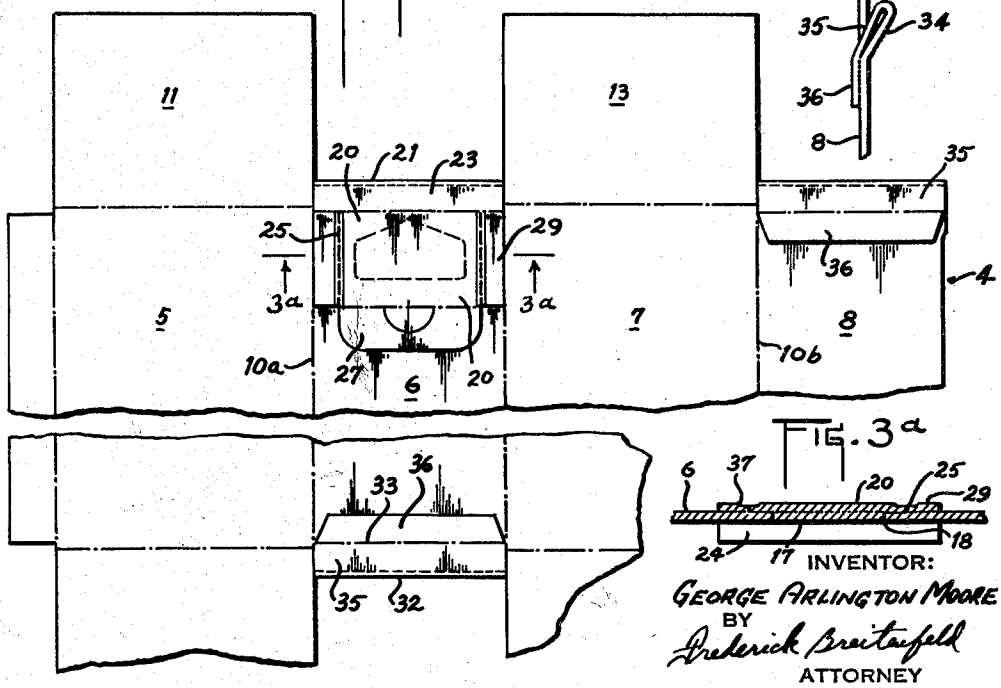


FIG. 3

FIG. 3a

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FIG. 4

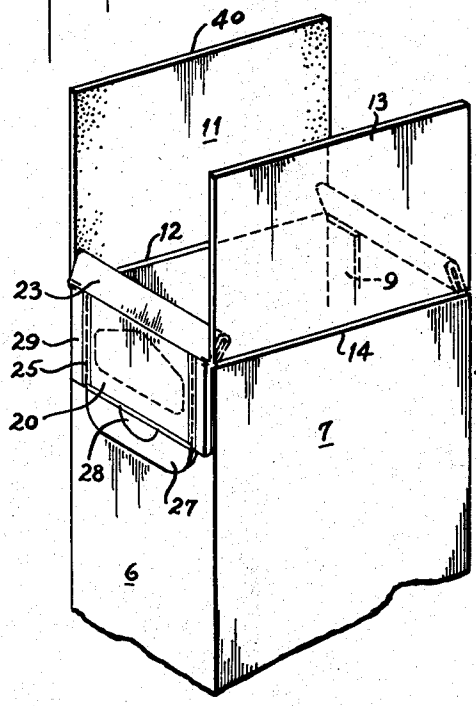


FIG. 7

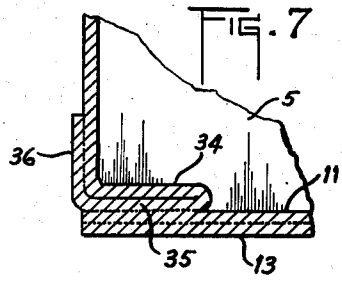


FIG. 5

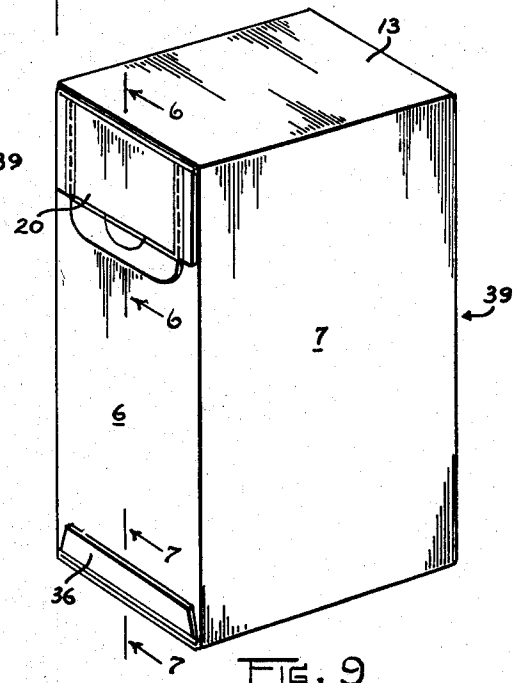


FIG. 6

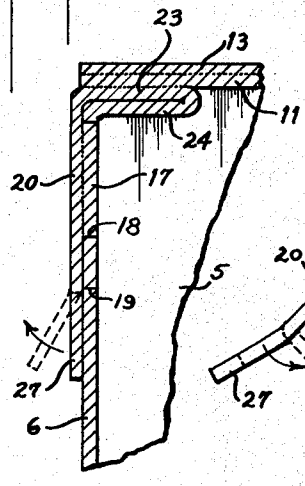


FIG. 8

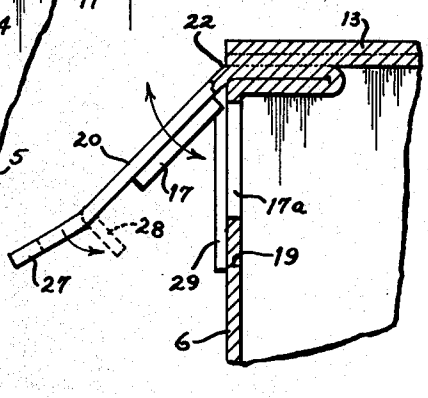
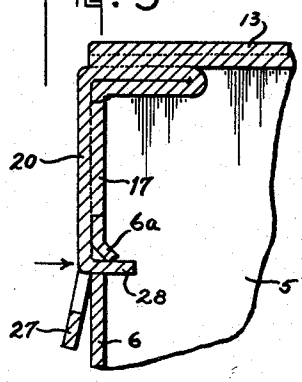


FIG. 9



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3,185,377

CONTAINER AND BLANK THEREFOR

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Filed Apr. 4, 1963, Ser. No. 270,687
14 Claims. (Cl. 229—17)

This invention relates to containers for packaging flowable material, and to a blank from which the container is formed.

More specifically, the invention provides a container having closure-forming elements so conceived that it is rendered thoroughly sift-proof, certain of the closure-forming elements being uniquely pre-folded and secured integral portions of the flat container blank. What is more, the container is provided with an efficient dispensing opening arrangement having an independent sub-closure flap for effecting the opening and which is also an integral pre-formed part of the flat container blank prior to shaping the container.

It is well known that present-day containers of the folding carton variety are not found to be structurally tight unless they are associated with interior bags or other lining material and/or overwrapping sheet materials. These auxiliary materials are needed because conventional folded cartons by themselves do not have structural means to make them tight enough to prevent sifting of powdered or granular material.

It is therefore a primary object of the present invention to provide a container of the above-mentioned variety that is formed of a novel blank designed to render the container leakproof without resorting to the use of any augmenting sheet materials and which can eliminate the use of conventionally used glue fountain apparatus on carton closing equipment.

Another object of the invention is to provide a novel container-forming blank having pre-folded structural elements formed preliminary to the folding of the blank as a whole into the body formation of the container, these elements, when further folded, forming the end closures of the container.

A further object of the invention is to provide a container having a dispensing opening facility with manually manipulable sub-closure means provided for uncovering and tightly reclosing it.

Another object of the invention is to provide a container-forming blank having pre-folded and secured end-closure-forming elements including a sub-closure pre-formed element that is formed to co-act structurally with the formation of one of the end closures of the container.

It is still a further object to provide a blank adapted for use with thermoplastic film pre-coatings or other adhesive applications that may be used in forming and sealing the completed container for the particular duty requirements intended to be fulfilled by the container.

The above and other objects and advantages are attained by this invention, a particular embodiment of which I have illustrated in the accompanying drawings which are utilized for the purpose of illustration only, and are not to be construed as a definition of the limits of the invention, reference being had for this purpose to the appended claims.

In the drawings, wherein similar reference characters refer to similar parts throughout the various views shown:

FIG. 1 is a plan view of the container-forming blank, the central portion of which has been broken away;

FIG. 2 is another similar plan view of the blank, with parts broken away, after completion of the initial steps taken in preparing the blank for carton set-up formation;

FIG. 3 is a fragmentary end elevational view of the blank in FIG. 2;

FIG. 3*a* is a cross-sectional view taken on line 3*a*—3*a* of FIG. 2;

FIG. 4 is a fragmentary perspective view of the set-up container prior to the closing of its end walls;

FIG. 5 is a perspective view showing the completed container as formed from the blank in FIG. 2;

FIG. 6 is an enlarged cross-sectional view taken on line 6—6 of FIG. 5;

FIG. 7 is another enlarged cross-sectional view taken on line 7—7 of FIG. 5;

FIG. 8 is a view similar to FIG. 6 after the dispenser opening has been uncovered; and

FIG. 9 is a view similar to FIG. 7 after reclosure of the dispenser opening.

It is contemplated that the container of the present invention will be used to package various types of powdered and granular material for commercial distribution, the container as formed and closed after filling being sift-proof. Furthermore, the container may be set up and end closures formed substantially in line with conventional practice and on conventional equipment utilized by the folding carton industry. Use of the present carton will afford greatly increased efficiency and other economical advantages.

To this end, the container forming blank 4 illustrated in FIG. 1 is prepared from any suitable sheet material such as paperboard or other foldable substrate. For purposes of illustration, any suitable grade of paperboard used in making blanks for folding cartons may be utilized and printed in accordance with conventional practices. The blank 4 as cut and creased from such sheet material consists of the container body-forming panels 5, 6, 7 and 8 which will be arranged in opposed pairs. The panel 5 has a longitudinal projected marginal portion 9 used to form a longitudinal body seam when folding the blank into collapsed and secured condition. Each of the body panels is separated by the longitudinal score lines 10.

The panel 5 is provided with two outwardly opposed laterally projecting foldable end closure forming panels 11, the panels 11 each having a scored hinge line 12 perpendicular to the score lines 10. In one instance, for a particular purpose, each of the panels 11 may be coated on its opposite surfaces with a suitable hot-melt resinous dry adhesive material, the purpose of which will be hereinafter described. The body panel 7 is also provided with two outwardly opposed laterally projecting panels 13 each having a scored hinge line 14 parallel to the score line 12 but spaced outwardly thereof a distance equal to about one thickness of the blank material.

The body panel 6 is provided with the top and bottom score lines 15 each disposed parallel to the score lines 12 and 14 but each spaced inwardly of the corresponding line 12 a distance equal to subsantially two thicknesses of the blank material. Top and bottom score lines 16 define the ends of the body panel 8, the lines 16 each being spaced inwardly of the corresponding score line 14 a distance equal to substantially three thicknesses of the blank material. The upper part of the panel 6 is provided with a slit-through section defining an openable aperture area 17. At the top of the area 17, the slits 18 converge upwardly. The area 17 is coated with a dry activator adhesive indicated by the strippling thereupon. A U-shaped slit line 19 is provided through the panel spaced below the bottom slit line of the area 17.

The panel 6 is also provided with a multiple foldable sub-closure forming panel 20 having two spaced-apart score lines 21 and 22 parallel to score lines 15. The score lines 21 and 22 define the twin ledge-forming portions 23 and 24. These twin portions are duplicated on the bottom end of the panel 6 and upon the top and bottom ends of the body panel 8 by the ledge-forming portions 34

and 35. The panel portion 20 is provided with a pair of spaced-apart perforated lines 25, each being spaced inwardly of the adjacent side edge of the panel and extending between the transverse score lines 22 and 26. The panel 20 is provided with an outwardly projecting end flange 27 having side edges extended in line with the perforated lines 25, the flange being provided with a circular slit tab 28 foldable on the score line 26 of the flange. The base width of the tab is about the same as the width of the U-slit line 19 in the panel 6.

The panel 6 and the first-mentioned twin portions 23 and 24 are provided at their margins with dry activator adhesive in the pattern shown by the stippled areas "*a*". The adhesive extends inwardly from the score line 22 and terminates substantially in line with the U-shaped slit line 19. The portions of the pattern adhesive "*a*" extending inwardly from the score line 15 are adapted to register with the marginal borders 29 of the panel 20, the borders 29 being located outwardly of the perforated lines 25 and extending between the transverse score lines 22 and 26.

Each of the other twin ledge-forming elments on the bottom end of the body panel 6 and on the top and bottom ends of the body panel 8 is identical to the others. Each element is provided with two spaced-apart score lines 32 and 33 parallel to score lines 15 thereby defining the foldable margins 34 and 35. The element is also provided with an end flange 36 projecting outwardly from the score line 33. The exterior surface of the flange 36 is coated with the adhesive "*a*" as are the ends of the twin portions 34 and 35.

The gloss overcoat on the printed blank is not applied to the surface of the portion 9, the panels 11 and 20, and the twin elements 23, 24 and 34, 35. It is to be understood, that if desired, the entire interior surface of the blank may be provided with an extruded or otherwise applied plastic film material having thermoplastic properties, such as polyethylene, polypropylene or any other appropriate material that may be selected to meet the requirements of the container to be formed from the blank. In such event, the panel elements 11 will not be provided with a coating of adhesive as hereinbefore described, but rather the exterior surfaces thereof will be left uncoated.

The next step taken in finishing the blank 4 is illustrated in FIG. 2 wherein the closure forming elements on the ends of the body panels 6 and 8 have been folded upon and secured to their respective parent panels, as shown. The panel 20 and portion 23 are reversely folded along the score line 21 into superposed relation with the portion 24 and panel 6. As a result, the twin portions assume substantially the form of a slack loop as illustrated in FIG. 3. (FIG. 3 shows the portions 34 and 35 but the loop formed by portions 23 and 24 is identical.) The loop is bent inwardly and may be confined at an incline while heat and pressure are applied, by suitable means (not shown), to the panel 20 thereby activating the dry adhesive "*a*." A bond is thus effected between the opposed marginal portions 29 and central region of the panel 20 and the corresponding adhesive coated areas of the panel 6. This bond serves to maintain the portions 23 and 24 in superposed relationship to the panel 6. While pressing the panel 20, higher pressure is concentrated upon the perforated lines 25 thereby embossing a groove 37 inwardly upon each of these lines as illustrated in FIG. 3*a*. The purpose served by the embossed grooves will be hereinafter described.

The other end elements 34, 35, 36 are folded in the same manner as described for the panel 20 and elements 23, 24. These elements are folded along their respective score lines 32, the twin portions 34 and 35 being superposed substantially in a slack loop as shown in FIG. 3. The flange 36 of each element is firmly bonded by heat and pressure to the exterior surface of its respective parent panel as illustrated in FIG. 2. The flange 36 may be bonded in such a position that the loop normally assumes the inclined condition of FIG. 3 in order to facilitate further folding operations. It will now be observed that a sub-closure has been completely formed in the flat blank, the sub-closure becoming the dispenser facility of the completed container. In addition, the other pre-folded and secured elements 34, 35, 36 as well as the portions 23, 24, constiute ready-made cushion-like resistant seating ledges which the end closure panels of the container will engage in leakproof seam-forming relationship.

The finished blank may be folded and secured in collapsed form by conventional carton folding machines. For example, the blank 4 may be folded on the score lines 10*a* and 10*b* to bring the margin 9 under the panel 8, whereupon the margin can be adhesively secured to the interior surface of the panel 8. The container in collapsed form may be set up along the lines of conventional practice. Acocrdingly, the container 39 is formed from the blank 4 as illustrated in FIG. 4. It will be noted that the sub-closure dispenser is already completely constructed and sealed as well as the panel seating ledges when the folded blank is opened into carton formation as shown.

The steps taken to form both of the end closures of the container are substantially conventional and consist of first folding the slightly inclined opposing pair of ledges 23, 24 and 34, 35 inwardly and downwardly so that the upper faces of the elements 23 and 35 of the ledges are about parallel to the hinge line 12 of the foldable panel 11. The panel 11 is then folded inwardly and downwardly upon the upper faces of the ledges. Due to the constant tendency of the ledges to spring upwardly, they firmly oppose the downward movement of the panel 11. Consequently, the end edge 40 of the latter is brought into edge-to-face abutment with the interior surface of the side wall panel 7 which simultaneously causes the underlying opposite end edges of the ledges to be brought into edge-to-face abutment firmly against the opposing side wall 7 and their opposite end edges against the opposing side wall 5. The panel 13 is then folded inwardly and downwardly upon the upper face of the folded panel 11. It is important to note that due to the offset relationships of the hinge lines 12, 14, 15 and 16, provided in the blank, the ledges and panels are positioned uniformly in flat superposed parallel planes. Heat and pressure applied upon the side walls 5, 7 adjacent their respective corner edges 12, 14 and upon the exterior surface of the folded panel 13, activates the adhesive upon the inner disposed panel 11 thereby sealing the end closure in leak-proof seam forming relationship. The bottom end closure is formed in the same manner after filling the container with its intended product.

The completed container is illustrated in FIG. 5, and the end closures as formed are illustrated in section in FIGS. 6 and 7. It can be observed that the hot-melt resinous dry adhesive applied upon the panel 11, when activated, firmly bonds itself to the upper surfaces of the pressure-resisting ledges and also to the inner face of the panel 13, as shown in the illustrations. In addition, the exudation of the heated resinous adhesive adjacent the edge-to-face abutments, augmented by the adhesive "*a*" between the superposed ledges, is the medium that bonds them together. These constituted leakproof end closures are permanent throughout the life of the container inasmuch as the pre-formed novel sub-closure has been provided independently for dispensing purposes.

With further reference to the forming of the flat top and bottom end closures of the container, during the application of heat and pressure thereupon, each in a separate stage of operation, the exterior surfaces of the panel 20 and flanges 36 may be contacted by cooling plates to prevent any softening of the adhesive upon these pre-bonded surfaces while sealing the particular end closure. If desired, the adhesive "*a*" applied on these pre-bonded elements may be formulated having a heat-softening point

above that of the resinous material utilized on the closure forming panels **11**. These panels constitute a sealing gasket medium that renders the end closure construction strongly reinforced and leakproof thus eliminating any need for other augmenting sheet materials, such as insert liners and/or overwraps, and the use of any adhesive applying apparatus.

The present invention in instances contemplates the use of plastic film material upon the interior surfaces of the container for protective purposes in keeping with its particular duty to be performed by the container. In such instance, the interior face of the blank shown in FIG. 1 may be coated, extruded or laminated with a selected plastic film material, such as polyethylene, polypropylene, Pliofilm, vinyl or other desired material, preferably having thermoplastic properties. In such event, the panels **11** need not be separately coated with resinous adhesive. Also, referring to FIG. 2, the plastic film will be on the exterior face of the pre-folded and secured elements. Therefore, when effecting the bonds of these elements as hereinbefore described, the heating and pressure-applying apparatus members are provided with tack insulated surfaces to avoid sticking to the panel surface **20** and flanges **36**. Accordingly when forming the container the plastic film is utilized as the medium for bonding the end closures thereof.

The completed container as shown in FIG. 5 is strongly reinforced yet may be easily and cleanly opened by the consumer in the manner illustrated in FIGS. 6 and 8. The flange **27** is grasped and pulled outwardly causing the central wall portion of the panel **20** to sever itself progressively along the perforated lines **25** thus pulling the bonded wall portion **17** out of the side wall **6** leaving an aperture **17***a* through which to dispense the product from the container. Due to the embossed grooves **37** along the perforated lines **25**, the density of the blank material along these lines is greatly increased, causing the material to cleanly separate in an orderly manner that avoids mutilation or undue fraying of the material. Furthermore, the embossed grooves serve to stiffen the panel. The severed panel portion pivots freely on the score hinge line **22**. The bonded marginal sides **29** of the panel **20** remain intact. After tilting the opened container for dispensing the desired amount of product therefrom, the severed panel portion may be restored to substantially its original position and tightly retained therein. This is accomplished by pressing on the tab **28** in the flange **27** in order to bend it inwardly, as shown in dotted lines in FIG. 8, and then inserting it into the U-shaped slit **19**. The plug **17** on the panel reenters the aperture **17***a*, and the insert tab **28** is gripped by the yielded wall part **6***a* defined by the slit line **19** thereby tightly latching the reclosure as illustrated in FIG. 9. The dispenser closure may be opened and reclosed many times without loss of its efficiency in being released and tightly restored. The unique manner provided for pivoting the severed section of the panel **20** insures the registry of the plug **17** in the aperture **17***a*. The novel latch and plug means described and illustrated insures stability of the dispenser reclosure against being jarred loose.

It is contemplated that the flat blank of the present invention may be provided on both its faces with a film of thermoplastic material, such as polyethylene. In such a case, the dry activator adhesive "*a*" described above need not be provided on the exterior surface of the blank since the thermoplastic film will serve in its place. Instead, a pattern of non-thermoplastic material, such as a heat-resistant lacquer, is applied to the area of the outer surface of the panel **6** which eventually underlies the central portion of the panel **20** between the perforated lines **25**. However, the non-thermoplastic material is not applied to the section **17**. As a result, when the flange **27** is grasped and pulled, the central portion of the panel **20** will freely separate from the panel **6** as it is severed along the perforated lines **25**, and will pull the section **17** with it. In addition, the flanges **36** may be eliminated and the portions **34** and **35** bonded together in prefolded condition by the thermoplastic coating on their exterior faces.

The invention has been shown and described in preferred form only, and by way of example, and many variations may be made in the invention which will still be comprised within its spirit. It is understood, therefore, that the invention is not limited to any specific form or embodiment except insofar as such limitations are included in the appended claims.

What is claimed is:

1. A carton blank of foldable material comprising hinged panels adapted to form the front, rear, and side walls of said carton, when said carton is in folded condition one of said side wall panels being slit to define a removable section adjacent to its end edge, said section when removed forming a dispensing aperture, panels hinged to the end edges of the front and rear wall panels and adapted to overlie each other to form an end wall of said carton, ledge-forming panels secured by connecting hinges to the end edges of the side wall panels respectively and adapted to form ledges underlying the end wall of the carton, each ledge-forming panel comprising adjacent twin portions hinged together along a line parallel to the connecting hinge, a cover panel for said removable section hingedly connected to and integral with the outer edge of the outer twin portion of the ledge-forming panel nearest said removable section, a flange hingedly connected to the outer edge of the outer twin portion of each of the remaining ledge-forming panels, said ledge-forming panels being adapted to be turned back upon themselves to form two-ply slack loop cushion-like resistant seating ledges and to bring said cover panel and flanges into overlying relationship upon the outer surfaces of their respective side wall panels, and adhesive means adapted to secure said cover panel and flanges to said side wall panels.

2. A carton blank as defined in claim 1 wherein said cover panel has a central region larger than said removable section, marginal areas flanking said central region, and a line of perforations between each marginal area and said central region, said adhesive means being adapted to secure said marginal areas to said side wall panel but said central region being adapted to remain free of permanent attachment to said side wall panel whereby said central region may be swung away from said side wall by severing it from said marginal areas along said lines of perforations.

3. A carton blank as defined in claim 2 wherein said adhesive means is adapted to secure said removable section to the inner surface of said central region whereby when said central region is swung away from said side wall panel it carries said removable section with it thereby forming a dispensing aperture in said side wall panel.

4. A carton blank as defined in claim 2 wherein said cover panel is provided with embossed grooves within which said perforated lines are located.

5. A carton blank having inner and outer surfaces and comprising hinged panels adapted to form the front, rear, and side walls of said carton when said carton is in folded condition, panels hinged to the end edges of said front and rear wall panels and adapted to overlie each other to form an end wall of said carton, two-ply ledge-forming elements adapted to form slack loop cushion-like resistant seating ledges projecting perpendicularly from said side wall panels and underlying said end wall of said carton, the inner ply of each of said elements secured by a connecting hinge to the end edge of its respective side wall panel, a flange hingedly connected to the outer edge of the outer ply of each of said elements, said flange being adhesively secured to the outer surface of its respective side wall panel in such a location that said element is bent inwardly at an acute angle to the side wall panel normally assuming an inclined condition and maintained in that condition whereby said ledges

will resist being moved to a perpendicular position underlying said end wall of said carton and will tend to exert an outward force on the inner face of said end wall.

6. A carton blank as defined in claim 5 wherein said plies of each of said ledge-forming elements are integral and joined along their inner edges by a hinge.

7. A carton blank as defined in claim 5 wherein one of said side wall panels is slit to define a removable section adjacent to its end edge, said section when removed forming a dispensing aperture, and the flange secured to and integral with said one side wall panel is relatively large and forms a cover panel for said removable section.

8. A carton formed from the blank defined in claim 1.

9. A carton formed from the blank defined in claim 5.

10. A flat container forming blank of sheet material cut and creased to define side wall panels and integral end closing foldable elements, one of said side wall panels being provided with a slit removable section and an integral projected foldable panel sectionally divided by creased lines, one of which defines its ultimate hinge, the exterior surface of said projected panel having an applied pattern of dry adhesive thereupon and a pair of surface embossed and aligned perforated cut lines therein to sectionally divide said panel transversely and outwardly in its hinge line, said panel being folded inwardly and downwardly 180 degrees from a creased line spaced inwardly of and parallel with said hinge line, whereby two substantially equal marginal wall portions at the base of said panel are superposed and extended outwardly of the end of the one side wall, and the section of the folded panel defined by the cut lines being flatly disposed thereupon, heat and pressure being applied thereto to activate said adhesive to secure said panel upon the side wall and upon its removable section adapted to provide an openable dispensing sub-closure construction in said blank prior to forming the container thereof.

11. A flat blank according to claim 10 wherein said folded superposed margins provide a two-ply slack loop cushion-like resistant panel seating ledge for another of said end closing elements when folded thereupon in forming the end closure of the container adjacent the preformed dispensing sub-closure construction.

12. In a container forming blank of suitable sheet material which includes a pre-folded sub-closure forming element that covers a dispensing aperture provided in a side wall forming panel of said blank, said pre-folded element having a projected superposed marginal ledge portion folded and secured to provide a two-ply slack loop cushion-like resistant seating ledge to be coactive in structure when forming the end closure of said container adjacent said pre-folded sub-closure.

13. A folding carton blank of sheet material cut and creased to define four side wall forming panels each having foldable end closure forming elements, one of said side wall panels being provided with a slit removable and replaceable section to define a dispensing aperture when said carton is in folded condition, a panel element hinged to and integral with an end of said side wall panel adjacent said slit section, the latter panel having two foldable marginal portions of substantially equal areas and a further projected foldable wall portion having a hinge that defines the outer end of said two marginal portions thereof, said hinged panel having sectionally defined border embossed lines cut centrally thereof for severance and a pattern applied dry adhesive adapted when activated to secure said panel upon the surface of said one side wall panel including its removable section, said two marginal portions being superposed when folded and adapted to form a two-ply slack loop cushion-like resistant seating ledge for one of the other closure forming elements when being folded to close an end of said carton.

14. A folding carton blank according to claim 13 wherein said border embossed lines provide means for effecting clean lines for partial separation of said hinged panel and for stiffening the side edges thereof when being severed along said cut lines in the borders thereby arresting the tendency of the released sectional part of said panel to warp out of its original flat shape.

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FRANKLIN T. GARRETT, *Primary Examiner.*