

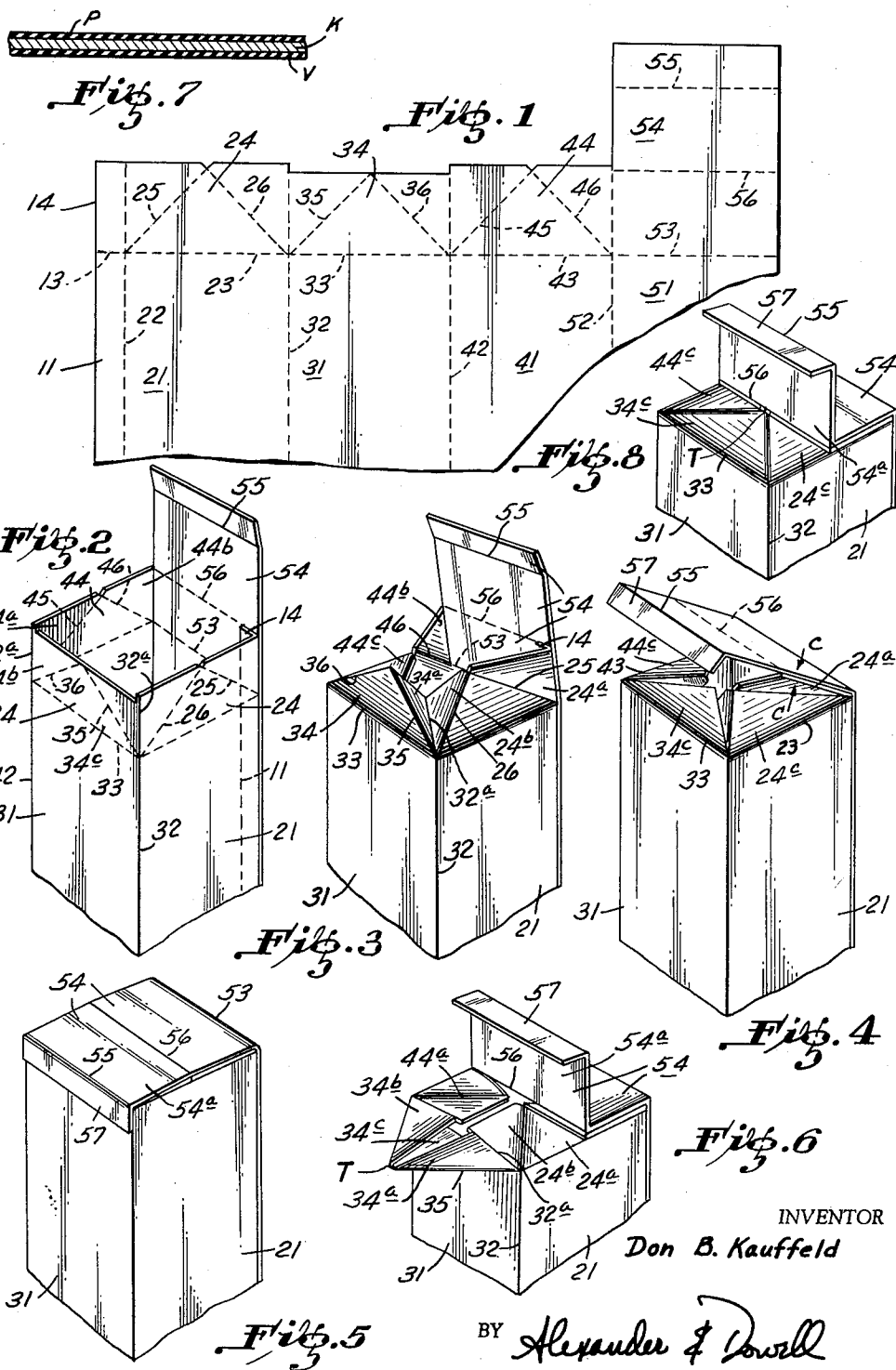
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CONTAINER AND END CLOSURE

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CONTAINER AND END CLOSURE

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This invention relates to a blank and to a container to be made therefrom, and more particularly relates to an improved end closure structure therefor.

It is an important object of this invention to provide an improved end closure which will be leakproof, and especially to provide an improved end structure made of a material having plastic surfaces, said end structure lending itself to heat-sealing techniques wherein the plastic surfaces are welded as distinguished from glued, although the present end closure can be glued if desired, or assembled by using any other suitable adhesive.

It is another very important object of the invention to provide an inexpensive and easily set-up container and end closure which is especially adapted for the packaging of milk or other food products, and wherein the container and end closure structure will meet both the requirements of the food packaging industry as well as the requirements of government food packaging regulations. However, the present container is also suitable for the packaging of other products such as oils, jellies, syrup, acids, alkalies, detergents, bleaches or other solid or liquid products either hot, cold or frozen.

Still another major object of the invention is to provide a body and substantially flat end closure therefor which forms a rectangular container when the latter is set-up, closed and sealed, the container having no recesses to catch and hold foreign matter falling thereon after sealing. Moreover, when opened by pulling open the outside closure flap, a portion of the inside flap is automatically extended to provide a pouring spout, which spout is entirely enclosed and maintained sanitary by the outside flap until the container is opened, and which spout can be easily reclosed and covered to protect the remaining contents of a partially-emptied container, the tip end of the spout catching under a portion of the outside flap to hold the spout in this reclosed position.

A further major object is to provide an end structure especially adapted to be folded from a one-piece die-cut blank, which blank is also novel per se.

Further objects and advantages of the invention will become apparent during the following discussion of the drawings, wherein:

FIG. 1 is a plan view of the upper portion of a blank according to the invention, the illustrated portion of the blank including part of the length of the side panels, and further including the top closure structure for the container made by folding and sealing the blank, the bottom structure of the blank not being illustrated in view of the fact that any suitable bottom closure structure may be employed;

FIG. 2 is a perspective view showing the blank of FIG. 1 set up to provide a tubular body, the top closure flaps being open and lying substantially in the plane of the side panels to which they are attached;

FIG. 3 is a perspective view similar to FIG. 2 and showing the top closure flaps partially closed;

FIG. 4 is a perspective view similar to FIG. 3, but showing the top closure flaps in nearly-closed position;

FIG. 5 is a perspective view similar to FIG. 4, but showing the top of the container fully closed and sealed;

FIG. 6 is a perspective view similar to FIG. 5, but showing the container opened for use and showing the pouring spout extended in operative position;

FIG. 7 is an enlarged cross-sectional view showing the

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preferred lamination from which the blank and containers shown in the other figures may be made; and

FIG. 8 is a perspective view similar to FIG. 6, but showing the container reclosed and showing the tip of the pouring spout caught under a portion of the outer closure flap.

Referring now to FIGS. 1 and 2, it will be seen that the blank includes four side panels 21, 31, 41 and 51, these panels being arranged side by side and mutually separated by four longitudinal embossed bend lines 22, 32, 42 and 52, these bend lines extending the full length of the blank. To the left of the bend line 22 is a side seam tab 11, this tab being bent at right angles to the side panel 21 along the bend line 22, and sealed to the inside surface of the rightmost side panel 51 as illustrated in FIG. 2 wherein the blank is set up to form a tubular body as shown in the latter figure.

The blank is transversely divided by a transverse embossed crease line which includes the crease lines 13, 23, 33, 43 and 53, and which crease lines divide the blank longitudinally into side panels 21, 31, 41 and 51 and closure flaps 24, 34, 44 and 54, as well as a tab 14 which is sealed to the rightmost inside surface of the top closure flap to form part of the entire longitudinal side seam of the container. The flap 24 is provided with two diagonal crease lines 25 and 26; the flap 34 is provided with two diagonal crease lines 35 and 36; and the flap 44 is provided with two diagonal crease lines 45 and 46. The flap 54 is also provided with two auxiliary crease lines 55 and 56 which, however, are disposed parallel with the main transverse crease line 53.

When the blank is set up as shown in FIG. 2 to form a tubular body of rectangular cross-section, the next step is to fold certain of the flaps along diagonal crease lines as shown in FIG. 3. The blank is first folded inwardly at the two uppermost portions of the longitudinal bend lines 32 and 42, as at the locations marked 32a and 42a in FIGS. 2 and 3. When the blank is folded inwardly along the line 32a in FIG. 3, the flap 24 is then folded inwardly along the embossed diagonal crease line 26, and the flap 34 is folded inwardly along the embossed diagonal crease line 35. Although it is not visible in FIG. 3, the same procedure is applied at the bend line 42a whereby the flap 34 is folded inwardly along the crease line 36 and the flap 44 is folded inwardly along the crease line 45. These folds provide two bellows-like webs one of which is formed by the two inwardly folded portions 24b and 34a, and the other web is formed of the flap portions 34b and 44a, FIG. 2. Note especially that the central portion 34c of the flap 34 comprises the pouring spout when pulled outwardly of the container as explained later in connection with FIG. 6.

As can be seen in FIGS. 3 and 4, the central portion 34c of the flap 34 is then folded inwardly around the transverse crease line 33 and this central portion lies in a plane disposed transversely of the body of the container when the container is actually sealed. The central portion 24c of the flap 24 is also folded inwardly about the transverse crease line 23 and the central portion 44c is also folded inwardly about the transverse crease line 43. The remaining two triangular portions 44b and 24a are pulled outwardly along their respective diagonal crease lines 46 and 25 so that the triangular portions 44b and 24a actually overlie the respective upper surfaces of the central portions 44c and 24c when the outside closure flap 54 is brought down into close position as shown in FIGS. 4 and 5. So far, no sealing has been applied to the container except that required to secure the tabs 11 and 14 to the panel 51 and the flap 54 when setting up the blank to form a tubular body.

With respect to FIG. 7, this figure illustrates a preferred laminated material of which the present carton may

be made. If the carton is to hold a dry material such as bird seed, it could be made of reclaimed kraft or other paper board and merely glued closed, but the present disclosure seeks to place particular emphasis on the structure of a container employing materials from which a satisfactory milk carton can be manufactured. In this case, a preferred embodiment of the invention would be made of virgin kraft K coated on both sides with a plastic. This plastic should be a heat sealable material such as polyethylene P, at least on the inner surface, and for the sake of appearance, the outer surface of the container should also be coated with a plastic material which may also be polyethylene, or which may alternatively comprise some other plastic such as vinyl V, it merely being necessary that the outer coating V will bond to the polyethylene P of the inner coating when heat is applied thereto so that the carton may be heat-sealed by a step closely resembling welding. This disclosure is not to be limited, however, to any particular materials, and as stated before, it is only necessary that at least one of the plastics be of a weldable type which can be melted at a temperature low enough that the kraft K will not be damaged by the heat applied. It is also contemplated that layers of other materials may be included in the laminate for the sake of improving its appearance, rigidity, or heat conductive properties. It is to be further noted that the laminate need not be limited to a core of kraft.

Referring now to FIG. 4, the first sealing step is carried out during closing of the end flaps at approximately the stage shown in FIG. 4. As stated above, when the outside closure flap 54 is folded from the position shown in FIG. 3 through the position shown in FIG. 4 to the position shown in FIG. 5, the triangular portions 44b and 24a, FIG. 3, are disposed between the central portion 44c of the flap 44 and the central portion 24c of the flap 24 and the inner surface of the flap 54. The sealing step is carried out, assuming that heat-sealing is employed as distinguished from other adhesives, by grabbing the triangular flap portions 24a and 44b and pressing these portions against the inner surface of the outside closure flap 54, while applying heat and pressure.

This step can be conveniently performed by calrod-type heaters applied to opposite sides of each seal in order to bring sealing heat and pressure to bear. As much of the triangular portions 44b and 24a are sealed against the inner surface of the flap 54 as is possible taking into consideration the fact that the sealing operation must be carried out with the main closure flap 54 in approximately the position shown in FIG. 4 so that the lower calrod unit can be placed between the folds 24a and 24c of the flap 24, for instance. The heat and pressure then are applied over as much of the surfaces of the triangular portions 24a and 24c as possible, and the application thereof is made approximately in the directions of the arrows marked C—C, FIG. 4. When the application of heat and pressure by the calrod units has sealed the inner surface of the flap 54 to the inner surface of the triangular portion 24a, and likewise sealed in flap portions 44b to the inner surface of the main flap 54, the latter is then fully closed into the position shown in FIG. 5.

The flap 54 is then sealed around its periphery to the surfaces of the flaps 24, 34, and 44, or at least to those areas thereof lying in the vicinity of the transverse crease lines 23, 33 and 43, and in addition, the pull flap 57 is bent downwardly so as to overlie the face of the side panel 31. If desired, the pull flap may be tacked to this front surface by heat-welding a small area of the flap 57 thereto. The carton is then sealed as shown in FIG. 5. The application of heat and pressure to seal the flap 54 down in the position shown in FIG. 5 may be accomplished by placing a jacket around the sides 21, 31, 41 and 51 of the carton immediately below the transverse crease lines 23, 33, 43 and 53 so as to confine the periphery of the container, and then by applying heat and pressure to the top surface of the flap 54 near its periphery.

When the carton which is sealed as shown in FIG. 5 is to be opened for use, the consumer grasps the pull flap 57 and tears it upwardly, also tearing upwardly the forward portion 54a of the flap 54 and bending it to the upright position as shown in FIG. 6 along the auxiliary embossed crease line 56. The central portion 34c of the flap 34 (FIG. 4) is then exposed, and can be pulled outwardly as shown in FIG. 6 so as to provide a pouring spout as illustrated. When the central portion 34c is pulled outwardly, the portion 32a of the bend line 32 is pulled out substantially straight, and the bellows-like web comprising the portions 24b and 34a lying out substantially straight to prevent the contents from overflowing except by pouring out the tip end T of the spout. A slight squeezing pressure between the thumb and forefinger applied to the side panels 21 and 41 at points near the transverse crease lines 23 and 43 will cause further spreading of the spout so as to permit the contents to be poured more rapidly. The bellows-like web on the other side of the spout and comprising the flap portions 34b and 44a also lies out flat when the flap 34 is pulled outwardly to form the pouring spout as stated above.

After part of the contents of the container have been poured through the spout, the container can then be reclosed by folding the flap 34 inwardly so as to return the flap to the position shown in FIG. 8 wherein the tip end T of the spout is caught under the rear portion of the outside flap 54 at about the center of the crease line 56, and then reclosing the forward portion 54a of the outside flap 54 so as to return the carton substantially to the closed position of its members shown in FIG. 5.

I do not limit my invention to the exact form shown in the drawings, for obviously, changes may be made therein within the scope of the following claims:

I claim:

1. A container and end closure made from a single blank and comprising four panels and a tab integrally interconnected at four longitudinal bend lines, the blank having a transverse crease line crossing the bend lines at right angles and dividing the blank into longitudinal side panels and end flaps, the tab and one panel being lapped and sealed together to form a tubular body of rectangular cross-section; the first end flap comprising the outside closure flap and being long enough to fully cover the end of the body when bent transversely thereacross, the second, third and fourth flaps respectively being of length substantially no greater than sufficient to halfway cross the end of the body and the latter three flaps each having a pair of diagonal crease lines, each pair intersecting substantially at the center of the outer transverse edge of a flap and extending divergently to the intersection of a bend line with said transverse crease line in opposite inner corners of the flap, the third flap being opposite the first flap and being folded inwardly of the body at both diagonal crease lines and the second and fourth flaps being each folded inwardly of the body at its diagonal crease line nearest the third flap to form bellows-like webs adjacent the longitudinal bend lines respectively joining the third flap with the second and fourth flaps, and the second and fourth flaps each being folded outwardly of the body at a triangular portion bounded by a diagonal crease line nearest the first flap and a fold line at the edge of the first flap, and the second, third and fourth flaps being folded inwardly across the end of the container along said transverse crease line, said triangular portions being sealed against the first flap, and the latter being folded to overlie the end of the container and the other flaps and being sealed thereto at least in the vicinity of said transverse crease line.

2. In a container as set forth in claim 1, said first flap having a pull-flap across its outer end connected therewith at a crease line, and said pull-flap overlying part of the side panel to which the third flap is attached.

3. In a container as set forth in claim 1, said third flap being slightly shorter longitudinally than the second

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and fourth flaps and the central portion thereof lying between the diagonal crease lines and the transverse crease line lying on top of said bellows-like webs when the container end is closed, said central portion being hingeable outwardly about the transverse crease line to form a pouring spout when the first flap is opened.

4. In a container as set forth in claim 3, said first flap having an auxiliary crease line extending transversely thereacross, substantially at the longitudinal center of the flap, whereby when the first flap is half opened it will hinge about the last-mentioned crease line and expose the pouring spout.

5. A container and end closure made from a flat blank having its surfaces made of a heat-fusible plastic material and comprising four panels and a tab integrally interconnected at four longitudinal bend lines, the blank having a transverse crease line crossing the bend lines at right angles and dividing the blank into longitudinal side panels and end flaps, the tab and one panel being lapped and heat-sealed together to form a tubular body of rectangular cross-section; the first end flap comprising the outside closure flap and being long enough to fully cover the end of the body when bent transversely thereacross, the second, third and fourth flaps respectively being of length no greater than sufficient to halfway cross the end of the body and the latter three flaps each having a pair of diagonal crease lines, each pair intersecting substantially at the center of the outer transverse edge of a flap and extending divergently to the intersection of a bend line with said transverse crease line in opposite inner corners of the flap, the third flap being opposite the first flap and being folded inwardly of the body at both diagonal crease lines and the second and fourth flaps being each folded inwardly of the body at its diagonal crease line nearest the third flap to form bellows-like webs adjacent the longitudinal bend lines respectively joining the third flap with the second and fourth flaps, and the second and fourth flaps each being folded outwardly of the body at a triangular portion bounded by a diagonal crease line nearest the first flap and a fold line at the edge of the first flap, and the second, third and fourth flaps being folded inwardly across the end of the container along said transverse crease line, said triangular portions being heat-sealed against the first flap, and the latter being folded to overlie the end of the container and the other flaps and being heat-sealed thereto.

6. In a container as set forth in claim 5, said first flap having a pull-flap across its outer end connected therewith at a crease line, and said pull-flap overlying part of the side panel to which the third flap is attached.

7. In a container as set forth in claim 5, said third flap being slightly shorter longitudinally than the second and fourth flaps and the central portion thereof lying between the diagonal crease lines and the transverse crease line lying on top of said bellows-like webs when

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the container end is closed, said central portion being hingeable outwardly about the transverse crease line to form a pouring spout when the first flap is opened.

8. In a container as set forth in claim 7, said first flap having an auxiliary crease line extending transversely thereacross, substantially at the longitudinal center of the flap, whereby when the first flap is half opened it will hinge about the last-mentioned crease line and expose the pouring spout.

9. A blank for making a container and an end closure therefor comprising four transversely aligned panels and a longitudinal seam-closing tab defined by four longitudinal embossed bend lines, the blank having a transverse embossed crease line crossing the bend lines at right angles and longitudinally dividing the blank into side panels and end flaps, the distances from said transverse crease line to the outer transverse edges of three of the end flaps being respectively no greater than one half of the transverse width of an adjacent end flap, and each of these three flaps having a pair of embossed diagonal crease lines, each pair intersecting substantially at the center of said outer edge and extending divergently to the intersection of a bend line with said transverse crease line in opposite corners of the flap, and the other flap being at least as long as an adjacent flap is wide whereby the latter flap will overlie the end of the container made from the blank.

10. In a blank as set forth in claim 9, said other flap being longer than the width of an adjacent flap and having a second embossed transverse crease line thereacross and spaced from said first transverse crease line by a distance equal to the width of an adjacent flap.

11. In a blank as set forth in claim 9, said other flap having an auxiliary embossed crease line thereacross and disposed parallel to said transverse crease line and spaced therefrom by a distance substantially equal to one-half the width of an adjacent flap.

12. A blank as set forth in claim 9, wherein the blank has its surfaces of plastic materials, and the material of at least one surface being a heat-fusible plastic having a melting point below the temperature at which other materials in the blank would be damaged.

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