

Dec. 25, 1956

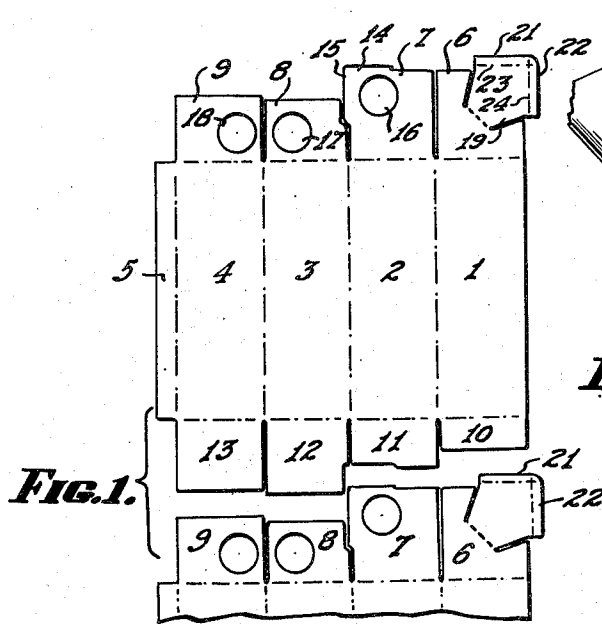
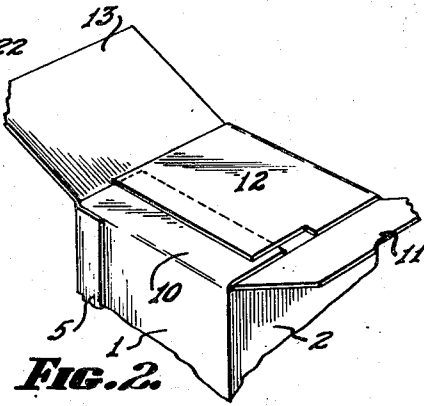
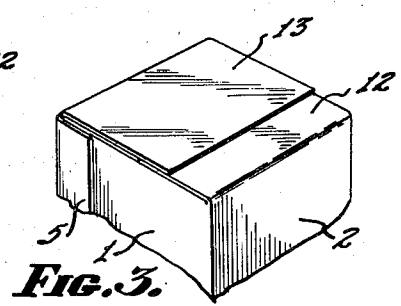
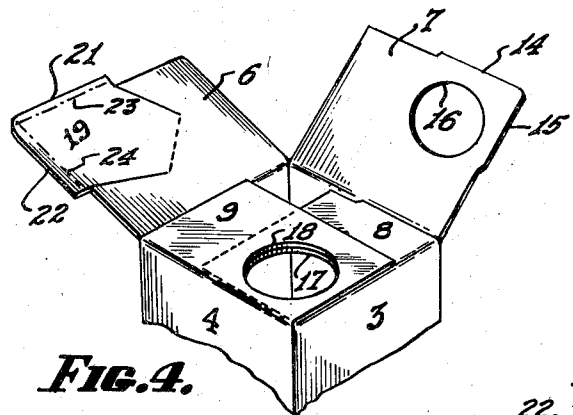
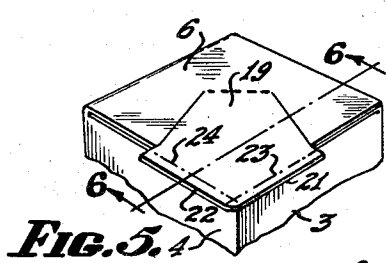
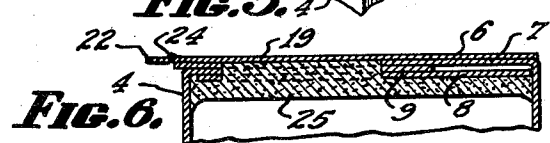
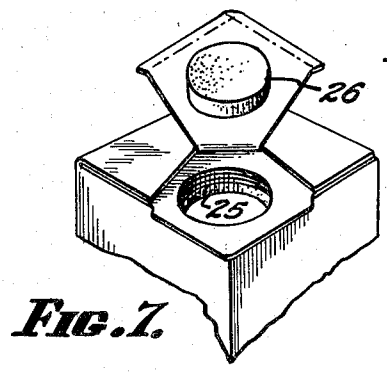
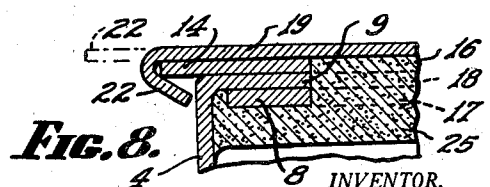
R. W. NERENBERG

2,775,388

POURING OPENING FOR CONTAINERS

Filed Oct. 23, 1953

2 Sheets-Sheet 1



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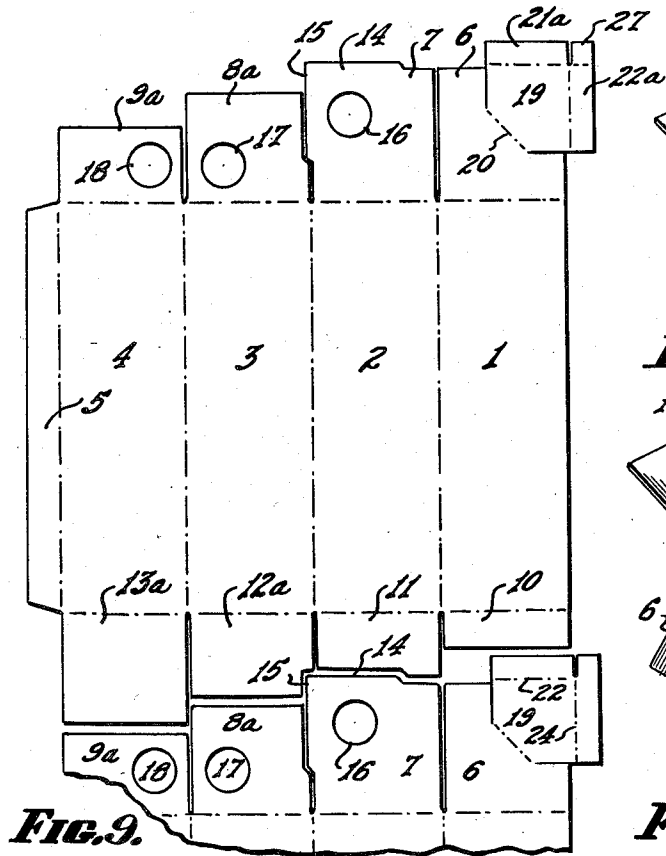
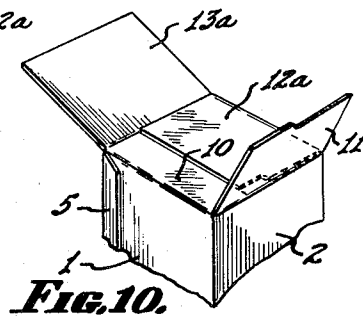
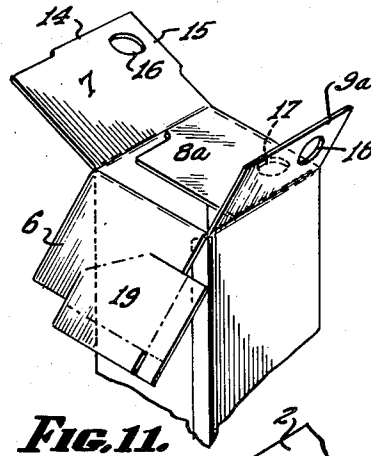
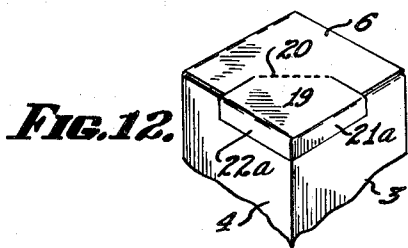
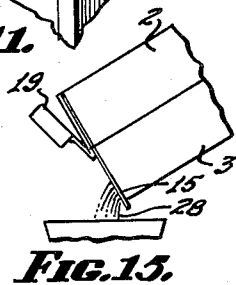
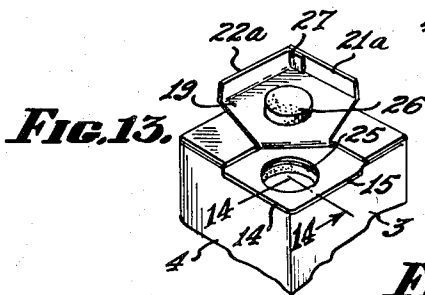
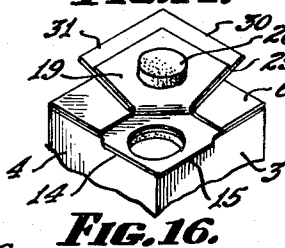
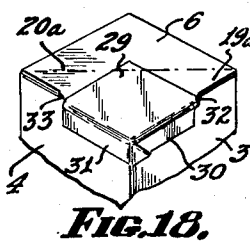
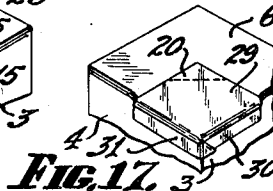
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2,775,388

POURING OPENING FOR CONTAINERS

Filed Oct. 23, 1953

2 Sheets-Sheet 2



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2,775,388

POURING OPENING FOR CONTAINERS

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Application October 23, 1953, Serial No. 387,910

3 Claims. (Cl. 229—17)

My invention has to do with reclosable containers and more particularly with paperboard milk containers having reclosable openings through which the milk may be poured from the containers.

In recent years considerable work has been done on paperboard milk containers in an endeavor to provide structures which are both liquid-tight and yet capable of being opened easily so that the contents may be readily poured therefrom. In connection with such containers, one of the major difficulties has been the provision of a pouring opening from which the milk may be poured in a controllable stream without dripping and without the liquid being poured running down the sides of the container. In addition, considerable difficulty has been encountered in providing a pouring opening which, upon uprighting of the container after pouring, provides for the positive cut-off of the flow of liquid, again without dripping or without the liquid running down the sides of the container. It is to the solution of these problems that the instant invention is directed.

It is a principal object of my invention to provide a liquid-tight paperboard container having a pouring opening formed in the top wall adjacent a corner edge thereof, the edges of the top adjacent the pouring opening being provided with extending flanges defining a pouring lip, and in which the pouring opening is closed by means of an integrally formed closure element including a plug-like member for insertion in the pouring opening.

It is a principal object of my invention to provide a container construction of the character described in which the top wall of the container is formed from a plurality of seal-end flaps having mating openings therein defining the pouring opening, and wherein an intermediate one of said flaps includes extending flange portions defining a lip extending outwardly beyond the body walls of the container adjacent the pouring opening.

It is a further object of my invention to provide a container structure of the character described employing a minimum amount of boxboard, the blanks from which the containers are formed being arranged in nested condition so as to effect substantially at 10% reduction in the amount of paperboard otherwise required to form the blanks by a conventional arrangement of the end flaps. To this end, the seal end flaps of my container are formed so as to provide a substantially perfect nest without waste.

Yet another object of my invention is the provision of a container structure including a pouring opening and closure therefor of the character described in which the closure includes flange portions adapted to coat with the extending lip portions of the container to maintain the closure element in the closed condition.

These and other objects of my invention which will appear hereinafter or which will be apparent to the skilled worker in the art upon reading these specifications, I accomplish by those constructions and arrangements of parts of which I shall now describe exemplary embodiments.

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Reference is now made to the accompanying drawings wherein:

Figure 1 is a plan view of one style of blank from which my container structures are formed and illustrates the manner in which the blanks are nested.

Figure 2 is a partial perspective view illustrating the manner in which the closure flaps at the bottom of the container are folded to form the bottom end closure.

Figure 3 is similar to Figure 2 and illustrates the bottom closure flaps in closed and sealed condition.

Figure 4 is a partial perspective view illustrating the manner in which the closure flaps at the top of the carton are folded to effect the closure thereof.

Figure 5 is a partial perspective view of the container top in the completely assembled condition.

Figure 6 is a sectional view taken along the line 6—6 of Figure 5.

Figure 7 is a perspective view similar to Figure 4 but with the closure for the pouring opening in raised condition.

Figure 8 is an enlarged sectional view similar to Figure 6 illustrating the extending flanges in crimped condition.

Figure 9 is a plan view of another form of blank.

Figure 10 is a partial perspective view of the bottom closure formed by the blank of Figure 9.

Figure 11 is a partial perspective view of the top closure formed by the blank of Figure 9.

Figure 12 is a partial perspective view of the container top of Figure 11 in completely closed condition.

Figure 13 is a perspective view similar to Figure 12 but with the closure for the pouring opening in raised condition.

Figure 14 is a sectional view taken along the line 14—14 of Figure 13.

Figure 15 is a partial side elevational view illustrating the carton in pouring position.

Figure 16 is a partial perspective view similar to Figure 13 but showing the use of a foil sheet in connection with the closure element.

Figure 17 is a partial perspective view illustrating the closure of Figure 16 in the closed condition.

Figure 18 is a partial perspective view illustrating the use of a foil sheet with a modified closure element.

Briefly in the practice of my invention, I provide a container formed from paperboard having the desired proofed characteristics as to its body walls. The container is of the seal-end variety, the ends of the tubular body being closed by means of a plurality of end closure flaps. Upon erection of the carton and the closing of the end flaps, internal end castings are formed across the inner ends of the carton bonding with the proofed walls thereof so as to form a completely proofed structure. For details relative to the formation of containers having interior end castings of the character contemplated, reference is hereby made to Patents 2,543,757, 2,549,048 and 2,604,252 in the name of my co-worker, Frank D. Bergstein.

Referring now to Figure 1 of the drawings, I have therein illustrated a carton blank having a series of body walls 1, 2, 3 and 4 in articulation in the order named and a glue flap 5 articulated to body wall 4. At the tops of the body walls I provide closure flaps 6, 7, 8 and 9; and similarly at the bottom of the body walls, closure flaps 10, 11, 12 and 13 are provided. It will be noted that closure flaps 6 and 7 at the top of the carton are full width flaps, whereas the closure flaps 8 and 9 are of less than full width. At the bottom of the carton, the closure flaps 10 and 11 are extremely narrow, whereas the closure flaps 12 and 13 are of greater width, although none of the bottom closure flaps are of a width sufficient to extend completely across the bottom of the carton. The par-

ticular flap arrangement illustrated is such that the top and bottom flaps of adjacent blanks will nest together in the manner illustrated in Figure 1. This nest not only enables me to decrease the amount of paperboard required for the formation of a plurality of the container blanks, but in addition enables me to utilize edge portions of the bottom flaps 11 and 12 to form the extending lip portions 14 and 15 carried by intermediate top flap 7. Similarly, side edge of top flap 8 is utilized to form a part of the lip portion 15 carried by adjacent top flap 7.

While the flap arrangement just described results in irregularities in the shapes of certain of the closure flaps, such irregularities, as well as the reduced widths of the underlying flaps, do not adversely affect the end closures. The flaps are all of sufficient dimensions to provide for good sealing contact when infolded, and the interior end castings employed to proof the closed carton ends act to seal over the irregularities occasioned by the removal of edge portions of the flaps. The carton ends, when sealed, have been found to be substantially equal in strength characteristics with those taught in the aforementioned Bergstein patents.

Top flap 7 is provided with an opening 16 offset outwardly from the center of the flap toward the corner thereof carrying the lip portions 14 and 15. Mating openings 17 and 18 are provided in top flaps 8 and 9, respectively, in the positions illustrated. Top flap 6 is cut and scored to provide liftable flap portion 19 articulated to the flap 6 along the diagonally disposed score line 20. The liftable flap portion 19 carries narrow flanges 21 and 22 articulated thereto along the score lines 23 and 24, respectively. These score lines, it will be noted, are spaced outwardly from the adjacent side edges of the flap 6 so as to coincide, in the erected structure, with the edges of the lip portions 14 and 15.

It will be noted that the relative sizes of the abutting top and bottom closure flaps of adjacent blanks results in a full nest in which the combined widths of the abutting top and bottom closure flaps is only slightly more (the width of narrow flap 11) than the width of the carton body itself, thereby effecting a considerable saving in board. It is essential, however, that the full width top closure flaps 6 and 7, which carry the liftable flap portion 19 and lip portions 14 and 15, respectively, lie adjacent each other; for it is only when they lie adjacent each other in the relative positions illustrated that the full nest is achieved and the intermediate bottom flaps 11 and 12 can be utilized to provide the lip portions 14 and 15 carried by top flap 7.

It will be understood that the container will be formed from boxboard or paperboard suitably proofed as to its inside surface at least in keeping with the nature of the liquid which is to be transported in the container. Of course, instead of proofing the board, the body walls of the container may be lined with a suitably proofed lining material. The nature of such proofing material does not, however, form a limitation upon my invention. The container blank will be tubed in the ordinary way through the use of conventional folding and gluing equipment, and the adhesive used in tubing the container will preferably be one which is unaffected by the nature of the liquid to be transported.

Following the tubing of the container body, the closure flaps at the bottom end of the container will be infolded and glued in the manner illustrated in Figures 2 and 3. As seen in Figure 2, the bottom closure is formed by first infolding and adhesively securing the flaps 10 and 12, which will just overlap when folded, then infolding the flap 11 with the interposition of suitable adhesive between it and the underlying portions of flaps 10 and 12; whereupon the flap 13, which is the widest of the bottom closure flaps, is infolded to complete the end closure.

At the top of the carton, as seen in Figure 4, the narrow flap 8 is first infolded followed by adjacent narrow flap 9, again with the interposition of adhesive between

contacting portions of the two flaps. The infolding of the flaps 8 and 9 will bring the openings 17 and 18 into juxtaposition; and thereafter the flap 7 is infolded and secured to the exposed portions of the flaps 8 and 9, with the opening 16 overlying juxtaposed openings 17 and 18. The flap 7 is a full width flap; and, when infolded, it will position the lips 14 and 15 to extend beyond the edges of the side walls 3 and 4. Thereafter, outermost flap 6 is infolded and secured to flap 7 excepting in the areas thereof occupied by the liftable flap portion 19 and the extending flanges 21 and 22. The score lines 23 and 24 connecting the flanges to the liftable flap portion 19 will coincide with the edges of the lips 14 and 15. The flanges 14 and 15 will be folded downwardly and crimped about the lip portions 14 and 15, in the manner illustrated in Figure 8 wherein the flange 22 is shown crimped beneath lip portion 14. Where the flanges are crimped in this manner, they have been found to securely maintain the liftable flap portion 19 in the closed position and yet permits the user to readily open the closure by pulling the flanges outwardly.

In actual practice, I have found it preferable to first close the top end of the carton and then introduce sealing substance therein through the open bottom end so as to form a casting extending interiorly across the closed top end of the carton, in accordance with the teachings of Bergstein Patent 2,549,048 referred to hereinbefore. The sealing substance will be introduced into the container with the closed end thereof extending downwardly and the sealing substance will run into the mating openings 16, 17 and 18 and will bond against the undersurface of liftable flap portion 19. After the sealing substance has hardened into an internal end casting 25, as seen in Figures 6 and 8, the liftable flap portion may be raised to break the casting away from the walls of the pouring opening, thereby providing a plug 26 (Figure 7) bonded to the undersurface of the liftable flap portion 19.

The bottom of the container may then be closed and sealing substance introduced into the container through the pouring opening so as to form a casting sealing the bottom of the container.

In Figure 9 of the drawings I have illustrated a modified form of blank for my container construction. For purposes of simplicity, like parts have been given like reference numerals. In this embodiment the top and bottom closure flaps are arranged in step-wise relation, the closures flaps 8a and 9a decreasing in width in the manner illustrated, with the mating bottom closure flaps 12a and 13a correspondingly increasing in width. This flap arrangement has been found to be particularly suited to containers wherein the pouring opening in the top wall is of relatively small diameter. However, where a larger diameter pouring opening is required, the flap arrangement illustrated in Figure 1 is preferred since the top closure flaps 8 and 9a, particularly the latter flap, may be increased in width to accommodate the larger pouring opening.

In the embodiment illustrated in Figure 9, the lip portions 14 and 15 are formed from edge portions of bottom closure flaps 11 and 12a, and from a side edge portion of bottom closure flap 8a. In this instance, however, the flanges 21a and 22a carried by the liftable flap portion 19 are of increased width and one of the flanges, such as the flange 22a, may be provided with a tab 27 by means of which the flanges may be secured together in the erected condition.

The bottom closure is formed in the manner illustrated in Figure 10 wherein the opposed closure flaps 10 and 12a are first infolded and secured, followed by the infolding and adhesive attachment of the closure flaps 11 and 13a, respectively, with the interposition of suitable adhesive between the contacting parts. In this instance the closure flap 13a will be a substantially full-width flap. It will be understood, however, that the order of infolding the first three folded flaps may be varied; but it is preferred

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that in all instances the substantially full-size width flap 13a be outermost.

In forming the top closure the flaps 8a and 9a are first infolded, followed by the flap 7, which is the third folded flap, followed by outermost flap 6 carrying liftable flap portion 19. The flanges 21a and 22a are thereafter folded downwardly over the lip portions 14 and 15 which they are adapted to cover, and the tab 27 will be folded over and adhesively secured to the end of flange 21a so as to secure the flanges in the folded condition. The folded flanges will preferably remain free of attachment to the adjacent body walls of the carton, although they may be detachably secured thereof if desired. The completely erected condition of the top closure is shown in Figure 12, wherein it will be seen that the flanges 21a and 22a cover the lip portions and extend downwardly along the adjacent edge portions of the container body walls 3 and 4. Figure 13 illustrated the container with the closure flaps in the raised position thereby exposing the pouring opening and the lip portions 14 and 15. It will be understood that the container structure will be provided with internal end castings as hereinbefore described, the plug 26 serving, upon reclosing of the liftable flap portion, to reclose the pouring opening.

With either of the container structures described, the contents may be poured in the manner illustrated in Figure 15 wherein it will be noted that the lip portions 14 and 15 serve to control the flow of the liquid 28 and prevent it from dripping along the adjacent edges of the container body. Upon uprighting of the container following pouring, the lip portions will serve to provide positive cut-off of the stream of liquid, again without dripping or the flow of residual liquid down the sides of the container. It will be understood that the liftable flap portion 19 may be repeatedly opened and closed. When closed, the flanges 21 and 22 or 21a and 22a protect the lip portions from possible contamination.

In Figures 16 and 17, I have illustrated a modification of my invention wherein the flanges articulated to the flap portion 19 are omitted and the flap portion covered by a piece of foil 29 position so as to have edge portions 30 and 31 extending beyond the outer edges of the flap portion 19 to about the same extent as did flanges 21a and 22a.

It will be apparent from Figure 17 that when the liftable flap portion 19 is in the closed position, the extending edge portions 30 and 31 of the foil may be folded downwardly over the lips 14 and 15 and pressed against edge portions of the body walls 3 and 4 immediately beneath the lip portions, thereby assuring the maintenance of the liftable flap member in the closed position. While the specific nature of the foil piece does not constitute a limitation on my invention, I have found aluminum foil of .003" in thickness to be highly satisfactory. As seen in Figure 17, a corner of the foil piece will extend beyond the hinge line 20 connecting the liftable flap to the closure flap 6, and this corner will be folded when the liftable flap portion 19 is raised. Thus the foil, which is dead-folding in that when folded it will remain in the folded condition, imparts its dead-folding characteristic to the liftable flap thereby tending to maintain the flap in the open or closed position, as the case may be.

In Figure 18 I have shown yet another modification of my invention wherein the liftable flap 19a extends diagonally across closure flap 6 and is liftable relative thereto along a line of fold 20a extending diagonally between opposite corners of the container. As before, the foil piece may be employed to cover the lip portions 14 and 15. In this embodiment, the liftable flap 19a is pref-

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erably provided with extending portions 32 and 33 corresponding in size to the lip portions 14 and 15 so that the foil will be supported to the edges of the lip and can be conveniently folded downwardly over the lips to effect a neat closure.

Modifications may of course be made in my invention without departing from the spirit of it.

Having, however, described my invention in certain exemplary embodiments, what I desire to protect and secure by Letters Patent is:

1. A one-piece liquid-tight carton comprising a tubular body rectangular in cross-section each wall of which lies in a single plane throughout its entire length, an end closure comprising a plurality of juxtaposed face contacting closure flaps connected to the end edges of each of said carton body walls and secured together in face-to-face relationship, an adjacent pair of said closure flaps being first folded flaps and a third of said closure flaps overlying said first folded closure flaps, said third closure flap being coextensive with the rectangular cross-section of said carton body and having a pouring opening formed in a corner thereof remote from the body wall to which said flap is connected, the two sides of the said third closure flap defining said corner having integral extensions projecting outwardly therefrom beyond the planes of the underlying carton body walls and forming extending lip portions defining a projecting pouring lip for the said pouring opening, and a liftable closure member overlying and closing said pouring opening.

2. A one-piece liquid-tight carton comprising a tubular body rectangular in cross-section each wall of which lies in a single plane throughout its entire length, an end closure comprising a plurality of juxtaposed face contacting closure flaps connected to the end edges of each of said carton body walls and secured together in face-to-face relationship, an adjacent pair of said closure flaps being first folded flaps and a third of said closure flaps overlying said first folded flaps, said third closure flap being coextensive with the rectangular cross-section of said carton body and having a pouring opening formed in a corner thereof remote from the body wall to which said flap is connected, the two sides of said third closure flap defining said corner having integral extensions projecting outwardly therefrom beyond the planes of the underlying carton body walls and forming extending lip portions defining a projecting pouring lip for the said pouring opening, and the fourth of said closure flaps overlying said third closure flap and being coextensive therewith, said fourth flap having a hinged portion overlying and covering said pouring opening, the hinged portion of said fourth closure flap being liftable with respect to said pouring opening to provide a reclosable cover for said opening, said liftable portion having outwardly projecting flanges capable of being folded downwardly about the said pouring lip.

3. The carton structure claimed in claim 2 wherein a sheet of foil is secured to the hinged portion of said fourth closure flap, and wherein the said projecting flanges are defined by extending edge portions of the foil sheet.

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