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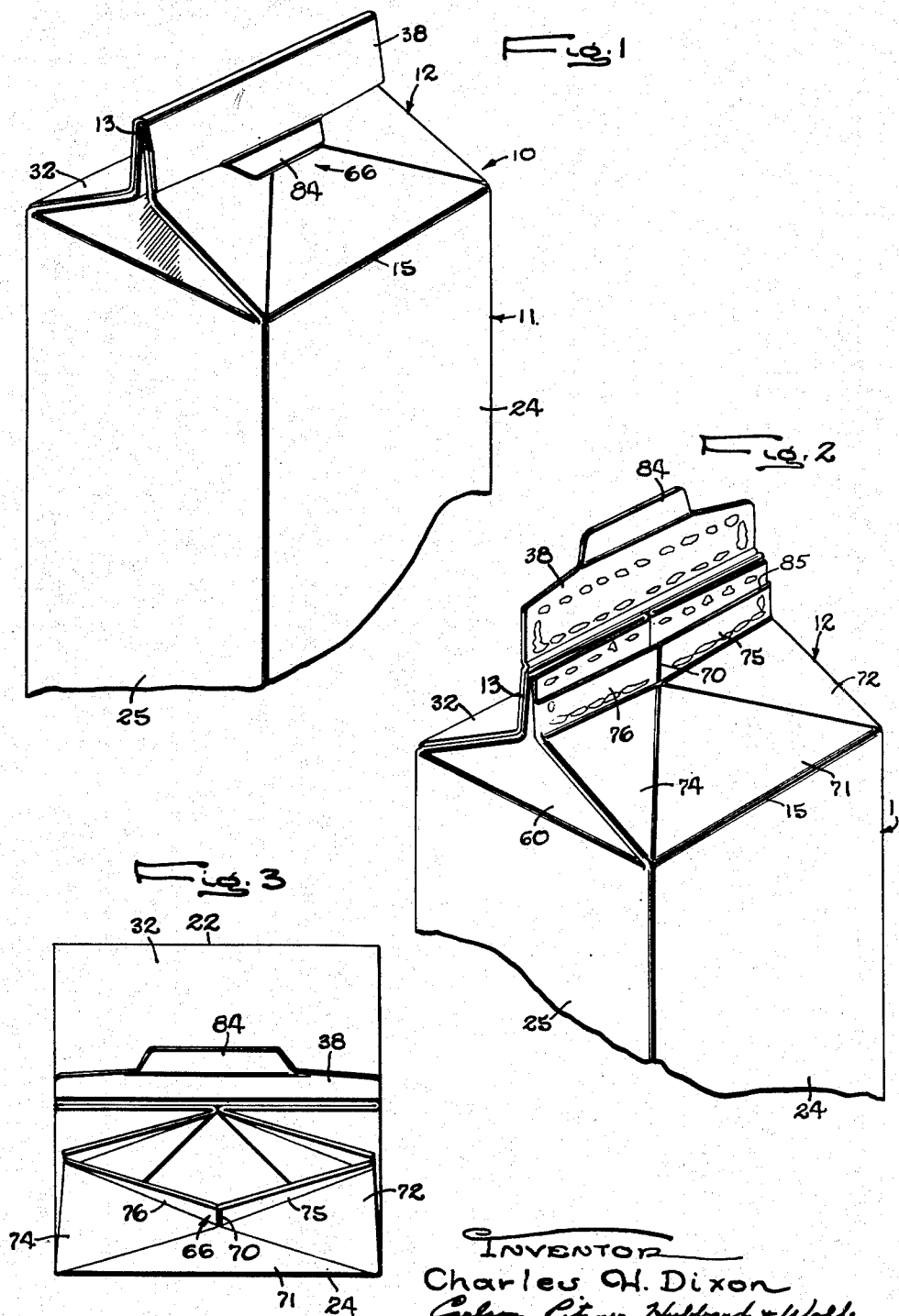
C. H. DIXON

2,695,745

DISPENSING CARTON WITH GABLE TOP

Filed Jan. 20, 1950

3 Sheets-Sheet 1



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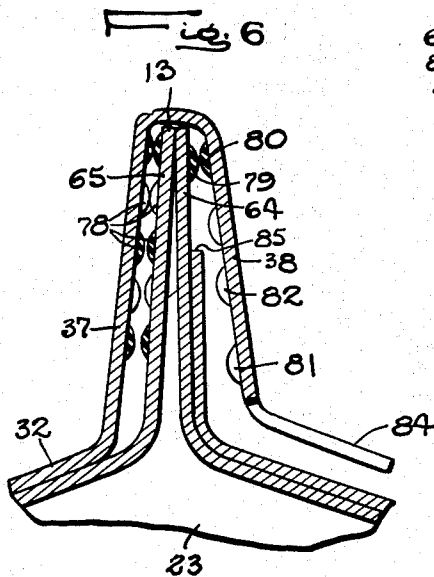
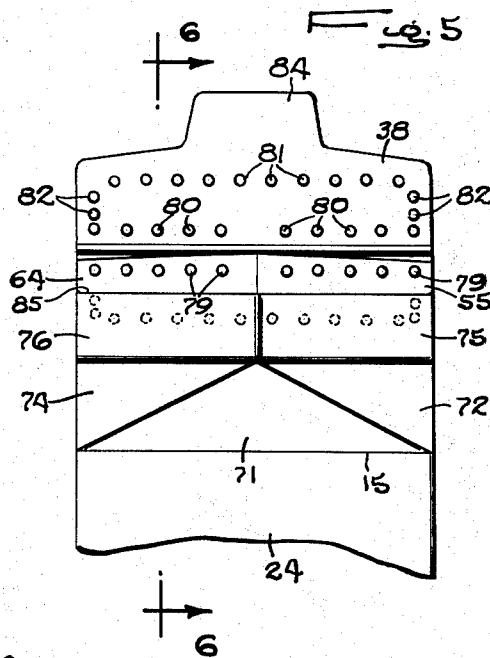
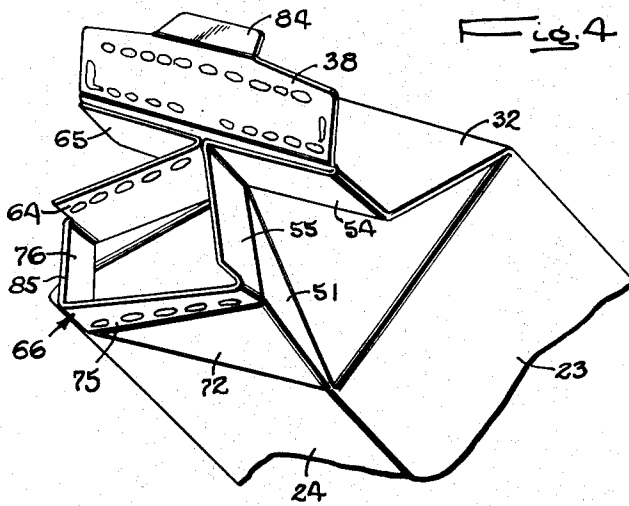
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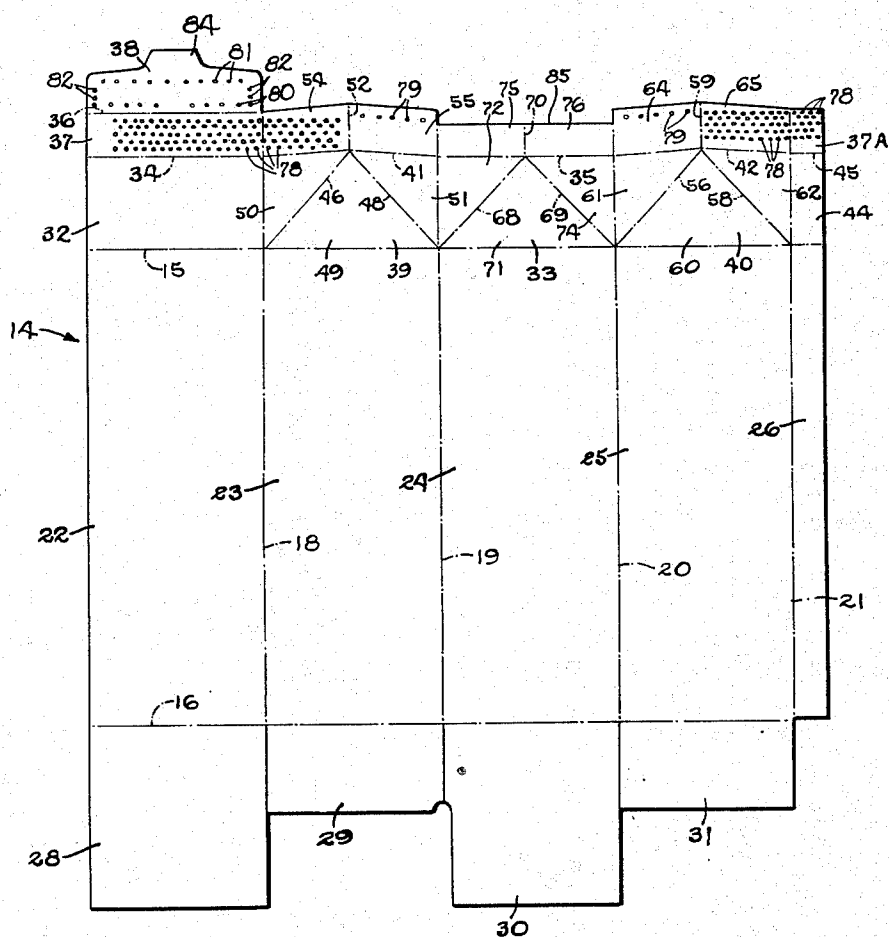
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Fig. 7



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DISPENSING CARTON WITH GABLE TOP

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Application January 20, 1950, Serial No. 139,565

1 Claim. (Cl. 229—17)

The present invention pertains generally to containers and more specifically to disposable, self-sustaining cartons of paper or the like of the general type disclosed in U. S. Patent Nos. 2,025,477, issued December 24, 1935, to Henry T. Scott and 2,360,439, issued October 17, 1944, to Charles Z. Monroe, and also in copending U. S. application Serial No. 139,628, filed January 20, 1950, by Carroll R. Alden. The invention finds particular, but by no means exclusive, utility in cartons adapted for distributing milk and other dairy products.

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

One object of the present invention is to provide a carton of the character set forth and having incorporated into its top end closure an extensible, sanitarily protected pouring spout which may be opened with ease for precise, dripless dispensing of the contents of the carton. A related object is to provide a pouring spout which recloses readily and does not require closure retention means other than those parts of the top closure associated therewith.

Another object is to provide a carton of the above type which permits partial disintegration of a portion of the top end closure as an incident to opening of the same and reformation of the disintegrated portion into an extensible pouring spout.

A further object is to provide a carton of the character set forth and having a gable top end closure with sufficient strength to permit normal handling of the carton, both before and after initial opening.

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

Figure 1 is a fragmentary perspective view of an illustrative carton embodying the present invention, the carton being in closed condition.

Fig. 2 is a fragmentary perspective view of the carton of Fig. 1 but showing the same in an initially opened condition with its pouring spout fully collapsed.

Fig. 3 is a plan view showing the illustrative carton with its pouring spout in a partially extended position.

Fig. 4 is a fragmentary perspective view showing the carton in pouring position with its pouring spout fully extended.

Fig. 5 is a fragmentary front elevation of the carton in the condition shown in Fig. 2.

Fig. 6 is an enlarged sectional view taken vertically through the illustrative carton just prior to sealing of the top end closure, such view being taken in the plane of the line 6—6 in Fig. 5.

Fig. 7 is a plan view detailing the inside face of a blank from which the illustrative carton of Fig. 1 may be constructed.

While the invention is susceptible of various modifications and alternative constructions, a preferred embodi-

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ment 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, there is shown in Figure 1 an exemplary disposable carton 10 embodying the present invention and being formed from paper or other appropriate sheet stock. It is self-sustaining in shape and is coated or impregnated with a suitable material to render it fluidtight and capable of holding liquids such as milk. The carton 10 comprises a tubular body portion 11 which in the present instance happens to be of substantially square cross section. At its base, the body 11 is provided with a suitable bottom closure (not shown), the details of which are unimportant for present purposes. The upper end of the body 11 terminates in what will be recognized as the familiar gable top end closure 12 which is surmounted by a central laminar rib 13. The gable top also has incorporated therein suitable means for dispensing the contents of the carton.

The carton 10 is preferably fashioned from a flat blank 14 of heavy paper stock or the like, the inside face of such blank being illustrated in Fig. 7. By means of an appropriate pattern of score lines, the blank 14 is divided into a plurality of panels and areas which are utilized for the walls of the carton and the closure parts when the carton is erected. The central and major area of the blank 14 becomes the carton body 11 and is defined by spaced apart transverse score lines 15, 16 running in substantially parallel relation from edge to edge of the blank. Intersecting the lines 15, 16 at spaced intervals therealong are a series of perpendicular score lines 18, 19, 20 and 21 which define, in the central and major area of the blank, side panels 22, 23, 24, 25 together with a fractional side panel or glue flap 26 which overlies the outer marginal edge portion of the inside face of side panel 22 when the carton is erected. Integral with the lower edges of the side panels along the line 16 are a plurality of panel extensions or bottom closure flaps 28, 29, 30 and 31 of the usual type.

Connected to the upper ends of the side panels along the line 15 are a plurality of rectangular and triangular panel extensions which serve to give the top of the carton its characteristic gable shape. Thus alternate side panels 22, 24 have rectangular extensions 32, 33 respectively connected therewith along the score line 15, such extensions lying between the latter and the upper edge of the blank as viewed in Fig. 7. The extensions 32 and 33 are further subdivided by score lines 34 and 35 which are substantially parallel to the line 15. The stock above the lines 34, 35 becomes part of the rib 13 upon erection of the carton while the stock below these lines but above the line 15 defines the inclined panels of the top closure 12. The upper end of the panel extension 32 is crossed by a transverse score line 36 substantially even with the top edges of the adjacent panel extensions and which defines a rectangular subpanel 37 and a flap 38. Alternate body panels 23, 25, on the other hand, have extensions 39, 40 lying between the score line 15 and the upper edge of the blank. Those portions of such edge which are common to the extensions 39, 40 each happen to be of shallow inverted V-shape. The stock in the panel extensions 39, 40 which is utilized in the rib 13 is separated from the remaining stock in these panels by score lines 41, 42 which follow the upper edge of the blank but are in substantial alinement with the lines 34 and 35. The glue flap 26, of course, has a corresponding panel extension 44 which overlies the inside face of the panel extension 32 when the carton is erected. Running across the extension 44 from the right-hand edge of the blank and terminating at the adjacent end of the score line 42 is a score line 45 defining a subpanel 37A which overlies the inner face of the subpanel 37 upon completion of the carton.

To permit infolding of the panel extensions 39, 40 as an incident to completing the top closure of the carton,

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each of such extensions is provided with converging score lines. In the panel extension 39, score lines 46, 48 start at the intersections between the corner score lines 18, 19 and the score line 15, converging upwardly and intersecting at the center of score line 41. These lines define a central triangular subpanel 49 flanked by smaller triangular subpanels 50, 51. Starting at the intersection of the score lines 41, 46 and 48 and running parallel to the corner score lines, but terminating at the upper edge of the blank, is a relatively short score line 52. This line, together with the score line 41, defines additional subpanels 54, 55 almost rectangular in shape and which are ultimately included in the structure of the rib 13. In like manner, the panel extension 40 is scored along lines 56, 58 and 59. These lines, together with the intersecting score line 42, define triangular subpanels 60, 61, 62, together with subpanels 64, 65 having comparable shape and location to subpanels 54, 55.

Provision is made for permitting partial disintegration of the central rib 13 as an incident to initial opening of the carton 10 and for utilizing such disintegration portion to create an extensible, sanitarily protected pouring spout 66 for dispensing the contents of the carton. This is accomplished without undue weakening of the top closure, the full strength of the rib 13 existing prior to initial opening and sufficient strength for normal handling being present after initial opening. In effecting such objective, advantage is taken of the angular pattern of the score lines on the panel extensions 39, 40. Turning once more to Fig. 7, it will be perceived that the panel extension 33 is provided with a pattern of score lines 68, 69 and 70 similar to the scoring on the adjacent panel extensions 39, 40 and all intersecting at about the center of the transverse score line 35. These lines define in the panel extension 33 a central triangular subpanel 71 flanked by smaller subpanels 72, 74 and a pair of rectangular subpanels 75, 76 which ultimately form part of the structure of the rib 13. The subpanels 72, 75 lie opposite the subpanels 51, 55, respectively, of the panel extension 39, being separated therefrom by the corner score line 19. Similarly, the subpanels 74, 76 lie opposite the subpanels 61, 64 respectively of the panel extension 40, being separated therefrom by the corner score line 20. The foregoing subpanels, together with the subpanel 33, being hingedly connected to each other and also to the remaining portions of the top closure, are utilized to define the side walls of the pouring spout 66.

In order to maintain the full strength of the rib 13 prior to initial opening of the carton, as well as sufficient strength in the rib for normal handling of the carton after initial opening thereof, adhesive material is applied to those subpanels of the blank which define the rib 13 so as to effect a permanent adhesive juncture between predetermined ones of these subpanels and a separable juncture between the remaining ones of such subpanels. The adhesive is preferably of the thermoplastic or hot-melt type and has an activating temperature somewhat higher than that of the bath of paraffin or the like to which the carton is subjected prior to filling. Thus adhesive material is applied over a substantial portion of the inside face areas of the subpanel 37 and the overlying subpanel 37A of the glue flap. By the same token, subpanels 54 and 65 are also subjected to an application of adhesive over the major portion of their inside face areas. As the top closure is being made, the inside face areas of the subpanels 54, 65 are brought into contact with those of the subpanels 37, 37A (as indicated in Fig. 6) and the adhesive material is activated by the application of heat and pressure to the outside planar faces of the rib 13. This secures such surfaces with a permanent juncture which cannot be ruptured without deliberate destruction of the structure of the sheet material defining the carton. In the present instance, the adhesive material is applied to these surfaces by means of a printing operation which distributes it in several rows of closely spaced circular gobs or dots 78. The spacing of the adhesive dots 78 is such that those on the subpanels 37, 37A will register with those on the contacting surfaces of the subpanels 54, 65. When the rib faces are subjected to heat and pressure during completion of the top closure, the registering and contacting dots of adhesive 78 become firmly bonded together. Any paraffin or other coating film which may cover the adhesive initially simply melts out of the way due to the fact that the activating temperature of

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the adhesive is considerably above the melting point of the paraffin or other coating material on the carton.

For the purpose of effecting between the remaining ones of the rib subpanels a separable adhesive juncture which will easily rupture upon the application of a moderate opening force to the flap 38, the adhesive material is distributed relatively lightly thereover. Referring to Figs. 5 and 7, it will be seen that the subpanels 55 and 64 which define the rear lip of the pouring spout 66 have a row of adhesive gobs or dots 79 running thereacross and spaced at intervals substantially greater than those between the dots 78. The inside face of the flap 38 is provided with a parallel row of adhesive dots 80 spaced to correspond with the dots 79. Upon downfolding of the flap 38 to the position indicated in Fig. 6, the dots 80 register with and contact the dots 79, bonding together upon the application of heat and pressure. The bond thus formed is of lesser strength than that between the dots 78 and the surfaces joined by the former may be separated with only slight and unobjectionable delamination of their sheet stock. This delamination is coextensive with the contacting area of the individual dots, thereby avoiding destruction of, or substantial damage to, the sheet stock defining the foregoing surfaces. Also located in a row on the flap 38 in spaced apart parallel relation to the row of dots 80 are additional adhesive dots 81 which in the present instance happen to be staggered with respect to the dots 80. Located between adjacent ends of the rows of dots 80, 81 are pairs of dots 82. When the flap 38 is downfolded to the position of Fig. 6, the dots 81, 82 do not register with any others but simply become bonded directly to the subpanels 75 and 76 when heat and pressure are applied. These areas of contact are indicated by the series of circles in dot dash outline in Fig. 5. The bond thus created is of even less strength than that which obtains between the dots 79, 80 and contributes to the ease with which the flap may be raised. To further facilitate such action, the latter may be provided with an integral lift tab 84 which may be gripped by the fingers. It should be borne in mind, however, that the adhesive bonds holding the flap 38 in closed position over the pouring spout 66 are of sufficient strength to preclude accidental lifting of the flap during normal handling of the carton and that a deliberate application of opening force is required.

In the construction thus far described, the common outer edge 85 of the subpanels 75 and 76 acts as a pouring weir for the extensible pouring spout 66. For the purpose of precluding injury to this edge during opening of the carton, due, for example, to excessive delamination of the sheet stock, the edge 85 is recessed below the upper terminal edges of the panel extensions 39, 40. This arrangement also enhances the sanitary protection afforded to the edge 85 by binding the same tightly between the flap 38 and the remaining plies of the rib 13.

With further regard to the sanitary protection of the pouring spout 66, it should be noted that the paraffin or other coating on the plies of the rib 13 becomes remelted in response to the application of the heat which activates the thermoplastic adhesive material. As a result of such remelting, the coating material flows into all voids in the rib 13 which might harbor contamination from external sources and, under the application of sealing pressure, completely fills such voids. This action effects a fluidtight seal of the top closure of the carton and, at the same time, completely seals the pouring spout against contamination from the outside.

In actual usage, assuming the carton to be in the initially sealed condition shown in Fig. 1, an upward pull by the user's fingers upon the lift tab 84 will initially effect separation of the outer end portion of the flap 38 from the panels 75 and 76 by pulling the adhesive dots 81, 82 free from the stock to which they tend to adhere. At the same time, this lifting force will also break the paraffin seal between these surfaces. Further lifting on the tab 84 pulls the merged adhesive dots 79, 80 loose from either the flap 38 or the subpanels 55, 64 and permits the flap to be raised to its fully opened position. Any delamination which occurs here is confined to the area immediately underlying the dots and in any event is relatively moderate. At this point, the spout 66 may easily be extended from its collapsed position by the application of a moderate squeezing force to its diagonally opposed corners defined by the score lines 19 and 20. When fully ex-

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tended, the spout 66 may have a cross-sectional area approximating a fourth of that of the carton body. The spout may readily be restored to its collapsed position by the application of a moderate force to its front central portion. It may then be retained in reclosed position by the simple expedient of bending the flap 38 down over it, the natural stiffness of the flap providing the necessary retaining force.

I claim as my invention:

A top end closure for a self-sustaining tubular carton of substantially square cross section and having a body portion defined by four side panels of substantially equal width, said top end closure comprising, in combination, a plurality of panel extensions corresponding to said side panels, a central laminar rib having a length substantially equal to the lateral dimension of one of said side panels, said rib having a relatively rigid portion of two-ply thickness extending substantially its entire length, said rigid portion being defined by a section of one of said side panel extensions together with an overfolded section of each adjacent side panel extension joined thereto with a permanent adhesive bond, said rib having a separable portion of two-ply thickness defined by a section of the fourth one of said side panel extensions and another section of each of said adjacent side panel extensions, said section of said fourth panel extension having a medial fold therein and also having a shorter dimension trans-

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verse to said rib than said other sections, said separable rib portion having a cross section in the shape of an equilateral parallelogram with a maximum cross-sectional area approximating one-fourth the transverse cross-sectional area of said body, a hinged flap integral with said first panel extension and folded over both portions of said hinged rib, said flap being joined to the plies in said separable portion of said rib by means of a separable adhesive bond, whereby said flap may be raised in response to a finger-tip lifting force to expose said separable rib portion without disintegrating said rigid rib portion.

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