May 19, 1964 N. J. ASMAN 3,133,688

RECLOSABLE ANGLE SPOUT CARTON

Filed Sept. 12, 1962 2 Sheets-Sheet 1

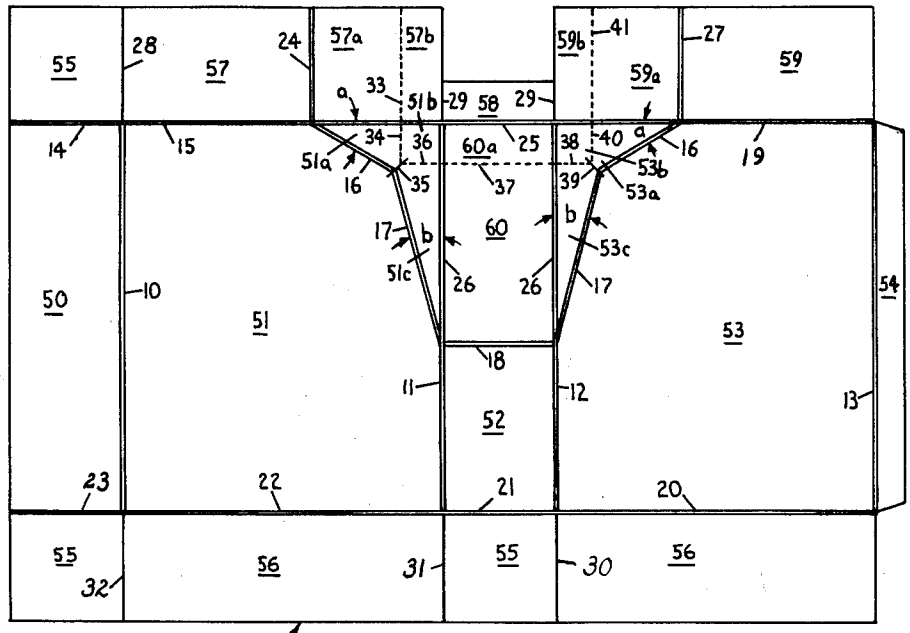


Fig. 1

Fig. 2

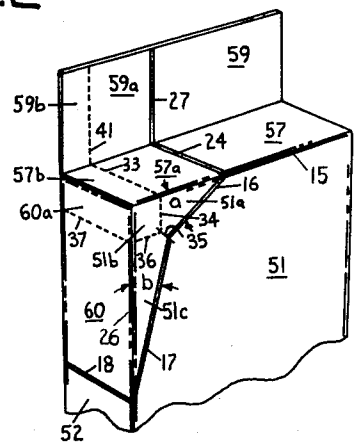
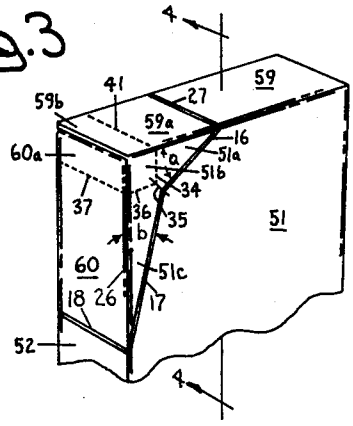


Fig. 3



INVENTOR.
NORMAN J. ASMAN
BY Fabian V. Jakes
ATTORNEYS

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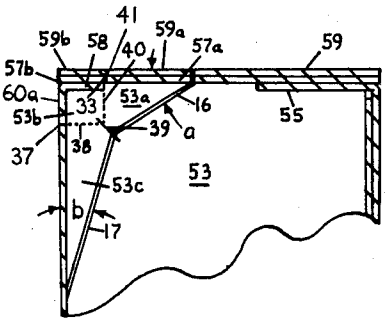


Fig 4

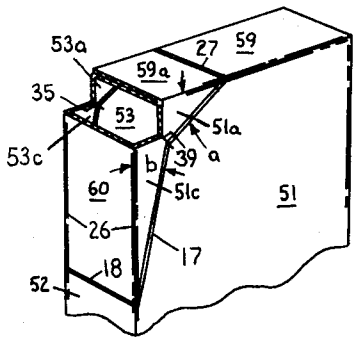


Fig.5

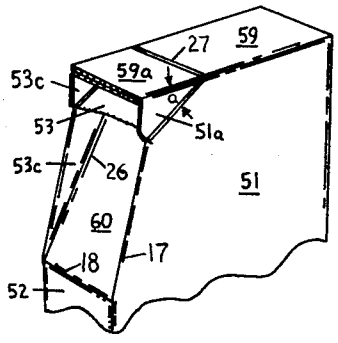
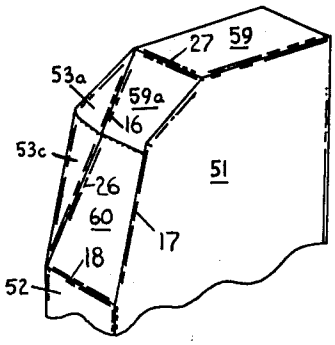


Fig.6

Fig.7



INVENTOR.
NORMAN J. ASMAN
BY Florian W. Jabro
Jose M. Russman
ATTORNEYS

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RECLOSABLE ANGLE SPOUT CARTON

Norman J. Asman, Appleton, Wis., assignor to American Can Company, New York, N.Y., a corporation of New Jersey

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This invention relates to a dispensing container with a reclosable pouring spout, suitable for a variety of uses such as the packaging of granular, flaked and powdered products. More specifically, the invention may with particular advantage be used as a carton for packaging soap flakes or breakfast cereals.

Further details and advantages will be apparent from the following specification and appended drawings wherein:

FIGURE 1 is a plan view of an integral blank suitably cut and scored to form a dispensing carton,

FIGURE 2 is a perspective view, partially cut away, of the blank of FIGURE 1 partially set up and glued to form a carton shell,

FIGURE 3 is a perspective view, partially cut away, of the completed carton,

FIGURE 4 is a cross sectional view of the completed carton, taken along line 4—4 of FIGURE 3,

FIGURE 5 is a perspective view, partially cut away, of the carton completed with the opening means removed for dispensing of the packaged product,

FIGURE 6 is a perspective view partially cut away of the carton partially reclosed, and

FIGURE 7 is a perspective view, partially cut away, of the carton completely reclosed.

Referring first to FIGURE 1, the carton is made of a single foldable blank A of flexible material such as paperboard. The blank A is divided by score lines 10—27 and cut lines 28—32 into hingedly connected panels and flaps including side panels 50 and 52, main panels 51 and 53, glue flap 54, dust flaps 55 and 58, end closure flaps 56, 57 and 59, and spout panel 60.

End closure flaps 57 and 59 have in addition to score lines 24 and 27, lines of weakness impressed therein, such as perforation lines 33 and 41, respectively. The score lines and perforation lines in the closure flaps define portions 57*a*, 57*b*, 59*a* and 59*b*, which facilitate the opening and reclosing of the completed set-up carton, as will be described in detail later herein. Similarly main panels 51 and 53 for the same reason have perforation lines 34, 36, 38 and 40 as well as cut lines 35, 39 impressed therein. The score lines, perforation lines and cut lines define portions 51*a*, 51*b*, 51*c*, 53*a*, 53*b* and 53*c* in main panels 51 and 53, the function of which will be described more fully hereinafter. Perforation line 37 in spout panel 60 defines portion 60*a* which is detached from spout panel 60 when the sealed carton is opened.

The blank A is formed into a glued carton shell by folding glue flap 54 and main panel 53 about score line 12 to overlie main panel 51 and side panel 52, applying adhesive to the exposed surface of flap 54, and then folding side panel 50 about score line 10 to overlie the adhesive surface of flap 54 to become adhered thereto. In such condition, the shell may be economically shipped to the product packager for set-up, filling and closing.

FIGURE 2 depicts an initial stage in closing the top of the carton. In forming the carton from the glued shell previously described, the shell is squared to position the panels 50, 51, 52 and 53 consecutively at right angles to each other. Usually one end of the carton is closed and sealed, the carton filled and the other end closed and sealed. Since the sealing of the bottom end is conventional and readily accomplished by infolding in order

flaps 55 and 56, adhering the inner surface of one end closure flap to the outer surface of the other of the end closure flaps 56, reference is had to closing just the top end of the carton.

In closing the top end of the carton the outer surfaces of dust flaps 55 and 58 are covered with adhesive and the dust flaps folded inwardly about score lines 14 and 25, respectively, to lie in a common plane. End closure flap 57 is then infolded about score line 15 to overlie and become adhered to the adhesive bearing surfaces of dust flaps 55 and 58. The closure is completed by applying adhesive to the inner surface of end closure flap 59, infolding the flap about score line 19 and adhering it to the underlying end closure flap 57. The completed top closure thus formed is shown in FIGURES 3 and 4.

If desired, the upper end of the carton may be sealed first using increased pressure. The collapsed shell in this case is placed over a mandrel, essentially equal in configuration to the inside of the completed carton, and the dust flaps 55 and 58 and the end closure flaps 57 and 59 infolded and adhered as described above. At each step in the closing process, where two surfaces are adhered, pressure can be brought to bear on the surfaces using the mandrel as a reinforcing or pressure absorbing medium. The carton is then removed from the mandrel, filled and the other end is closed and sealed.

Referring to FIGURES 3–5, in opening the carton, portions 51*b* and 53*b* are pushed inwardly towards each other, causing a tear action along perforation lines 34, 36 and 38, 40, respectively. The corner of the carton comprising portions 51*b*, 53*b*, 57*b*, 59*b* and 60*a*, is then removed by lifting causing detachment along perforation lines 33, 37 and 41. The contents of the carton can then be either partially or wholly dispensed through the corner opening in the carton. Cut lines 35 and 39, separating portions 51*a* from 51*c*, and 53*a* from 53*c*, and which serve no purpose in the opening of the carton, facilitate the reclosure of the opened carton as described more fully hereinafter.

The carton is reclosed by pushing inwardly on spout panel 60 adjacent its upper edge, forcing the spout panel between main panels 51 and 53. Portions 51*c* and 53*c* which infold with the spout panel 60, then lie in parallel contacting relationship with main panels 51 and 53. The partially reclosed carton is shown in FIGURE 6. Next, downward pressure is applied to portion 59*a*, adjacent the opening, forcing portion 59*a* down between main panels 51 and 53. Portions 51*a* and 53*a* at this point overlie and are in contact with portions 51*c* and 53*c*, respectively, at their adjacent edges. When reclosed, the carton as shown in FIGURE 7 is substantially siftproof. Cut lines 35 and 39 facilitate reclosing by allowing the folding of portions 51*a*, 51*c*, 53*a* and 53*c* to occur along the score lines rather than along lines intersecting at the corners of the tear out portion. The folding along the score lines provides an overlapping of the adjacent edges of portion 59*a* and spout panel 60 to give a complete reclosure of the carton. The opened carton of FIGURE 5 may also be closed by first infolding portion 59*a* and then infolding spout panel 60.

In order to insure formation of a tight spout seal when the top closure is formed, proper tearing action in opening the carton and to provide a substantially siftproof reclosure of the pouring spout, several elements of the carton design are particularly important. In the closed carton, the perforation line 33 should be substantially aligned with overlying perforation line 41. The upper surface of dust flap 58 also should be adhered to the lower surface of portion 57*b*, and the interior edge of the dust flap 58 substantially aligned with the perforation lines 33 and 41. When the perforation lines and edge

are properly aligned, the corner portion of the carton defined by the perforation lines is readily detached.

It is essential in the reclosed carton for the adjacent edges of portion 59*a* and spout panel 60 to overlap rather than merely abut. The use of cut lines 35 and 39 facilitate the necessary overlapping in that they ensure the folding of elements 51*a*, 53*a* and 51*c*, 53*c* along score lines 16 and 17, respectively. If the portions 51*a*, 53*a* and 51*c*, 53*c* were infolded instead along lines between the intersection of perforation lines 34, 36 and 38, 40, and the score lines 24, 27 and 18, the edges of portion 59*a* and spout panel 60 would abut rather than overlap. In order to obtain a complete and tight reclosure it is also necessary to employ particular relationship between angles *a* and *b*. If the choice of angles is inappropriate, a gap will result in the reclosed carton between the adjacent edges of portions 59*a* and spout panel 60.

The required relationship between angles *a* and *b* is such that, when the carton is reclosed, portion 59*a* and spout panel 60 lie in what is substantially a common plane hereinafter referred to as the reclosure plane passing through score lines 18 and 24, 27. When the carton is open (FIGURE 5), the sum of the angles formed by the reclosure plane with the portion 59*a* and the spout panel 60 must equal 90° since the plane, score line 26 and either score line 15 or 19 (depending on which side of the carton is referred to) define a right triangle. The angles formed by the reclosure plane with portion 59*a* and spout panel 60 are of necessity equal to twice the angles *a* and *b*, respectively, and it is therefore apparent that the sum of angles *a* and *b* will equal 45°. Selection of a given value for either angle *a* or angle *b* will therefore establish the particular value of the other of the two angles which will ensure the desired relationship of the elements 59*a* and 60 when in opened and closed positions. A suitable set of angles would be 30° for angle *a* and 15° for angle *b* although other pairs of angles totalling 45° may be employed, i.e. 22° 30′ for each of the two angles. Based on interrelated considerations such as the amount of board used in the carton, the size of the opening, and ease of opening and reclosing the carton, it is preferred that angle *a* be about 30° and angle *b* be about 15°. Obviously, since both sides of the spout are identical, the aforementioned relationship holds true for each side.

The present invention provides a carton construction incorporating a convenient pour spout means which requires a minimum of paperboard stock. The carton can be readily set up, filled with the commodity to be packaged and sealed by automatic machinery. The carton has ample strength to withstand shipping and handling without premature opening, and the design of the pour opening is such that a tight reclosure can be readily made with a minimum of handling. Any conventional end closure means, such as illustrated and described, may be employed on the end of the carton opposite the spout, and such means do not constitute a feature of this invention. It is to be understood that the size and shape of the carton and the material from which it is formed may be varied in numerous ways by those skilled in the art without departing from the spirit of the invention.

I claim:

1. A reclosable dispensing carton formed of a single blank suitably cut and scored to provide a pair of opposed main panels, each of said main panels having one of a first pair of opposed biased score lines extending from a top edge and intersecting one of a second pair of opposed biased score lines extending from a lateral edge near one corner thereof; a pair of opposed side panels hingedly connected to the lateral edges of said main panels, one of said side panels terminating at its upper end along a line extending between the points where said second pair of biased score lines intersect said lateral edges; a pair of bottom closure flaps hingedly connected to adjacent ends of said main panels; a pair of top closure flaps hingedly connected to adjacent ends of said main panels and each having a transverse score line therein extending from one main panel to the other between the points of intersection of said first pair of biased score lines with said top edges; a spout front panel connected to the upper end of said one side panel and also to the lateral edges of said main panels intermediate said one side panel and said top edges; and a tear out portion at the said corner defined by lines of weakness in said top closure flaps, said main panels and said spout panel.

2. A reclosable dispensing carton formed of a single blank suitably cut and scored to provide a pair of main panels, each of said main panels having one of a first pair of biased score lines extending from a top edge and intersecting one of a second pair of opposed biased score lines extending from a lateral edge near one corner thereof; the sum of twice the angle formed by one of said first pair of biased score lines and the top edge and twice the angle formed by one of said second pair of biased score lines and the lateral edge being equal to ninety degrees; a pair of opposed side panels hingedly connected to the lateral edges of said main panels, one of said side panels terminating in a transverse score line extending between the points where said second pair of biased score lines intersect said lateral edges; a pair of bottom closure flaps hingedly connected to adjacent ends of said main panels; a pair of top closure flaps hingedly connected to adjacent ends of said main panels and each having a transverse score line therein extending from one main panel to the other between the points of intersection of said first pair of biased score lines with said top edges; a spout front panel hingedly connected to said one side panel along said terminating score line and also to the lateral edges of said main panels intermediate said terminating score line and the top edges; and a tear out portion at the said corner defined by lines of weakness in said top closure flaps, said main panels and said spout panel.

3. A reclosable dispensing carton formed of a single blank suitably cut and scored to provide a pair of main panels, each of said main panels having one of a first pair of opposed biased score lines extending from a top edge and intersecting one of a second pair of opposed biased score lines extending from a lateral edge near one corner thereof; a pair of opposed side panels hingedly connected to the lateral edges of said main panels, one of said side panels terminating in a transverse score line extending between the points where said second pair of biased score lines intersect said lateral edges; a pair of bottom closure flaps hingedly connected to adjacent ends of said main panels; a pair of top closure flaps hingedly connected to adjacent ends of said main panels and each having a transverse score line therein extending from one main panel to the other between the points of intersection of said first pair of biased score lines with said top edges; a spout front panel hingedly connected to said one side panel along said terminating score line and also the lateral edges of said main panels intermediate said terminating score line and the top edges; and a tear out portion at the said corner defined by lines of weakness, said lines of weakness including lines extending from one main panel to the other in said spout panel and both top closure flaps, and lines in said main panels extending from the lines in said top closure flaps and spout panel intersecting adjacent the intersection of said biased score lines.

4. The carton of claim 3 including a cut line extending from the intersection of the biased score lines to the intersection of the lines of weakness.

5. A reclosable dispensing carton formed of a single blank suitably cut and scored to provide a pair of main panels, each of said main panels having one of a first pair of opposed biased score lines extending from a top edge and intersecting one of a second pair of opposed biased score lines extending from a lateral edge near one corner thereof; the sum of twice the angle formed by one of said first pair of biased score lines and a top edge and twice the angle formed by one of said second pair of biased

score lines and a lateral edge being equal to ninety degrees; a pair of opposed side panels hingedly connected to the lateral edges of said main panels, one of said side panels terminating in a transverse score line extending between the points where said second pair of biased score lines intersect said lateral edges; a pair of bottom closure flaps hingedly connected to adjacent ends of said main panels; a pair of top closure flaps hingedly connected to adjacent ends of said main panels and each having a transverse score line therein extending from one main panel to the other between the points of intersection of said first pair of biased score lines with said top edges; a spout front panel hingedly connected to said one side panel along a terminating score line and also the lateral edges of said main panels intermediate said terminating score line and the top edges; and a tear out portion at the said corner defined by lines of weakness, said lines of weakness including lines extending from one main panel to the other in said spout panel and both top closure flaps, and lines in said main panels extending from the lines in said top closure flaps and spout panel intersecting adjacent the intersection of said biased score lines.

6. The carton of claim 5 including a cut line extending from the intersection of the biased score lines to the intersection of the lines of weakness.

7. A unitary carton blank adapted to be formed into a carton with an extensible, reclosable spout, said blank being suitably cut and scored to form a pair of main panels each defined by a pair of longitudinal, parallel, spaced score lines, a pair of lateral, parallel, spaced scored lines and at one end of each main panel near adjacent

corners a pair of intersecting biased score lines, one of the biased score lines extending from the lateral score and the other extending from one of said longitudinal score lines; two pairs of end closure flaps, the first pair of which is hingedly attached along said lateral score lines to said one end of said main panels with each of said first pair of end closure flaps having a transverse score line perpendicular to and at the point where said one biased score line intersects the lateral score line, the second pair of which is hingedly attached along the other lateral score lines to the other end of said main panels; a connecting side panel hingedly attached to adjacent edges of said main panels along said one longitudinal score lines and terminating in a transverse score line extending between the points where said other biased score lines intersect said longitudinal score lines; a spout panel hingedly attached along said terminating score line to said connecting panel and along said one longitudinal score lines to said main panels; a second side panel hingedly attached to one of said main panels along the other longitudinal score line thereof; said first pair of end closure flaps, spout panel and main panels having suitable lines of weakness to facilitate removal of a portion of the corner of the carton when completed.

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