Dec. 2, 1969 G. E. RUUD ET AL 3,481,524

CONTAINER WITH POURING SPOUT

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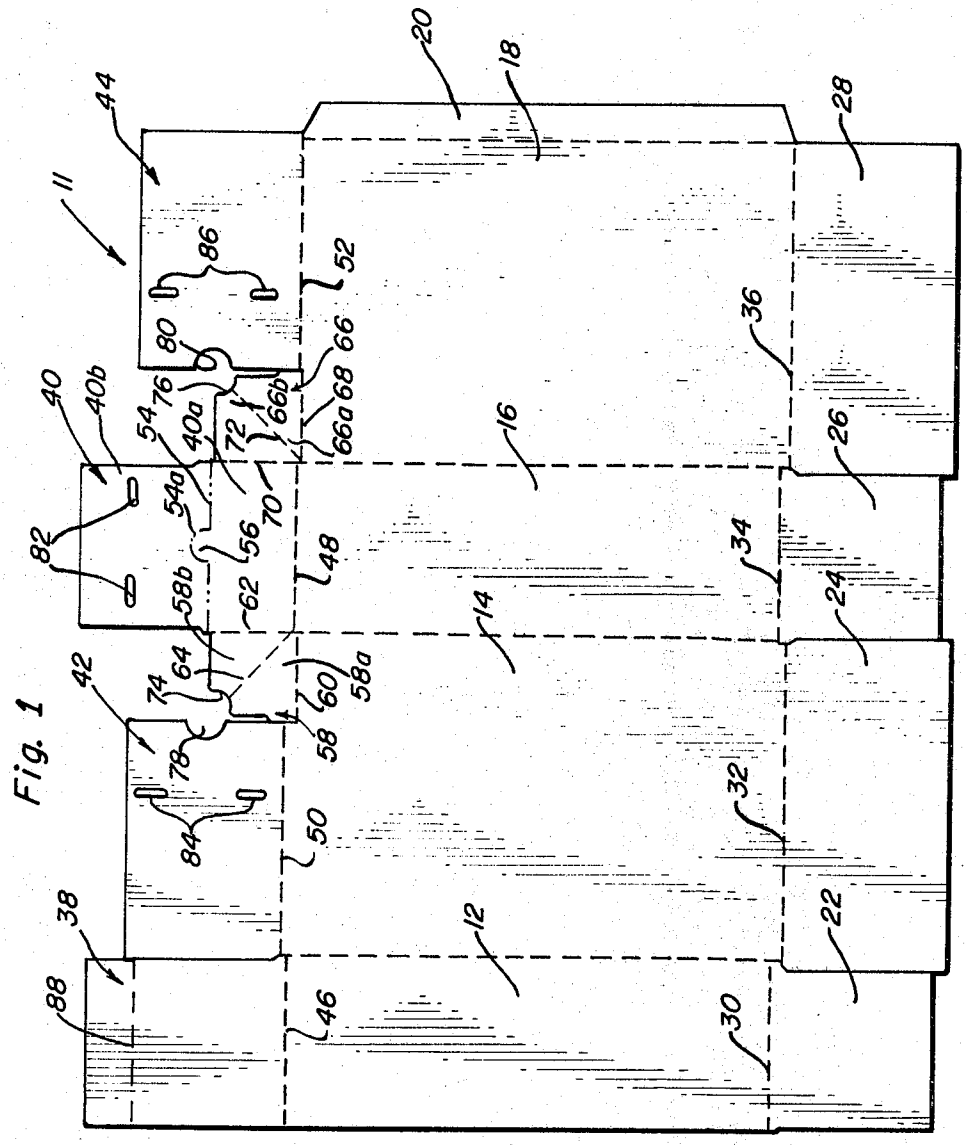


Fig. 1

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Fig. 3

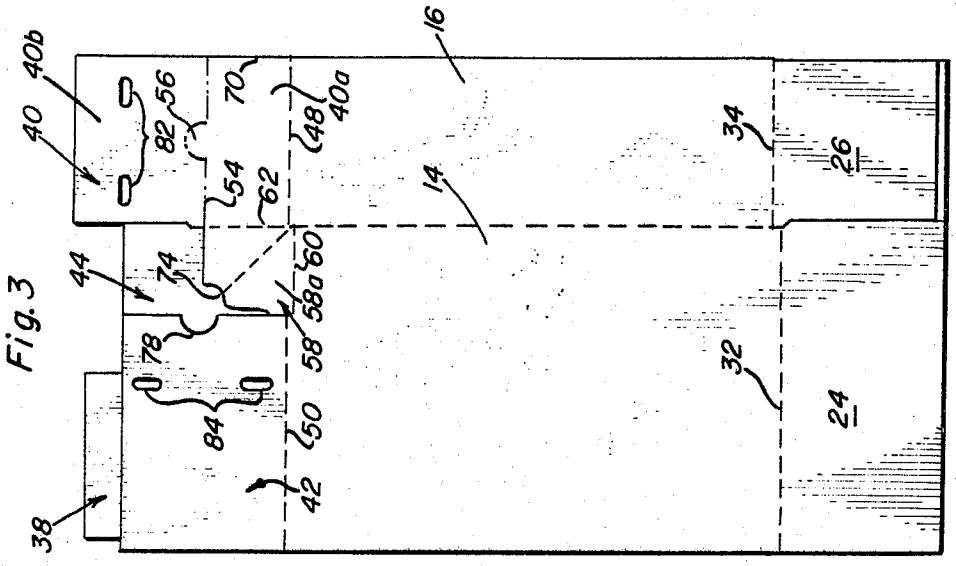
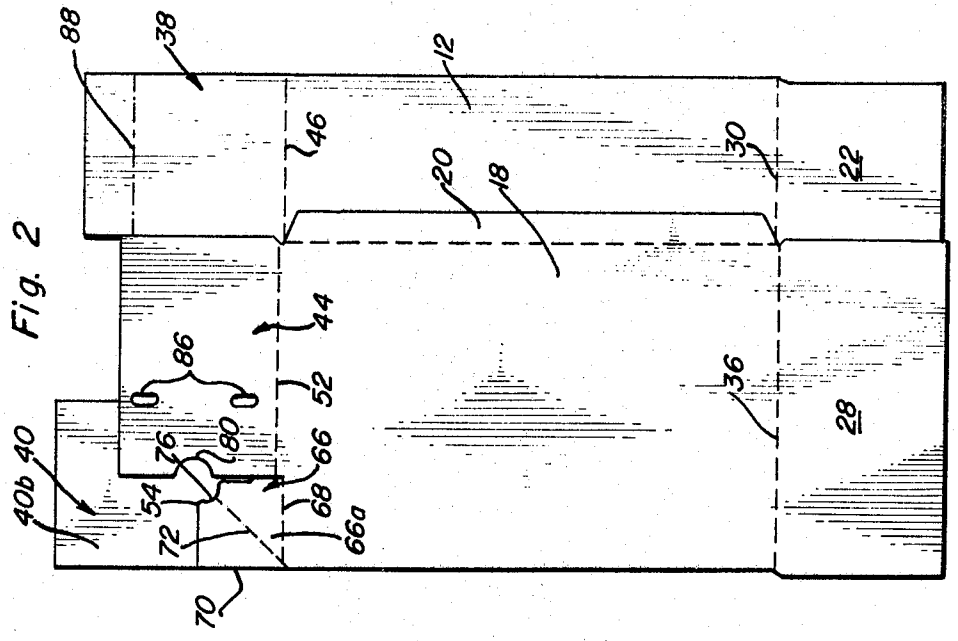


Fig. 2



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Fig. 5

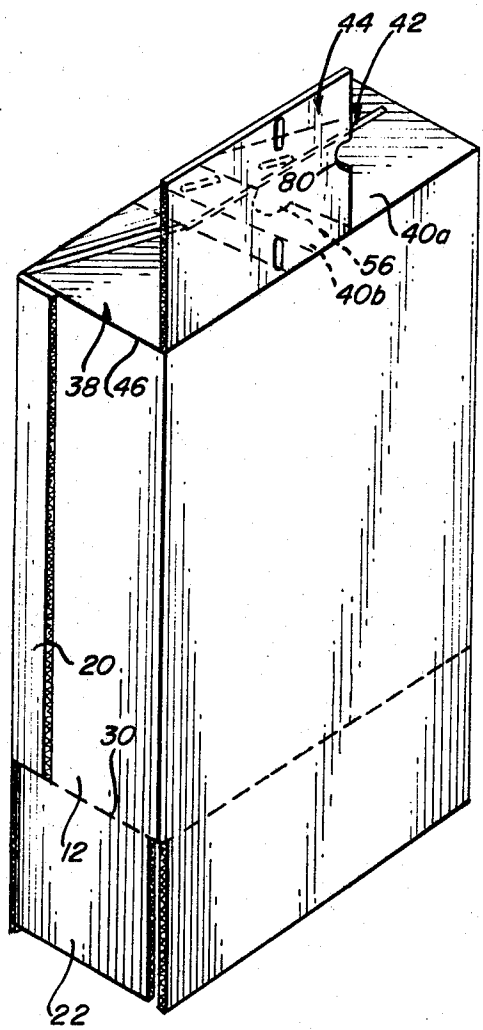
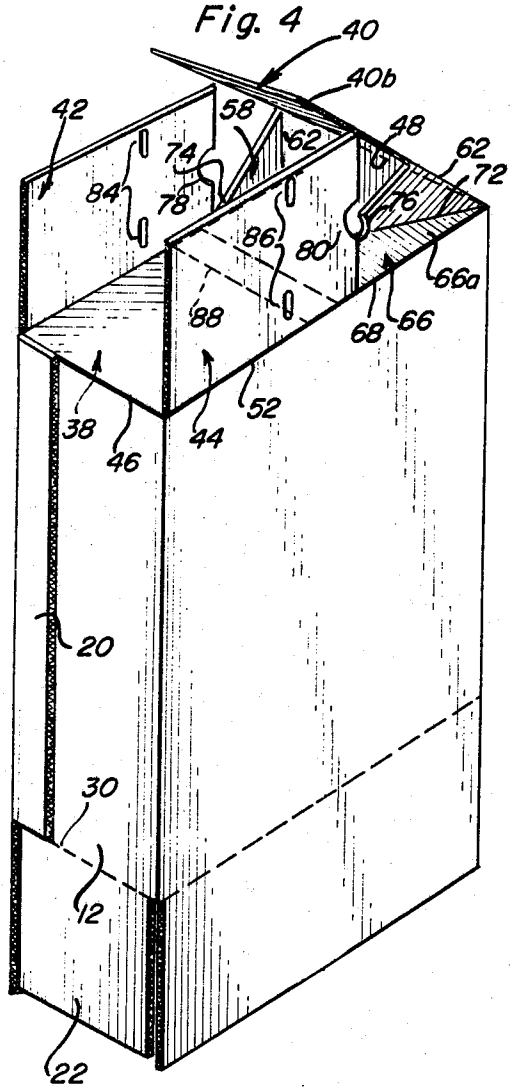


Fig. 4



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CONTAINER WITH POURING SPOUT

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Fig. 6

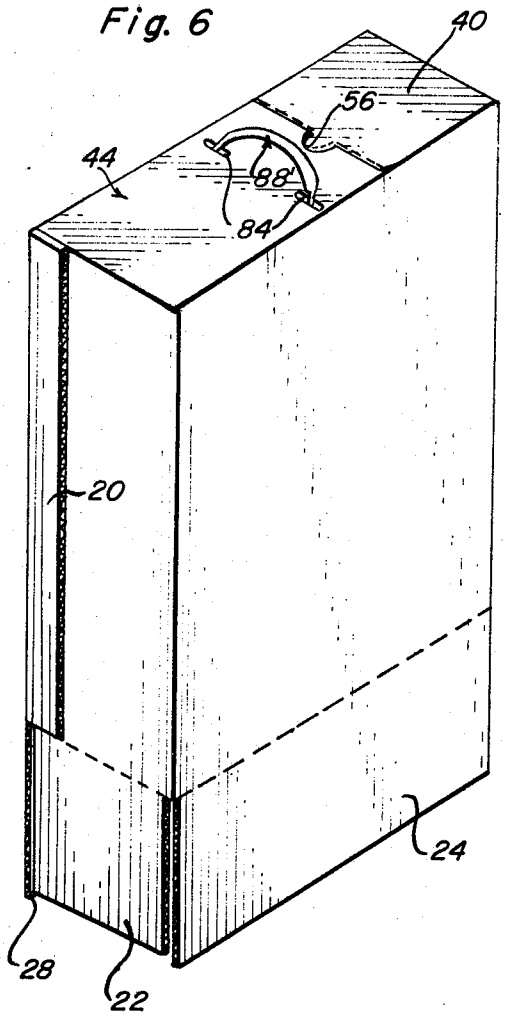


Fig. 7

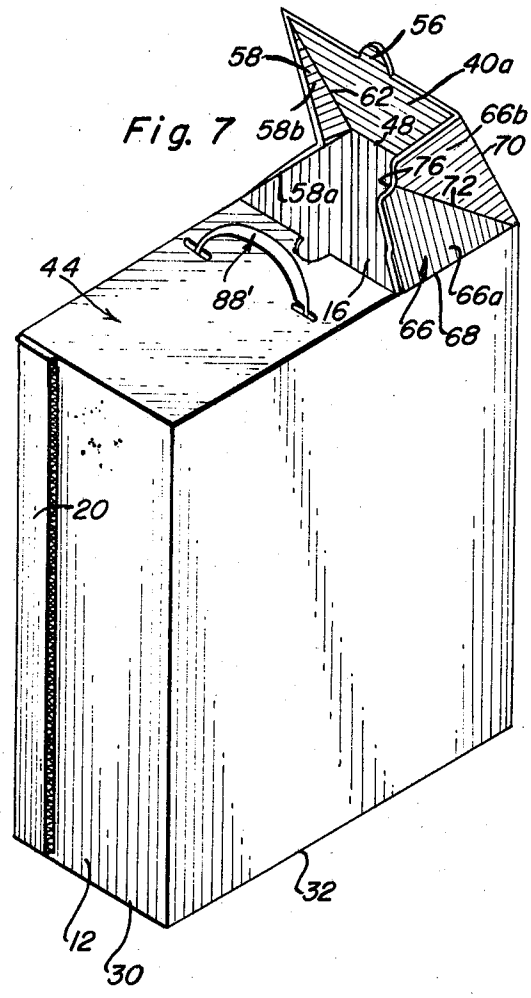
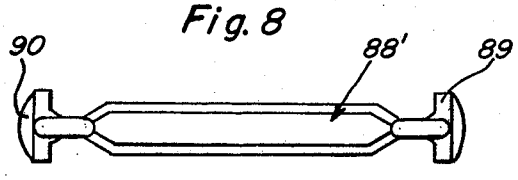


Fig. 8



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3,481,524

CONTAINER WITH POURING SPOUT

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Int. Cl. B65d 5/74
U.S. Cl. 229—17 15 Claims

ABSTRACT OF THE DISCLOSURE

A carton having four side panels defining a tubular body and a top closure openable to provide a pouring spout. The pouring spout is formed by a portion of one of the top flaps which is hinged to one side panel and diagonally scored gusset flaps which are hinged to the adjacent side panels.

This invention relates to a carton construction which may be formed from a single blank of flexible material, preferably paperboard, and is erectable into a convenient stackable shape, preferably a rectangular hexahedron. The normally flat top closure of the carton provides a convenient, easily openable and closable pouring spout of novel construction. The hinge line connections between the carton side panels and the closure flaps at the top and bottom of the carton are offset so that the closures will be tight, and there will be little tendency for the product to sift therethrough. A carrying handle may be used in connection with the top closure without requiring additional reinforcing. Cartons constructed in accordance with this invention may be conveniently used for such products as soap flakes, pelletized, granular or other flowable materials where the convenience of a pouring spout for accurate discharging of the carton contents is a desire.

In accordance with one embodiment of the invention, the carton is formed of an integral blank of double-faced corrugated paperboard cut and scored to provide a tubular body having a bottom closure and four hingedly connected side panels defining a rectangular top opening. The top opening is closed by means of a closure comprising a pair of first top flaps hingedly connected to a respective pair of opposed side panels. The width of the first top flaps is substantially equal to the width of said top opening, and the first top flaps are foldable inwardly toward each other to substantially close the opening.

One of the first top flaps has a laterally extending weakened tear line dividing it into proximate and distal portions. A pair of second top flaps, which are hingedly connected to the remaining opposed pair of side panels, have a width substantially less than the width of the remaining carton side panels, and these second top flaps are spaced from the hinge connection which joins the one top flap to its associated carton side panel. The second top flaps are foldable inwardly into overlapping relationship with respect to each other and with respect to the distal portion of the one first top flap, leaving the proximate portion of the one first top flap exposed.

A pair of gusset flaps are hingedly connected to respective sides of the one first top flap proximate portion and to the remaining carton side panels laterally adjacent the second pair of top flaps. Each gusset flap has a reverse fold line which substantially bisects the interior corner angle thereof formed by the intersection of the hinge line connections thereof with the one first top flap and the adjacent remaining carton side panel respectively. The gusset flaps are folded inwardly beneath the one first top flap proximate portion as the

pair of first top flaps are folded downwardly to close the top opening in the carton, and means, preferably in the form of a push-in tab, is provided for facilitating the manual tearing of the one top flap along said weakened tear line and for facilitating the swinging of the one first top flap proximate portion upwardly so that one end of the top closure will be opened and the proximate portion and said gusset flaps will form a three-sided pouring spout leading therefrom.

With reference to the drawings:

FIGURE 1 shows a blank from which a carton constructed in accordance with this invention may be constructed;

FIG. 2 is a top plan view of a collapsed carton formed by the uniting of the ends of the blank of FIG. 1;

FIG. 3 is a bottom plan view of the collapsed carton illustrated in FIG. 2;

FIG. 4 is a perspective view of the carton as it is being set up and as the top flaps thereof are being folded downwardly to close the top opening;

FIG. 5 is a perspective view of the carton showing the final stages of folding the top flaps to close the top opening;

FIG. 6 is a perspective view of the carton showing the top completely closed and the handle inserted into position, but with the bottom end open for loading;

FIG. 7 is a perspective view of the carton after the top has been opened and the pouring spout has been raised to an elevated position; and

FIG. 8 is an enlarged top plan view of a handle which may be used in connection with the carton.

The carton constructed in accordance with this invention may be formed from a single blank **11** of paperboard or other flexible material. It is preferred that the material be doublefaced corrugated board as illustrated in FIG. 1. The blank **11** includes four side panels **12**, **14**, **16** and **18** and a side glue flap **20** for securing the side panel **18** to the side panel **12**. Four bottom flaps **22**, **24**, **26** and **28** are connected to the respective side panels **12**, **14**, **16** and **18** along hinge lines **30**, **32**, **34** and **36** respectively. The hinge lines **30** and **34** are preferably offset with respect to hinge lines **32** and **36** by an amount approximately equal to the thickness of the individual bottom flaps, so that the bottom flaps **22** and **26** may be closed first and then the bottom flaps **24** and **28** may be folded over these flaps to provide a very tight siftproof closure.

The side flap **20** may be stitched or adhesively secured to the side panel **12** to form the collapsed or knockdown carton construction illustrated in FIGS. 2 and 3. The carton may be stored and shipped in this collapsed condition and when set up, the construction has a quadrilateral and preferably a rectangular cross-section, with the rectangular bottom opening therein being closed by the bottom flaps **22–28**.

The rectangular top opening in the tubular carton is closed by means of four top flaps, the flaps **38** and **40** forming the first pair of these top flaps and the flaps **42** and **44** forming the second pair of these top flaps. The top flap **38** is connected to side panel **12** along a hinge line **46**, and the top flap **40** is connected to the side panel **16** along a hinge line **48**. The top panels **38** and **40** are substantially the same width as the side panels **12** and **16** to which they are respectively hinged. In like manner, the top flap **42** is connected to the side panel **14** along a hinge line **50**, and the top flap **44** is connected to the side panel **18** along a hinge line **52**. The top flaps **42** and **44**, however, are somewhat shorter than the width of the side panels **14** and **18** to which they are attached, and these top flaps are positioned at the side of their respective side panels in spaced relationship with respect

to the hinge line connection 48 between the top flap 40 and its associated side panel 16. As was the case with the bottom panels, the hinge lines 46 and 48 of panels 38 and 40 are slightly offset with respect to the hinge lines 50 and 52 of top flaps 42 and 44 so that a very tight siftproof top closure results.

Extending laterally across the top flap 40, in spaced parallel relation with respect to the hinge line connection 48, is a weakened tear line 54 which divides the top flap 40 into a proximate portion 40*a* and a distal portion 40*b*. The tear line 54 is weakened preferably by perforations so that it may be easily torn or sheared by manual force. The central portion 54*a* of the tear line 54 protrudes into the distal portion 40*b* of the top flap 40 thereby forming a substantially U-shaped push-in tab 56, the purpose of which will be more fully described.

Hingedly attached to the carton side panel 14 adjacent the top panel 42 and extending the remainder of the way across the side panel 14 is a gusset flap 58. The gusset flap 58 is connected to the side panel 14 along a hinge line 60 which is preferably offset below the hinge line 50 and below the hinge lines 46 and 48 to allow for the thickness of the gusset flap sections 58*a* and 58*b* and the top flap proximate portion 40*a* when in the closed position. The gusset flap 58 is not connected to the side flap 42 but it is connected to the proximate portion 40*a* of the top flap 40 along a hinge line 62. A reverse fold line 64 substantially bisects the interior angle formed by the intersection of the hinge lines 60 and 62 of the gusset flap 58 and thus divides the gusset flap into the aforementioned bottom and top sections 58*a* and 58*b*, respectively.

A similar gusset flap 66 is attached to the carton side panel 18 along a hinge line 68 which is aligned with the hinge line 60 and offset below the hinge lines 48 and 52. The adjacent side of the gusset flap 66 is connected to the proximate portion 40*a* of the top flap 40 along a hinge line 70. A reverse fold line 72 bisects the interior angle formed at the intersection of fold lines 68 and 70 dividing the gusset flap into bottom and top sections 66*a* and 66*b*, respectively. The exterior angle of the gusset flap 58, that is the angle opposite the interior angle thereof, is truncated or recessed at 74, and a similar truncation or recess 76 is formed at the exterior angle of gusset flap 66. Except the corner truncations 74 and 76, in the illustrated embodiment, the gusset flaps 58 and 66 are substantially square with hinge line connections 60, 62, 68 and 70 being substantially equal in length. Thus the spacing of top flaps 42 and 44 from the hinge line connection 48 is approximately equal to the height of the proximate portion 40*a*, i.e., the distance between hinge line 48 and the weakened tear line 54. A substantially U-shaped recess 78 is provided in the side of top panel 42 adjacent the truncation 74 in the gusset flap 58, and a similar recess 80 is provided in the side of top panel 44 adjacent the truncation 76 in the gusset flap 66. Also, top panel 40 has a pair of slotted apertures 82, and a corresponding pair of apertures 84 and 86 are provided in the top panels 42 and 44 respectively. Finally, the top panel 38 has a reverse fold line 88 in spaced parallel relation with respect to the hinge line connection 46.

When the carton is set up from its collapsed condition as illustrated in FIG. 3, it is first opened into a tubular configuration, and then the top flaps are folded downwardly to close the top of the carton. In this top closing operation, the top flap 38 is folded downwardly into the position illustrated in FIG. 4, then the opposite top flap 40 is folded downwardly in partial overlying relationship with respect to top flap 38. As the top flap 40 is folded downwardly, the gusset flaps 58 and 66 are folded inwardly along their fold line connections 60, 62, 68 and 70 and along their central reverse fold lines 64 and 72 respectively. These gusset flaps thus fold under the proximate portion 40*a* of the top flap 40 as the latter is folded downwardly as shown in FIG. 4. When top panel 40*b* has been folded downwardly, the apertures 82 of the distal portion 40*b* thereof will overlie the reverse fold line 88 of the top flap 38. The remaining pair of top flaps 42 and 44 are then folded downwardly over the distal portion 40*b* of the top flap 40, as shown in FIG. 5. It will be noted that when the top flaps 42 and 44 are folded downwardly, the proximate portion 40*a* of the top flap 40 will remain exposed, and in this downwardly folded position, the apertures 84 and 86 of the top flaps 42 and 44 will align with the apertures 82 in the top flap distal portion 40*b* and with the reverse fold line 88 of top flap 38. Also, the side recesses 78 and 80 in the top flapr 42 and 44 will align with the tab 56 of the proximate portion 40*a* of top flap 40.

In the illustrated embodiment, the top flap 44 is folded over and may be adhesively secured to the distal portion 40*a* of the top flap 40, and in like manner, the top flap 42 is folded over and may be adhesively secured to the top flap 44. The carton will thus be in the condition illustrated in FIG. 6, and a handle 88′ such as illustrated in FIG. 8 may be attached. This handle 88′ has laterally extending arms 89 and 90 at its ends and may be attached by inserting these ends into the aligned slotted apertures 82, 84 and 86 of the top panels 40, 42 and 44. The slots are preferably slightly longer than the width of the arms 89 and 90, and the handle is preferably of a resilient material which may be twisted in order to insert the arms 89 and 90. It will be noted that the reversely folded portion of the top panel 38 will underlie the apertures and prevent the contents of the carton from spilling out therethrough. The reverse fold 88 will also permit the handle ends 89 and 90 to be inserted into the apertures 82, 84 and 86 after the carton has been filled, if that is desired.

In FIG. 6 the top opening of the carton has been completely closed with all top flaps sealed in place. The carton may then be inverted and filled with the product, such as soap flakes, pellets or the like. Bottom panels 22 and 26 are then folded inwardly and bottom panels 24 and 28 are folded thereover and adhesively secured thereto in the usual manner.

The product consumer may open the carton quickly and easily by merely pushing downwardly on the tab 56, thereby rupturing the central portion 54*a* of the weakened tear line 54. By inserting a thumb or finger through the aperture created by the displacement of tab 56, the user may grip the proximate portion 40*a* and pull upwardly, thereby completing the rupture of the weakened tear line 54 and separating proximate portion 40*a* from the distal portion 40*b*. The recesses 78 and 80 in the sides of the top flaps 42 and 44 will permit easy access to the tab 56, and the corner truncations or recesses 74 and 76 in the gusset flaps 58 and 66 permit unimpeded inward movement of the tab 56 for effecting initial rupture of the central portion of the tear line 54. The proximate portion 40*a* may be swung upwardly, and the gusset flaps 58 and 66 will be opened, thereby forming a three-sided pouring spout leading from the opening in the top of the carton which was previously covered by the proximate portion 40*a*. The pouring spout will permit accurate discharge of the contents of the carton.

It has been found that a novel toggling effect occurs with the pouring spout structure, particularly if the carton is constructed of the double-faced corrugated board. For greatest effect it is preferred that the corrugations run in the horizontal direction or parallel to fold lines 48, 50, 52, 60 and 68. The reverse fold lines 64 and 72 may then be formed by slicing through the inner facing and corrugation so that only the outer facing connects the two parts or sections of each of the gusset flaps. Thus, along the reverse fold lines 64 and 72, there is very little resistance to sharp folding (e.g., 30° or less) as contrasted with the normal resistance to sharp folding along fold lines 60, 62, 68 and 70 resulting from the tendency toward

tension in the outer facing and compression in the corrugations and in the inner facing.

It will be noted that when the proximate portion **40***a* is fully open or upright the upper sections **58***b* and **66***b* of the gusset flaps are perpendicular thereto. As the gusset flaps are folded inwardly in the closing of the carton, the upper gusset flap sections **58***b* and **66***b* are obliquely folded along lines **62** and **70**, whereas the lower sections **58***a* and **66***a* are just beginning to be folded inwardly and remain obtusely folded until passing a horizontal position. The resistance to folding along fold lines **62** and **70** is substantially greater than along fold lines **60** and **68** because the fold is much sharper along lines **62** and **70**, and as the sections **58***a* and **66***a* reach a horizontal position, the fold angles (and folding resistance) along lines **62** and **70** are the greatest. The unbalance in folding resistance causes forces of tension and compression to be generated in the top and bottom gusset flap sections respectively.

After passing center, the bottom sections **58***a* and **66***a* quickly swing downwardly partly into the interior of the carton, and, because of the ease of folding along the reverse fold lines **64** and **72**, the top sections **58***b* and **66***b* swing open slightly and into substantial face to face relation with their respective bottom sections. This partial opening of the top sections along fold lines **62** and **70**, aided by the substantially complete 180° folding along the reverse fold lines **64** and **72**, tends to balance the fold angles and to release the compressive and tensile forces in the gusset flap sections. In opening the carton, the forces of resistance are maximum as sections **58***a* and **66***a* reach a horizontal position and then these are released as the horizontal position is passed. Thus the horizontal position of sections **58***a* and **66***a* becomes the center point of maximum stress, and movement of these gusset flap sections through that position results in a toggling of the gusset flaps and of the proximate portion **40***a* between an open and a closed position.

In FIG. 7 the proximate portion **40***a* and the gusset flaps **58** and **66** are shown in an open position. In order to again close the top of the carton, all the user need do is to push the proximate portion **40***a* downwardly to a horizontal position, and it will remain in this horizontal position because in moving toward the horizontal position, the lower gusset flap sections **58***a* and **66***a* move through the horizontal center position. This novel toggling feature whereby the top of the carton may remain closed and the pouring spout flatly retracted is a unique feature of this construction, providing protection for the contents of the carton and giving a clean and neat appearance to the carton even after it has been opened.

It is to be understood that the present disclosure has been made only by way of example and that many additional modification and changes in various details may be resorted to without departing from the invention.

What is claimed is:

1. A closure for a carton having four connected side panels defining a quadrilateral opening, said closure comprising a pair of first flaps hingedly connected to a respective first pair of side panels, one of said first flaps having a laterally extending weakened tear line dividing said one first flap into proximate and distal portions, the proximate portion of said one first flap having a width substantially equal to the width of said quadrilateral opening, a pair of second flaps hingedly connected to the remaining opposed pair of carton side panels and having a width substantially less than the width of the remaining carton side panels, said pair of second flaps being spaced from the hinge connection between said one first flap and its associated side panel and being foldable inwardly into overlapping relationship with respect to each other and with respect to said one first flap distal portion, a pair of gusset flaps hingedly connected to the sides of said one first flap proximate portion and to the remaining carton side panels laterally adjacent said pair of second flaps, each gusset flap having a reverse fold line substantially bisecting the interior corner angle thereof formed by the intersection of the hinge line connections with said one first flap and with the remaining carton side panel, whereby said gusset flaps may be folded inwardly beneath said one first flap proximate portion, and means facilitating the manual tearing of said one first flap along said weakened tear line and for swinging the proximate portion thereof upwardly, whereby one end of said closure will be opened and said proximate portion and said gusset flaps will form a three-sided pouring spout leading therefrom.

2. The structure of claim **1** wherein said pair of second flaps are adhesively secured to each other and to the distal portion of said one first flap.

3. The structure of claim **1** wherein said opening is rectangular and said first flaps are of a width substantially equal to the width of said opening and are of a length sufficient to overlap when said first flaps are folded inwardly toward each other, whereby said opening may be substantially closed thereby.

4. The structure of claim **1** wherein said weakened tear line has a central portion extending into the distal portion of said one first flap to provide a frangible push-in tab, whereby said proximate portion may be gripped, torn from said distal portion and raised to an elevated position for discharge of the contents of said carton through said pouring spout.

5. The structure of claim **4** wherein the side edges of said pair of second flaps are provided with recesses which align with each other and with said one first flap tab, thereby exposing said push-in tab for initial tearing of said weakened tear line.

6. The structure of claim **5** wherein the portion of each of said gusset flaps opposite said interior corner angle are truncated, whereby said tab may be swung inwardly beneath said proximate portion of said one first flap.

7. The structure of claim **1** wherein the distance between said weakened tear line and the hinge connection between said one first flap and its associated carton side panel is approxmiately equal to the difference in width between said second flaps and their associated remaining carton side panels and to the length and width of said gusset flaps.

8. The structure of claim **1** wherein said closure is formed of double-faced corrugated paperboard and the inner face and corrugations of said gusset flaps are severed to provide the reverse fold lines in said gusset flaps, whereby the gusset flaps may be easily folded along said reverse fold lines and said proximate portions of said one first flap may be toggled between an open and a closed position.

9. The structure of claim **1** wherein said one first flap and said pair of second flaps are each provided with a pair of apertures which align when said flaps are folded inwardly to close said opening, and a handle is provided, said handle having laterally extending locking formations at its ends, said first and second flap apertures being dimensioned to permit insertion of said ends therethrough, whereby said locking arms may lock in place after insertion through said apertures.

10. The structure of claim **9** wherein said apertures are elongated slots.

11. The structure of claim **9** wherein the other of said first flaps has a reverse fold line substantially aligned with said apertures, whereby the ends of said handle may be accommodated between the overlapping portions of said first flaps.

12. The structure of claim **1** wherein said hinge connections between said carton side panels and said pair of first flaps are offset with respect to the corresponding hinge line connections between said pair of second flaps and their associated carton side panels by an amount approximately equal to the thickness of said flaps, where-

by when said panels are folded inwardly into overlapping relationship they will be flat and substantially seal said opening.

13. A carton formed of an integral blank of double-faced corrugated paperboard, cut and scored to provide a tubular body having four connected side panels, a bottom closure, a rectangular top opening and a closure for said top opening; said top closure comprising a pair of first top flaps hingedly connected to a respective first pair of opposed side panels, the width of said first top flaps being substantially equal to the width of said top opening and said first top panels being foldable inwardly toward each other to substantially close said top opening, one of said first top flaps having a laterally extending weakened tear line dividing said one top flap into proximate and distal portions, said tear line having a central portion extending into said distal portion to provide a frangible tab for initiating rupture of said tear line and for facilitating the separation of said distal and proximate portions and the swinging of said proximate portion upwardly to an elevated position, a second pair of top flaps hingedly connected to the remaining opposed pair of carton side panels, having a width substantially less than the width of the remaining carton side panels and being spaced from the hinge line connection between said one top flap and its associated side panel, said second pair of top flaps being foldable inwardly into overlapping relation with respect to each other and with respect to said one top flap distal portion, leaving the proximate portion of said one top flap exposed, a pair of substantially square gusset flaps hingedly connected to the sides of said one

top flap proximate portion and to said remaining carton side panels laterally adjacent said pair of second top flaps, each gusset flap having a reverse fold line substantially bisecting the interior corner angle thereof formed by the intersection of the hinge line connections with said one top flap and with the remaining carton side panel and having the opposite corner angle thereof truncated for facilitating the inward swinging of said tab, said gusset flaps being foldable inwardly beneath said one top flap proximate portion when said pair of top flaps are folded downwardly to close said opening, and means adhesively securing said one top flap distal portion to said pair of second top flaps and for securing said pair of second top flaps to each other.

14. The structure of claim 13 wherein the corrugations of said paperboard extend parallel to the hinge line connections between said top flaps and said carton side panels.

15. The structure of claim 14 wherein the inner face and corrugations of said gusset flaps are severed to provide the reverse fold lines in said gusset flaps.

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DAVIS T. MOORHEAD, Primary Examiner