United States Patent

Zeitter

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[54] FOLDING CARTON

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[52] **U.S. Cl.** .....**229/39**, 229/41 B

[51] **Int. Cl.** **B65d 5/10**

[58] **Field of Search**.....229/41, 39, 38

[56] **References Cited**

UNITED STATES PATENTS

1,103,708	7/1914	Thumb	229/39 R
2,513,079	6/1950	Buerger	229/41 B
2,927,720	3/1960	Adams	229/41 B X
2,990,099	6/1961	Ryder	229/41 B X

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[57] **ABSTRACT**

A folding carton is provided which is adapted to assume a collapsed tubular condition when in an unloaded condition. The carton is provided with bottom closure flaps which automatically assume a closed bottom-forming position when the collapsed tubular carton is set up for loading.

13 Claims, 8 Drawing Figures

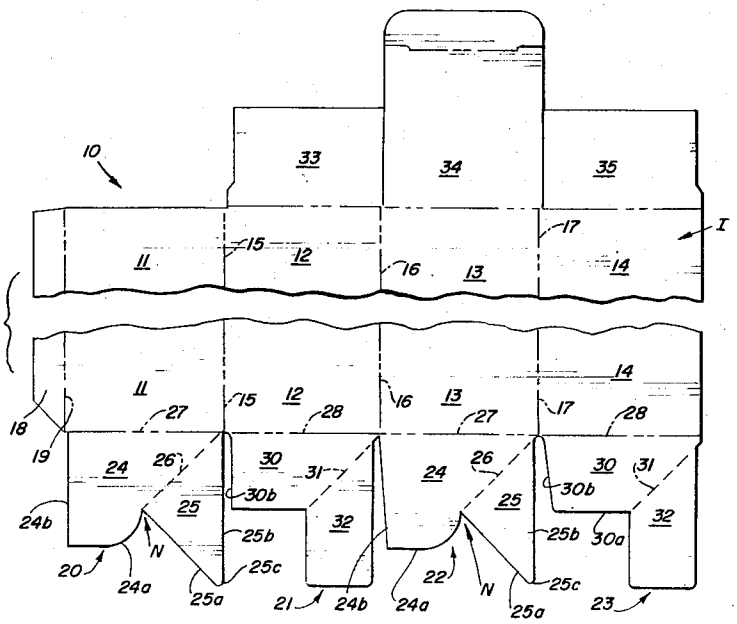


FIG. 1

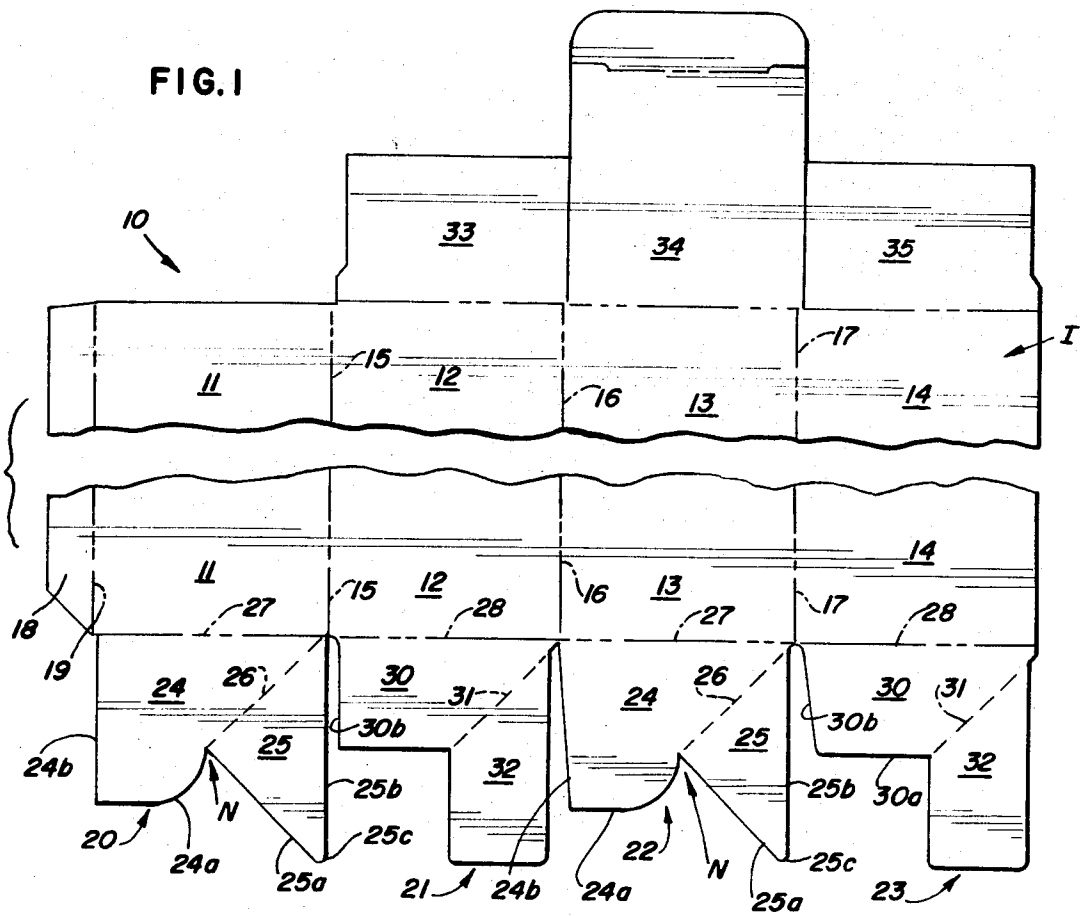
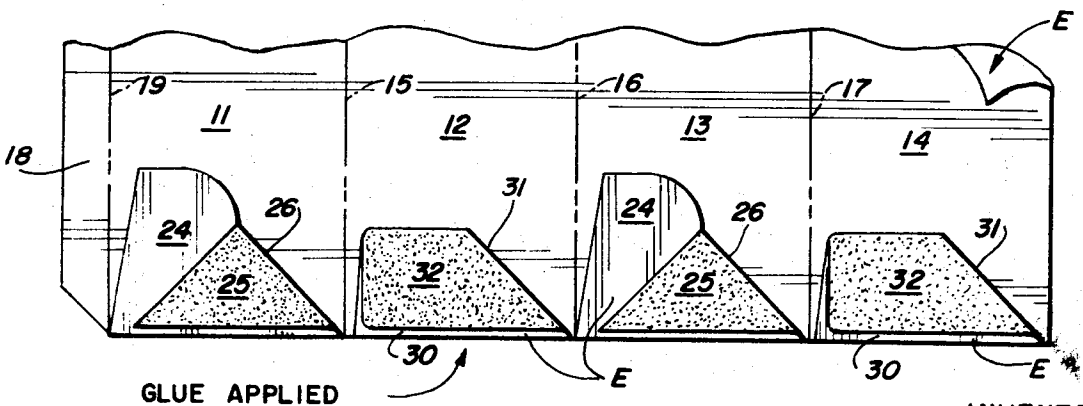


FIG. 2



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FIG. 3

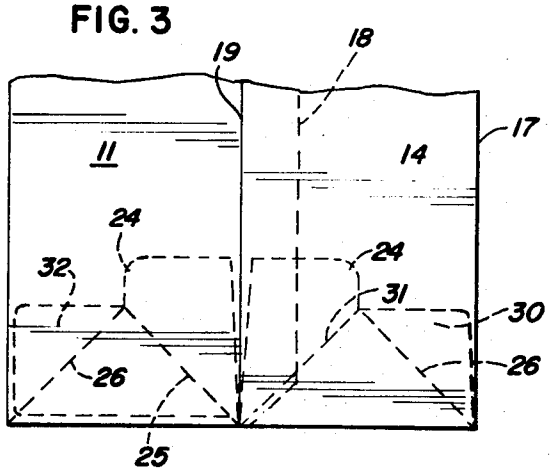


FIG. 4

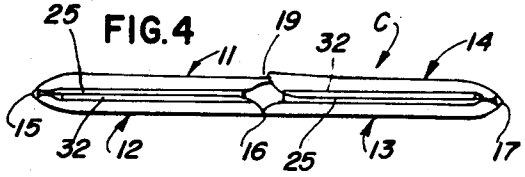


FIG. 5

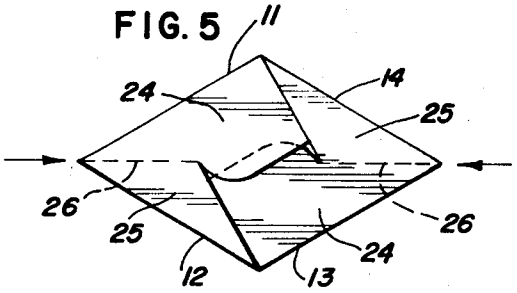


FIG. 6

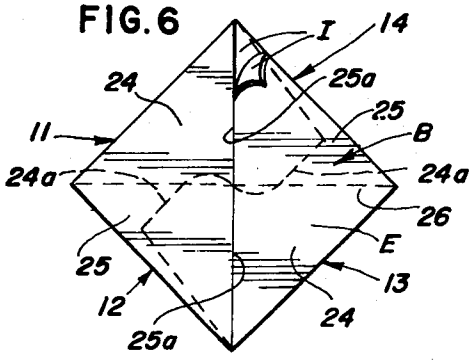


FIG. 7

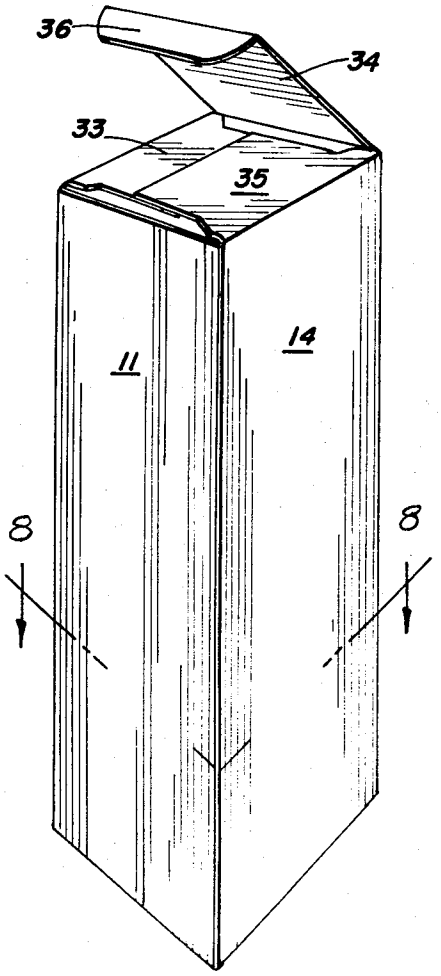
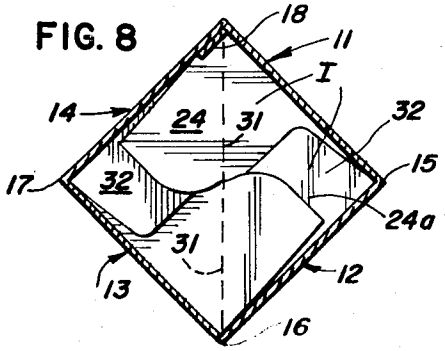


FIG. 8



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FOLDING CARTON

BACKGROUND OF THE INVENTION

Various cartons having an automatic bottom closing feature have heretofore been provided; however, such cartons have been beset with one or more of the following shortcomings: (a) the carton is of complex construction and is difficult and awkward to set up; (b) the carton, prior to loading, is incapable of assuming a substantially flat collapsed tubular condition suitable for storage; (c) the carton is not formed from a single blank of sheet material; (d) the carton blank must have both surfaces thereof capable of being readily bonded to one another and thus, requires an overwrap to be utilized if a decorative, esthetic exterior is to be obtained; and (e) the bottom of the carton must be reinforced so as to remain in a closed position and support the contents of the carton.

SUMMARY OF THE INVENTION

Thus, it is an object of this invention to provide a carton of the type described which is not beset with the afore-noted shortcomings associated with prior structures.

It is a further object of this invention to provide a folding carton having an automatic bottom-folding feature which is capable of accommodating a variety of products.

It is a still further object of this invention to provide a folding carton wherein the bottom thereof may be automatically formed upon said carton being set up by a simple manual manipulation.

It is a still further object of this invention to provide a blank for forming a carton of the type described, wherein one surface of the blank has a decorative finish and is not readily bondable to itself or another surface and only said one surface is exposed when said blank is set up to form the carton.

Further and additional objects will appear from the description, accompanying drawings, and appended claims.

In accordance with one embodiment of the invention, a folding carton is provided which embodies bottom closure flaps that automatically fold into a closed bottom-folding position when the carton is set up from a collapsed tubular condition. The carton includes four elongated foldably connected wall panels, a pair of first closure flaps foldably connected to the lower end limits of one pair of opposed wall panels, and a pair of second closure flaps foldably connected to the lower end limits of the other pair of opposed wall panels. Each first closure flap is provided with a first section having one side thereof foldably connected to the lower end limit of one of the first pair of wall panels, and a second section foldably connected to a second side of the first section whereby the second section is adapted to be folded back into overlying relation with respect to the first section when the carton is in a collapsed tubular condition. The first and second sides of the first section define an acute included angle.

Each second closure flap is provided with a first portion having one side thereof foldably connected to the lower end limit of one of the second pair of wall panels. Foldably connected to a second side of the first portion is a second portion which is in fold-back overlying relation with respect to the first position when said carton

is in its collapsed tubular condition. Each folded-back second section of one of the first closure flaps is affixed in face-to-face contact with the folded-back second portion of an adjacent one of the second closure flaps. The closure flaps are sandwiched between the wall panels, when the carton assumes a collapsed tubular condition. When the carton is set up for loading, however, the closure flaps assume transversely disposed positions with respect to the wall panels and form a closed bottom for the carton.

DESCRIPTION

For a more complete understanding of the invention reference should be made to the drawings wherein:

FIG. 1 is a fragmentary plan view of one form of blank for the improved carton.

FIG. 2 is a fragmentary plan view of the blank of FIG. 1, but showing the closure flaps thereof in folded position prior to the wall panels being folded to form a collapsed tubular configuration.

FIG. 3 is similar to FIG. 2, but showing the blank in said collapsed tubular configuration.

FIG. 4 is a bottom end view of the carton of FIG. 3.

FIGS. 5 and 6 are bottom end views of the carton in various stages of being set up for loading.

FIG. 7 is a perspective side view of the set up carton and showing the top closure flaps being folded into closed position.

FIG. 8 is a sectional view taken along line 8—8 of FIG. 7.

Referring now to the drawings and more particularly to FIG. 1, a blank 10 is shown which is formed of sheet material. The blank material may have an interior surface I, which is adapted to be readily bonded to itself, and an exterior surface E (see FIG. 2) having a decorative finish which renders said exterior surface not readily bonded to itself or another surface.

The blank 10, as shown in FIG. 1, includes four side wall panels 11, 12, 13, and 14 arranged in side-by-side relation and separated from one another by parallel foldlines 15, 16, and 17. A conventional glue flap 18 may be foldably connected to the elongated edge of panel 11. When the blank is set up, panels 11–13 and 12–14 will be in opposed substantially parallel relation. To effect attachment of the glue flap to the interior surface I of panel 14, the exterior surface of flap 18 may be scuffed so as to enable the flap to be bonded to the panel.

Foldably connected to the lower edges of the side wall panels are closure flaps 20, 21, 22, and 23. Flaps 20 and 22 are of like configuration and are connected to alternate panels 11 and 13, respectively. Flaps 21 and 23, on the other hand, are of like construction and are connected to panels 12 and 14, respectively.

Flaps 20 and 22 are each provided with a first section 24 which has one edge thereof foldably connected to and coextensive with the lower edge of the panel 11 or 13. A triangular second section 25 is provided, which is foldably connected to a second edge of section 24. A foldline 26, connecting sections 24 and 25, extends diagonally from one end of a foldline 27 connecting section 24 and panel 11 or 13. Foldlines 26 and 27 define an acute angle of approximately 45°.

The outer end of foldline 26 terminates at approximately mid-width of section 24, see FIG. 1. The outer

edge 24*a* of section 24 curves abruptly outwardly from the outer end of foldline 26. The third, or remaining, edge 24*b* of section 24 is substantially rectilinear and extends outwardly from the lower end limit of foldline 16 or 19; foldline 19 interconnecting the glue flap 18 and side panel 11.

As aforementioned, one side of triangular section 25 is defined by foldline 26. A second side 25*a* cooperates with section edge 24*a* to form a notch N. The remaining third side 25*b* of section 25 is substantially aligned with foldline 15 or 17. The apex 25*c* of section 25 formed by the intersection of sides 25*a* and 25*b*, projects outwardly from the foldline 27 a substantially greater distance than the outer edge 24*a* of section 24.

Closure flaps 21 and 23 are of like configuration and are connected by foldlines 28 to the lower edges of panels 12 and 14. Each flap 21 or 23 includes a first portion 30 which has one side thereof defined by foldline 28. Connected by a foldline 31 to a second side of portion 30, is a second portion 32. The foldline 31 extends diagonally from one end of foldline 28 and the two foldlines 28 and 31 define an acute angle of approximately 45°. The outer end of foldline 31 terminates at approximately mid-width of portion 30. The outer edge 30*a* of portion 30 is disposed substantially parallel to foldline 28 and extends from the outer terminus of diagonal foldline 31. The opposite end of edge 30*a* terminates at a side edge 30*b* which extends outwardly from the lower end limit of foldline 15 or 17.

By reason of the diagonal disposition of foldlines 26 and 31, the second sections 25 and the second portions 32 of the closure flaps 20, 21, 22, and 23 are adapted to be folded back into overlying relation with respect to the respective first section 24 and first portion 30, when said closure flaps are folded relative to the side wall panels 11, 12, 13, and 14 into the positions shown in FIG. 2. By reason of the relative folding of the closure flaps, the surface I of the second sections 25 and second portions 32 will be exposed so that an adhesive can be applied thereto and thus, when the side wall panels are folded relative to one another so as to form a collapsed tubular member C, see FIGS. 3 and 4, the exposed adhesively coated surface of one section 25 is brought into face-to-face contact with the exposed surface of portion 32 of an adjacent closure flap. Only the adhesively coated surfaces of the section 25 and portion 32 will be bonded together. This structural features is of utmost importance in permitting the closure flaps to move relative to one another so as to form a closed bottom B when the collapsed tubular member C is squared or set up to form the carton.

Foldably connected to the upper edges of side panels 12, 13 and 14 are conventional top closure flaps 33, 34, and 35, respectively. Flaps 33 and 35 are of like construction and are initially folded inwardly towards one another so as to be in partially overlapping relation, when the top of the loaded carton is to be closed, see FIG. 7. Flap 34 completely overlies flaps 33 and 35, and is provided with a tab 36 which is adapted to be tucked behind panel 11 and frictionally hold flap 34 in its closed position. Various other means, not shown, may be utilized to close the top of the loaded carton.

The size and shape of the carton may be varied as desired without departing from the scope of the invention.

Thus, it will be seen that a simple, inexpensive, one-piece carton has been provided which has bottom closure flaps that automatically assume a bottom closing position when the carton is squared up for loading. When not loaded, the improved carton may be readily manipulated so as to assume a substantially flat collapsed tubular condition for compact storage. The improved carton may be formed from a single blank of sheet material wherein the exposed exterior surface has a decorative finish rendering said surface not readily bondable to itself or another surface. The interior surface of the blank, on the other hand, is capable of being bondable to itself. Thus, the improved carton may have a highly decorative exterior thereby avoiding the need for an overwrap.

I claim:

1. A folding carton adapted to assume a collapsed tubular condition and provided with an automatic bottom closing feature when said carton is set up for loading, said carton comprising two pairs of opposed walls foldably connected so as to define a tube when said carton is set up; a first set of closure flaps foldably connected to the lower end limits of a first pair of opposed walls, each flap of said first set having a first section foldably connected to the lower end limit of a wall of the first pair, and a second section foldably connected to said first section and in fold-back relation with respect thereto, when said carton assumes a collapsed tubular condition; and a second set of closure flaps foldably connected to the lower end limits of a second pair of opposed walls, each flap of said second set having a first portion foldably connected to the lower end limit of a wall of the second pair and a second portion foldably connected to said first portion and in fold-back relation with respect thereto, when said carton assumes a collapsed tubular condition; the second section and the second portion of adjacent closure flaps being affixed to one another and disposed in sandwiched relation with the first section and the first portion of said adjacent closure flaps when said carton is in a collapsed tubular condition; the first sections of said first set of closure flaps being in interlocking relation when said carton is set up for loading.

2. The carton of claim 1 wherein each closure flap of the first set, the first and second sections thereof are interconnected by a first diagonally extending foldline, and in each closure flap of the second set, the first and second portions thereof are interconnected by a second diagonally extending foldline; the second foldline between the first and second portions being in substantial registered relation with a side of the adjacent second section affixed to said second portion.

3. The carton of claim 1 wherein the second section of each closure flap of the first set is of substantially triangular configuration and with one side thereof foldably connected to the first section and with a second side thereof substantially aligned with a folding connection between adjacent walls.

4. The carton of claim 3 wherein the first section of each closure flap of the first set has a curved outer edge with one end thereof terminating at the foldline between said first and second sections and forming a notch.

5. The carton of claim 1 wherein said closure flaps automatically fold back upon themselves and are con-

cealed between the carton walls when said carton is in a collapsed tubular condition.

6. A blank of sheet material for use in forming a tubular carton having an automatically folded bottom when said carton is set up from a collapsed tubular condition, said blank comprising four elongated wall panels arranged in side-by-side relation and separated from one another by foldlines; first closure flaps foldably connected to the lower end limits of alternate wall panels; and second closure flaps foldably connected to the lower end limits of remaining intermediate wall panels; each first closure flap including a first section having a first side thereof foldably connected to the lower end limit of one of said alternate wall panels, and a second section having one side thereof foldably connected to a second side of said first section, the first and second sides of said first section defining an acute included angle whereby said second section is movable into a fold-back relation with said first section; each second closure flap including a first portion having a first side thereof foldably connected to the lower end limit of one of said intermediate wall panels, and a second portion foldably connected to a second side of said first portion, the first and second sides of said first portion defining an acute included angle whereby said second portion is movable into a fold-back relation with said first portion.

7. The blank of claim 6 wherein the first sides of said first sections and said first portions are substantially coextensive with the lower end limits of the wall panels to which they are foldably connected.

8. The blank of claim 6 wherein adjacent closure flaps are separated from one another by cuts, each cut being substantially aligned with a foldline separating adjacent wall panels.

9. The blank of claim 6 wherein the apexes of said acute angles are in spaced relation and each apex is disposed at substantially the lower end limit of one elongated side of the wall panel to which said closure flap is foldably connected.

10. The blank of claim 6 wherein all of said included angles are of substantially the same size.

11. The blank of claim 6 wherein the surface thereof forming the interior surface of the set up carton is capable of being bonded to itself, and the opposite surface of the blank forming the exterior surface of the set up carton has a finish rendering same not readily capable of being bonded to itself or another surface.

12. The blank of claim 6 including top closure flaps foldably connected to the upper end limits of said wall panels.

13. The blank of claim 6 wherein said first closure flaps are of substantially like configuration and said second closure flaps are of substantially like configuration.

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