

[54] **TUBULAR CARTON WITH AXIALLY CLOSED ENDS**

[72] Inventor: **Harry J. Rossi**, Parsippany, N.J.

[73] Assignee: **Continental Can Company, Inc.**, New York, N.Y.

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[58] Field of Search. **229/40; 206/65 E; 220/115**

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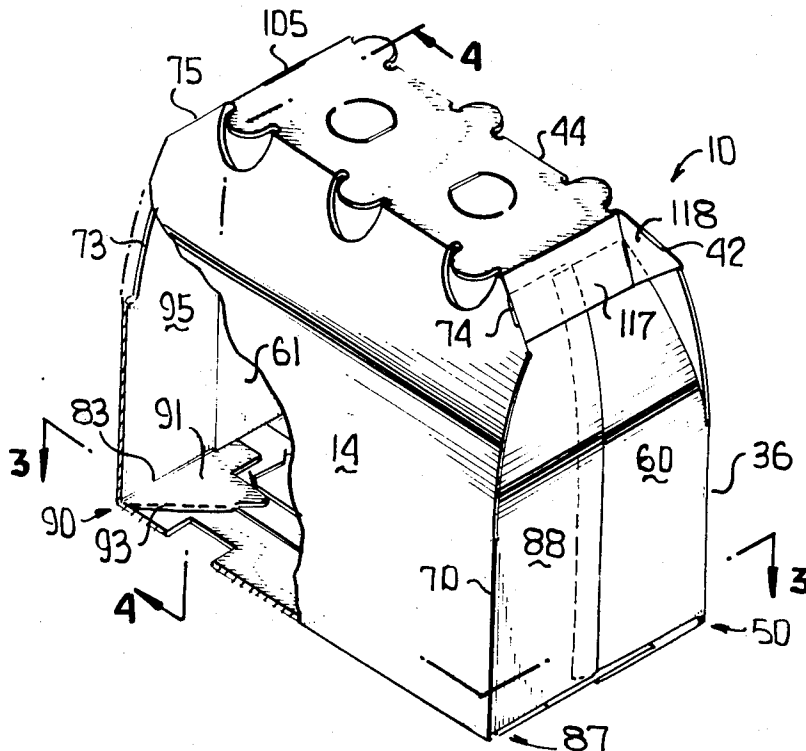
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Primary Examiner—Donald F. Norton
Attorney—Diller, Brown, Ramik & Holt

[57] **ABSTRACT**

This disclosure relates to a carton blank and a carton formed therefrom which includes top, side and bottom panels with the side panels each including an end panel joined thereto along a fold line whereupon being set up into a generally tubular configuration the end panels close axially opposite ends of the carton. Novel locking panels are also associated with the top and side panels to maintain the upper end portions of the end panels generally normal to both the top and side panels.

4 Claims, 5 Drawing Figures



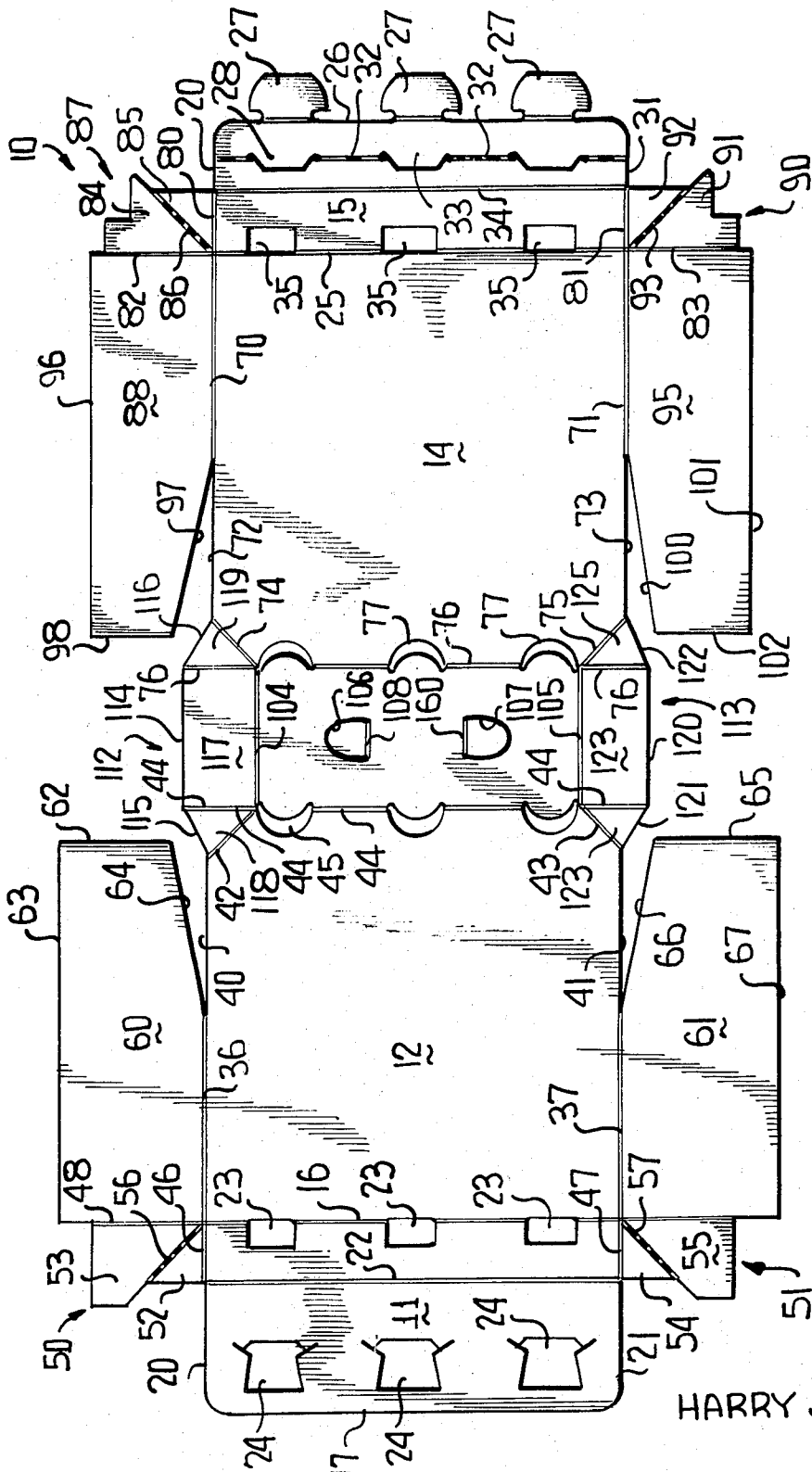
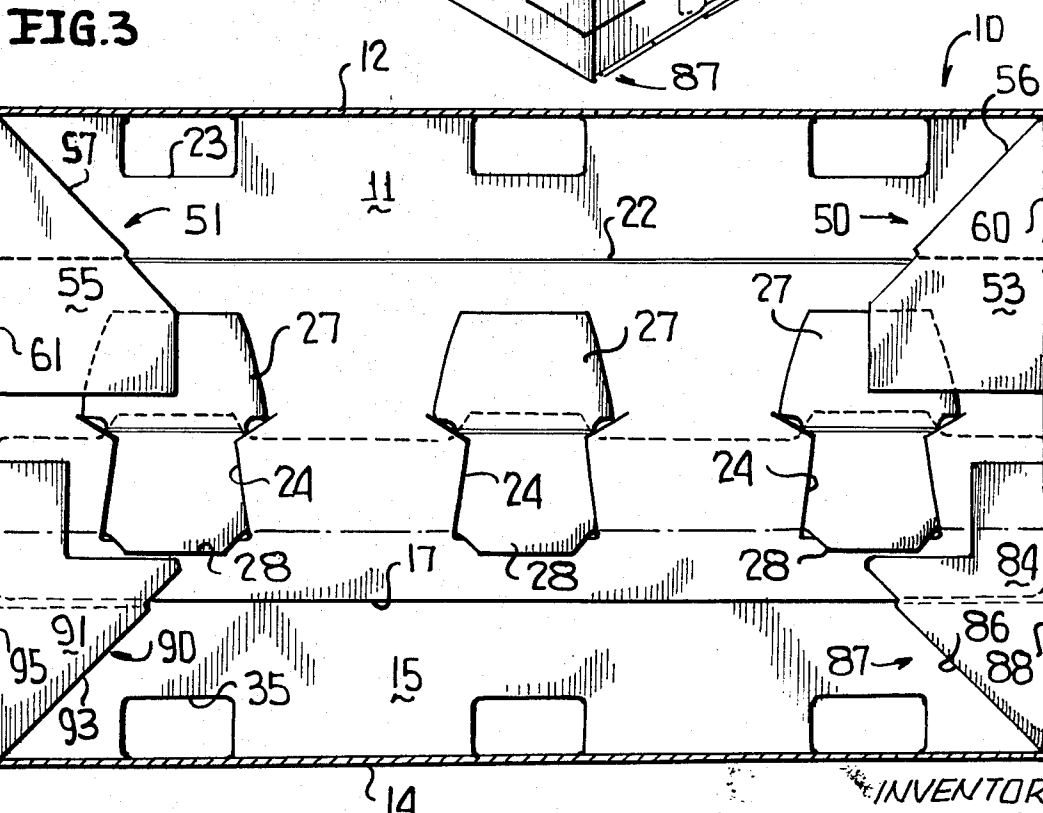
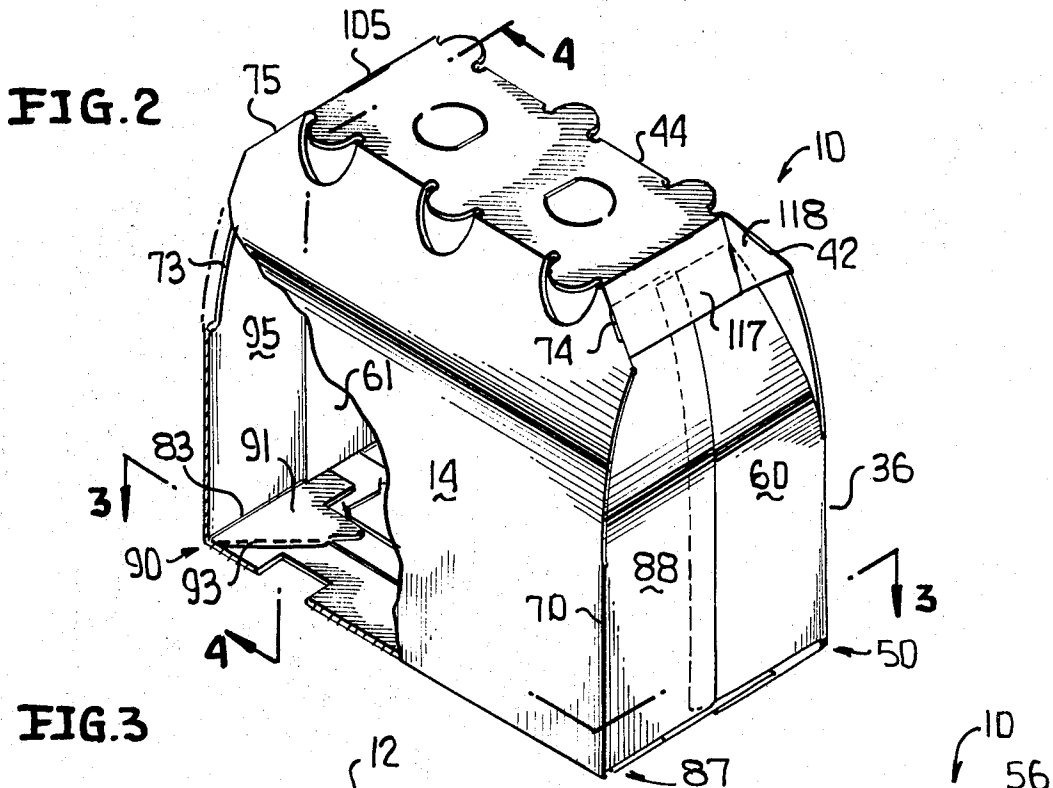


FIG. 1

INVENTOR
HARRY J. ROSSI

By *Drew Brown*, *Ramick + Valt*
ATTORNEYS



INVENTOR
HARRY J. ROSSI

By
Dillon, Brown, Rank & Holt
ATTORNEYS

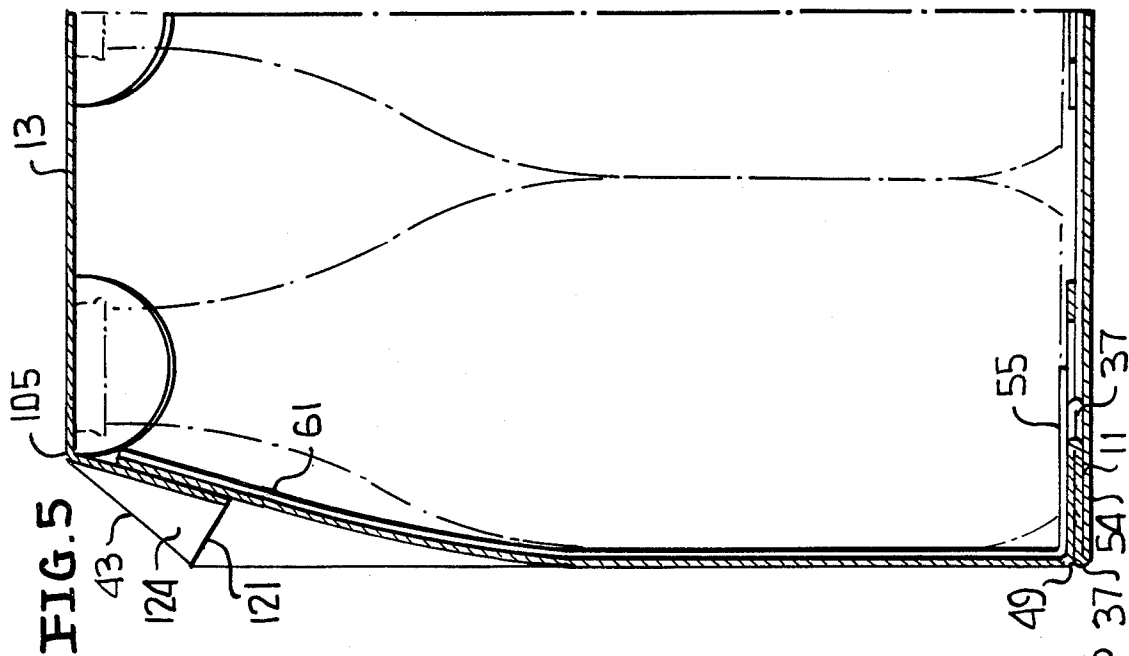


FIG. 5

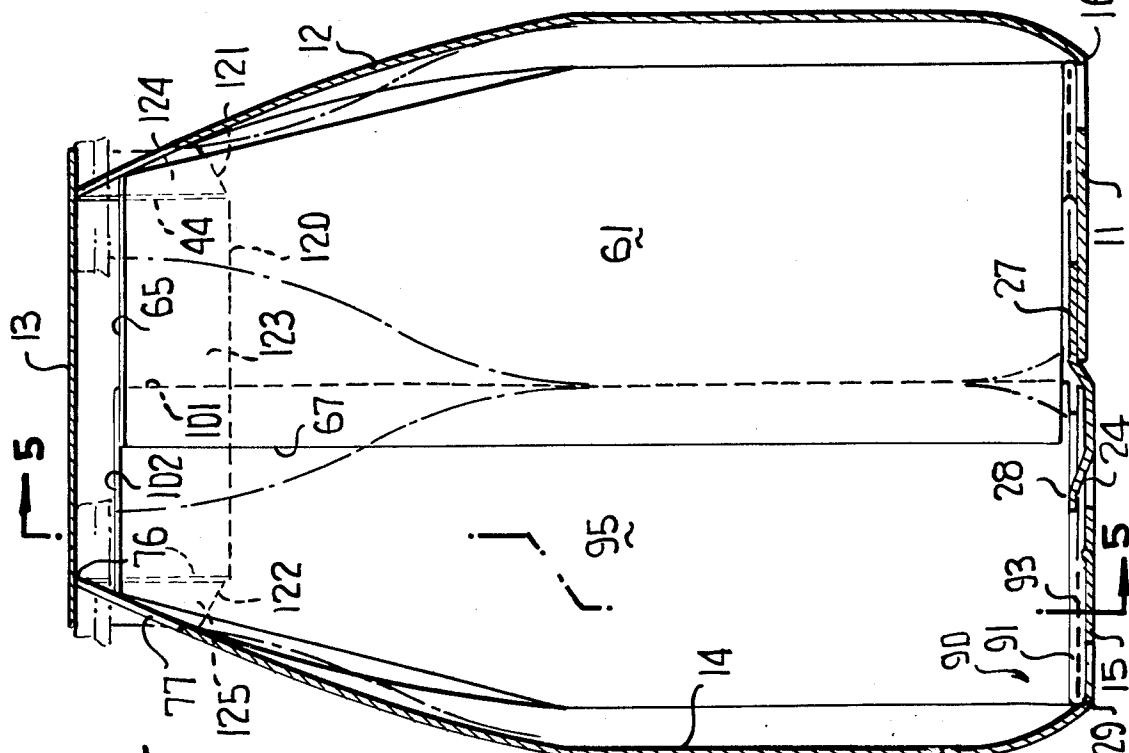


FIG. 4

INVENTOR
HARRY J. ROSSI

By *Diller, Brown, Ranik & Haet*
ATTORNEYS

TUBULAR CARTON WITH AXIALLY CLOSED ENDS

A primary object of the present invention is to provide a novel carton blank and a carton formed therefrom of the generally tubular type having normally open axially opposite ends which in the present case are closed by "barn door" end panels, each end panel being joined to an edge of each side panel, and locking panel means being folded internally of the tubular carton into overlying relationship to an upper portion of each end panel to maintain the end panels generally normal to the side panels and thus the tubular carton is essentially closed at both of its axially opposite ends.

Still another object of this invention is to provide a novel carton of the type heretofore described wherein each end of the top panel has joined thereto said locking panel means for holding upper ends of the end panels generally within the tubular configuration of the carton, each top locking panel means being divided into three locking panel portions with a middle locking panel portion being disposed generally normal to the top panel while the outboard pair of locking panel portions are disposed generally parallel to the side panels thereby maintaining the inboard upper ends of the end panels within the tubular carton.

With the above and other objects in view that will hereinafter appear, the nature of the invention will be more clearly understood by reference to the following detailed description, the appended claimed subject matter, and the several views illustrated in the accompanying drawings.

IN THE DRAWINGS:

FIG. 1 is a perspective view of a novel carton blank constructed in accordance with this invention, and illustrates four barn door type end panels associated with a pair of side panels, and locking panel means joined by fold lines to associated top and side panels.

FIG. 2 is a perspective view of a carton constructed from the blank of FIG. 1 after the latter has been set up with a portion broken away for clarity, and illustrates the manner in which the barn door type end panels are retained in locked position at the upper ends thereof by the locking panel means.

FIG. 3 is an enlarged sectional view taken generally along line 3-3 of FIG. 2, and illustrates overfolded locking panels at each corner of the carton for holding the bottoms of the end panels in normal relationship to the side panels.

FIG. 4 is an enlarged sectional view taken generally along line 4-4 of FIG. 2, and more clearly illustrates the upper and lower locking panels, as well as the manner in which inner and outer bottom panels are secured together by associated latching tabs and openings.

FIG. 5 is a fragmentary sectional view taken generally along line 5-5 of FIG. 4, and additionally illustrates one of the lowermost locking panels, as well as more clearly illustrating the folded condition of the uppermost one of the pair of the locking panels between the top panel and upper edges of the end panels.

Reference is made particularly to FIG. 1 of the drawings which illustrates a carton blank generally designated by the reference numeral 10 which, as viewed from left to right, includes an inner bottom panel 11, a first side panel 12, a top panel 13, another side panel 14 and an outer bottom panel 15.

The inner bottom panel 11 is defined between a fold line 16, an opposite parallel edge 17, and a pair of transverse edges 20, 21. A fold line 22 is provided between the edge 17 and the fold line 16 to allow the bottom panel 11 to be positioned toward and into its closed position more readily, as will be understood more fully hereinafter. The inner bottom panel 11 additionally includes a plurality of identical openings 23 for partially receiving bottom portions of articles A in a conventional manner, as is readily apparent from FIGS. 4 and 5. Additionally, the inner bottom panel 11 includes a plurality of latch-receiving apertures 24 which also function in a conventional manner to interlock the inner panel 11 with the outer bottom panel 15 in a conventional manner.

Referring to the outer bottom panel 15, the same is defined by a transverse fold line 25, and a regular transverse edge 26

interrupted by three identical latching tabs 27, each of which is in alignment with an oppositely directed latching tab 28 and the apertures 24 of the bottom panel 11, and a pair of transverse edges 30, 31. The latching tabs 28 are spaced from each other by fold lines 32, which facilitate the folding of a portion 33 of the bottom panel 15 incident to the latching engagement of the tabs 27, 28 with the apertures 24. The fold line 34 likewise facilitates the movement of the outer bottom panel 15 to its closed position during the setting-up of the blank 10. Apertures 35 are likewise formed in the outer bottom panel 15 adjacent the fold line 25 for receiving the bottoms of the articles A, in much the same manner as the apertures 23 of the inner bottom panel 11.

The side panel 12 is defined by the fold line 16, a pair of parallel fold lines 36, 37, merging with respect to edges 40, 41 and respective short angular fold lines 42, 43 merging at a fold line 44 adjacent the top panel 13 which is interrupted by a plurality of identical crescent-shaped openings 45. It will be noted that the fold lines 36, 37 include extensions 46, 47 which intersect the fold line 16 and terminate adjacent the ends of the fold line 22. Likewise, the fold line 16 includes extensions 48, 49 defining an angle of approximately 90° with respective extensions 46, 47 of the respective fold lines 36, 37.

The fold lines 46, 48 set off holding or locking means 50 which are identical to locking means 51 set off by the fold lines 47, 49. The locking means 50, 51 are identical and each includes a locking panel defined by a pair of locking portions 52, 53, and 54, 55, separated by respective fold lines 56, 57. The fold lines 56, 57 define an angle of approximately 45° between the fold lines 46, 48 and 47, 49, and merge therewith at their points of intersection. As will be described more fully hereinafter, the locking panels 50, 51 are foldable to a position which retains a pair of barn door end panels 60, 61 in a closed position generally normal to the side panel 12 and the bottom panel 11.

The end panel 60 is of a generally rectangular configuration and is defined by the fold lines 36, 48, an opposite transverse edge 62, and longitudinal edges 63, 64.

Likewise, the barn door end panel 61 is defined by the fold lines 37, 49, a transverse edge 65, and opposite longitudinal edges 66, 67.

At the opposite side of the carton blank 10 the side panel 14 is similarly set off by the fold line 25, a pair of fold lines 70, 71, adjacent edges 72, 73 and angular fold lines 74, 75 merging with a fold line 76 which is interrupted by a plurality of identical crescent-shaped openings 77. As in the case of the fold lines 36, 37, the fold lines 70, 71 likewise include respective extensions 80, 81 projecting into the bottom panel 15 while the fold line 25 includes respective extensions 82, 83. The extensions 80, 82 define holding or locking means in the form of a locking panel defined by a pair of locking portions 84, 85 set off by a fold line 86 disposed at an angle of approximately 45° to the fold lines 80, 82. The latter noted structure defines locking means designated by the reference numeral 87 which is opposite to the locking means 50 in the set-up state of the carton, as will be described more fully hereinafter, to maintain another barn door end panel 88 in a position normal to the panels 14, 15.

Locking means in the form of another locking panel generally designated by the reference numeral 90 is set off between the fold lines 81, 83 and is defined by a pair of locking portions 91, 92 divided by a fold line 93 which bisects the angle between the normal fold line extensions 81, 83. Likewise, the function of the locking panel 90 is to maintain a barn door end panel 95 disposed normal to the panels 14, 15.

The end panel 88 is set off by the fold lines 82, 70, an opposite longitudinal edge 96, another opposite longitudinal edge 97, and a transverse edge 98.

The end panel 95 is defined by the fold lines 71, 83, a pair of generally opposite longitudinal edges 100, 101, and a transverse edge 102.

The top panel 13 is defined by the interrupted fold lines 44, 76 and the associated crescent-shaped openings 45, 77, and a

pair of longitudinal generally parallel fold lines 104, 105. A pair of arcuate cut lines 106, 107 and fold lines 108, 110 associated therewith provide a pair of finger-receiving openings for carrying the carton in a conventional manner.

Means generally designated by the reference numerals 112, 113 are provided at opposite ends of the top panel 13 for maintaining terminal ends (unnumbered) of the panels 60, 88 and 61, 95, respectively, inboard of the carton body 10, as is best illustrated in FIGS. 1, 4 and 5. The locking means 112 is in the form of a locking flap or panel defined by the fold lines 42, 74 and 104, along with an edge 114 joined to the respective edges 40, 72, by angular edges 115, 116, thereby defining a generally rectangular central locking flap or panel portion 117, and generally triangular outboard locking flap or panel portions 118, 119.

Likewise, the locking means 113 is defined by the fold lines 43, 75, 105, and associated edges 120, 121 and 122. The locking means 113 is thus defined by a generally rectangular central locking flap or panel portion 123 and outboard generally triangular locking flap or panel portions 124, 125.

Reference is now made particularly to FIGS. 2 through 5 of the drawings which illustrate the manner in which the carton 10 is set up to form the carton or carrier 10 whose ends are closed by the end panels 60, 61 and 88, 95. Though the carton blank 10 is set up by machinery in the manner which has nothing to do with the present invention, the following description is that of merely manually assembling the carton 10 and a plurality (six) of articles A internally thereof.

The six articles are supported in a conventional manner with caps C thereof beneath the tabs (unnumbered) defined by the crescent-shaped openings 45 and 77. Thereafter the side walls 12, 14 are folded downwardly to bring the side panels 12, 14 into generally normal relationship to the top panel 13.

The end panels 60, 61 are then folded inwardly toward a position normal to the fold lines 36, 37 during which time the inner bottom panel 11 is folded toward a position normal to the side panel 12. During this folding the panel 53 of the locking panel 50 is folded into overlying relationship to the locking panel portion 52 while the locking panel portion 54 is likewise folded into sandwiched relationship between the locking panel portion 55 and the bottom panel 11. At this point the panels 60, 61 are normal to the panels 11, 12 with the locking panel portions 52, 54 being sandwiched between the locking panel portions 53, 55, respectively, and the bottom panel 11.

Thereafter the end panels 88, 95 are likewise folded in an identical manner, as is the bottom panel 15 whereupon the locking panel portions 85, 92 are folded inwardly into sandwiched relationship between the respective panels 84, 91 and the bottom panel 15. During this folding operation the latching tabs 27, 28 are united with the latching apertures 24 to complete the assembly of the carton, including the locking of the end panels at the lower portions thereof, though it is to be understood at this time that the uppermost ends (unnumbered) of the end panels 60, 61, 88 and 95 are not yet captivated or held immobile. This is accomplished by merely folding downwardly the rectangular panel portions 117, 123 until the latter are substantially normal to the top panel 13 which brings the triangular panels 115, 116 and 124, 125 into inwardly directed relationship, as is best illustrated in FIG. 2, thus completing the setting-up of the carton and its contents.

Modification of the blank or carton 10 will be apparent to those skilled in the art, and such modifications are considered in keeping with the present disclosure. For example, the locking flaps 50, 51, 87 and 90 may be omitted if it is found that the locking flaps 112, 113 are sufficient to maintain the "barn door" end panels 60, 61, 88 and 95 properly positioned generally normal to the side panels 12, 14. Likewise, the locking means 112, 113 may be omitted if the lower locking means 50, 51, 87 and 90 are sufficient to maintain the end panels 60, 61, 88 and 95 normal to the side panels 12, 14. However, in the preferred embodiment of the invention the cartons constructed as illustrated in FIG. 1, although in keeping with a further modification, the scrap material created by forming the edges 40, 64, 41, 66, 72, 97 and 73, 100 may be eliminated simply by not cutting the latter noted edges which would result in end panels 60, 61, 88 and 95 of almost a perfect rectangular configuration. However, by removing the latter noted material the edges 64, 66, 97 and 100 permit the end panels to be more readily folded inwardly while the side panels 12, 14 can bend toward an upwardly converging position, as is best illustrated in FIG. 2, to more readily contour to the configuration of the articles A within the carton 10.

While preferred forms and arrangements of parts have been shown in illustrating the invention, it is to be clearly understood that various changes in details and arrangement of parts may be made without departing from the spirit and scope of this disclosure.

I claim:

1. A carton comprising a generally tubular body including a top panel joined to a pair of side panels by first and second longitudinal fold lines, a pair of end panels at one axial end of said body substantially closing the same, first and second ones of said end panels being joined to first and second ones of said side panels by respective first and second vertical fold lines, said end panels having free upper terminal ends, and means holding said ends disposed inboard of said body to maintain at least portions of said end panels normal to said side walls, said holding means including a central locking panel portion joined by a first transverse fold line to said top panel and a pair of locking panel portions outboard thereof, one outboard locking panel portion being joined between said top panel and each of said first and second side panels by a pair of angularly disposed fold lines, said central locking panel portion being folded downwardly about said first transverse fold line into overlying relationship to said terminal end panel ends, and said outboard locking panels being folded inwardly of said body in generally side-by-side relationship to adjacent ones of said side panels for maintaining said central locking panel portion in its overlying position whereby said end panels are precluded from moving outward of said body.

2. The carton as defined in claim 1 wherein said central locking panel portion is of a generally rectangular configuration and said outboard locking panel portions are of a triangular configuration.

3. The carton as defined in claim 2 wherein each side panel has a free edge coincident with each of said vertical fold lines, and each end panel has an edge in upward diverging relationship with said free edge.

4. The carton as defined in claim 1 wherein each side panel has a free edge coincident with each of said vertical fold lines, and each end panel has an edge in upward diverging relationship with said free edge.

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