United States Patent

Stone

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[54] **END STRUCTURE FOR SHADOW BOX DISPLAY CARTON**

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[21] Appl. No.: **84,425**

[52] **U.S. Cl.**.....**206/45.14,** 206/45.19

[51] **Int. Cl.** **B65d 5/50**

[58] **Field of Search**.....206/45.14, 45.19, 45.31, 79, 206/46 FR; 229/16 D, 14 C, 39 B

[56] **References Cited**

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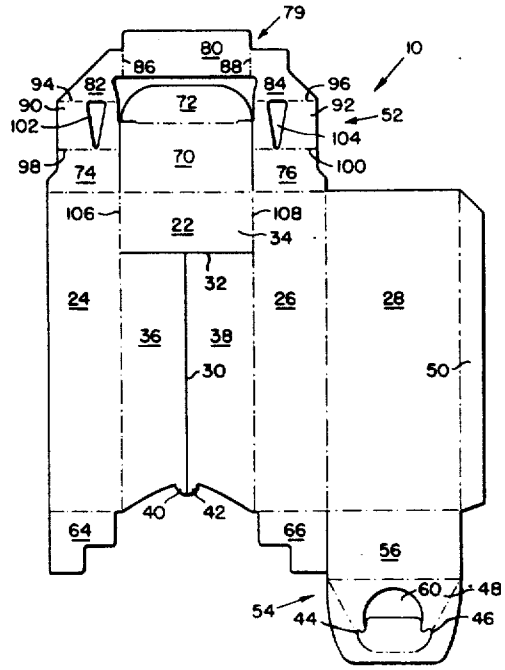
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Assistant Examiner—Steven E. Lipman
Attorney—Schovee & Boston

[57] **ABSTRACT**

An improved upper end construction for a shadow box display carton, comprising a sliding sling structure hingedly interconnected between a pair of upper end dust flaps and including a sling panel positioned in a plane parallel to the longitudinal axis of the carton. The sliding sling structure also includes a pair of article-supporting, wedge panels hingedly connected between the sling panel and the dust flaps, and angularly positioned in the upper end of the carton. The sling panel cooperates with ledges or slots in the wedge panels to support one end of the article received in the carton.

29 Claims, 10 Drawing Figures



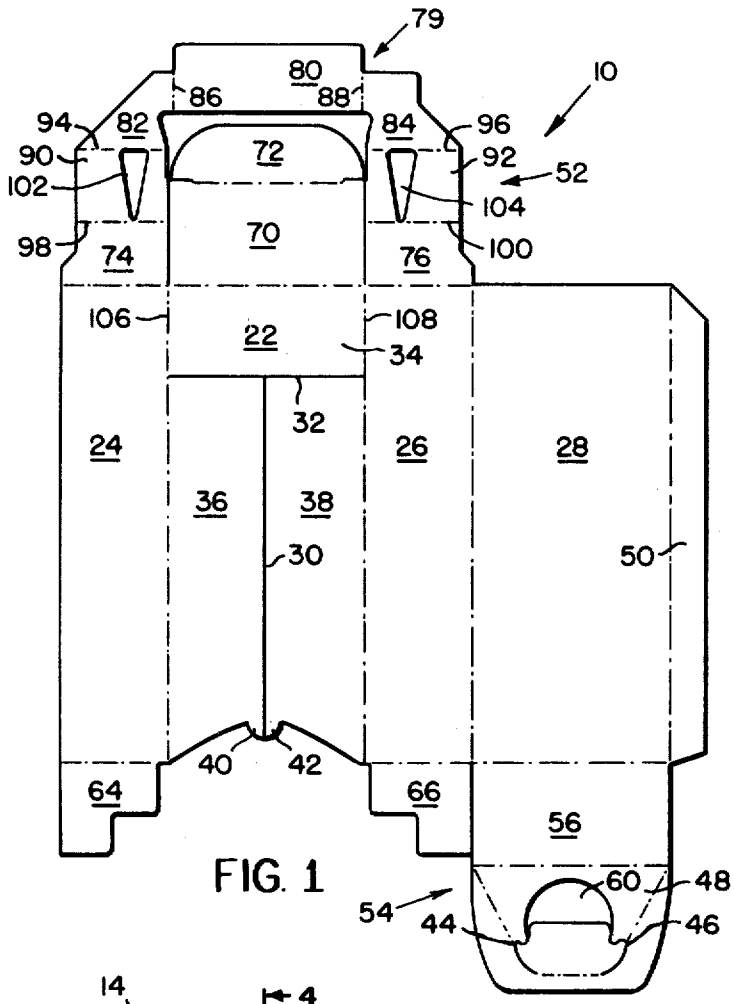


FIG. 1

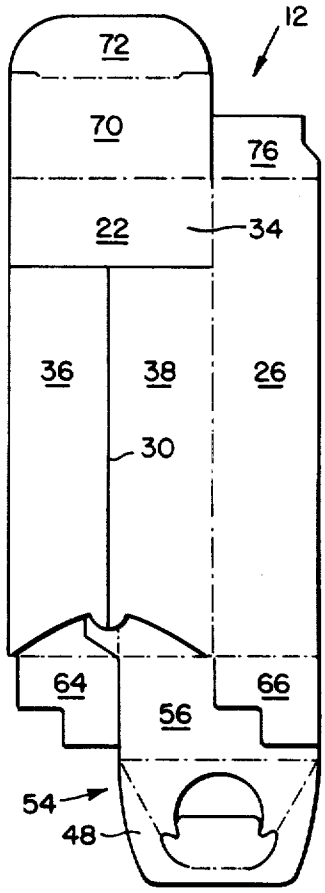


FIG. 2

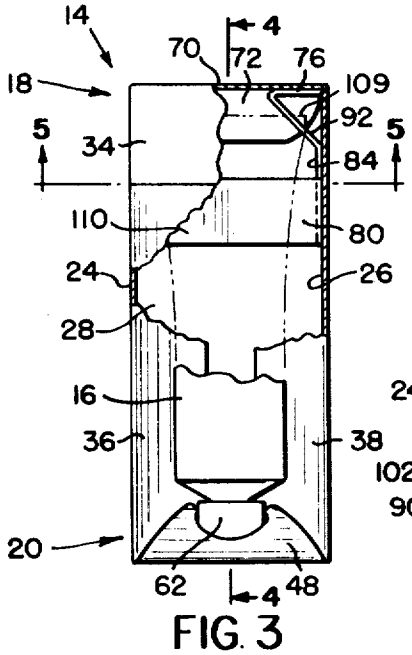


FIG. 3

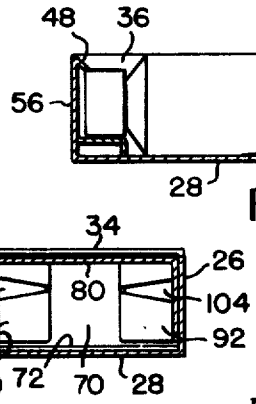


FIG. 5

FIG. 4

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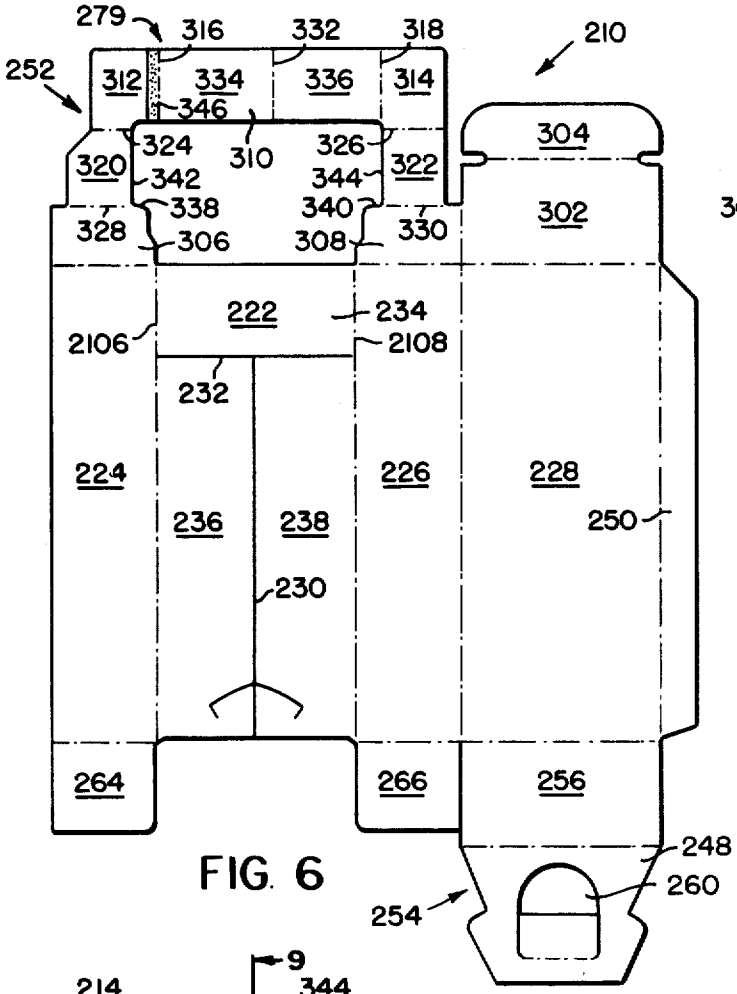


FIG. 6

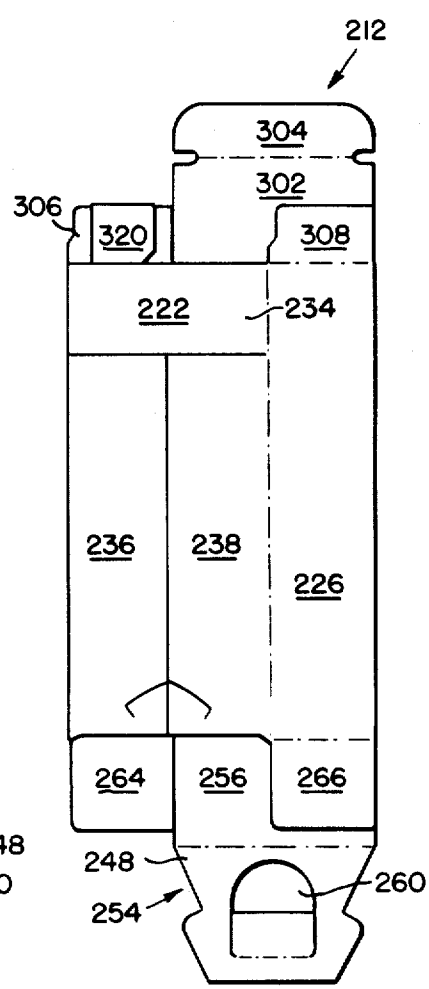


FIG. 7

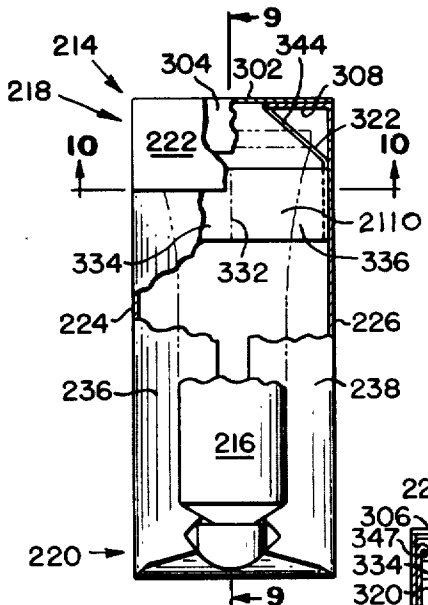


FIG. 8

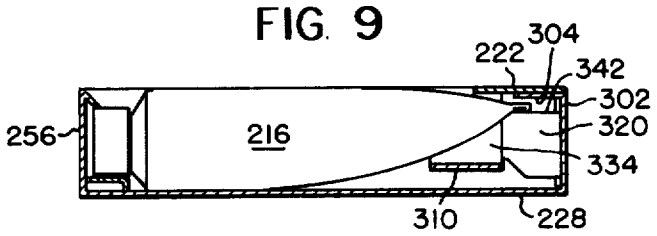


FIG. 9

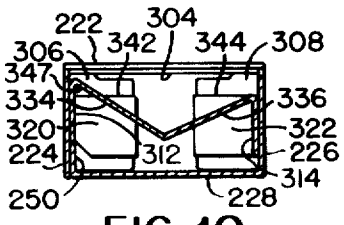


FIG. 10

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END STRUCTURE FOR SHADOW BOX DISPLAY CARTON

BACKGROUND OF THE INVENTION

This invention relates to shadow box display cartons and in particular to an improved end structure for supporting one end of an article displayed within the carton.

Known types of end structures for shadow box display cartons are disclosed in my U.S. Pat. Nos. 3,379,305, 3,378,137 and 3,419,133.

It is an object of the present invention to provide an improved end structure for a shadow box display carton.

It is another object of the present invention to provide a sliding sling structure hingedly interconnecting a pair of upper end dust flaps, and including a sling panel positioned in a plane parallel to the longitudinal axis of the carton and article-supporting wedge panels.

It is another object of the invention to provide a carton having a sling panel positioned such that the front surface of the sling panel supports an article in the carton.

SUMMARY OF THE INVENTION

Two different end structure embodiments are disclosed, each of which employs a sliding sling panel positioned in one or more planes parallel to the longitudinal axis of the carton. The sliding sling panel is connected to the upper end dust flaps by intermediate wedge panels. Movement of the dust flaps to their closed position causes the sliding sling panel to slide toward the lower end of the carton and causes the wedge flaps to be positioned in a predetermined location. The sling panels preferably cooperate with ledges or slots in the wedge panels to support the article in the carton. In a first embodiment, the sling panel has a length equal to that of the width of the carton and the sling panel exerts an upward biasing force to clamp the article between the sling panel and the top wall of the carton. In a second embodiment the sling panel is longer than the width of the carton and includes a fold line parallel to the longitudinal axis of the carton such that it is formed in the shape of a "V" for supporting the article without any upward biasing force.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be more fully understood by reference to the following detailed description thereof, when read in conjunction with the attached drawings, wherein like reference numerals refer to like elements, and wherein:

FIG. 1 is a top planar view of a carton blank of a first embodiment of the present invention;

FIG. 2 is a top planar view of a carton tube made from the carton of FIG. 1 and folded flat;

FIG. 3 is a top planar view, partially broken away, of a fully erected carton formed from the carton tube of FIG. 2;

FIG. 4 is a cross-sectional side view through the carton of FIG. 3 along the line 4—4;

FIG. 5 is a cross-sectional end view through the carton of FIG. 3 along line 5—5 thereof, showing the end structure of the carton prior to insertion of the article 16;

FIG. 6 is a top planar view of a carton blank of a second embodiment of the present invention;

FIG. 7 is a top planar view of a carton tube made from the carton blank of FIG. 6 and folded flat;

FIG. 8 is a top planar view, partially broken away, of a fully erected carton formed from the carton tube of FIG. 7;

FIG. 9 is a vertical cross-sectional view through the carton of FIG. 8 along the line 9—9; and

FIG. 10 is a cross-sectional end view through the carton of FIG. 8 along line 10—10 thereof, showing the end structure of the carton prior to insertion of the article 216.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

With reference to the drawings, FIGS. 1–5 show a first embodiment of the present invention. FIG. 1 shows a carton blank 10 which can be formed into a carton tube 12 (see FIG. 2) that can be erected automatically to form a shadow box display carton 14 (see FIGS. 3–5) for receiving and displaying therein an article 16. The carton 14 includes an upper end 18 and a lower end 20.

Referring now in detail to FIG. 1, the carton blank 10 includes four serially connected walls including a top wall 22 hingedly connected at opposite sides thereof to sidewalls 24 and 26 and a bottom wall 28 hingedly connected to the sidewall 26. The top wall 22 is divided by a central longitudinal slit 30 and a horizontal slit 32 into a flat upper wall panel 34 and a pair of shadow panels 36 and 38. The shadow panels 36 and 38 include locking tabs 40 and 42, respectively, for hooking into a pair of slots 44 and 46 in a tuck panel 48, as shown in FIG. 3, when the carton 14 is erected.

The carton blank 10 further includes a glue flap 50 hingedly connected to the bottom wall 28. A surface of the glue flap 50 (facing up in FIG. 1) is glued to the underside (as shown in FIG. 1) of the sidewall 24, to form the carton tube 12 of FIG. 2. The carton blank 10 also includes an upper end construction 52 and a lower end construction 54. The lower end construction 54 includes a lower end wall 56 hingedly connected to the bottom wall 28 and to the lower end wall tuck panel 48, having a hole 60 therein, into which hole 60 a cap 62 (see FIG. 3) of the article 16 projects. The lower end construction 54 also includes a pair of lower end dust flaps 64 and 66 hingedly connected to sidewalls 24 and 26 respectively.

Reference will now be made in detail to an upper end construction 52 of the present invention. The upper end construction 52 includes an upper end wall 70 hingedly connected to the top wall 22, and an upper end wall tuck flap 72 hingedly connected to the upper end wall 70. A pair of upper end dust flaps 74 and 76 are hingedly connected to the sidewalls 24 and 26, respectively.

According to the present invention, a sliding sling structure 79 is provided comprising a panel 80 hingedly connected to a pair of sling support panels 82 and 84 along hinge lines 86 and 88. The sling panels 82 and 84 are hingedly connected to a pair of wedge panels 90 and 92 along hinge lines 94 and 96. The wedge panels 90 and 92 in turn are hingedly connected to the upper end dust flaps 74 and 76 along hinge lines 98 and 100.

The wedge panels **90** and **92** each include a slot **102** and **104** therein respectively, for supporting an end of the article **16** received in the carton **14** as shown in FIG. **3**. The hinge lines **94, 96, 98** and **100** are all transverse to the longitudinal axis (which axis is parallel to slit **30**) of the carton blank **10** and of the carton **14**. The hinge lines **86** and **88** are parallel to the longitudinal axis of the carton blank **10** and are "in-line" with a pair of hinge lines **106** and **108** connecting the top wall **22** with the sidewalls **24** and **26**, respectively. The length of the sling panel **80** is thus equal to the width of the top wall **22** of the carton **14**.

FIG. **2** shows a carton tube **12** formed from the carton blank **10** and folded flat. The carton tube **12** is formed by folding the sliding sling structure **79** underneath the carton blank **10** along the hinge lines **98** and **100**, and by gluing the glue flap **50** to the sidewall **24**.

FIGS. **3–5** show the carton tube **12** fully erected into a carton **14** into which the article **16** is to be inserted. As the upper end dust flaps **74** and **76** are folded toward the lower end **20** of the carton **14**, the sling panel **80** is caused to slide toward the lower end **20** of the carton **14**, underneath and adjacent the top wall **22**. The sling panel **80** is positioned in the erect carton **14**, immediately adjacent the undersurface of the top wall **22**, and the sling support panels **82** and **84** are each positioned immediately adjacent the sidewalls **24** and **26**, respectively. The sliding action of the sling panel **80** continues until the upper end dust flaps **74** and **76** are positioned transverse to the longitudinal axis of the carton **14**. When the sliding action terminates, the wedge panels **90** and **92** are properly angularly positioned (as shown in FIG. **3**), in a predetermined location. This location is predetermined to properly position the slots **102** and **104** for receiving an end **109** of the article **16** received in the carton **14**. In the position occupied by the sling panel **80** in the erect carton **14**, a lower portion **110** of the sling panel **80** extends underneath the slit **32**.

In operation, the shadow panels **36** and **38** are forced downwardly as the article **16** is forced into the carton **14** such that the end **109** of the article **16** enters the slots **102** and **104**. The panels **36** and **38** contact the sling panel **80** and force it downwardly also. Since the sling panel **80** is only as long as the top wall **22** is wide, this downward force causes an upward biasing force on the article **16** received in the carton **14**. The end **109** of the article **16** is supported by both the sling panel **80** and the slots **102** and **104**.

Reference will now be made to FIGS. **6** thru **10** of the drawings showing a second embodiment of the present invention. FIG. **6** shows a carton blank **210** which is similar to the carton blank **10** of FIG. **1**. The elements of carton blank **210** that are the same or substantially the same as corresponding elements of the carton blank **10**, are referred to by the same reference numerals as used in FIGS. **1–5** except that they are preceded by a "2". The carton blank **210**, and a carton **214** erected from the blank **210**, differ from the embodiment shown in FIGS. **1–5** in the nature of the upper end construction **252** of the carton **214**. This description of the second embodiment of FIGS. **6–10** of the present invention therefore, need not go into detail concerning the parts of the carton blank **210** that are the same as corresponding parts of the carton blank **10** of the first embodiment of FIGS. **1–5**.

The upper end construction **252** of the carton blank **210** comprises an upper end wall **302** hingedly connected to a bottom wall **228** of the carton blank **210**. An upper end wall tuck flap **304** is hingedly connected to the upper end wall **302**. A pair of upper end dust flaps **306** and **308** are hingedly connected to a pair of sidewalls **224** and **226** of the carton blank **210**. The crux of the invention in the second embodiment shown in FIGS. **6–10** is in a sliding sling structure **279** comprising a sling panel **310** hingedly connected to a pair of sling support panels **312** and **314** along a pair of hinge lines **316** and **318**. The sling support panels **312** and **314** are hingedly connected to a pair of wedge panels **320** and **322** at hinge lines **324** and **326**. The wedge panels **320** and **322** are hingedly connected in turn to the upper end dust flaps **306** and **308** at hinge lines **328** and **330**. The hinge lines **316** and **318** are parallel to the longitudinal axis of the carton blank **210** as are the corresponding hinge lines **86** and **88** of the first embodiment of FIGS. **1–5**. However, as contrasted with the hinge line **88**, the hinge line **318** is not "in-line" with the hinge line **2108** connecting a top wall **222** with the sidewall **226**. As will be discussed in detail below, the hinge line **318** is about ⅜ inch to the right (as viewed in FIG. **6**) of the hinge line **2108**. By this construction, the sling panel **310** has a length greater than the width of the top wall **222**. The sling panel **310** includes a fold line **332**, dividing the sling panel **310** into a pair of article support panels **334** and **336**, the purpose of which will be described in more detail below. The hinge lines **324, 326, 328** and **330** are all transverse to the longitudinal axis of the carton **214**. Each of the wedge panels **320** and **322** includes a cutout portion **338** and **340**, respectively, whereby the wedge panels each include a top edge **342**, and **344**, respectively, which edges **342** and **344** support the article **216** in cooperation with the sling panel **310**, as will be described hereinbelow. Both of the edges **342** and **344** are, in the preferred embodiment, about ⅜ inch displaced from the hinge lines **2106** and **2108**, respectively. The hinge line **318** is preferably "in-line" with the edge **344** whereby the sling panel **310** is preferably about ⅜ inch longer than the top wall **222** is wide.

FIG. **7** shows a carton tube **212** formed from the carton blank **210** of FIG. **6** and folded flat. The carton tube **212** if formed by folding the sling structure **279** underneath the remaining portion of the carton blank **210** along the hinge lines **328** and **330**, and gluing a glue flap **250** to the sidewall **224**. In addition, a quantity of glue **347** (see FIG. **10**) is applied to the sling support panel **312** in the stippled area **346**. In this way, when the carton blank **210** is folded into the carton tube **212**, the sling support panel **312** is glued to the article support panel **334**. Then, when the carton **214** is "squared up", the sling panel **310** is forced to fold along the fold line **332** into a "V" shape (see FIG. **10**). While the glue is not essential to this operation of forming the sling panel **310** into a "V" shape, it is preferred. It is a noted that the "V" is lop-sided as shown in FIG. **10**. The panel **334** is adjacent to the top wall **222** and the panel **336** is located about ⅜ inch below the top wall **222**. The article support panel **334** is slightly longer than the panel **336**. This construction allows the carton tube

212 to fold flat. The V-shaped sling panel **310** provides easier entry of an article into the carton **214** than does the sling panel **80** in FIGS. **1–5**, and the V-shaped sling panel **310** does not exert an upward biasing force as does the sling panel **80** of FIGS. **1–5**.

FIGS. **8–10** show the carton **214** in its fully erected position. As with the first embodiment described above, when end dust flaps **306** and **308** are folded down into position forming the upper end **218** of the carton **214**, the downward folding action forces the sling panel **310** to slide toward the lower end **220** of the carton **214**. The sling panel **310** slides down and a lower portion **2110** extends below the slit **232** and underlies the two shadow panels **236** and **238**. The two wedge panels **320** and **322** are positioned at a predetermined location (and at a predetermined angle to the longitudinal axis of the carton **214**) by the sliding action of the sling panel **310**. The top edges **342** and **344** of the wedge panels **320** and **322** are positioned in a predetermined location for supporting an article **216** to be received in the carton **214**. When the carton **214** is erected, the sling panel **310** is caused to form a "V" shape with the apex being at the fold line **332**. The article support panels **334** and **336** cooperate with the top edges **342** and **344** of the wedge panels **320** and **322** to support the article **216**.

As will be seen from the above description of the invention, the present invention comprises a sliding sling construction including a sling panel and wedge panels, and which, upon erection of the carton causes the wedge panels to be positioned at a predetermined angular location for supporting, in cooperation with the sling panel itself, an end of the article to be received in the carton. In both embodiments, the sling panel itself is in a plane parallel to the longitudinal axis of the carton. The term "the longitudinal direction of said sling panel" is hereby defined to mean, throughout the present specification and claims, the direction of the sling panel from its edge adjacent the upper end **18** of the carton **14** (see FIG. **3** for example) to its other edge adjacent the lower end **20** of the carton **14** in the longitudinal direction of the carton **14**. That is, the line (such as the line to which numeral **80** points in FIG. **4**) formed by taking a side cross-section through the sling panel, is parallel to the top wall **22**. The direction of the sling panel transverse to the longitudinal direction of the carton may also be parallel to the top wall **22**, as in the embodiment of FIG. **1** before the article **16** is inserted, or it may not be parallel to the top wall **22** and may extend in several different planes, as in the embodiment of FIG. **6**. In the embodiment of FIGS. **1–5**, the sling panel **80** is also parallel to the top wall **22**, while this is not true in the erect carton **214** of the second embodiment of FIGS. **6–10**. The wedge panels can be either slotted or provided with a top edge for supporting the article. The sling panel can be used to properly locate article-supporting wedge panels in other than shadow box display cartons. The article can, alternatively, be supported by the sling panel or by the wedge panels, rather than by the cooperation of both.

The invention has been described in detail with particular reference to preferred embodiments thereof, but it will be understood that variations and modifications can be effected within the spirit and scope of the invention as described hereinabove, and as defined in the appended claims.

I claim:

1. In a carton for supporting an article, the improvement of an end structure, for supporting one end of said article, comprising:

a. a pair of separate dust flaps connected at one end of said carton to opposite sidewalls of said carton;

b. a sliding sling structure hingedly interconnecting said dust flaps; and

c. said sliding sling structure including a sling panel positioned underneath a top wall of said carton, the longitudinal direction of said sling panel being approximately parallel to said top wall, said sling panel including a surface thereof adjacent said top wall for supporting an article between said surface and said top wall.

2. The apparatus according to claim **1** wherein the longitudinal direction of said sling panel is parallel to said top wall of said carton.

3. The apparatus according to claim **2** wherein said sling panel has a length approximately equal to the width of said top wall.

4. The apparatus according to claim **3** wherein aid sliding sling structure includes a pair of sling panel support panels hingedly connected to opposite ends of said sling panel, each of said sling panel support panels being hingedly connected in turn to a pair of wedge panels, and said wedge panels being hingedly connected in turn to said dust flaps, whereby said sliding sling structure interconnects said dust flaps.

5. The apparatus according to claim **4** wherein the hinge lines connecting said sling panel and said sling panel support panels are parallel to the longitudinal axis of said carton, and wherein the hinge lines on both ends of each of said wedge panels are transverse to the longitudinal axis of said carton.

6. The apparatus according to claim **5** wherein said wedge panels are angularly positioned in said carton and are positioned in a plane normal to a bottom wall of said carton and at an angle to the longitudinal axis of said carton, and wherein said wedge panels include means for supporting said article.

7. The apparatus according to claim **6** wherein said support means comprises a slot in each of said wedge panels for receiving an end of said article.

8. The apparatus according to claim **1** wherein said sling panel has a length greater than the width of a top wall of said carton and wherein said sling panel has a fold line therethrough parallel to the longitudinal axis of said carton, such that said sling panel forms "V" shape in a plane normal to the longitudinal axis of said carton.

9. The apparatus according to claim **8** wherein said sliding sling structure includes a pair of sling panel support panels hingedly connected to opposite ends of said sling panel, each of said sling panel support panels being hingedly connected in turn to a pair of wedge panels, and said wedge panels being hingedly connected in turn to said dust flaps, whereby said sliding sling structure interconnects said dust flaps.

10. The apparatus according to claim **9** wherein the hinge lines connecting said sling panel and said sling panel support panels are parallel to the longitudinal axis of said carton, and wherein the hinge lines on both ends of each of said wedge panels are transverse to the longitudinal axis of said carton.

11. The apparatus according to claim 10 wherein said wedge panels are angularly positioned in said carton and are positioned in a plane normal to a bottom wall of said carton and at an angle to the longitudinal axis of said carton, and wherein said wedge panels include means for supporting said article.

12. The apparatus according to claim 11 wherein said support means comprises a top edge of each of said wedge panels, said top edges being positioned a predetermined distance below said top wall.

13. The apparatus according to claim 1 wherein said sliding sling structure includes a pair of wedge panels hingedly connected between said sling panel and said dust flaps, and wherein said wedge panels are angularly positioned in said carton and are positioned in a plane normal to a bottom wall of said carton and at an angle to the longitudinal axis of said carton, and wherein said wedge panels include means for supporting said article, and wherein said sling panel cooperates with said support means for supporting an article within said carton.

14. The apparatus according to claim 1, including an article positioned in said carton and supported by said sling between said sling and a top wall of said carton.

15. In a shadow box display carton for an article, including a plurality of serially connected walls including a top wall having a pair of shadow panels, a bottom wall, and a pair of sidewalls, the improvement of an end structure for one end of said carton comprising:

a. an end wall connected to one of said top wall and bottom wall;

b. an end wall tuck flap hingedly connected to said end wall;

c. a pair of separate dust flaps, each hingedly connected to one of said sidewalls; and

d. a sliding sling structure hingedly interconnected between said pair of dust flaps, and including a sling panel positioned underneath a top wall of said carton, the longitudinal direction of said sling panel being approximately parallel to said top wall, said sling panel including a surface thereof adjacent said top wall for supporting an article between said surface and said top wall.

16. The apparatus according to claim 15 wherein said sliding sling structure includes said sling panel hingedly connected at opposite ends thereof to a pair of sling panel support panels, each of said sling panel support panels being hingedly connected in turn to a pair of wedge panels, and said wedge panels being hingedly connected in turn to said dust flaps.

17. The apparatus according to claim 16 wherein the hinge lines between said sling panel and sling panel support panels are parallel to the longitudinal axis of said carton and wherein the hinge lines on both ends of each of said wedge panels are normal to the longitudinal axis of said carton.

18. The apparatus according to claim 17 wherein said wedge panels are angularly positioned in said carton and are positioned in a plane normal to a bottom wall of said carton and at an angle to the longitudinal axis of said carton, and wherein said wedge panels include means for supporting said article.

19. The apparatus according to claim 18 wherein said support means comprises a slot in each of said wedge panels for receiving an end of said article.

20. The apparatus according to claim 18 wherein said support means comprises each of said wedge panels having a cutout portion on the top thereof defining a support edge for supporting said article.

21. The apparatus according to claim 18 wherein said sling panel cooperates with said support means for supporting said article between said top wall and said sling panel.

22. The apparatus according to claim 21 wherein said sling panel has a length approximately equal to the width of said top wall and exerts an upward biasing force on said article toward said top wall.

23. The apparatus according to claim 18 wherein said sling panel has a length greater than the width of said top wall and includes a fold line approximately centrally located with respect to the width of said carton, said fold line being substantially parallel to the longitudinal axis of the carton, said sling panel forming a "V" in a plane normal to the longitudinal axis of the carton.

24. The apparatus according to claim 23 wherein said sling panel fold line divides said sling panel into first and second portions forming the two legs of said "V" shape, and wherein said first portion is longer than said second portion and wherein said first portion is hingedly connected to a sling panel support panel adjacent said top wall of said carton and said second portion is hingedly connected to a sling panel support panel spaced a predetermined distance below said top wall.

25. The apparatus according to claim 24, including a quantity of glue positioned on both sides of the hinge line connecting said first portion to the sling panel support panel connected thereto and said quantity of glue being positioned on the opposite surface of said sliding sling structure from said top wall.

26. The apparatus according to claim 15 including an article positioned in said carton and supported by said sling panel between said sling panel and a top wall of said carton.

27. A carton blank comprising:

a. a plurality of serially connected walls including a top wall hingedly connected at each side thereof to a sidewall, and a bottom wall hingedly connected to one of said sidewalls;

b. an upper end wall hingedly connected to one of said top wall and said bottom wall, and an upper end wall tuck flap hingedly connected to said upper end wall;

c. a lower end wall hingedly connected to said bottom wall and a lower end wall tuck flap hingedly connected to said lower end wall;

d. a pair of lower end dust flaps, each hingedly connected to one of said sidewalls;

e. a pair of upper end dust flaps, each hingedly connected to one of said sidewalls; and

f. a sliding sling structure hingedly interconnecting said upper end dust flaps, said sliding sling structure including a sling panel hingedly connected at opposite ends thereof to a pair of sling panel support panels, each of said sling panel support panels being hingedly connected in turn to a pair of wedge panels, said wedge panels being hingedly connected in turn to said dust flaps; the hinge lines between said sling panel and sling panel support

panels being parallel to the longitudinal axis of said carton blank and the hinge lines on both ends of each of said wedge panels being normal to the longitudinal axis of said carton blank.

28. The apparatus according to claim 27 wherein said sling panel has a length approximately equal to the width of said top wall.

29. The apparatus according to claim 27 wherein said sling panel has a length greater than the width of said top wall and includes a fold line therein parallel to the longitudinal axis of said carton blank.

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