May 10, 1955 W. H. INMAN 2,708,065

COLLAPSIBLE CARTON

Filed Aug. 25, 1952 3 Sheets-Sheet 1

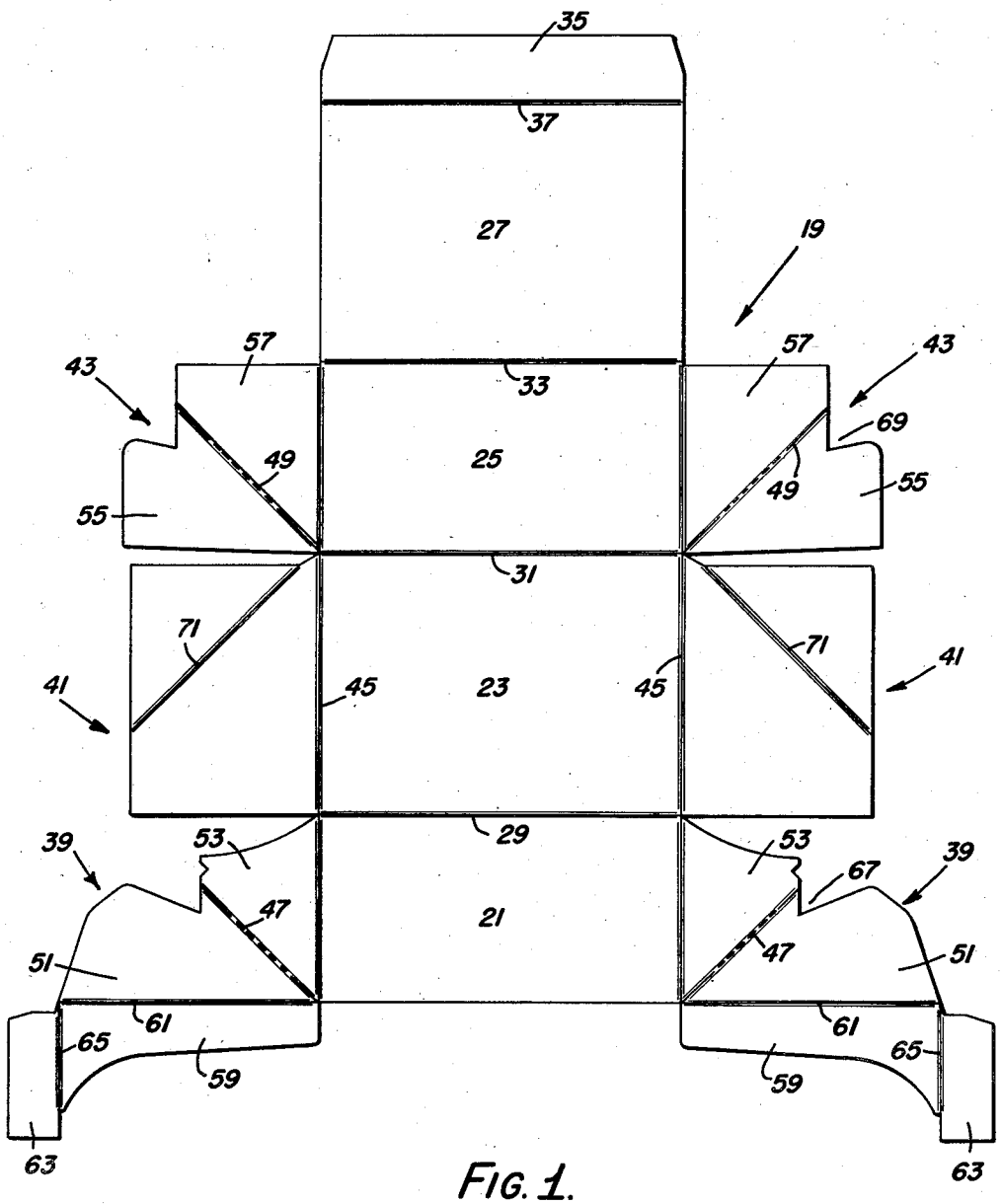



FIG. 1.

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COLLAPSIBLE CARTON

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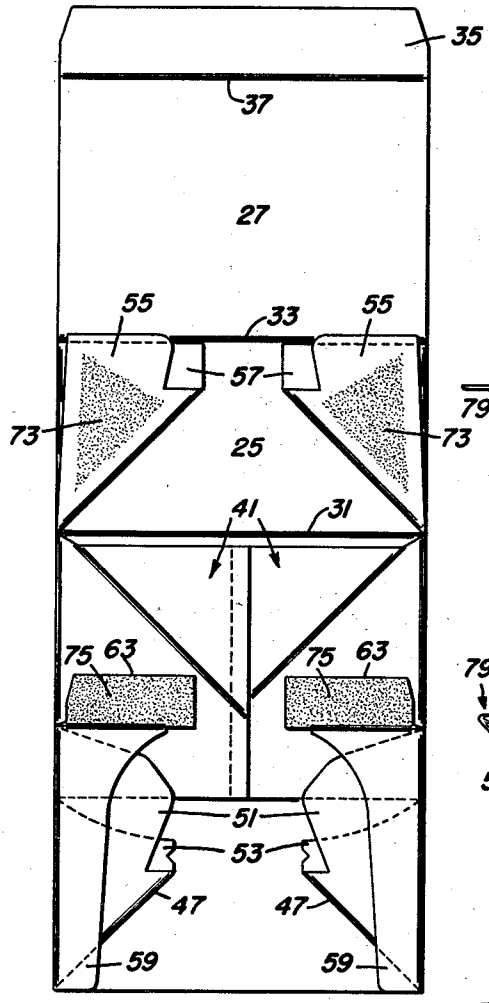



FIG. 2.

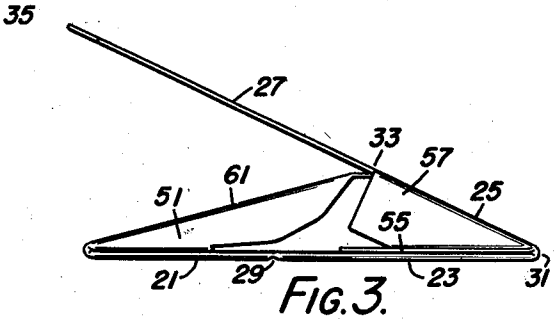



FIG. 3.

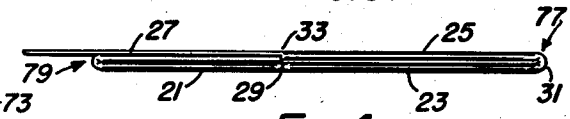



FIG. 4.

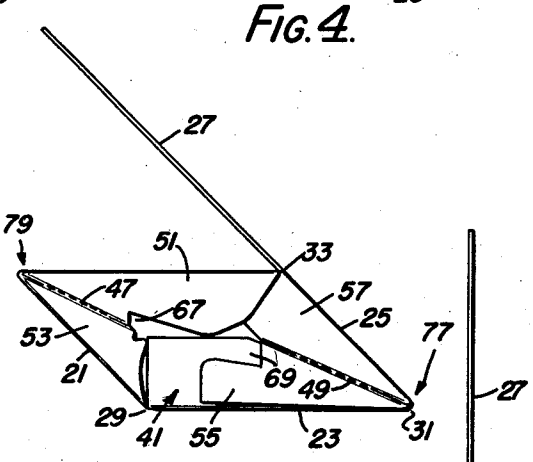



FIG. 5.

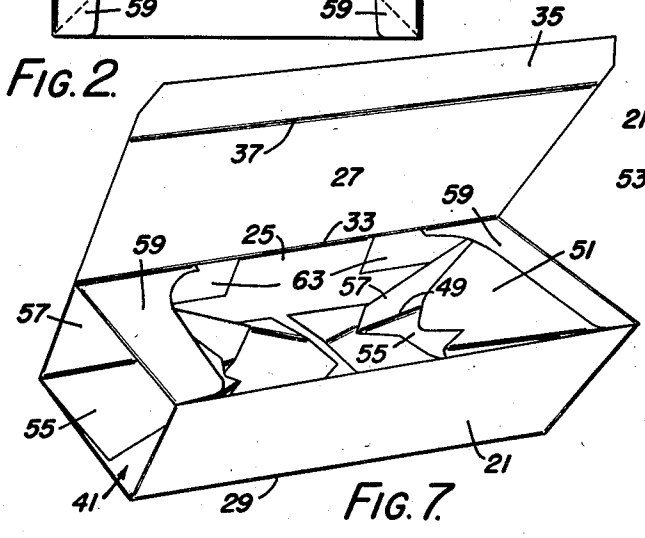



FIG. 7.

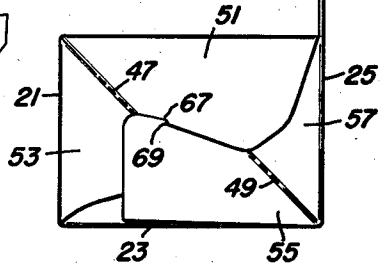



FIG. 6.

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COLLAPSIBLE CARTON

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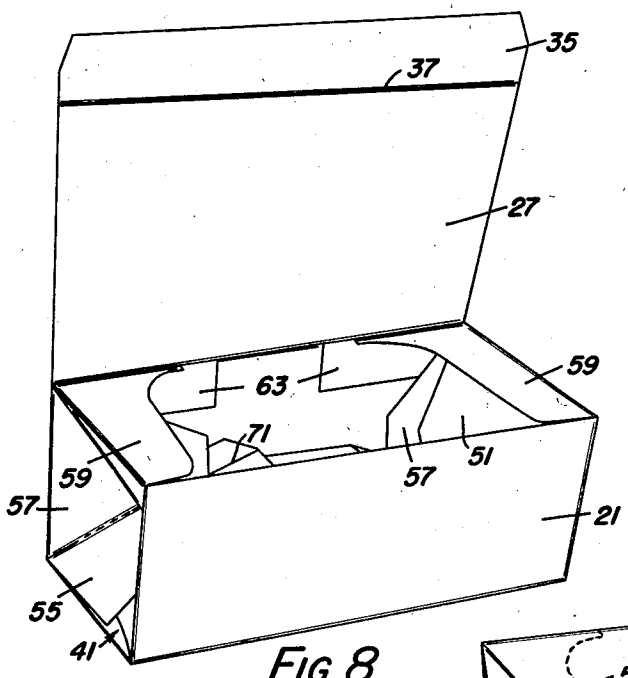



FIG. 8.

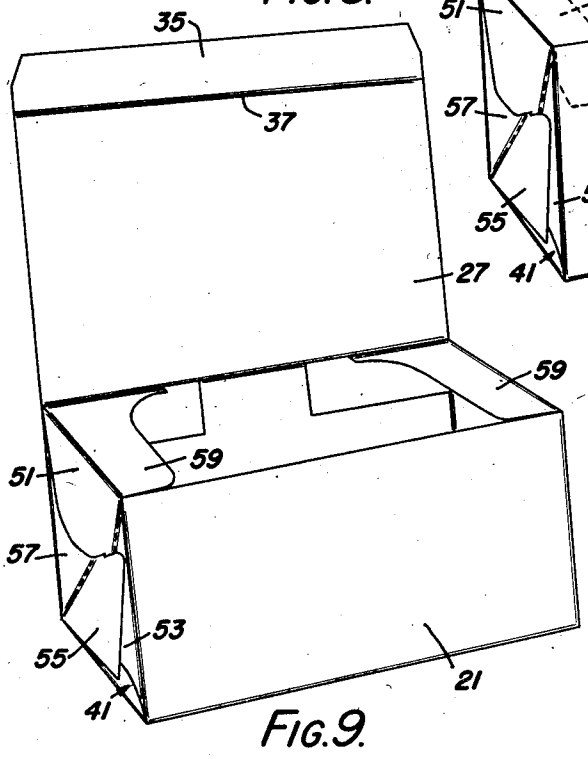



FIG. 9.

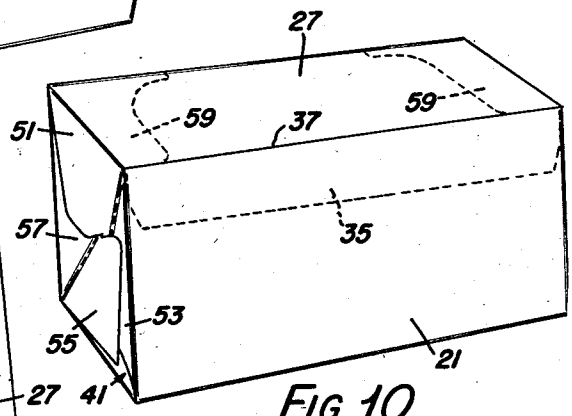



FIG. 10.

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United States Patent Office

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2,708,065

# COLLAPSIBLE CARTON

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Application August 25, 1952, Serial No. 306,128

6 Claims. (Cl. 229—33)

This invention relates to cartons and trays, and more particularly to collapsible cardboard cartons and trays of the variety used for packaging fruits and vegetables and the like, one object being to provide an improved carton of the above character having a simpler and more economical construction.

Another object is to provide a carton of the above character capable of being readily collapsed to flat condition for shipping and storage, and quickly erected for filling.

Another object is to provide a carton of the above character which may be readily swung from its flat condition to erected position by merely applying pressure at its opposite corners.

Still another object is to provide a carton having the above advantages and including self-erecting end closures which are completely folded and glued by the manufacturer and which automatically swing to erected position closing the ends of the carton as the carton is erected.

Still a further object is to afford a carton having the above advantages in a form capable of being readily manufactured in quantity lots, by known machines and at relatively low cost.

To these and other ends the invention resides in certain improvements and combinations of parts, all as will be hereinafter more fully described, the novel features being pointed out in the claims at the end of the specification.

In the drawings:

Fig. 1 is a plan view of a cardboard blank for forming the carton;

Fig. 2 is a similar view with end-closure flap portions folded over and glue applied;

Fig. 3 is an edge view of the blank as seen from the right in Fig. 2, but with the outer wall portions partly folded over toward glued positions;

Fig. 4 is a view similar to Fig. 3, but with the parts glued together and the carton in collapsed position;

Figs. 5 and 6 are end elevations of the carton in progressive positions of erection for filling;

Figs. 7 and 8 are perspective views of the carton in progressive positions of erection for filling;

Fig. 9 is a perspective view of the carton fully erected with the cover in open position, and

Fig. 10 is a view similar to Fig. 9, but showing the cover in closed position.

The preferred embodiment of the present invention, herein disclosed by way of illustration, is preferably made of a one-piece cardboard blank such as shown generally at **19** in Fig. 1 of the drawings, cut and scored to form a plurality of side walls **21**, **23**, **25** and a closure wall **27**, respectively, separated by parallel scored fold lines **29**, **31** and **33**, as shown. Closure wall **27** carries a securing strip **35** foldably connected therewith along a scored fold line **37** and adapted to be folded over for detachably closing the carton when the same is erected, as hereafter described.

Walls **21**, **23** and **25**, inclusive, which may be designated as front, bottom, and back walls, respectively, are



provided at each end thereof with a series of end-closure flaps shown generally at **39**, **41** and **43**, respectively, which are foldably connected therewith along parallel score lines **45**. Flaps **39** and **43** are provided with diagonally-extending score lines **47** and **49**, respectively, which separate each of said flaps into two sections as **51** and **53** and **55** and **57**, respectively, as shown in Fig. 1, so that each flap may be folded on itself and rolded over the respective side wall on which it is foldably connected, as hereafter further described.

Flaps **39** each carry a relatively narrow flange **59** foldably connected therewith along a score line **61**. Flanges **59** each have a narrow flange **63** foldably connected therewith along a fold line **65** which extends at substantially right angles to fold line **61** as shown in Fig. 1.

The outer free edges of flaps **39** and **43** have the irregular shape shown in the drawings, including notches **67** and **69**, respectively, for engagement with each other in the erected position as hereafter described. Flaps **41** which are foldably connected to side wall **23** are substantially rectangular, as shown, and are substantially of the same size and shape as the inside of the ends of the carton when in erected position, so as to completely cover the same, as hereafter described. Flaps **41** are each crossed with a diagonally-extending fold line **71** (Fig. 1) to enable them to bend more flexibly while in contact with back wall **25** during the erection of the carton as hereafter described.

In the folding and gluing of the blank, as shown in Fig. 2, flaps **41** are folded over side wall **23**, end-closure flaps **39** are folded on themselves and folded inwardly over wall **21** and flaps **41**, and flanges **59** and **63** are folded inwardly over the folded flaps **39** and **41** as shown. Flaps **43** are folded on themselves and over wall **25** as shown in Fig. 2. In this position of the parts glue is applied to a restricted area **73** of flaps **43** and to substantially the entire upper surface of flanges **63** as at **75**, as shown in Fig. 2.

In the further folding and gluing of the blank, rear wall **25** with the inwardly-folded flaps **43**, and closure wall **27**, are folded over bottom wall **23** and front wall **21**, about score line **31**, as shown in Fig. 3, flaps **39** being folded inwardly as shown in Fig. 2. Flanges **59** are raised slightly and flanges **63** inserted between the inner surface of back wall **25** and flap portions **57** as shown in Fig. 3. This brings the glued portions **75** of flanges **63** into glued cohesion with the inner surface of wall **25** and brings the glued areas **73** of flap portions **55** into glued cohesion with flaps **41** thereby completing the folding and gluing of the carton in the compact collapsed position shown in Fig. 4 and readying the carton for storage and shipment.

When it is desired to erect the carton for filling, this is quickly accomplished by an inward pressure against the opposite folded edges shown generally at **77** and **79** in Fig. 4, which serves to separate and distend the side walls in the progressive manner shown in Figs. 5 and 6, as viewed from the end of the container and in Figs. 7 and 8 as viewed from the top of the container.

The separation of rear wall **25** from side wall **23** tends to pull the inwardly-folded flaps **43** and inner end flaps **41** to erected position, and through flanges **63** and **59** pulls inwardly-folded flaps **39** toward erected position. In such movement a portion of the edge of flap **43** rides under a portion of the edge of flap **39**, as shown in Fig. 5, with the result that the opposing edges move along one another in crossing relation and are finally interengaged in notches **67** and **69**, as shown in Fig. 6. Such an arrangement tends to limit the erecting movement with these inwardly-folded flaps in a position normal to the walls of the carton. The erecting movement is further limited by the engagement of inner-end flaps **41** with the inside of

flaps 39. The end flaps are quickly snapped to such erected position by merely pressing on the opposite corners 77 and 79 of the carton, as stated, leaving closure flaps 27 and 35 in open position to receive the contents.

The carton, resting on bottom wall 23, is then filled and closure flap 27 folded down across the top of the carton and flap 35 is folded along line 37 at substantially right angles to flap 27 and is inserted between the free ends of flanges 59 and the inner surface of front wall 21 as shown in Fig. 10. There is sufficient friction between flanges 59 and front wall 21 so as to securely hold the cover in closed position, but if desired a sealing tape or paper label may be placed on cover 27 and front wall 21, for sealing the same, as well understood in the art. In addition, flange 35 may be adhesively secured to the outer surface of front 21 instead of being inserted inside thereof. In either case, the carton is opened by breaking the detachable connection between the cover and front of the carton.

If desired, closure flaps 27 and 35 may be omitted and the open top of the carton covered with cellophane or other suitable material, or left open as in the case of fresh fruits and the like. Regardless of the omission of cover flaps 27 and 35, the carton is folded and glued in the same manner as before and will readily assume the position shown in Fig. 4 thereby requiring minimum shipping and storage space. The carton or tray is again set up in the same manner by inward pressure at corners 77 and 79 and, after filling, may be covered with a suitable cellophane or plastic covering or, if desired, may be left uncovered.

Thus it will be seen that the above invention provides a novel carton or tray which may be readily formed from a one-piece blank of stock and completely folded and glued by the manufacturer. The cartons or trays may be shipped in compact, flat position to the purchaser. The purchaser may quickly set up the cartons by merely applying pressure at the opposite corners of the collapsed carton and is not required to separately fold or glue any of the end-closure flaps, but rather the end closures are completely formed by the manufacturer and automatically spring into erected position upon the erection of the side walls as above. If a cover or closure wall is provided, the carton may be readily closed by tucking flap 35 inside front wall 21, or by a glued or taped connection, depending upon the use to which the carton is put.

It will thus be seen that the invention accomplishes its objects and, while it has been herein disclosed by reference to the details of a preferred embodiment, it is to be understood that such disclosure is intended in an illustrative, rather than a limiting sense, as it is contemplated that various modifications in the construction and arrangement of the parts will readily occur to those skilled in the art, within the spirit of the invention and the scope of the appended claims.

I claim:

1. A collapsible carton having self-erecting end closures comprising a one-piece blank cut, scored and folded to form foldably-connected front, bottom and back walls, said front and back walls each having an end-closure flap foldably connected therewith at each end thereof, each of said end-closure flaps being formed with a fold line extending diagonally inwardly from a corner of the carton, said fold lines in said flaps being substantially parallel to each other and said flaps being adapted to fold inwardly at said fold lines between the walls when the back and bottom walls are collapsed toward each other, an end-closure flap foldably connected to each of the opposite ends of the bottom wall and each having a glued connection with the inner surface of one of said inwardly folding flaps, the others of said inwardly folding flaps each having a flange extending foldably inwardly between the front and back walls and glued to the opposite one of said front and back walls, said end-closure flaps being moved to erected position substantially normal to said front, bottom and back walls by erecting movement of said walls.



2. A collapsible carton comprising a one-piece blank cut, scored and folded to form foldably-connected front, bottom and back walls and a closure wall, said front and back walls each having an end-closure flap foldably connected therewith at each end thereof, each of said end-closure flaps being formed with a fold line extending diagonally inwardly from a corner of the carton, said fold lines in said flaps being substantially parallel to each other and said flaps being adapted to fold inwardly at said fold lines between the walls when the back and bottom walls are collapsed toward each other, an end-closure flap foldably connected to each of the opposite ends of the bottom wall and each having a glued connection with the inner surface of one of said inwardly folding flaps, the others of said inwardly folding flaps each having a flange extending foldably inwardly between the front and back walls and glued to the opposite one of said front and back walls, said end-closure flaps being moved to erected position substantially normal to said front, bottom and back walls by erecting movement of said walls, said closure wall being foldably connected to one of said front and back walls and detachably connected to the other of said front and back walls for securing said closure wall in a closed position and completing the closure of said carton, and said closure wall being detachable from said other of said front and back walls and movable to open position to expose the carton contents with the carton in erected condition.

3. A collapsible carton comprising a one-piece blank cut, scored and folded to form foldably-connected front, bottom and back walls, said front and back walls each having an end-closure flap foldably connected therewith at each end thereof, each of said end-closure flaps being formed with a fold line extending diagonally inwardly from a corner of the carton, said fold lines in said flaps being substantially parallel to each other and said flaps being adapted to fold inwardly at said fold lines between the walls when the back and bottom walls are collapsed, an end-closure flap foldably connected to each of the opposite ends of the bottom wall and each having a glued connection with the inner surface of one of said inwardly folding flaps, the others of said inwardly folding flaps each having a flange extending foldably inwardly between the front and back walls and glued to the opposite one of said front and back walls, said end-closure flaps being moved to erected position substantially normal to said front, bottom and back walls by erecting movement thereof, said inwardly-folding flaps having notched edges for engagement with each other to locate the same in erected position.

4. A collapsible carton comprising a one-piece blank cut, scored and folded to form foldably connected front, bottom and back walls, said front and back walls each having an end-closure flap foldably connected therewith at each end thereof, each of said end-closure flaps being formed with a fold line extending diagonally inwardly from a corner of the carton, said fold lines in said flaps being substantially parallel to each other and said flaps being adapted to fold inwardly at said fold lines between the walls when the back and bottom walls are collapsed, an end-closure flap foldably connected to each of the opposite ends of the bottom wall and each having a glued connection with the inner surface of one of said inwardly folding flaps, said closure flaps of said bottom wall having substantially the size and shape of the respective inside end of said carton and adapted to cover the same, the others of said inwardly folding flaps each having a flange extending foldably inwardly between the front and back walls and glued to the opposite one of said front and back walls, said end-closure flaps being moved to erected position substantially normal to said front, bottom and back walls by erecting movement of said walls.

5. A collapsible carton comprising a one-piece blank cut, scored and folded to form foldably connected front,

bottom and back walls and a closure wall, said front and back walls each having an end-closure flap foldably connected therewith at each end thereof, each of said end-closure flaps being formed with a fold line extending diagonally inwardly from a corner of the carton, said fold lines in said flaps being substantially parallel to each other and said flaps being adapted to fold inwardly at said fold lines between the walls when the back and bottom walls are collapsed, an end-closure flap foldably connected to each of the opposite ends of the bottom wall and each having a glued connection with the inner surface of one of said inwardly folding flaps, said closure flaps of said bottom wall having substantially the size and shape of the respective inside end of said carton and adapted to cover the same, the others of said inwardly folding flaps each having a flange extending foldably inwardly between the front and back walls and glued to the opposite one of said front and back walls, said end-closure flaps being moved to erected position substantially normal to said front, bottom and back walls by erecting movement of said walls, said closure wall being foldably connected to one of said front and back walls and detachably connected to the other of said front and back walls for securing said closure wall in a closed position and completing the closure of said carton, and said closure wall being detachable from said other of said front and back walls and movable to open position to expose the carton contents with the carton in erected condition.

6. A collapsible carton comprising a one-piece blank cut, scored and folded to form foldably connected front, bottom and back walls, said front and back walls each having an end-closure flap foldably connected therewith at each end thereof, each of said end-closure flaps being formed with a fold line extending diagonally inwardly from a corner of the carton, said fold lines in said flaps being substantially parallel to each other and said flaps being adapted to fold inwardly at said fold lines between the walls when the back and bottom walls are collapsed, an end-closure flap foldably connected to each of the opposite ends of the bottom wall and each having a glued connection with the inner surface of one of said inwardly folding flaps, said closure flaps of said bottom wall having substantially the size and shape of the respective inside end of said carton and adapted to cover the same, the others of said inwardly folding flaps each having a flange extending foldably inwardly between the front and back walls and glued to the opposite one of said front and back walls, said end-closure flaps being moved to erected position substantially normal to said front, bottom and back walls by erecting movement of said walls, said inwardly folding flaps having notched edges for engagement with each other to locate same in erected position.




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