May 12, 1964 A. A. MINION 3,132,792

SHIPPING CONTAINERS

Filed June 26, 1961

FIG. 1

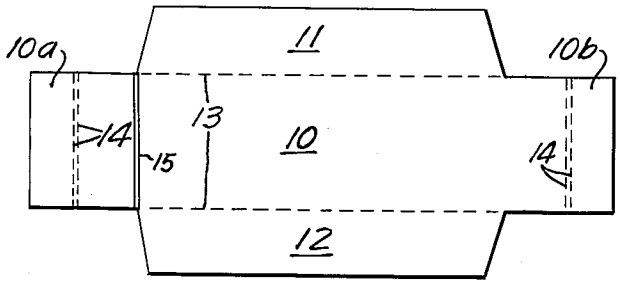


FIG. 3

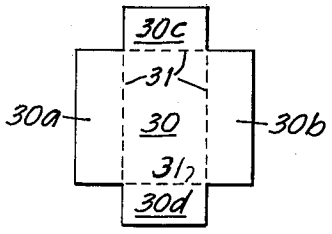


FIG. 2

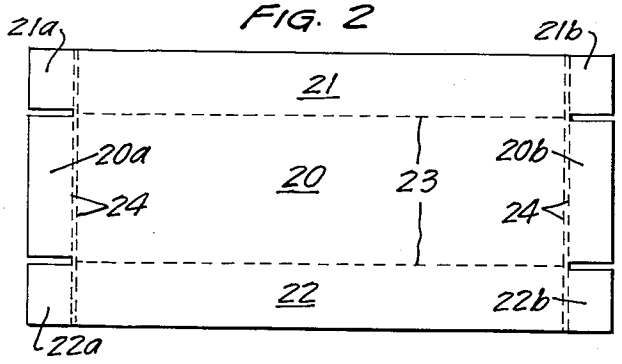


FIG. 5

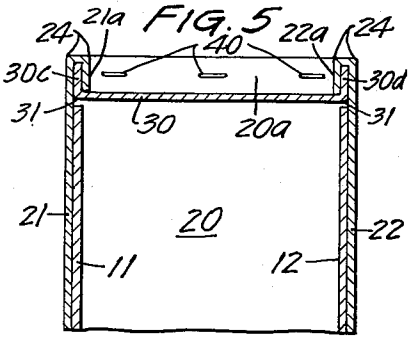


FIG. 4

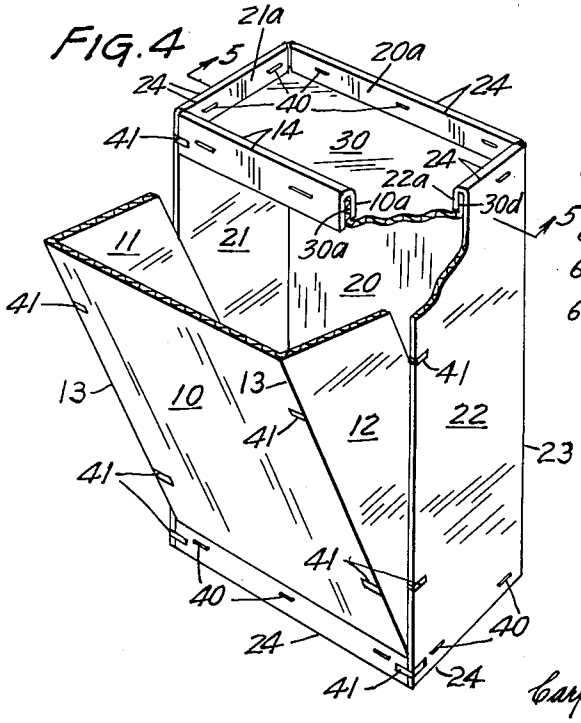
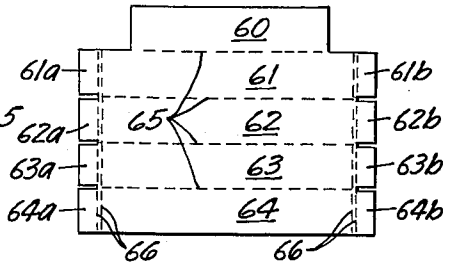


FIG. 6



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SHIPPING CONTAINERS

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This invention relates to shipping containers, particularly corrugated cartons having recessed ends, and to blanks for the use in the manufacture of such cartons.

One of the common forms of shipping containers is known as a recessed-end carton, which typically has a four-sided body and two inset ends formed from end caps positioned snugly within the polygon defined by the inner surfaces of the sides. Each end cap has tabs which lie against the inner walls of the carton and extend nearly to the end thereof, and each side panel is provided with an integral flap, which is bent over the corresponding tab and extends toward the center of the carton. The individual sandwiches of flap, tab, and side panel are then stapled together, thus insetting, or recessing, the ends. Cartons of this type have great resistance to edge drop because of the strengthening effect provided by the multiple thicknesses at the ends, and the need for expensive interior padding is reduced. The strength and/or inner dimensions of a given carton can be varied quite greatly merely by varying the strength and/or dimensions of the tabs on the end cap.

Despite their advantages, conventional recessed-end cartons suffer from drawbacks which have seriously restricted their widespread use. For example, if the body is formed from one or more blanks subdivided by creases into a total number of side panels exceeding by at least one the number of sides of the carton, at least two of the side panels overlap throughout their length. Where the side panels overlap, the tab of the end cap is sandwiched between a flap and two carton walls instead of between a flap and one carton wall. Not only is stapling more difficult, but the end is also bulky, flared, and non-uniform in strength. In addition, a drastic attack on the carton is necessary to open it sufficiently to remove the contents.

Because of the problems associated with cartons of the type described in the preceding paragraph, most presently commercial recessed-end cartons are formed from a blank in which the total number of side panels equals the number of carton sides, the raw corner where the two edges meet being provided with a strip of tape extending along the entire length of the carton prior to loading. Although such cartons are neat in appearance, they are expensive, awkward to load, and subject to being crushed during stacking or shipping. Cylindrical tubular cartons are still more expensive, equally hard to load, awkward to stack, and inconvenient to open.

I have now devised a novel recessed-end carton which retains all the advantages possessed by prior art recessed-end cartons and simultaneously overcomes the defects inherent in such prior art structures. The recessed-end is easily fabricated, and the strength it possesses is equal in all directions. At no place is the end closure obtained by fastening through more than three layers of material, thus resulting in a conveniently storable crush-resistant carton having straight non-flaring ends. My carton can be conveniently loaded and readily opened to gain acces to its contents. In a particularly preferred embodiment of my invention, I prepare a full-telescoping carton having recessed ends, a totally novel concept, so far as I am aware.

In accordance with my invention I provide one or more carton blanks for forming the polygonal cross-sectioned body of a carton, each blank being subdivided

into a number of side panels by means of conventional creases. The number of side panels exceeds the number of carton sides by at least one, at least two of the panels thus substantially overlapping each other. The inner of each pair of overlapping panels is foreshortened at each end by an amount equal to at least about the width of the end flap which is an integral part of each outer panel. This arrangement avoids the previous problem of excess bulk at the recessed end by eliminating that portion of the inner panel previously incorporated into the end closure while retaining a sturdy package resistant to shipping injury. My novel structure is extremely simple to open, thus greatly enlarging the utility of recessed-end cartons.

The attached drawings will aid in understanding my invention. In these drawings:

FIGURE 1 is a blank for forming the body of a full-telescoping recessed-end carton;

FIGURE 2 is a blank for forming the cover of a full-telescoping recessed-end carton;

FIGURE 3 is one of two identical end cap blanks to be used in conjunction with the blanks of FIGURES 1 and 2 in forming a full-telescoping recessed-end carton;

FIGURE 4 is an assembled full-telescoping recessed-end carton, partially cut away to aid in understanding its constructional features, showing the manner in which it is opened;

FIGURE 5 is a cross-sectional view of one end of the carton in FIGURE 4 prior to opening, taken along the section lines 5—5; and

FIGURE 6 is a five-panel folder blank for forming a recessed-end square cross-section carton embodying the principles of my invention.

With particular reference to the structure shown in FIGURES 1–5 inclusive, the body blank of FIGURE 1, formed from a sheet of corrugated board, is subdivided by crease lines **13** into three tetragonal panels, viz., rectangular bottom panel **10** and trapezoidal side panels **11** and **12**. Panel **10** is also delineated by double crease lines **14** from integral flaps **10***a* and **10***b*. Panels **11** and **12** are shorter than panel **10** at each end by an amount at least equal to but not substantially greater than the distance flaps **10***a* and **10***b* extend beyond crease lines **14**. Tear strip **15** provides a convenient means for the consumer to open the carton. In similar manner the cover blank shown in FIGURE 2 is subdivided by crease lines **23** into top panel **20** and side panels **21** and **22**, each having corresponding integral flaps **20***a*, **20***b*, **21***a*, **21***b*, **22***a* and **22***b*, from which they are delineated by double crease lines **24**. For reasons which will shortly become apparent, double crease lines **14** and **24** are preferably spaced apart a distance approximately equal to the thickness of the material from which the end cap blanks are formed. Panel **20** is wider than panel **10** by about twice the thickness of the material from which the latter is formed; similarly panels **21** and **22** are wider than panels **11** and **12** by about a single thickness. The end cap blank of FIGURE 3 comprises central portion **30** and tabs **30***a*, **30***b*, **30***c* and **30***d*, the latter being delineated from the central portion by crease lines **31**.

In loading and preparing a carton of the type shown in FIGURE 4, the body blank is laid flat on a table and the material to be packaged placed on panel **10**. Panels **11** and **12** are then bent upwards at approximately 90°. A cover, formed from the blank of FIGURE 2 by bending panels **21** and **22** at approximately 90° downward along crease lines **23**, is then positioned over the body. The resultant rectangular cross-sectioned carton body is held in position by strips of pressure-sensitive adhesive tape **41** which extend across the corners formed by the intersection of panel **10** and panels **21** and **22**. The end

cap blank of FIGURE 3 is now formed by bending tabs 30*a–d* upward at 90° along crease lines 31 and placing it inside one end of the carton in such a manner that the tabs point toward the open end of the carton with their outer extremities positioned along the inner line of double crease lines 14 and 24. Flaps 10*a*, 20*a*, 21*a* and 22*a* are then bent over tabs 30*a*, 30*b*, 30*c* and 30*d* so as to grip the tabs between the flaps and the corresponding carton side panel, double crease 14 and 24 assuring a neat appearance; where the end cap is comparatively thin or where neatness is not of prime importance single crease lines may be used. The three layers of material are then fastened together with staples 40 and the entire procedure repeated with a second end cap at the opposite end of the carton. It will be noted that in this assembly side panels 11 and 12 of the body of the carton are not incorporated in the end closure. This construction avoids the nuisance of stapling through an extra layer of material along the two sides of the carton, provides a uniformly strong closure, and obviates flaring of the ends. The resulting carton is readily opened, as shown in FIGURE 4, by cutting tape strips 41 and utilizing tear strip 15 to sever body panel 10. The entire body of the carton may then be swung outward, the tapered ends of trapezoidal side panels 11 and 12 readily swinging clear of the end closure, to permit easy removal of the contents.

Cartons of the type illustrated in FIGURES 1–5 are useful in shipping carpets, wide rolls of adhesive tape, linoleum, and many other materials. Cartons having outer dimensions of about 16¾ inches x 8⅝ inches x 57⅜ inches long, the body and end caps being made from 200-lb. C flute corrugated board and the cover being made from 275-lb. C flute corrugated board, have been found to provide superior protection for nests of endless coated abrasive belts having a length of 243 inches and a width of 50 inches. A single size body and cover blanks may be formed into cartons which will accommodate narrower belts if end caps having suitably longer tabs are employed.

The blank shown in FIGURE 6 constitutes a modification of the well-known "five-panel folder." The blank is subdivided by crease lines 65 into tetragonal side panels 60, 61, 62, 63 and 64, panels 61–64 inclusive having integral end flaps 61*a* and 61*b*–64*a* and 64*b* corresponding to the panels with which they are associated but delineated therefrom by crease lines 66. The difference between this blank and the conventional blank used for making a five-fold carton lies in the fact that panel 60 is shorter than panels 61–64 at each end by an amount slightly greater than the distance flaps 61*a* and *b*–64*a* and *b* extend beyond crease line 66. In forming a recessed-end carton from a blank of the type shown in FIGURE 6, the blank is bent at 90° along crease lines 65 to form a hollow body having a square cross-section, panels 60 and 64 overlapping, with panel 64 on the outside, tape strips being used to hold the body together at the juncture of panels 61 and 64. End caps of the type shown in FIGURE 3 (except, of course, for the fact that the central portion is square) are now inserted in each end of the carton and stapled in the same manner described in connection with FIGURES 1–5 inclusive. The resulting square cross-sectioned carton has the same number of thicknesses of material on each of the four sides of the recessed end and is consequently far easier to form into a recessed-end carton than would be a traditional five-panel folder, in which panel 60 would be the same size as panels 61–64. A carton formed from a blank of the type shown in FIGURE 6 is readily opened by severing the tape strips and cutting through panel 61 just inside both end caps, thereby permitting panels 60 and 61 to swing open in the manner of a conventional box of envelopes.

Blanks analogous to the "five-panel folder" of FIGURE 6 but having additional foreshortened panels may also be formed into recessed-end rectangular cross-section cartons with increased rigidity. A foreshortened sleeve may be placed within a set up folder to achieve similar strengthening. Cartons having other than a tetragonal cross-section may be similarly formed by varying the number of panels which have flaps. Modifications of the structures herein described to produce such cartons are well within the skill of anyone in the packaging industry having the teachings of my invention before him.

Having disclosed my invention I do not intend to be limited in any manner other than by the scope of the appended claims.

What I claim is:

1. A recessed-end carton having two ends and a plurality of sides, the sides in cross-section taken at right angles to an imaginary line between the midpoints of the ends defining a polygon, said sides being formed from a plurality of panels, the number of said panels exceeding by at least one the number of sides of said carton and at least two of said panels being superposed and substantially overlapping, each outer panel having a flap at each end integral therewith but delineated therefrom by a crease line extending parallel to the end of the carton, each overlapped inner panel being shorter than its corresponding outer panel at each end by an amount equal to at least the distance between said crease line and the end of said flap, an end piece having a polygonal central portion essentially identical in size and shape to the polygon defined by the inner faces of said outer panels and positioned snugly therewithin parallel to each of the ends of said outer panels, said polygonal central portion being delineated by crease lines from sharply upturned integral tabs, each tab extending toward and terminating near the corresponding end of the outer panels and lying parallel to and in contact with one of said outer panels, each flap being folded back parallel to the panel with which it is integral so as to snugly grip a tab between said flap and said panel.

2. A recessed-end carton having two ends and four sides, said sides being formed from at least five panels, at least two of said panels being superposed and substantially overlapping, each outer panel having a flap at each end integral therewith but delineated therefrom by a crease line extending parallel to the end of the carton, each overlapped inner panel being shorter than its corresponding outer panel at each end by an amount equal to at least the distance between said crease line and the end of said flap, an end piece having a rectangular central portion essentially identical in size and shape to the rectangle defined by the inner faces of said outer panels and positioned snugly therewithin parallel to each of the ends of said outer panels, said central portion being delineated by crease lines from sharply upturned integral tabs, each tab extending toward and terminating near the corresponding end of the outer panels and lying parallel to and in contact with one of said outer panels, each flap being folded back parallel to the panel with which it is integral so as to snugly grip a tab between said flap and said panel.

3. A full-telescoping readily openable recessed-end carton having two ends and four sides, said sides being formed from a body and a cover, said body comprising a bottom panel and two side panels bent upward at 90° thereto, said cover comprising a top panel and two side panels bent downward at 90° thereto, said cover being positioned snugly over said body so that the side panels of the cover substantially overlap the side panels of the body, the four outer panels each having a flap at each end integral therewith but delineated therefrom by a crease line parallel to the end of the carton, the two side panels of the body each being shorter than the four outer panels by an amount equal to at least twice the distance between said crease line and the end of said flap, an end cap having a rectangular central portion essentially identical in size and shape to the rectangle defined by the inner faces of the four outer panels posi-

tioned snugly therewithin parallel to each of the ends of said outer panels, said rectangular central portion being delineated by crease lines from sharply upturned integral tabs, each tab extending toward and terminating near the corresponding end of the outer panels and lying parallel to and in contact with one of said outer panels, each flap being folded back parallel to the panel with which it is integral so as to snugly grip a tab between said flap and said panel.

4. As a new article of manufacture adapted for use in forming a requisite body member of a polygonal cross-sectioned open-ended carton body, said carton body being designed for conversion to a uniformly strong recessed-end carton having two ends and a plurality of sides by steps which comprise inserting at each end of said carton body a tab-bearing end piece having a polygonal central portion geometrically similar to and having substantially the same dimensions as the internal cross-section of said carton body, the body of said carton being formed from at least one but not more than two component members having a total number of panels exceeding by at least one the number of sides of said carton,

a foldable blank made from flat containerboard subdivided by crease lines into at least three laterally adjoining creasefree tetragonal panels, at least one but fewer than all of said tetragonal panels having integral therewith at each end thereof a creasefree flap separated therefrom by a crease line, each end

of each such flap-bearing panel extending beyond the corresponding end of each remaining panel by an amount approximately equal to the distance said flap extends beyond the crease line separating said flap and said flap-bearing panel, each said remaining panel adjoining a maximum of one flap-bearing panel.

5. As a new article of manufacture adapted for use, in conjunction with a 3-panel flap-bearing cover member and two tab-bearing rectangular end pieces, in the formation of a readily openable uniformly strong full-telescoping recessed-end carton having two ends and four sides, two of said sides being parallel and each being formed from a pair of substantially overlapping panels,

a foldable body blank made from flat containerboard subdivided by two parallel crease lines into a creasefree rectangular bottom panel adjoined on each side by the wider base of a trapezoidal side panel, said bottom panel having integral therewith at each end thereof a rectangular flap separated from said bottom panel by a crease line, each end of said bottom panel extending beyond the corresponding end of each of said side panels by an amount approximately equal to the distance said flap extends beyond the crease line separating it from said bottom panel.

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