Jan. 10, 1961 G. E. SEGER, JR 2,967,655

POLYGONAL CARTON

Filed May 19, 1958

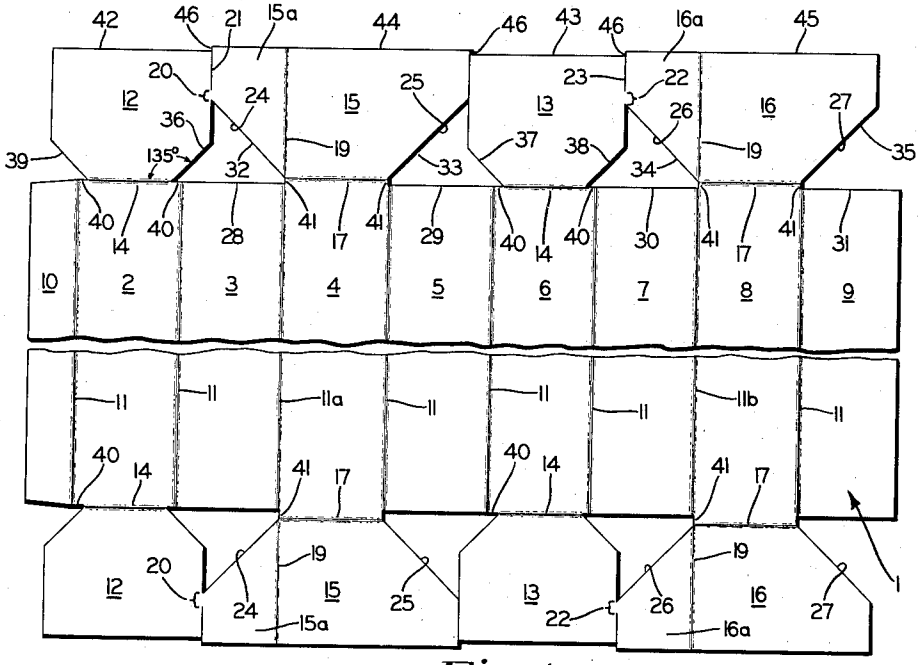


Fig. 1

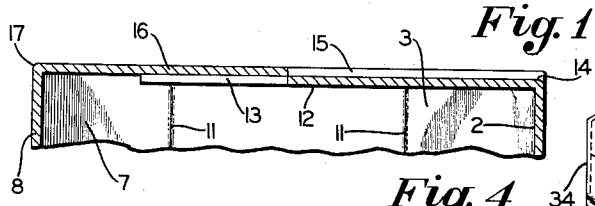


Fig. 4

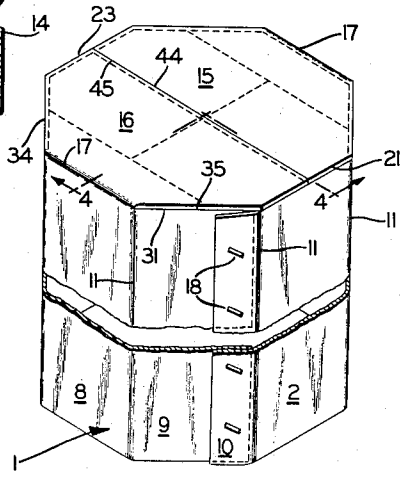


Fig. 3

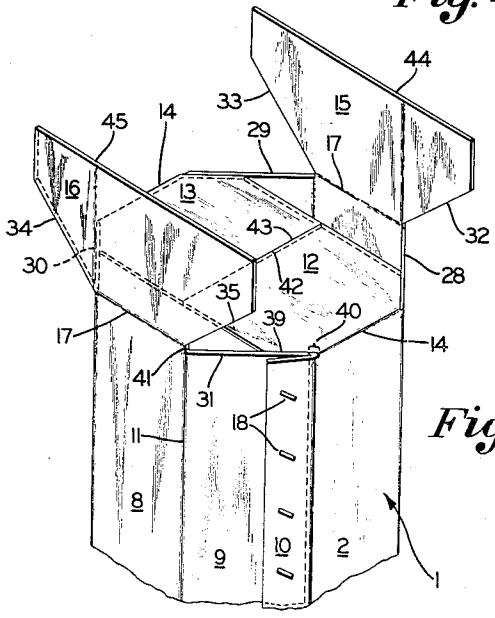


Fig. 2

INVENTOR

Gaylord E. Seger, Jr.

BY Frease & Bishop

ATTORNEYS

United States Patent Office 2,967,655 Patented Jan. 10, 1961

2,967,655

POLYGONAL CARTON

Gaylord E. Seger, Jr., Navarre, Ohio, assignor to Massillon Container Co., Navarre, Ohio, a corporation of Ohio

Filed May 19, 1958, Ser. No. 736,367

2 Claims. (Cl. 229—37)

This invention relates to polygonal cartons and more particularly it pertains to paperboard cartons having integral end closure flaps that are foldable to flat snug-fitting surfaces for stable storage of the cartons in stacks.

In recent years cartons for shipping and storage of manufactured articles have been fabricated from single blanks of paperboard or other suitable material. During its fabrication the body of a carton is usually provided with crease or score lines that divide the carton into a number of panels and integral end flaps for subsequent folding into a desired shape.

Many prior paperboard cartons, however, have been objectionable for shipping and storage purposes because among other things the end flaps of the final carton have not been properly fabricated to permit their folding in a satisfactory maner, such as in a plane perpendicular to the plane of the panels to which the flaps are attached. The end flaps have had a rounded or domed configuration due to an outwardly bulged distortion and permanent inability to lie flat in snug-fitting relationship with respect to adjacent flaps. As a result, cartons having outwardly bulged end flaps have not been satisfactory for stacking in end-to-end relationship. Accordingly, there has been a need for a paperboard carton having flat-unbulged end flaps which may be stacked for shipping or storage purposes in an end-to-end manner with other similar cartons.

The carton of the present invention is so constructed that the end flaps are foldable upon each other so that once the bent score lines connecting the flaps to the panels of the carton have assumed a permanent set the flaps are disposed in a flat position perpendicular to the panels and free from outward bulge due to binding action caused by adjacent flaps. The carton is cut and scored so that each end of the carton includes two pairs of oppositely disposed flaps, each pair of which is folded in one plane or zone on crease or score lines disposed in the same zone. By providing pairs of overlapping flaps which fold in different zones the flaps do not bulge outwardly to cause an unsteady stacking problem.

In addition to the foregoing, the construction of the present invention includes only four flaps divided into two pairs which are separately foldable on crease or score lines dividing each flap from an integral panel. Each flap of each pair of oppositely disposed flaps has a length equal to one-half the distance across the expanded carton between opposite pairs of panels. When each pair of panels is folded, their adjoining edges meet in abutment and thereby complement each other in maintaining the precise shape of the opened carton. In other words, each pair of flaps when folded meets on a line of abutment halfway between opposite panels on which the flaps are mounted. The advantage of such a construction not only provides for the reinforcement of the carton in the open position but also preserves the flaps in flat zones.

Accordingly, it is an object of this invention to provide a precut and scored carton with end flaps integral with the panels forming the body of the carton.

It is another object of this invention to provide a carton having integral end flaps which when folded with the carton in the opened position provide end closures for the carton which lie in flat planes perpendicular to the sides of the carton.

It is another object of this invention to provide a paperboard carton having a polygonal transverse cross section and having two pairs of flaps covering at least one open end of each carton with each pair of flaps disposed in a separate zone and folded on score lines disposed in their respective zones.

It is another object of this invention to provide a carton for shipping and storage which has end closure flaps disposed in flat planes at right angles to the axis of the carton and conducive to permanent stacking in an end-to-end manner with vertically adjacent similar cartons.

It is another object of this invention to provide a carton for containing a manufactured article and having an octagonal transverse cross section with two pairs of end closure flaps mounted on opposite panels forming the surface of the carton.

Finally, it is an object of this invention to provide a paperboard carton for shipping and storage of manufactured articles which accomplishes the foregoing objects and desiderata in a simple, effective, and inexpensive manner.

These and other objects and advantages apparent to those skilled in the art from the following description and claims may be obtained, the stated results achieved and the described difficulties overcome by the discoveries, principles, apparatus, parts, combinations, subcombinations, and elements which comprise the present invention, the nature of which is set forth in the following statement, a preferred embodiment of which—illustrative of the best mode in which applicant has contemplated applying the principles—is set forth in the following description, and which is particularly and distinctly pointed out and set forth in the appended claims forming part hereof.

Generally, the improved polygonal carton construction of the present invention may be stated as including eight side panels divided by foldable creases and adapted for assembly into a tubular body octagonal in transverse section, four alternate side panels having cut ends extending perpendicular to the foldable creases, the other four alternate side panels each having a flap integral therewith, the flaps being associated as inner and outer pairs of flaps, the inner pair of flaps being divided from their respective panels by foldable creases aligned with the cut ends of adjacent panels, the foldable creases of said inner flaps being shorter than the width of the corresponding panel by a distance at each end substantially equal to the thickness of the material constituting the carton, the outer pairs of flaps being divided from their respective panels by foldable creases spaced outwardly from the plane of alignment of said cut ends of the panels by a distance substantially equal to the thickness of the material constituting the carton, the inner flaps having outer ends abuttable with each other when the carton is in an assembled position in a zone alignable with the cut ends of the panels, the outer flaps having ends abuttable with each other when the carton is in an assembled position in a zone adjacent that of the inner flaps, each flap including an inclined side extending outwardly from the foldable crease of said flap, the inclined sides of the inner flaps being abuttable with the inner surfaces of adjacent side panels, and the inclined sides of the outer flaps being abuttable with the cut ends of the adjacent side panels.

By way of example, the preferred embodiment of the present invention is illustrated in the accompanying drawing, in which:

Figure 1 is a plan view of a precut and scored blank used for an assembled carton;

Fig. 2 is a perspective view of the upper portion of an assembled carton showing the inner pair of flaps folded to their assembled position and showing the outer pair of flaps in the unfolded position;

Fig. 3 is a perspective view of the assembled carton showing both pairs of inner and outer flaps folded to their assembled positions; and

Fig. 4 is a fragmentary vertical sectional view taken on the line 4—4 of Fig. 3.

Similar numerals refer to similar parts throughout the drawings.

A carton is generally indicated at **1** in an open or unassembled position in Fig. 1 and in a set-up or assembled position in Fig. 3. The carton **1** has a polygonal transverse cross section in the assembled position with a plurality of panels or sides **2**—**9**, the preferred number of which is eight. For the purpose of the embodiment of the invention shown in the drawing, the assembled carton **1** has an octagonal shape. In addition, the carton is provided with a stitch flap **10** and like the several panels **2**—**9**, is divided from the adjacent panel **2** by a crease or score line **11** which extends longitudinally of the assembled carton.

The carton **1** also is provided with a number of end flaps for closing the open ends of the assembled carton. The flaps include a pair of inner flaps **12** and **13** which are divided from the panels **2** and **6**, respectively, by similar score lines **14** extending preferably at right angles to the score lines **11**. Likewise, a pair of outer flaps **15** and **16** are divided from the panels **4** and **8**, respectively, by score lines **17** which also extend perpendicular to the longitudinal score lines **11**. Similar pairs of inner and outer flaps **12**, **13**, **15**, and **16** are provided at the other end of the carton **1** as shown in Fig. 1. Thus, each end of the assembled carton is provided with two pairs of flaps which when assembled serve to reinforce and maintain the carton in the assembled position and to provide flat end walls for the assembled carton.

As shown in Fig. 1, the unassembled or open carton **1** is fabricated from a single, flat blank of paperboard or other similar material. The blank is precut and scored so that the open carton **1** may subsequently be folded upon the particular score lines **11***a* and **11***b* so that the stitched flap **10** overlaps a portion of the panel **9**, whereupon the overlapped portions are secured together in a conventional manner such as by stitches or staples **18** as shown in Figs. 2 and 3. For the purpose of stitching, when the blank carton **1** is first folded on the lines **11***a* and **11***b*, the pairs of outer flaps **15** and **16** which are integral with the panels **4** and **8** are preliminarily scored at **19** in alignment with the score lines **11***a* and **11***b*. In addition, during the preliminary cutting of the blank carton **1** the adjacent sides of the flaps **12** and **15** are left uncut for a short segment **20** of the cut line **21** extending between said flaps.

Likewise, the flaps **13** and **16** are left uncut for a short segment **22** of a cut line **23** that divides said flaps. The uncut segments **20** and **22** are easily broken when the flaps are later folded. When the blank carton **1** is folded on the score lines **11***a* and **11***b*, the flaps **15** have overlapping portions which, because of their connection at **20** with the flap **12**, fold in the same plane with the flap **12** to facilitate the stitching of the stitch flap **10** to the panel **9**. The flaps **16** also have overlapping portions which because of their connection at the uncut segments **22** remain in the same plane with adjacent flaps **13**. Otherwise, without the score lines **19** and uncut portions **20** and **22**, upon folding the carton **1** on the score lines **11***a* and **11***b*, the portions **15***a* and **16***a* would extend beyond the score lines **11***a* and **11***b*, respectively, and inhibit the stitching operation.

The blank from which the carton **1** is cut also includes a number of cutout portions **24**, **25**, **26**, and **27** at opposite ends of the panels **3**, **5**, **7**, and **9**, which portions provide panel ends **28**—**31**, respectively. The cutout portions **24**, **25**, **26**, and **27** are substantially triangular members having sides that include the panel ends **28**—**31**, respectively, and having sides **32**—**35** inclined at angles preferably 45° to the cut ends **28**—**31**, respectively. The sides **32**—**35** have a length equal to the width of the panels **3**, **5**, **7**, and **9** so that when the carton is assembled the sides **32**—**35** are disposed along the cut ends **28**—**31**, respectively. In addition, the triangular cutout portions **24**—**27** include sides **36**, **37**, and **38** which are inclined to the cut ends **28**, **29**, and **30** at an angle similar to the sides **32**—**35**, namely 45°. The inner flap **12** also includes a side **39** similar to the sides **36**—**38**. When the carton **1** is assembled as best shown in Fig. 2, the sides **36**—**39** extend over portions of the lengths of the cut ends **28**—**31**.

In Fig. 1, the crease or score lines **14** for the flaps **12** and **13** are shorter in length than the width of the panels **2** and **6**. The cut ends **28**, **29** and **30** extend at one end beyond the score lines **11** for their respective adjacent panels. Thus the score lines **14** are shorter than the width of the panels **2**—**9** by a spacing **40** for relief folding equal to twice the added length of the end cuts **28**, **29**, and **30**. The reason for this configuration is due to the thickness of the paperboard comprising the carton.

As best shown in Fig. 2, when the inner flap **12** is folded across the open end of the carton, the side **39** extends over a portion of the cut end **31** of the panel **9** and fits in a plane extending across the open end of the assembled carton **1**. The spacing **40** permits the adjacent folded edges of the flap **12** and panels to interfit without bulge or binding, thereby producing a snug fit between the adjacent folded parts.

In Fig. 1, the panels **4** and **8** are longer than the other panels, because the score lines **17** are out of alignment with the score lines **14** and with the cut ends **28**, **29**, **30**, and **31** by a spacing **41** for relief folding which approximates the thickness of the paperboard composing the carton **1**. The spacings **40** and **41** for relief folding are preferably 1/16". Thus when the outer flaps **15** and **16** are folded into assembled position as shown in Fig. 3, they are folded on the score lines **17** in a plane or zone above that of the inner flaps **12** and **13**. The inner flaps **12** and **13** are folded in one zone and the outer flaps **15** and **16** are folded in an adjacent zone so that there is no binding which would otherwise occur if the score lines for the outer flaps were in alignment with those of the inner flaps.

As shown in Fig. 1, the outer ends of the inner flaps **12** and **13** have edges **42** and **43**, respectively, which lines are spaced from the score lines **14** by a distance equal to half the width of the assembled carton. Thus when the inner flaps **12** and **13** (Fig. 2) are folded into position, their edges **42** and **43** are in abutment with each other and thereby help to maintain the assembled carton in the desired octagonal shape.

Similarly, the outer flaps **15** and **16** have edges **44** and **45** that are spaced from their score lines **17** by a distance equal to one-half the distance across the assembled carton **1**. Thus the edges **44** and **45** are out of alignment with the edges **42** and **43** of the inner flaps by a distance **46** equal to the spacing **41** by which the score lines **17** are out of alignment with the cut ends **28** and **31** and score lines **14**. When the outer flaps are folded into assembled position as shown in Fig. 3, the edges **44** and **45** are in abutment with each other and thereby help to maintain the desired octagonal shape of the carton.

The manner in which the folded inner and outer flaps interfit in separate zones is shown in Fig. 4. The inner flaps **12** and **13** are disposed in a plane or zone in which the outer surfaces of the inner flaps are disposed in the plane of the cut ends **28**, **29**, **30**, and **31** so that the sides **36**—**39** engage the inner surface of the adjacent panels. Inasmuch as the angle between the various sides **36**—**39**

and their score lines is 135°, said sides fit snugly against the inner surfaces of the panels **3**, **5**, **7**, and **9**, which panels are disposed at 135° to adjacent panels when the carton is in the open or assembled position with the edges **42** and **43** of the inner flaps **12** and **13** in abutment as shown in Fig. 2.

The outer flaps **15** and **16**, being folded on creases or score lines **17** which are outwardly disposed from the score lines **14** of the inner flaps, are disposed in planes or zones outside of the zone in which the inner flaps are disposed and adjacent thereto. Moreover, in the completely assembled position of Fig. 3, the various sides **32—35** of the outer flaps **16** and **16** are in abutment with the cut ends **28—31** of the adjacent panels. Similarly, the cut lines **21** and **23**, which form sides of the flaps **15** and **16** are likewise disposed adjacent opposite panels **2** and **6**, as shown for panel **2** in Fig. 3.

The overlapping inner and outer flaps may be secured together in a conventional manner such as by use of glue on adjacent surfaces, by adhesive strip, or by stitching or stapling (not shown), extending along and over the adjoining abutting ends **44** and **45** of the outer flaps **15** and **16**, respectively.

Accordingly, a precut and scored carton with end flaps integral therewith is provided which in the assembled positions is devoid of bulged-out or domed ends customary in prior constructions. The carton **1** is octagonal in transverse cross section, having eight panels of preferably equal width with two inner flaps provided on one pair of oppositely disposed panels and with two outer flaps provided on another pair of oppositely disposed panels. In the assembled position the inner flaps are folded on a score line in alignment with the cut ends of the panels and the outer flaps are folded on score lines outwardly disposed from those of the inner flaps so that the outer flaps in a zone adjacent to that of the inner flaps may permanently maintain their zonal position without bulging outwardly due to binding with the inner flaps on other portions of the carton.

Moreover, when each pair of flaps is folded in the assembled position, they meet on lines of abutment preferably one-half the width of the carton as set up or assembled for use. Thus the flaps with abutting edges combine to reinforce the carton panels in the assembled or set-up position and provide a flat-ended carton that may be stacked in end-to-end manner with similar cartons for storage and shipping purposes.

In the foregoing description certain terms have been used for brevity, clearness and understanding, but no unnecessary limitations are to be implied therefrom beyond the requirements of the prior art, because such words are used for descriptive purposes herein and are intended to be broadly construed.

Moreover, the embodiment of the improved construction illustrated and described herein is by way of example, and the scope of the present invention is not limited to the exact details of construction shown.

Having now described the features, constructions and principles of the invention, the characteristics of the new improved polygonal carton, and the advantageous, new and useful results provided; the new and useful discoveries, principles, parts, elements, combinations, subcombinations, structures and arrangements, and mechanical equivalents obvious to those skilled in the art are set forth in the appended claims.

I claim:

1. A carton including eight side panels divided by foldable creases, some of said side panels having ends extending perpendicular to the creases, the other of said side panels each having flaps integral with corresponding panels, the flaps including an inner pair and an outer pair of flaps, the inner pair of flaps being divided from their respective panels by foldable creases aligned with the ends of adjacent panels, the foldable creases of said inner flaps being shorter than the width of the corresponding panel by a distance at each end substantially equal to the thickness of the material constituting the carton, the outer pair of flaps being divided from their respective panels by foldable creases offset and spaced outwardly from the plane of alignment of said ends of the panels by a distance substantially equal to the thickness of the material constituting the carton, the inner flaps having outer ends abuttable with each other when the carton is in an assembled position in a zone alignable with the ends of the panels, and the outer flaps having ends abuttable with each other when the carton is in an assembled position in a zone adjacent that of the inner flaps.

2. A carton including eight side panels divided by foldable creases, some of said side panels having ends extending perpendicular to the creases, the other of said side panels each having flaps integral with corresponding panels, the flaps including an inner pair and an outer pair of flaps, the inner pair of flaps being divided from their respective panels by foldable creases aligned with the ends of adjacent panels, the foldable creases of said inner flaps being shorter than the width of the corresponding panel by a distance at each end substantially equal to the thickness of the material constituting the carton, the outer pair of flaps being divided from their respective panels by foldable creases offset and spaced outwardly from the plane of alignment of said ends of the panels by a distance substantially equal to the thickness of the material constituting the carton, the inner flaps having outer ends abuttable with each other when the carton is in an assembled position in a zone alignable with the ends of the panels, each flap including an inclined side extending outwardly from the foldable crease of said flap, the inclined sides of the inner flaps being abuttable with the inner surfaces of adjacent side panels, and the inclined sides of the outer flaps being abuttable with the ends of said adjacent side panels.

References Cited in the file of this patent

UNITED STATES PATENTS

1,425,549	Scruby	Aug. 15, 1922
2,517,552	Field	Aug. 8, 1950
2,674,400	Ross	Apr. 6, 1954
2,783,933	Sharts	Mar. 5, 1957

FOREIGN PATENTS

42,972	Netherlands	Mar. 16, 1938
1,070,552	France	Feb. 24, 1954