My invention relates to an end closure device for paperboard cartons, and more particularly to a simple means of construction which will provide a cushion for the safe packaging of breakable merchandise.

With the growing number of commodities placed on the market in breakable containers, tubes, bottles, and the like there has been an increasing need for a packaging carton which will provide a certain measure of protection from breakage to its contents. In most presently available carton structures, the merchandise rests directly against the bottom of the carton, and so is especially subject to breakage due to dropping. If protection is to be afforded at all, it was only possible by means of relatively complicated and expensive liners and spacers. In the instant invention, I have devised an end closure construction which even though simple and inexpensive, avoids the disadvantages enumerated above.

Accordingly, it is a principal object of my invention to provide an end closure means for paperboard cartons which will adequately serve to cushion and protect the contents of the carton.

Another object of the instant invention is the provision of an end closure device which, when used with a carton structure having a die cut opening in its front panel, automatically forms a means of centering the contents of the carton for better and more complete display.

Still another object of my invention is to provide a cushioned end closure for a paperboard container which may be quickly and easily closed, either by hand or by machine, without any gluing or other manipulation before closing.

These and other objects of the instant invention which will be pointed out in more detail hereinafter, or which will be apparent from the accompanying drawings, I accomplish by those constructions and arrangements of parts of which I shall now describe certain exemplary embodiments.

Reference is made to the accompanying drawings wherein:

FIGURE 1 is a plan view of a carton blank in accordance with my invention;
FIGURE 2 is a plan view similar to FIGURE 1 after the first fold has been made;
FIGURE 3 is a plan view similar to FIGURE 2 after the second fold has been made, showing glue applied to one flap;
FIGURE 4 is a plan view of a carton embodying my invention in the flat-folded condition;
FIGURE 5 is a cross-sectional view taken along line 5--5 of FIGURE 4;
FIGURE 6 is a partial perspective view illustrating the carton body in an erected condition, and illustrating the flaps forming the cushioned end closure device in extended position;
FIGURE 7 is a partial perspective view similar to FIGURE 6 showing one of the end closure flaps infolded;
FIGURE 8 is a perspective view similar to FIGURE 7 showing both end closure flaps infolded;
FIGURE 9 is a perspective view with parts broken away of a carton embodying my invention;
FIGURE 10 is a vertical-sectional view taken along line 10--10 of FIGURE 9;
FIGURE 11 is a plan view of a carton blank showing a modification of my invention;
FIGURE 12 is a perspective view of an erecting carton embodying the modification of FIGURE 11.

In the embodiment shown in FIGURE 1 of the drawings, I have illustrated a carton blank in accordance with my invention, and utilizing in part the hollow wall box construction disclosed by co-worker Robert Bergstein in U.S. Patent No. 2,681,174. As seen in FIGURE 1, I provide a rear wall panel 1 flanked by articulated side wall panels 2 and 3; and to panel 2 is articulated an inner front panel 4 which is in turn articulated to a glue flap 5. Attached to side wall panel 3 is an outer front panel 6, adapted to be folded over panel 5.

An outer side wall panel 7 is provided which will be adhesively joined to side panel member 2.

As can be seen in FIGURE 1, inner top panel member 4 is cut and scored to provide the flaps 8a and 8b, joined to panel 5 along lines of articulation 9a and 9b, and divided by score lines 10a and 10b. Likewise, panel 6 is cut to form panels 11a and 11b joined to panel 6 by lines of articulation 12a and 12b.

As seen in FIGURE 2, panel 4 and glue flap 5 are first infolded over along the line of articulation between panels 2 and 4, and adhesive is applied to the upper surface of flap 5. A second fold is made along the line of articulation between panels 1 and 3, thereby juxtaposing the panel 4 to the underlying panel 6, with the glue flap 5 juxtaposed to the side wall panel 3 adjacent the line of articulation 12a, the part 5 now assuming the condition illustrated in FIGURE 3. Adhesive is applied to outer side wall panel 7 which, is then infolded and secured to panel 2, bringing the carton to the condition illustrated in FIGURES 4 and 5.

Referring back to FIGURE 1, it will be seen that identical closure flaps 13a and 13b are articulated to the opposite ends of rear wall panel 1, and closure flaps 14a and 14b are articulated to the opposite ends of outer front wall panel 6. Each pair of these four flap members forms cushioned end closure for the carton. Flaps 13a and 13b are provided with one or more die cut projections 15a and 15b. Flaps 14a and 14b are provided with medial lines of fold 16a and 16b and one or more die cut segments 17a and 17b lying along this line of fold.

To close the carton, it is only necessary to press the flaps 14a and 14b downward and inward, into the body of the carton. This will automatically cause the flaps 14a and 14b to fold along their medial line of fold 16a and 16b, thereby assuming an angular position, as seen in FIGURE 7, and at the same time open the die cut segments 17a and 17b. Flaps 13a and 13b are then folded inwardly, and their die cut projections 15a and 15b will snap into the opened segments 17a and 17b in flaps 14a and 14b. The carton is now completed and is in the stage shown by FIGURES 8 through 10.

When downward pressure is exerted on flaps 11a and 11b, they in turn force downward and inward panels 8a and 8b to form inner walls in which the merchandise contents of the carton may be fully displayed. It is understood of course that this blank could be formed from any boxboard or paperboard having the desired weight and surface finish. Furthermore, the illustrative "hollow wall box" construction by no means limits the instant invention; any conventional four-panel carton may be used equally well.

It will be understood of course that while the drawings show V shaped cut-outs on the top and bottom of all the side panel members to conform to the final shape of the fully formed end closure, they are by no means necessary to the invention. Ordinary rectangular wall panels could be used in the normal manner and the end closure would still operate in the same fashion.
As seen in the side sectional view of FIGURE 10, the contents of such a carton is automatically centered equidistant (approximate half to three-quarters of an inch) from the ends of the carton. This serves both the purpose of providing an adequate and simple means of cushioning the contents against sudden shocks, as well as assuring better display of the contents when a die cut opening is in the front panel or a hollow wall box of the type illustrated is used.

In FIGURES 11 and 12, I have illustrated a modification of my invention. A conventional four wall carton is shown having a rear wall panel 20, side wall panels 21 and 22, and a front wall panel 23. A glue flap 24 is articulated to rear wall panel 20. The front wall panel 23 is cut and scored to provide flaps 25a and 25b, which may be folded inward to provide full exposure of the contents of the carton. Articulated to rear wall panel 20 is a closure flap 13c similar to flaps 13a and 13b described earlier; and articulated to front wall panel 23 is a closure flap 14c similar to flaps 14a and 14b. Flap 13c is provided with at least one die cut projection 15c; flap 14c has a medial line of fold 16c, and at least one die cut segment 17c lying along the line of fold. Articulated to the opposite end of rear wall panel 20 is a modified closure flap 26, and articulated to the opposite end of front wall panel 23 is a second modified closure flap 27. Flap 27 is provided with a medial line of fold 28, and an oval cut-out 29. This cut-out 29 is of such shape when the flaps are folded into their erected position and examined from the end, the cut-out describes a circle. This oval cut-out is centered at the middle of the line of fold 28. Flap 26 is provided with a cut-out 30 which is substantially identical to one-half of cut-out 29 in flap 27. When the flap 27 is folded downward and inward into the carton body, it will fold along its line of fold 28 and assume an angular position. Flap 26 can then be folded over into juxtaposition with the outer portion of flap 27, as seen in FIGURE 12. In this position the oval cut-outs are superposed in such fashion as to receive the cap of a bottle, as also seen in FIGURE 12. When a cap projects through the cut-outs, the flaps are effectively secured in their infolded position. Furthermore, the shoulders of the bottle will be supported by the closure flaps and the top of the cap will be held some distance from the ends of the erected carton, thereby providing an effective cushion for the bottle or other contents.

Modifications may, of course, be made in my invention without departing from the spirit of it. For example, the shape of the cut-outs may be varied to accommodate them to bottles and the like of varying shapes. Having, however, described my invention in certain exemplary embodiments, what I claim as new and what I desire to secure and protect by Letters Patent is:

1. In a carton structure having enclosing body walls defining a tubular body, a cushioning end closure for said structure comprising a pair of closure flaps of unequal width articulated to opposite walls of said carton body, the longer of said closure flaps being of a width greater than the distance between said opposite walls of said carton body and divided into an inner portion and an outer portion by a line of fold extending parallel to the line of articulation joining the said closure flap to the carton body, the shorter of said closure flaps being of a width equal to that of said outer portion of said longer flap, whereby when said longer flap is depressed into the body of said carton and folded along said dividing line of fold to form a cushioning member which is of inverted V shape in cross-section, the free edge of said outer portion will lie along the line of articulation between said shorter flap and the carton wall, and the shorter of said flaps may be folded inward and juxtaposed over the outer portion of said longer flap with the free end of said shorter flap lying along the line of fold in said longer flap, and means for detachably securing said shorter flap in its infolded position.

2. The device claimed in claim 1 wherein said means for detachably securing said shorter flap in its infolded position comprises at least one die cut segment in said longer flap adjacent to said line of fold therein and adapted to be opened as said longer flap is folded along its line of fold, and mating projections on said shorter flap adapted to be engaged in the openings defined by said die cut segments.

3. The device claimed in claim 1 wherein the line of fold in said longer flap is a medial line of fold, and said shorter flap is substantially one-half the width of said longer flap.

References Cited in the file of this patent

UNITED STATES PATENTS
1,343,002 Markert ___________ June 8, 1920
2,103,382 Petter ___________ Dec. 28, 1937
2,533,264 Flick ___________ Nov. 24, 1942
2,648,401 Stone ___________ Aug. 31, 1954
2,666,567 Farrell ___________ Jan. 19, 1954

FOREIGN PATENTS
437,698 Great Britain ___________ Nov. 4, 1935
485,831 Canada ___________ Aug. 19, 1952