

Aug. 18, 1964

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3,144,979

EXPANSIBLE CORRUGATED PAPERBOARD CARTON

Filed Aug. 5, 1963

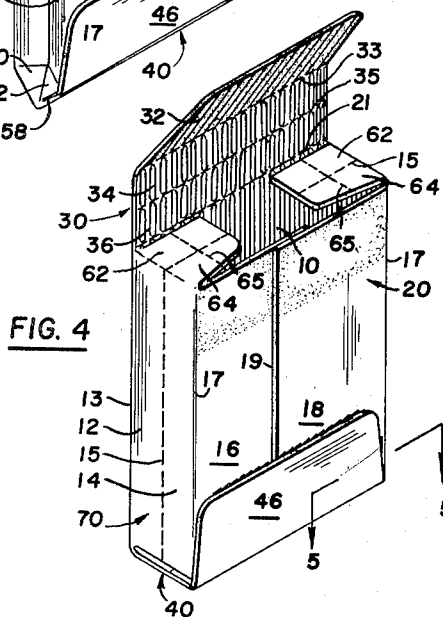
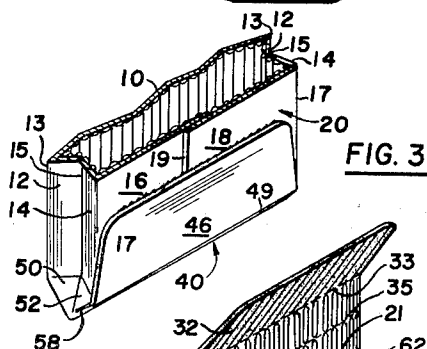
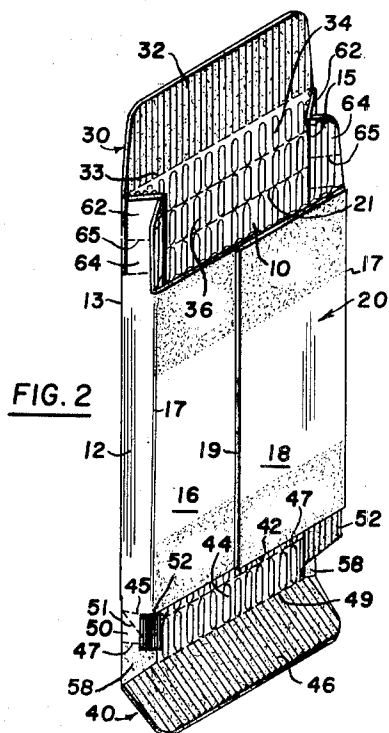
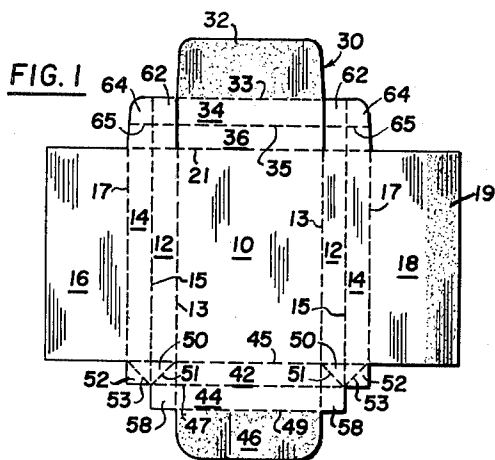
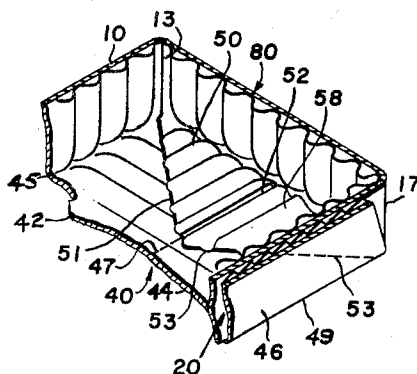


FIG. 5



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EXPANSIBLE CORRUGATED PAPERBOARD CARTON

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Filed Aug. 5, 1963, Ser. No. 299,812
2 Claims. (Cl. 229—41)

This invention relates to an expansible corrugated paperboard carton which is adapted to be fabricated from a single blank on continuous folding and gumming machines. More particularly, it relates to a flatly formed carton having folding lateral panels which are capable of being readily expanded or contracted to accommodate articles of various sizes while providing protection to fragile contents against shock or other damage at all times. The carton of the instant invention is especially suitable for shipping, mailing or storage of merchandise such as books, bottles and the like, and is easily convertible from a flat envelope configuration to a sturdy box-like container which will resiliently protect the enclosed article.

In the past, collapsible cartons were designed only to hold the contents when the container was fully erected in the form of a box. While the cartons themselves could be shipped or stored in flat or knock-down condition, they were not capable in their folded state of receiving articles. That is, their construction was primarily intended for employment as a completely assembled shipping container, and they were not adapted in collapsed condition for use as a shipping medium.

Furthermore, the prior art cartons of a particular cubic dimension could not readily accommodate articles of various sizes and shapes. Where articles of much smaller dimension than that of the carton itself were packed, stuffing with dunnage was required in order to prevent undue freedom of movement and rattling in transit.

It is therefore an object of this invention to provide a collapsible carton which has equal utility as a container in either flat-folded, partially expanded, or fully expanded condition.

Another object of this invention is to provide a corrugated paperboard container which is capable of being stored flat and thereafter used as a flat-folded envelope or which can be expanded into box-like configuration to receive articles of various sizes.

It is also an object of the invention to provide a container wherein irregularly shaped objects, not completely filling the container, may be wedged into fixed position by a bottom element, when said element is partially expanded.

Another object of this invention is to provide a corrugated paperboard envelope having expansible lateral panels which is adapted to offer protection against shock or other damage to fragile articles received therein.

An additional object of the invention is to provide an envelope having double edges on each side which afford additional protection for the contents when the envelope is partially expanded.

Another object of this invention is to provide an expansible corrugated paperboard carton which will resiliently embrace articles of various sizes and shapes so that articles having dimensions much smaller than the expanded carton can be retained in generally fixed position therein during shipment without requiring dunnage or stuffing.

Still another object of this invention is to provide an envelope-like, expansible, corrugated-paperboard carton which can be readily fabricated on continuous gumming and folding machines.

Yet another object of this invention is to provide a corrugated paperboard container which is urged into expanded condition as the articles are inserted therein.

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A still further object of this invention is to provide an expansible envelope fabricated from corrugated paperboard and having fully closed upper and lower corners.

Other objects of this invention are to provide an improved device of the character described that is easily and economically produced, which is sturdy in construction, and which is highly efficient and effective in operation.

With the above and related objects in view, this invention consists of the details of construction and combination of parts as will be more fully understood from the following detailed description when read in conjunction with the accompanying drawing, in which:

FIGURE 1 is a plan view of a corrugated paperboard blank from which an expansible carton embodying this invention is formed.

FIGURE 2 is a perspective view of the blank in partly folded position with marginal edges of the side flaps in overlying sealed relationship so as to form the front panel of the carton.

FIGURE 3 is a fragmentary perspective view of the bottom portion of the expansible carton with the bottom flap sealed in overlying relationship with the lower portion of the front panel.

FIGURE 4 is a perspective view of the carton in fully expanded position with the top flap open preparatory to sealing thereof.

FIGURE 5 is a fragmentary perspective view of the lower portion of the expanded carton taken generally along lines 5—5 of FIGURE 4.

Referring now in greater detail to the drawing in which similar reference characters refer to similar parts, I show a corrugated paperboard single blank, in FIGURE 1, which is so shaped and scored as to provide, when folded and adhesively secured, an expansible gusset carton that resembles an envelope in flat condition but which is adapted to be expandedly formed into a box-like configuration. The blank is preferably fabricated from single-faced, corrugated paperboard of a special design, generally classified in the trade as "B-fluting." The blank configuration comprises a generally rectangular central panel 10 having a pair of inwardly folding lateral panel sections 12 outwardly extending therefrom along longitudinal scores 13. A second pair of folding panel sections 14 are secured to the first panel sections along intermediate fold lines 15. Extending outwardly from the second folding panel sections on longitudinal scores 17 are respective wing sections 16 and 18 which are adapted to overlap at their marginal edges when the blank is folded inwardly, outwardly, and then inwardly along the triple score lines 13, 15, and 17. A paste or gum is applied to the portion 19 so that when the overlapped edges of the wing sections 16 and 18 are pressed together they are adhesively secured and form a "center seam" front panel 20 which overlies the central or back panel 10.

A top closure 30 upwardly extends from the central panel 10 along transverse scores 21 and includes a sealing flap 32 together with intermediate sections 34 and 36 disposed between transverse creases 33 and 35. Hinged to the lower edge of the central panel 10 is a bottom panel 40 which includes a pair of foldable panel sections 42 and 44 as well as a sealing flap 46. The bottom panel sections 42 and 44 and the sealing flap 46 are hinged together along triple transverse scores 45, 47, and 49.

Downwardly depending from the lateral panel sections 12 and 14 and contained intermediate continuations of the transverse scores 45 and 47 are a pair of gusset portions 50 and 52. These gusset portions 50 and 52 have respective diagonal scores 51 and 53 along which these portions are adapted to break to form triangular corner gussets during expansion of the carton. A sealing

tab 58 depends from each gusset portion 50 along score line 47 and is hinged to the lateral edges of bottom panel section 44 along extensions of the longitudinal scores 13.

Upper corner closures are defined by corner flaps 62 and 64 which upwardly extend from the respective lateral panel sections 12 and 14 along score line 21, both corner flaps terminating along a line registering with transverse score 33 and being hinged to each other along continuations of longitudinal scores 15. The corner flap portions 62 are split or spaced from the top panel sections 34 and 36 along extensions of the longitudinal scores 13. A transverse score 65 registering with score 35 divides the flaps 62 and 64 into sections along which the corner closures may break when the carton is partially expanded.

The blank is formed into the expansible carton by folding the wing portions inwardly, outwardly and inwardly along the longitudinal scores 13, 15, and 17 so as to bring the lateral panel sections 12 and 14 into interiorly folded overlying disposition. The wings 16 and 18 are overlapped at their marginal edges and secured by adhesive at 19 so as to define a front panel 20 with a center seam. This initial folding operation causes the gusset portions 50 and 52 to be into face to face contact with each other while the sealing tabs 58 overlie the outboard areas of the bottom panel section 44. Similarly, the corner flaps 62 and 64 are urged into facing contact. FIGURE 2 is generally illustrative of the preliminary configuration of the carton after the first steps, as set forth above, have been completed. It is also to be observed that the outer marginal edge of the corrugated face of the wing 16 may be adhered to the abutting, smooth-back face of the wing 18.

The corrugated flutes on both the top sealing flap 32 and the bottom sealing flap 46 are pressed flat by passing them through steel rollers, for example. Similarly, the corrugated face of each gusset portion 52 is pressed flat so that better adhesive attachment will be provided when these surfaces are glued to the respective faces which they will abut. In addition, the fold line 47 is re-scored preparatory to the bottom flap fold-over and seal.

Glue is now applied to the flattened corrugated face of the bottom flap 46 and also to the now upwardly facing smooth surface of the sealing tab 58. If desired, the corrugated surface of the now upwardly facing gusset portions 52 may have adhesive applied thereto additionally. Lastly, a pressure sensitive adhesive is applied to the flattened corrugated surface of the top sealing flap 32 and also to the upper margin of the smooth, now outwardly facing surface of the front panel 20.

The bottom panel 40 is now folded outwardly along the intermediate score line 47 so that the corrugated face of the bottom sealing flap 46 is adhesively secured into face-to-face contact with the lower margin of the front panel 20. The smooth surface of the sealing tabs 58 will accordingly be pressed against and sealed in contact with the corrugated face of the corresponding gusset portions 52. As is apparent, the bottom corners of the carton are now fully closed and sealed, substantially as shown in FIGURE 3.

When the flat envelope, shown in FIGURE 3, is to be expanded to form the boxlike container of FIGURE 4, the front panel 20 is moved outwardly away from the back panel 10. The panel sections 12 and 14 hinge outwardly along the lines of fold 13, 15, and 17 respectively and form side walls 70 and 80. Simultaneously the transverse scores 45 and 49 break into folds while the bottom panel sections 42 and 44 are urged into a common plane to define the bottom wall 40, as shown in FIGURES 4 and 5. During this expansion, the gusset portions 50 and 52 break along the diagonal folds 51 and 53 so that a triangular gusset is formed which lies in a plane parallel to and in abutment with the bottom panel 40. The upper corner flaps 62 and 64 fold open in

unison with the lateral panel sections 12 and 14 and form common planes with the side walls 70 and 80. However, when the top flap 30 is folded downwardly so that its sealing flap 32 abuts the front panel 20, the corner flaps 62 and 64 are flattened along the fold line 21 so as to underlie the top panel 30. These corner flaps not only protect the contents of the container at its upper lateral edges but also serve to reinforce the top corners thereof against crushing. In a similar manner, the triangular gussets 50 and 52 reinforce the bottom corners of said carton. When the carton is shipped as a flat envelope, the corner flaps 62 and 64 may be folded along the intermediate score 65. This will also allow perfect registration of the pressure sensitive glue on flap 32 and upper portion of front panel 20.

The corrugated paperboard used in the fabrication of the carton hereindescribed serves to isolate fragile articles contained therein against shock, vibration and atmospheric conditions. The carton itself is easily formed on conventional continuous gumming and folding machines. In view of the nature of the resiliently expansible panels, the carton tends to maintain itself in collapsed position. Thus, when the contents are not sufficient to fully expand the carton into boxlike configuration, the various panels tend to resiliently bear upon the contained articles and retain them in a generally stable position therein. Many different articles including books, papers, and even glassware, such as bottles and dishes, can be conveniently handled by the above expansible carton. A single carton size can efficiently accommodate objects of various shapes and cubic dimensions. It is therefore obvious that the instant carton can be employed as a flat protective envelope, as a boxlike shipping container, or even as an intermediate collapsible container which would space adjacent articles in a case from each other.

Although this invention has been described in considerable detail, such description is intended as being illustrative rather than limiting since the invention may be variously embodied, and the scope of the invention is to be determined as claimed.

What is claimed is:

1. A gusset carton adapted to be expanded from an initially flat-folded container into a rectangular container of boxlike configuration comprising; a one-piece blank of single-faced corrugated paperboard including substantially rectangular front and back panels overlying each other, side walls hinged to the respective outboard edges of said front and back panels along pairs of longitudinal folds, each of said side walls having a longitudinal reverse fold intermediate each pair of longitudinal folds to form inwardly-folded lateral panel sections overlying each other between said front and back panels, a bottom hinged to the lower edges of said front and back panels along a pair of transverse folds and having an intermediate transverse fold therebetween to form outwardly-folded bottom panel sections overlying each other, said front panel including wings with sealed overlapping marginal edges at the central portion thereof, said bottom including a bottom seal flap having flattened corrugated flutes adhesively secured to the lower marginal edge of said front panel, diagonally-scored gusset portions downwardly depending from the respective lateral panel sections along continuations of the transverse fold connecting said bottom with said back panel and terminating along a line registering with the transverse fold intermediate said bottom panel sections, adjacent gusset portions being hinged to each other and the gusset portions next adjacent the bottom panel section which is hinged to said back panel being hinged to said last-mentioned bottom panel section, sealing tabs depending from the last-mentioned gusset portions along the intermediate transverse fold and being further hinged to the bottom panel section which is hinged to said front panel, said sealing tabs being adhesively secured in face-to-face abutment

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with the gusset portions which are connected to the lateral panel sections hinged to said front panel, said gusset portions being substantially co-planar with the respective inwardly-folded lateral panel sections when the carton is in flattened condition, said gusset portions breaking along their respective diagonal lines of fold and forming triangular sections overlying the flat bottom in parallel planes therewith when the carton is squared out into boxlike configuration, a top closure flap connected to the upper edge of said back panel and transversely triple scored so as to be divided into a top sealing flap adapted to be adhesively secured to said front panel and a pair of hinged-top panel sections which are adapted to form a squared-off top panel, and a corner flap hinged to the upper edge of each of said lateral panel sections and terminating at the transverse score intermediate said top sealing flap and the next adjacent top panel section, adjacent corner flaps being hinged together along continuations of the intermediate longitudinal folds.

2. A flatly-folded carton fabricated from a single blank of corrugated paperboard and adapted to be formed after being folded and sealed into a fully expansible gusset-type container, comprising substantially rectangular front and back panels overlying each other, side walls hinged to the respective edges of said front and back panels along pairs of longitudinal folds, each of said side walls having an intermediate longitudinal reverse fold with respect to each pair of longitudinal folds to form inwardly folded lateral panel sections overlying each other between said front and back panels, a bottom connected along one edge to the lower edge of said back panel by a transverse fold and having a width corresponding to the width of the side walls and having an intermediate fold to provide bottom panel sections overlying each other, said front panel including wings with sealed overlapping marginal edges at the central portion thereof, a bottom seal flap connected with the opposite edge of said bottom along a transverse fold and adhesively secured in overlapping relationship with the lower marginal edge of said front panel, diagonally-scored gusset

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portions downwardly depending from the respective lateral panel sections along continuations of said first-mentioned transverse fold and terminating along a line registering with the intermediate fold of said bottom, said gusset portions being adjacently hinged to each other and to the bottom along the respective longitudinal folds, sealing tabs depending from the gusset portions which are hinged to the lateral panel sections immediately adjacent the back panel along the intermediate transverse fold and being further hinged to the bottom panel section along a continuation of the longitudinal fold at the edge of said back panel, said sealing tabs being adhesively secured in face-to-face abutment with the gusset portions which are hinged respectively to the lateral panels connected to said front panel, said gusset portions being substantially co-planar with the respective inwardly-folded lateral panel sections when the carton is in collapsed condition, said gusset portions breaking along their respective diagonal lines of fold and forming triangular sections overlying the flat bottom in parallel planes therewith when the carton is squared out into boxlike configuration, and a top closure flap connected to the upper edge of said back panel and transversely triple-scored so as to be divided into a top sealing flap adapted to be secured to said front panel and a pair of hinged-top panel sections which are adapted to form a squared-off top panel.

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