June 5, 1956 L. C. PENNEBAKER 2,749,015

FOLDING CARTONS

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Fig. 1

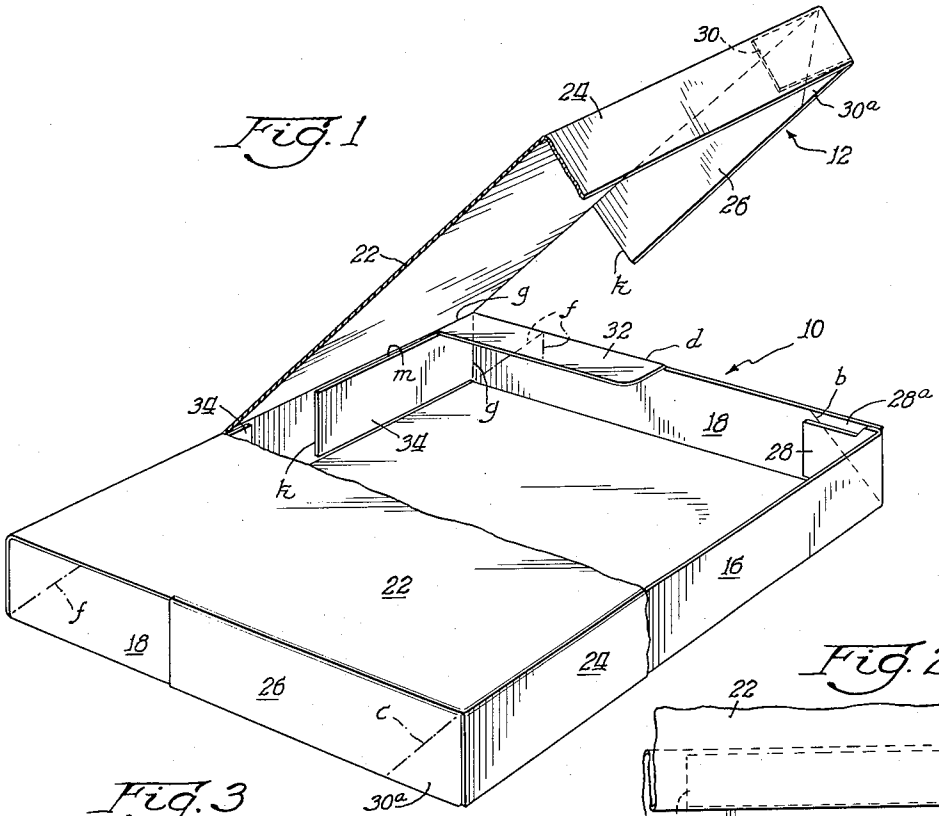


Fig. 2

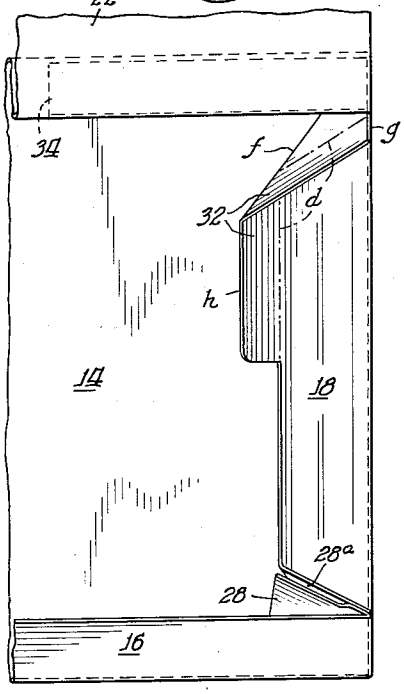
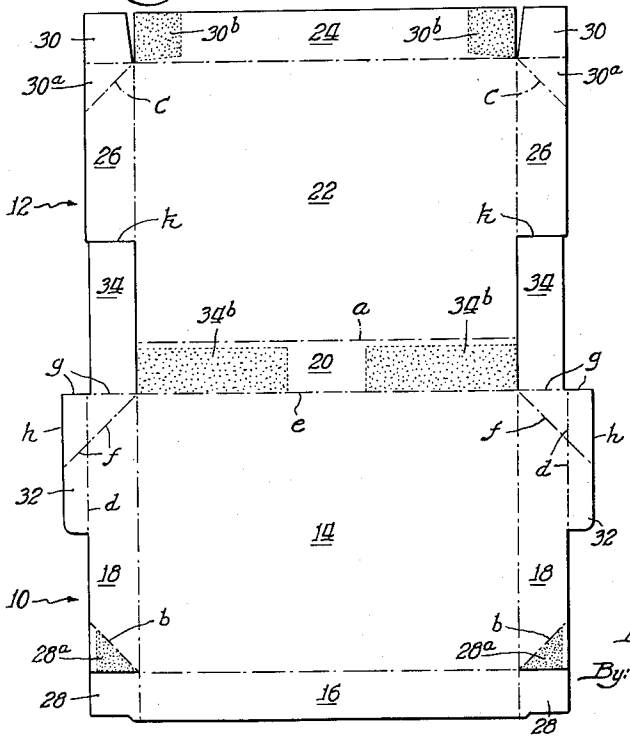


Fig. 3



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FOLDING CARTONS

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1 Claim. (Cl. 229—33)

The present invention relates to folding cartons and more particularly to an improved one piece carton with cover attached, capable of being shipped in flat knocked-down condition and of being easily erected for packing by the user. Cartons constructed in accordance with the principles of the present invention are particularly well adapted for use as suit boxes in retail department and other stores for packing suits and other garments for delivery to the customer, and it is for this use that the present carton has been designed. The invention is however capable of other uses and the same may, if desired, with or without modification, be employed for the packaging of numerous articles other than garments.

One-piece cartons of the type briefly outlined above and as currently and customarily manufactured are possessed of several limitations both in the manufacture as well as in the use thereof. Such cartons have their cover portion of the same depth as their bottom portion and, as a consequence, when each carton is erected, the front wall and the two side walls will present two thicknesses of material while the back wall will present but a single thickness of material and therefore will be structurally weak. To remedy this condition it has been the practice to reinforce the back wall with a separate strip or plural strips of cardboard or the like which may be adhered to the interior face of the back wall by a suitable adhesive. This operation has been costly, both from the point of view of the additional material involved and the cost of applying the strip.

The present invention is designed to overcome the above noted limitations that are attendant upon the construction of cartons of this character and, toward this end, it contemplates the provision of an improved carton with lid attached wherein the back wall is adequately reinforced with strips of material which are taken from adjoining regions of the paperboard blank but which remain integral with the folded blank when the box is erected and which furthermore do not impair the efficiency of the erected carton as a whole for lack of the material in the regions from which they have been obtained.

A second limitation that exists in connection with conventional cartons of this type, particularly those having diagonally scored side walls, resides in the fact that reliance must be placed upon the contents for support to maintain the carton in its "square" erected condition because of the tendency for the unloaded or empty carton to collapse in the absence of internal support. This limitation results in considerable difficulty in the actual loading of the carton. Even after the carton has been loaded, unless the contents is of a substantial nature, there may be a partial collapse of the carton side walls due to the tendency for these walls to spring inwardly and the cover side walls must be relied upon to conceal such partial collapse and to give the carton a reasonable amount of stacking strength.

To obviate this latter difficulty encountered in the loading of conventional one-piece cover-attached cartons, the present invention contemplates the provision of such a carton having the usual diagonally scored side walls but in which an additional strip of material in the blank adjacent and integral with each side wall assumes a position where it may be folded laterally of the diagonal score or fold line so as to provide an edgewise reinforcement for the side wall against collapse and also in which the additional strip assumes a position wherein an edge thereof abuts the rear wall and rests upon an edge of the adjacent rear wall reinforcing strip for counteracting the tendency of side wall collapse as well as for ready and facile "location" of this strip during rapid erection and loading of the carton.

The provision of a one-piece, collapsible, cover attached carton possessing the advantageous features briefly outlined above being among the principal objects of the invention, numerous other objects and advantages thereof not at this time enumerated will become apparent as the following description ensues.

In the accompanying single sheet of drawings forming a part of this specification, a preferred embodiment of the invention has been illustrated.

In these drawings:

Fig. 1 is a perspective view of a carton constructed in accordance with the principles of the present invention and showing a portion of the cover closed upon the carton body and a fragmentary portion thereof in partially opened condition to more clearly reveal the nature of the invention.

Fig. 2 is a fragmentary inside view taken in the vicinity of the rear wall of the partially erected carton, and

Fig. 3 is a plan view of a blank from which the carton of Figs. 1 and 2 is formed.

Referring now to the drawings in detail and in particular to Fig. 3 wherein the blank from which the improved carton is formed is shown, a transverse fold line *a* divides the blank generally into a body portion **10** and a cover portion **12** (see also Fig. 1). The body portion **10** includes a bottom panel **14**, a front wall panel **16**, side wall panels **18** and a rear wall panel **20**, to which latter panel the cover portion **12** is hingedly secured in a manner and for purposes that will be made clear presently. The cover portion **12** includes a top panel **22**, a front flange panel **24**, and side flange panels **26**.

A pair of front corner sustaining flaps **28** extend laterally from the opposite ends of the front wall panel **16**. The side wall panels **18** are diagonally scored as at *b* to provide triangular glue flaps **28***a*. The cover side flange panels **26** are diagonally scored as at *c* to provide triangular hinge flaps **30***a* to which there are connected corner sustaining flaps **30** designed for gluing to the stippled surface areas **30***b* on the inside of the front flange panel **24**.

The arrangement of the bottom front corners and of the cover front corners just described is purely conventional and no claim is made herein to any novelty associated with the same, the novelty of this invention residing rather in the construction of the composite wall panel including the panel **20** and in the means for preventing collapsing of the side wall panels **18** in the erected carton structure, which construction and means will be more particularly set forth and claimed hereinafter.

The side wall panels **18** have hingedly connected thereto along a hinge line *d* laterally extending, relatively narrow elongated bracing strips **32** which, in the form of the invention illustrated, extend from the hinge line *e* existing between the bottom panel **14** and rear wall panel **20** forwardly to approximately the transverse median line of the bottom **14**. A diagonal score line *f* extends across each side wall **18** and is continued through

the attached strip **32** to define a triangular portion defined by the sides *f*, *g*, and *h*. The strips **32** are termed herein "bracing strips" inasmuch as they are adapted to be turned laterally and inwardly of the erected carton at an angle of 90° to the plane of the erected side walls to brace the latter against the normal tendency thereof to collapse, all in a manner that will appear presently.

Each side wall panel **18** has hingedly connected thereto along the line *g* an elongated reinforcing strip **34** of a width substantially equal to the width of the panels **18** and **26** and arranged in alignment with these two latter panels. The strips **34** are completely severed from the panels **26** by a transverse cut *k* which is preferably located in a transverse plane spaced from the hinge line *e* a distance somewhat less than one-half the extent of the back wall panel **20**. The position of the cuts *k* and the consequent extent of the reinforcing strips 34 are not critical since these strips are provided for the purpose of reinforcing the rear wall **20** by gluing thereof to the glue areas indicated by stippling at 34*b*. The closer these cuts *k* are made to the hinge line *e*, the shorter will be the extent of the reinforcing strips and, since it is not desired that the two strips **34** shall overlap, the cuts are made as specified above.

It will of course be understood that the first steps in erecting the blank of Fig. 3 will be to glue the stippled areas **28***b* and **30***b* of the front corner assemblies to their respective glue flaps in the usual manner. The reinforcing strips **34** will likewise be adhered to the stippled areas **34***b*. It will be understood that these steps are normally effected on automatic equipment so that each carton is already suitable for shipment in flat condition with a series of similarly unexpanded cartons.

The setting up or erecting of the unexpanded carton is a semi-automatic operation in that after the cover **22** has been lifted or turned back, its weight, acting upon the resistance of the hinge line *a*, will tend to partially erect the rear wall **20**. Such partial erection of the rear wall will, through a sort of linkage arrangement including the triangular parts defined by the sides *f*, *g* and *h*, effects partial erection of the side wall panels **18** and the front wall panel **16**. Thereafter, in order to fully erect the side walls and rear wall, it is merely necessary to spread the side walls upwardly and outwardly, utilizing the thumbs against the inner side of the side walls and the third and fourth fingers of each hand against the outer side of these walls. When the side walls are perfectly erect, the index fingers may be employed for pushing the bracing strips **32** inwardly to horizontal position about the fold line *d* to brace or lock the side walls in their vertical positions.

Reference to Fig. 1 will reveal the fact that the strips **34** are slightly narrower than the back wall **20** and are glued to the back wall **20** in such positions that the upper edges *m* thereof extend horizontally a slight distance below the upper edge *a* of the back wall. These upper edges *m* of the strips **34** constitute in effect ledge portions which are adapted to receive the end edges of the bracing strips **32** to limit downward swinging movement of these latter strips beyond the horizontal during rapid erection of the carton.

From the above description it will be observed that, with the plane of the bracing strips **32** existing at right angles to the planes of the side walls **26**, the diagonal fold lines *f* will be maintained rigid against collapse and as a result thereof reliance need not be placed upon the character or rigidity of the contents of the box to hold these side walls rigid as is the case in connection with conventional one-piece boxes with lid attached.

Finally, it is to be noted that even if the operator fails to press the bracing strips **32** inwardly sufficiently far as to cause their end edges to seat upon the ledge portions defined by the edges *m* of the reinforcing flaps **34**, subsequent closure of the cover section **12** will effectively cam the bracing strips to their horizontal bracing positions and into engagement with the ledge portions *m*.

The invention is not to be limited to the exact arrangement of parts shown in the accompanying drawings or described in this specification as various changes in the details of construction may be resorted to without departing from the spirit of the invention. Only insofar as the invention has particularly been pointed out in the accompanying claim is the same to be limited.

I claim:

A folding carton comprising a body portion and a cover portion; said body portion including a bottom, side walls hingedly connected to opposite margins of said bottom, a front wall and a rear wall hingedly connected to opposite margins of said bottom, means hingedly joining said front and side walls, reinforcing strips hingedly connected to said side walls along the rear edges thereof, and a bracing strip hingedly connected to the upper edge of each side wall; said side walls each having a diagonal fold line extending thereacross from the juncture point of said bottom, side wall and reinforcing strip to the upper edge of said side wall, thus defining a triangular piece capable of assuming an intermediate position between the side wall and reinforcing strip when the side wall is folded inwardly upon the bottom; said reinforcing strips being adhesively secured to said rear wall and having a length substantially greater than the height of said rear wall but less than one-half the width of said rear wall and a height slightly less than the height of said rear wall, and having their upper edges located below the upper edge of said rear wall by an amount substantially equal to the thickness of the folding carton material; said bracing strips each extending forwardly from the rear edge of the side wall upon which it is hinged across the juncture of said diagonal fold line with the upper edge of the side wall and having a fold line thereacross in alignment with said diagonal fold line, whereby said carton may be collapsed when said bracing strip is in the same plane as said side wall, and each bracing strip also having its rear edge at right angles to the upper edge of said side wall, whereby said rear edge will rest upon the upper edge of said reinforcing strip when said bracing strip is extending inwardly at right angles to said side wall to limit the downward movement of said bracing strip and effectively prevent collapse of said carton; and said cover portion including a top hingedly connected to the upper edge of said rear wall and inwardly foldable front and side flanges hingedly connected to said top, each of said side flanges having a length substantially equal to the sum of the length of said top plus the height of said rear wall less the length of the adjacent one of said reinforcing strips.

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