Dec. 9, 1941. P. A. GRAF 2,265,279

COLLAPSIBLE CARTON

Filed Nov. 12, 1938 2 Sheets-Sheet 1

Fig. 1

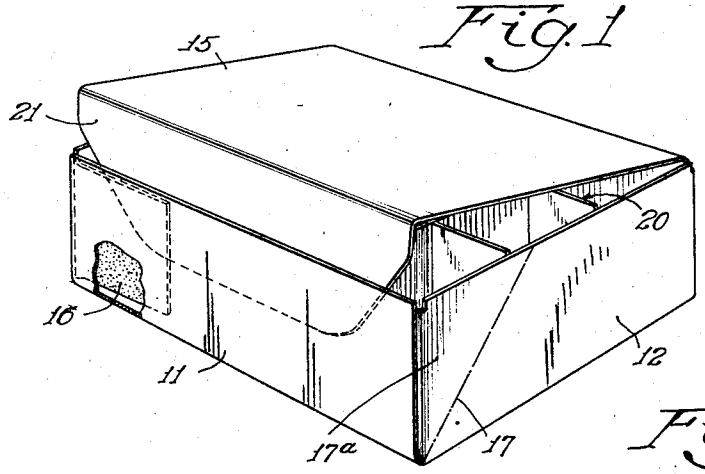


Fig. 2

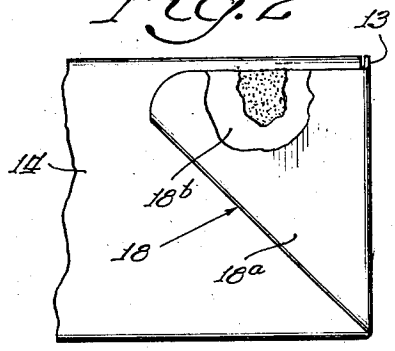
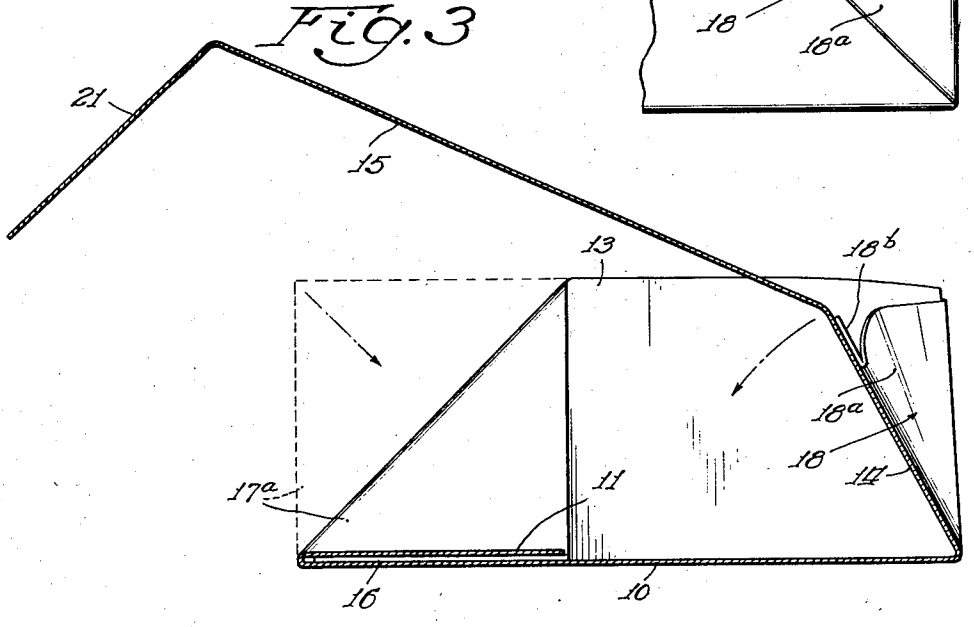


Fig. 3



Inventor:
Paul A. Graf
By: E. A. Wagonseller
Atty.

Dec. 9, 1941. P. A. GRAF 2,265,279

COLLAPSIBLE CARTON

Filed Nov. 12, 1938 2 Sheets-Sheet 2

Fig. 4

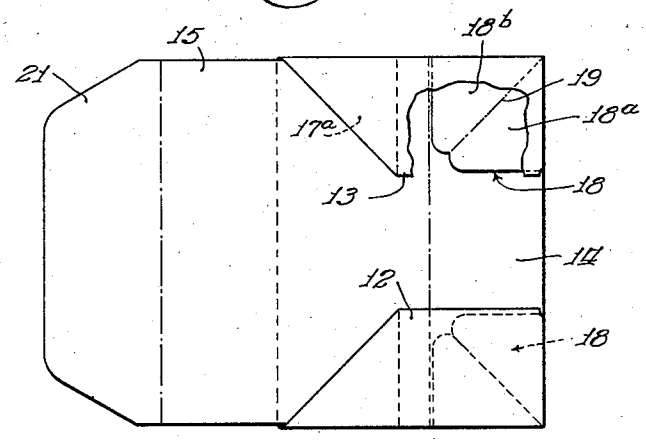
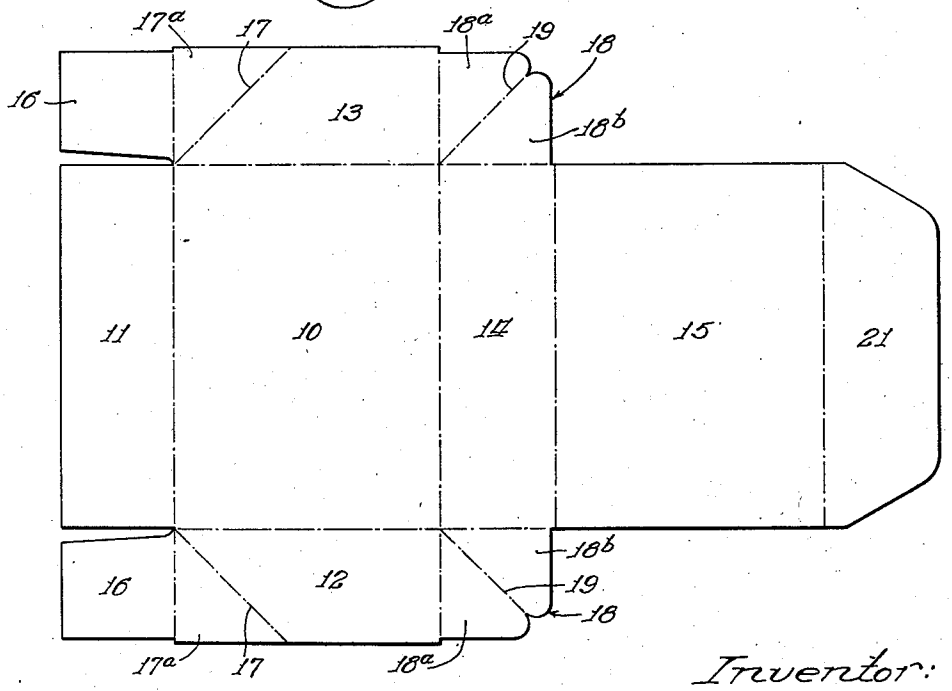


Fig. 5



Inventor:
Paul A. Graf
By: E. A. Wagoneller
Atty.

Patented Dec. 9, 1941 2,265,279

UNITED STATES PATENT OFFICE

2,265,279

COLLAPSIBLE CARTON

Paul A. Graf, Chicago, Ill., assignor to Container Corporation of America, Chicago, Ill., a corporation of Delaware

Application November 12, 1938, Serial No. 239,982

4 Claims. (Cl. 229—33)

The present invention relates to folding cartons and more particularly to a type of folding carton especially adapted for the shipment of eggs and other fragile articles.

An object of the present invention is to provide a fully collapsible carton having a cover element carrying a tuck flap extension so that the carton may be set up and the cover secured in position so as to completely enclose the contents.

Another object of the invention is to provide a collapsible carton having a cover flap extension carried on one of the walls, and in which all of the walls of the carton may be folded inwardly to lie on or adjacent the upper surface of the bottom wall to provide a rectangular shaped collapsed construction which may be set up by merely grasping and moving the front and rear walls successively upwardly and outwardly of the collapsed assembly.

A further object of the invention is to provide a collapsible carton in which at least the front and side walls are collapsible upon the bottom, but are so related as to cause the walls to readily assume a set-up condition and after being set up, the walls will not move to collapsed condition until conscious effort is made to collapse it.

A still further object of the invention is to provide an efficient method of securing together the parts of a collapsible carton of the type described in which the front, rear and side walls are collapsed inwardly to lie substantially within the contour of the bottom wall.

In the drawings, illustrating a preferred embodiment of the invention:

Fig. 1 is a perspective view of a carton made in accordance with the present invention, showing same as it appears in fully set-up position just prior to bringing the closure element to final position;

Fig. 2 is a fragmentary rear view showing the construction of one of the corner portions of the carton;

Fig. 3 is a cross sectional view of the carton as it appears when partially collapsed;

Fig. 4 is a top view of the carton illustrating it in a collapsed condition; and

Fig. 5 is a plan view of the blank of the carton.

The carton of the present invention finds particular application where a relatively inexpensive carton for eggs or other fragile articles is desired and where one of the requisites of the carton is that of having it adaptable to being set up ready for filling without requiring the operator to connect any of the parts together, which tends to slow up the operation of making the carton ready for use.

The present invention provides a collapsible carton fully completed at the box-plant, such carton having all of its walls, as well as the cover flap, collapsible over the bottom by inward swinging movement so as to provide a collapsed construction of generally rectangular form, whereby packing of the collapsed cartons for storage and shipment is simplified.

Referring more particularly to the drawings, the carton, as herein disclosed, is formed from a single blank of foldable paperboard comprising a bottom panel 10, a front wall 11, side walls 12 and 13, and rear wall 14. The rear wall 14 has a flap extension thereon which provides a cover element 15.

The front wall is suitably connected at its ends to the respective ends of the side walls, and, for this purpose, the front ends of the side walls are preferably formed with flap extensions 16, 16, adapted to be secured to the inner face of the front wall as by means of suitable adhesive.

The front and side walls are preferably so constructed as to enable the front wall to be folded flat upon the upper surface of the bottom wall and for this purpose the side walls 12 and 13 are provided respectively with fold lines 17, 17, extending rearwardly and upwardly from the lower front corners of the side walls and being disposed at an angle of approximately 45 degrees with the lower edges of the side walls. These fold lines thus define a triangular section 17a at the front part of the side walls which may be folded down to lie against the adjacent front part of the side walls in which position the front wall will assume a position in which it lies flat on the upper face of the bottom wall 10.

For the purpose of enabling the rear wall to be folded inwardly to lie flat upon the bottom wall, the side walls are in the present instance provided with extensions at their rear ends and these extensions are in turn connected to the rear face of the rear wall along a line spaced inwardly from the outer ends of the rear wall and disposed at an angle to the vertical rear corners of the carton. In the present instance the rear and side walls are connected together by integral corner elements 18, 18, each of these elements 18, 18 being formed with a diagonally extending crease line 19, 19, separating each of the elements 18, 18 into two symmetrical parts 18a and 18b. In order to hingedly associate the parts 18a, 18a with the rear wall of the carton, the parts 18b, 18b are secured to the rear face

of the rear wall as by means of adhesive. By this arrangement the individual parts 18a will each be hingedly secured to the rear face of the rear wall along the line extending upward from the lower rear corners of the carton and being disposed at an angle of approximately 45 degrees with the vertical corners of the carton, as well as the lower edge of the rear wall. Thus when the carton is in a set-up condition the respective parts 18a and 18b will lie flat against each other at the rear of the carton, leaving the interior of the carton free from any irregularities or projecting parts.

When the front, rear and side walls are in a relatively vertical position, as illustrated in Fig. 1, with the cover of the carton raised approximately as illustrated in Fig. 3, the box may then be collapsed by swinging the front wall inwardly and downwardly to lie flat upon the bottom wall. This operation is accompanied by a certain amount of outward deflection of the side walls due to the triangular parts 17A of the side walls acting as a connecting element between the front wall and the remaining portions of the side walls. When the front wall has assumed its position flat upon the bottom there will be a tendency for this wall to remain in this position due to the fact that the side walls somewhat resist outward bending movement, this being due in part to the fact that the rear ends of the side walls are so associated with the lateral ends of the rear wall that the ends of the side walls are held closely against the ends of the rear wall.

After the front wall has been moved to this collapsed position on top of the bottom panel, the rear wall is then moved to a position overlying the bottom, the cover panel is moved at the same time to a position in which it lies flat over the bottom panel and collapsed front wall lying thereon. It is apparent that the cover panel and rear wall are free to swing downward because the front wall, in being swung downward on the bottom wall, has left a clear space at the front of the carton. Due to the connection between the rear face of the back wall and the ends of the side walls there will be a tendency for the rear ends of the side walls to move inwardly as soon as the rear wall begins to swing downwardly. When the rear wall has reached its position substantially flat against the bottom, the side walls will be drawn inwardly to a considerable extent in which position it requires only a slight pressure to bring the side walls down flat against the outside surface of the rear wall and the cover panel. The collapsed carton then appears as substantially illustrated in Fig. 4.

In bringing the carton to an expanded position from its collapsed condition as just described, the first operation comprises holding the front of the carton then raising the cover and rear wall to a vertical position. The front wall is then raised to vertical position, whereupon the carton is in condition to receive its contents.

In general, when the carton is to be employed for eggs or similar fragile articles, a set of partitions as indicated at 20 in Fig. 1 will be inserted into the carton.

In the event no partitions are to be employed in the carton, there will be some tendency for the rear wall to swing inwardly due to the resiliency of the corner portions connecting the rear wall and the side walls. A convenient means for retaining the rear wall in vertical position with respect to the bottom of the carton is to retain the cover panel in closed position and, for this purpose, there is preferably provided on the free edge of the cover panel a tuck flap 21, this tuck flap being so formed as to be insertable at the front of the carton to lie directly behind the rear face of the front wall. When a set of partitions is employed the tuck flap 21 will fit snugly between the ends of the partitions and the front wall. It will thus be seen that with the partition element in the carton, only a small degree of stiffness of the cover flap is required to cause the rear wall of the carton to be maintained in a vertical position when the cover is held in closed position as by means of the tuck flap 21 just described.

From the foregoing it is apparent that the present invention provides a convenient form of collapsible carton which may be folded in compact rectangular form in which the front, rear and side walls are all moved inwardly upon the bottom wall of the carton. With the carton thus collapsed it may be conveniently packed in shipping containers for storage and shipment and, when it is desired to set up the carton, this may be done by holding the front part thereof and raising the cover and rear wall to vertical position after which the front wall is moved to vertical position and the box is set up in such condition that it will resist collapsing unless a conscious effort is made to collapse it. It is to be noted that the movement of the rear wall and cover to a position in which the rear wall is vertical causes the side walls to move to vertical position without requiring these side walls to be moved upwardly in a separate operation.

Due to the fact that the connection between the rear wall and the side wall is such as to prevent outward displacement of the rear end of the side walls, it is to be noted that the front wall will assume either a vertical position or a flat position and will stay in such position due to the construction of the carton. Movement of the front wall to either its collapsed or vertical position is accompanied by what may be termed a snap action of the parts, resisting displacement of the front wall when it has been moved to either one of its two final positions.

Due to the fact that the crease line in the side walls tends to cause the walls at this point to assume a somewhat outwardly convexed position, the insertion of a partition unit within the box is greatly facilitated, particularly in comparison with certain cartons of collapsible form which have a tendency on the part of certain walls to assume an inwardly directed convexed condition.

The use of a filler within the carton as illustrated in Fig. 1 retains the walls of the carton in substantially rectangular position and tends to supplement the construction whereby it is possible to use a relatively light fiberboard in the construction of the carton and still retain all of the advantages of a somewhat heavier board.

While the present description sets forth a preferred embodiment of the invention, certain changes may be made in the construction without departing from the spirit of the invention, and it is therefore desired that the present embodiment be considered in all respects as illustrative and not restrictive, reference being had to the appended claims rather than to the foregoing description to indicate the scope of the invention.

I claim:

1. A collapsible carton having a bottom, front, rear and side walls hinged to the bottom, the front and side walls being hingedly connected to each other, the side walls being provided with fold lines extending rearwardly from the lower front corners of the carton and disposed at an angle of approximately forty-five degrees to the lower edges of the side walls, whereby the front wall may be swung rearwardly to lie flat against the bottom with the diagonal front portion of the respective side walls folded down to lie against adjacent portions of the side walls, the rear ends of the side walls each having a triangular corner extension connected thereto along one side, the other side of the triangular corner extension being hingedly connected to the rear face of the rear wall along a line extending diagonally upward from the lower rear corners of the carton at an angle of approximately forty-five degrees to the lower edge of the rear wall, whereby, after the front wall has been folded to lie flat on the bottom, the rear wall, together with the side walls connected thereto, can also be folded to lie flat over the bottom with the side walls overlying the downfolded front and rear walls.

2. A collapsible carton having a bottom, front, rear and side walls hinged to the bottom, an extension flap on the rear wall forming a cover for the carton, the front and side walls being hingedly connected to each other, the side walls being provided with fold lines extending rearwardly from the lower front corners of the carton and disposed at an angle of approximately forty-five degrees to the lower edges of the side walls, whereby the front wall may be swung rearwardly to lie flat against the bottom with the diagonal front portion of the respective side walls folded down to lie against adjacent portions of the side walls, the rear ends of the side walls each having a triangular corner extension connected thereto along one side, the other side of the triangular corner extension being hingedly connected to the rear face of the rear wall along a line extending diagonally upward from the lower rear corners of the carton at an angle of approximately forty-five degrees to the lower edge of the rear wall, whereby, after the front wall has been folded to lie flat on the bottom, the cover and rear wall can be folded to lie flat over the bottom and front wall and, whereby the movement of the rear wall to flat position over the bottom will cause the side walls to assume a position overlying the rear wall and cover portion due to the connection between the side walls and the rear wall.

3. A collapsible carton having a bottom, front, rear and side walls hinged to the bottom, the front and side walls being hingedly connected to each other, the side walls being provided with fold lines extending rearwardly from the lower front corners of the carton and disposed at an angle of approximately forty-five degrees to the lower edges of the side walls, whereby the front wall may be swung rearwardly to lie flat against the bottom with the diagonal front portion of the respective side walls folded down to lie against adjacent portions of the side walls, the rear ends of the side walls each having a triangular corner extension connected thereto along one side, the other side of the triangular corner extension being hingedly connected to the rear face of the rear wall along a line extending diagonally upward from the lower rear corners of the carton at an angle of approximately forty-five degrees to the lower edge of the rear wall, whereby, after the front wall has been folded to lie flat on the bottom, the rear wall can be folded to lie flat over the bottom and, whereby the movement of the rear wall to flat position over the bottom will cause the side walls to assume a position overlying the rear wall due to the connection between the side walls and the rear wall, and means for retaining the rear wall in vertical position with respect to the bottom panel when the carton is in set-up position.

4. A collapsible carton having a bottom, front, rear and side walls hinged to the bottom, an extension flap on the rear wall forming a cover for the carton, the front and side walls being hingedly connected to each other, the side walls being provided with fold lines extending rearwardly from the lower front corners of the carton and disposed at an angle of approximately forty-five degrees to the lower edges of the side walls, whereby the front wall may be swung rearwardly to lie flat against the bottom with the diagonal front portion of the respective side walls folded down to lie against adjacent portions of the side walls, the rear ends of the side walls each having a triangular corner extension connected thereto along one side, the other side of the triangular corner extension being hingedly connected to the rear face of the rear wall along a line extending diagonally upward from the lower rear corners of the carton at an angle of approximately forty-five degrees to the lower edge of the rear wall, whereby, after the front wall has been folded to lie flat on the bottom, the cover and rear wall can be folded to lie flat over the bottom and front wall and, whereby the movement of the rear wall to flat position over the bottom will cause the side walls to assume a position overlying the rear wall and cover portion due to the connection between the side walls and the rear wall, and a tuck flap on the cover insertable behind the front wall when the cover is closed, whereby the rear wall which supports the cover will be retained in vertical position thereby.

PAUL A. GRAF.