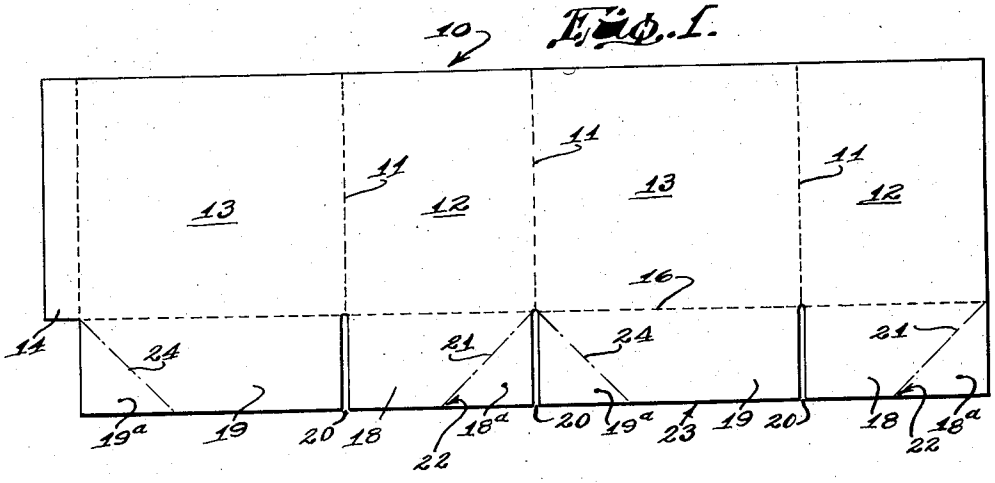
Nov. 25, 1958 E. B. GARMAN 2,861,734

COLLAPSIBLE CARTON

Filed Oct. 9, 1956

FIG. 1.



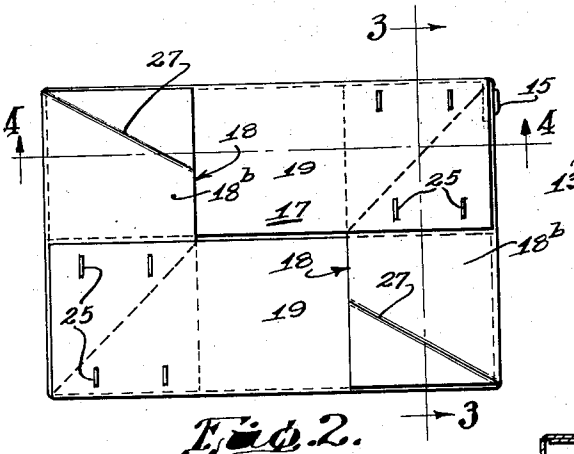


FIG. 2.

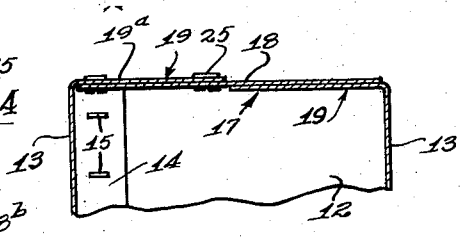


FIG. 3.

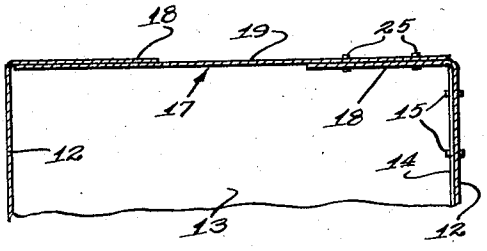


FIG. 4.

FIG. 5.

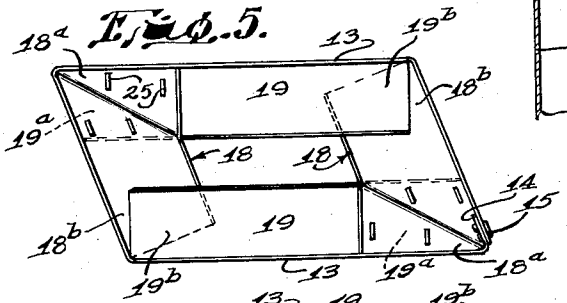
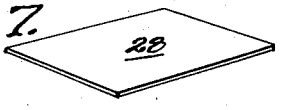


FIG. 7.



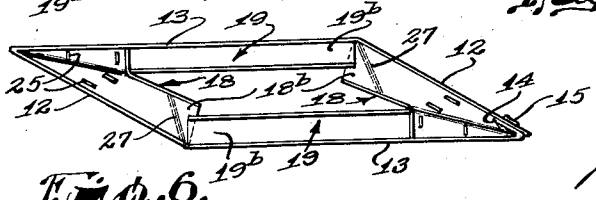


FIG. 6.

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COLLAPSIBLE CARTON

Edward B. Garman, Toledo, Ohio, assignor to Owens-Illinois Glass Company, a corporation of Ohio

Application October 9, 1956, Serial No. 614,835

2 Claims. (Cl. 229—41)

The present invention relates to cartons and more especially is a novel open-top paper box which may be completely collapsed prior to and between periods of actual use and as a consequence occupy a minimum of space during storage and shipment, when empty. Such a box is usable for many purposes and because it can be collapsed and so shipped at low cost, may be reused economically over a substantial period of time.

An object of my invention is the provision of a collapsible open-top box or carton, which, by reason of a novel bottom formation can be knocked-down or set up, quickly and easily, without any need for locking tongues, tabs and the like devices which invariably complicate both initial setting up of any carton for use and later collapsing of same.

A further object of my invention is the provision of a carton or box of generally rectangular form wherein the bottom is composed of pairs of end and side flaps so interconnected and relatively positioned that all walls and the flaps collapse under lateral pressure upon one selected corner or selected diagonal corners of the side walls to produce a comparatively thin space saving article.

Other objects will be in part apparent and in part pointed out hereinafter.

In the drawings:

Fig. 1 is a plan view of the blank from which the box or carton is produced.

Fig. 2 is a bottom plan view of the carton set up for use.

Fig. 3 is a sectional view taken along the line 3—3 of Fig. 2.

Fig. 4 is a sectional view taken along the line 4—4 of Fig. 2.

Fig. 5 is a top plan view looking into the interior of the box at the time collapsing is initiated.

Fig. 6 is a view similar to Fig. 5 showing a succeeding stage of collapsing of the box.

Fig. 7 is a perspective view of a supplementary bottom member usable with my carton or box, if desirable.

Referring to the drawings, the blank **10** (Fig. 1) from which the box or carton is formed is an elongated rectangular sheet of corrugated paperboard, or such material. By means of a plurality of parallel transverse scores **11** the sheet is divided to form alternate narrow and wide panels **12** and **13** which in the set-up box constitute the end and side walls respectively. At the transverse free edge of a side wall panel is a narrow flap **14** which is of the same length as said wall and when the box is set up, is secured by staples **15** or other means to the adjacent margin of an end wall.

As explained heretofore this is an open-top carton or box and as such does not have a cover part. It is provided with a bottom so formed as to facilitate collapsing, while at the same time performing the customary functions of a box bottom, effectively and reliably. To this end a longitudinal score **16** is formed the entire length of the blank nearer one margin than the other to define

the lower end of the side and end walls of the box, as well as the juncture of the latter with the bottom **17**.

This bottom **17** comprises four flaps, each being an extension of either a side or an end wall. Alternate end flaps **18** (Figs. 1 and 2) of rectangular form are provided at the bottom margin of each end wall, while side flaps **19** are formed at the bottom margin of the box side walls. Notches **20** in the blank separate the end and side flaps **18** and **19** respectively. Each of the end flaps **18** (Fig. 1) has a diagonal score **21** extending from a point **22** substantially medially of its long free edge **23** to the longitudinal score **16** which defines the lower end of the box side and end walls. These diagonal scores **21** are so positioned that in the set-up box, or carton, they are in a pair of diagonally opposed corners only, for reasons which will be apparent hereinafter. Each of the long side flaps **19** is formed with a diagonal score **24** near one end, such score being so positioned that when the carton or box is set up, one of these scores **24** will align or register with one of the scores **21** in an end flap **18**.

In producing a carton or box from the blank shown in Fig. 1, the blank is folded at the several transverse scores **11** and the narrow end flap **14** is secured by staples **15** or other fastening means to the free edge portion of the adjacent end wall or narrow panel **12**. At this stage the article is a tubular open-ended member. This member is then set up to form a rectangle and the bottom flaps are arranged relatively so that the diagonally scored end 18^a of each end flap **18** (Fig. 5) overlies the scored end 19^a of one of the side flaps **19**, the other free unscored ends 18^b of the end flaps being tucked beneath the free ends 19^b of the adjacent side flaps **19**. Staples **25** secure the overlapped scored ends of the end and side flaps together.

Such relative positioning of the bottom flaps and stapling certain of them together as just described tends to flex and partially break the grain in the vicinity of the free unscored 18^b end of the end flaps **18** in a rather unpredictable fashion, except that it ordinarily occurs in a wide zone extending generally diagonally from a corner of the box toward the central portion of the latter. This I have endeavored to indicate by the lines **27** in Fig. 6.

The box or carton, as just described, can be "knocked-down" for storage or shipment, empty, to the ultimate user simply by applying collapsing pressure to the unstapled diagonally opposed corners or to the unstapled overlapping ends of either pair of side and end flaps of the bottom. This is quite evident by reference to Figs. 5 and 6. When collapsed completely, the structure occupies a minimum of space with the advantages explained heretofore.

By reason of the described flexing and resultant partial breaking of the grain near the free end of each bottom end flap, this portion is always in such position that it invariably slips beneath the free end of the adjacent side flap quite readily incident to initiation of a setting-up operation. Frictional contact between the engaging surfaces of these flaps contributes very materially to retention of the carton in a set-up condition.

Should it prove desirable to do so, a supplementary bottom may be provided in the form of a rectangular sheet **28** of corrugated paperboard or such material. The dimensions of such sheet may well be such that this supplementary bottom will perform the twofold function of closing any gap or gaps between the bottom flaps and lending overall rigidity to the box, resisting any possible tendency toward collapsing.

Modifications may be resorted to within the spirit and scope of the appended claims.

I claim:

1. A generally rectangular foldable open-top paperboard box formed from a one-piece blank and comprising interconnected side and end walls, a bottom formed inte-

grally with the side and end walls and consisting of pairs of side and end flaps formed as extensions of said side and end walls, respectively, adjacent ends of the side and end flaps in diagonally opposed corners of the box being disposed in overlapping relationship and formed with registering diagonal scores extending inwardly substantially from said corners, the diagonally scored portions of the end flaps overlying the side flaps and therefore positioned internally of the box, means securing said overlapping scored portions together and the free end portions of the side and end flaps being in overlapping relationship with said end portions of the end flaps positioned below the side flaps, the free end portions of the end flaps being flexed to partially break the grain in a zone extending generally diagonally from the adjacent

box corner toward the central areas of the box, whereby to facilitate setting up of the box by positioning such portions for sliding over a surface of the side flaps.

2. The structure defined in claim 1 and a separate supplementary bottom sheet of substantially the area and dimensions of the box interior and adapted to freely rest upon the bottom flaps when the box is set up for use.

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