The present invention relates to folding cartons and more particularly to cartons of tray form having a cover with a locking tab engageable with a wall of the tray to keep the cover closed.

A principal object of the invention is to provide an improved construction of collapsible carton of tray form, tray section being curved carrying a locking tab or tongue designed to enter an opening in a vertical wall of the carton, the construction being such that the tab-receiving opening tends to be distended when the carton is set up.

A further object of the invention is to provide a collapsible tray form of carton with hinged cover panel having a depending front flap carrying a locking tab designed to enter a slit in the carton front wall, the connection between the front wall and carton bottom panel being such that movement of the tray section of the carton to set-up condition tends to open the slit to facilitate the insertion therein of the locking tab.

Other and more specific objects and advantages of the present invention will become apparent as the description proceeds.

In the drawings illustrating a preferred embodiment of the invention—

Fig. 1 is a perspective view of the carton, showing it set up with the hinged cover swung down close to its final closing position;

Fig. 2 is a plan view of the blank from which the carton is constructed;

Fig. 3 is a fragmentary front elevation, showing the cover in closed position with the locking tab engaged within the slit in the front wall;

Fig. 4 is a fragmentary cross sectional view taken along line 4--4 of Fig. 3 looking downward and in the direction of the arrows; and

Fig. 5 is a fragmentary cross sectional view taken along line 5--5 of Fig. 3, looking in the direction of the arrows.

The carton of the present invention may have a number of specific forms but essentially it comprises a collapsible paperboard tray having a cover with one or more depending flanges, at least one of which is formed with a rigid locking tab or tongue receivable into a slit in a vertical wall of the tray section. A portion of the hinge line between such vertical wall and the bottom panel of the tray section being curved or deviated from a straight line, whereby the wall having the slit therein is caused to be deflected in the locality of the slit, causing the material along one of the edges of the slit to assume a bowed condition, while the material along the other edge of the slit tends to remain unbowed. By thus causing the slit edges to separate, the cover locking tab may be inserted into the slit with relative ease.

Referring more particularly to the drawings, the carton is preferably formed from a single blank of foldable paperboard which is suitably cut and creased, or scored, to provide a bottom panel 16, a front wall panel 11, a rear wall panel 12, and a cover panel 13, defined from each other by parallel crease lines 14, 15, and 16. At the lateral edges of the blank set off by fold lines 18, 18 are end walls 19, 19 at the ends of the bottom panel, corner flaps 20, 20 and 21, 21 at the ends of the front wall 11 and rear wall 12 and cover end flanges 22, 22. Attaching flaps 23, 23 are carried at the forward ends of the end flanges 22. A front cover flange 24 projects from the front edge of the cover. This flange and the flaps 23, 23 are foldable along fold line 25 extending laterally of the blank.

Various manners of securing the vertical tray walls together may be employed. In the present instance the walls 19, 21 are diagonally scored to provide fold lines 26, 26 and 27, 27. The main portions of the end walls are then folded in to lie against the bottom panel 10, while the triangular end sections are folded back to lie on the outside of the end walls. Adhesive is applied to these triangular sections. Flaps 20 and 21 are folded to lie against their respective attached walls 11 and 12 and the walls and flaps are then folded inward to overlie the bottom panel 10 and the infolded end walls. The flaps 20 and 21 will thus be brought into contact with the glued triangular sections of the end walls and will become adhered thereto.

When it is desired to set up the tray portion of the carton, it is only necessary to lift up on an opposite pair of the downfolded attached walls. This lifting action will automatically bring up the other opposite walls to vertical position with respect to the bottom 10. Any tendency of the end walls to assume an inwardly inclined position will be taken care of by filling the carton with the desired contents.

The cover flanges 22 have diagonal fold lines 29, 29 to form triangular end sections adjacent the flaps 23, 23. The desired connection between the front and end panels of the cover may be effected by swiveling the end section and attaching flap 23 of each flange 22 as a unit so they will come to rest flat upon the blank with the triangular section lying against the main portion of flange 22 and the flap 23 lying flat upon the cover panel 13. Adhesive is then applied to the exposed surfaces of flaps 23, 23 and end flange 24 is then folded over to lie flat against the infolded flaps 23, 23 and the cover panel 13. After the adhesive has set, the cover flanges may be brought simultaneously to vertical position. This may be accomplished by pressing inwardly and upwardly on the end flanges 22, 22, or by holding panel 13 and swinging the front flange 24 upwardly and outwardly. The particular sequence of applying adhesive to the flaps and folding them to form a collapsed carton is not important.

The front cover flange 24 is secured to the tray front wall 11 by means of a locking tab 30 on the cover flange receivable within a slit 31 cut in the front wall. For the purpose of facilitating entry of the tab into the slit means are provided to cause the material of the front wall at each side of the slit to move relatively in setting up the tray so that one portion at one edge of the slit is moved out of the plane of the other, thereby opening up the slit to present an upwardly directed opening of appreciable width. The locking tab may thus enter the slit in a substantially straight downward movement without requiring any deflection of the tab end. This is particularly desirable in utilizing the carton on high speed, automatic machinery.

In the present instance the slit is caused to open when the tray is set up by forming the crease line 14 with a central portion 32 which deviates from a straight line. This portion of the crease is preferably slightly curved and has its convex side toward the slit in the front wall. The crease thus is impressed in that portion of the blank which would form a part of the front wall if the crease line had been impressed exactly parallel with the top edge of the wall.

The locking tab 30 preferably has laterally extending
portions 33, 33 formed by cuts 34, 34 at the juncture of the tab with the cover front flange. The overall width of the locking tab measured from the tips of portions 33, 33 is less than the length of the slit.

The central part of the slit 31 is preferably formed as a straight-line cut extending approximately parallel with the upper and lower wall edges. To further facilitate entry of the tab within the slit and to provide for a more positive locking engagement, the ends of the slit terminate in downwardly inclined portions 36, 36. Insertion of the locking tab into the opened slit and in contact with the slightly bulging front wall tends to cause the lateral tab end portions 33 to be deflected slightly away from the normal plane of the tab 30. See Fig. 4. This effect, as soon as the tab 30 has entered the slit completely, tends to move the tab ends 33, 33 inwardly beneath the edge presented by the upper part of the slit, thereby locking these tab ends positively beneath the wall edge portions forming the upper margin of the slit.

The carton as stated above is preferably formed in a flat, collapsed condition with the major portions of the tray end walls folded flat against the tray bottom, the triangular portions of the end walls are folded to lie on the outside surfaces of their walls, and such triangular portions are adhered to the adjacent corner flaps 20 and 21. This requires the front and rear walls to be folded inwardly to lie substantially parallel to the bottom panel. The front cover flange is folded to lie against the inside surface of the cover, the major portions of the cover side flanges are folded outwardly, and the corner flaps 23, 23 are adhered to the inside surface of the front flange. As so formed, the collapsed cartons are delivered to the user. The cartons in the most common practice are opened, filled and closed on high speed automatic carton loading machines which are designed to insert the locking tabs into the front wall slits as a part of their operation. By so forming the cartons that the slit tends to open up in the process of setting up the carton, the successful insertion of the locking tabs into the slits in each carton is substantially assured.

While the foregoing description sets forth a preferred embodiment of the invention, numerous 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 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 carton formed of foldable paperboard, comprising a tray section having a bottom panel, a front wall panel integrally hinged thereto along a crease line, said front wall panel having a slit cut therein of which at least a portion extends substantially parallel to the crease line, a cover for the tray section including a top panel, front cover flange and a tab depending from an edge of said cover flange adjacent the slit in the front wall panel, the crease line having a portion thereof located adjacent and substantially coextensive with said slit portion and slightly deviated from a straight line, said front wall panel having a portion thereof intermediate the slit and the deviated portion of the crease line deflected out of the general plane of said front wall panel to receive and lock said tab.

2. A carton formed of foldable paperboard, comprising: a tray having a bottom wall panel and a front wall panel hingedly attached thereto along a crease line; a cover for the tray having a top wall panel and a locking tab depending therefrom; said front wall panel having therein, for receipt of said tab, a slit with portion which is spaced from and extends substantially parallel to said crease line; said crease line having a portion substantially coextensive with said slit portion and slightly deviated from a straight line so that the portion of the front wall panel which lies between said slit and crease line portions is slightly deflected from the normal plane of said front wall panel to facilitate insertion of the tab into the slit.

References Cited in the file of this patent

UNITED STATES PATENTS

2,531,507 Goodyear Nov. 28, 1950
2,623,684 Collura Dec. 30, 1952
2,804,258 Petter Aug. 27, 1957
2,846,132 Carpenter Aug. 5, 1958