April 1, 1958 J. E. MIRES ET AL 2,828,904

FOLDABLE CARTONS

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FIG. 1

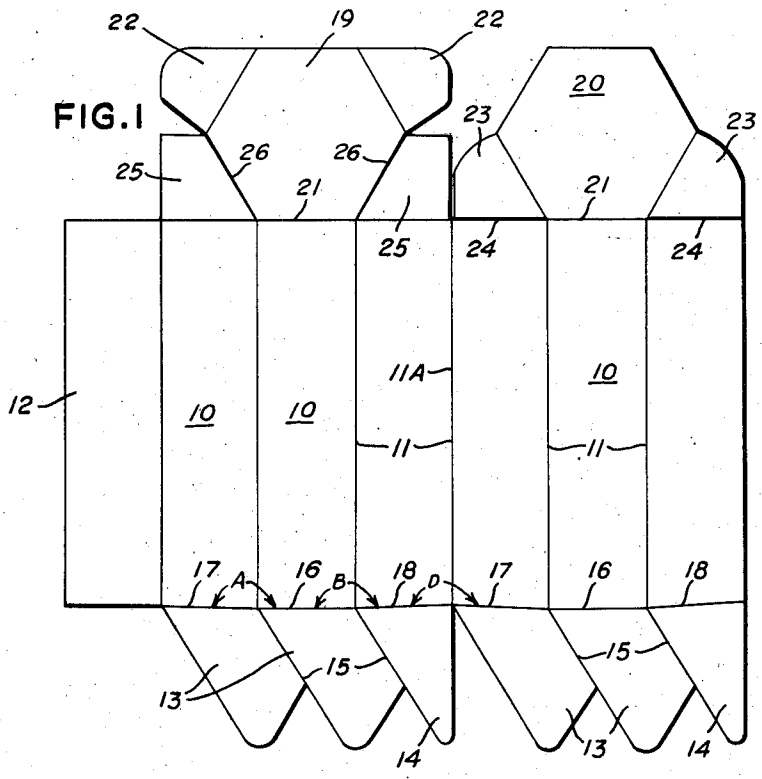


FIG. 2

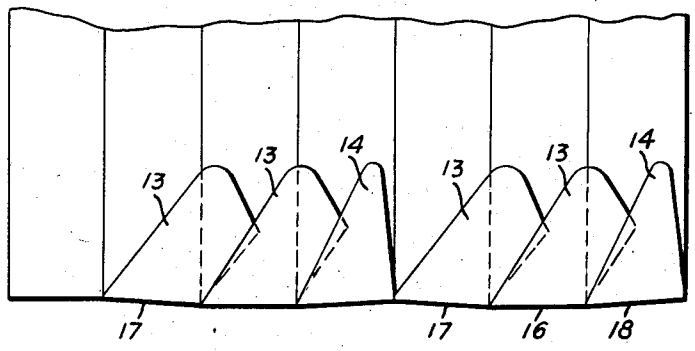
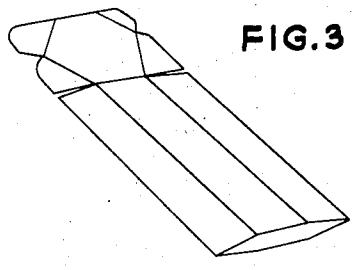


FIG. 3



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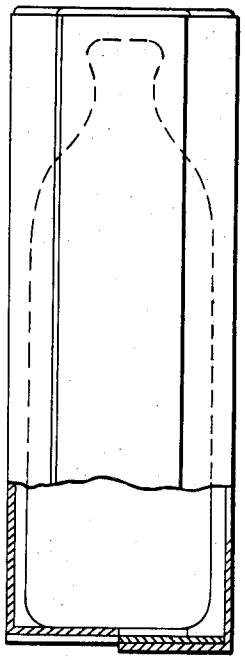


FIG. 5

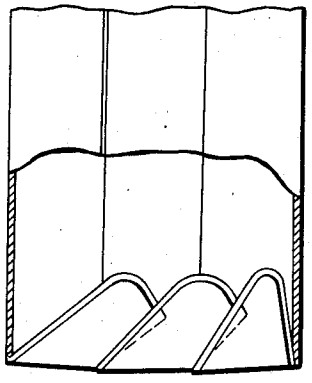


FIG. 4

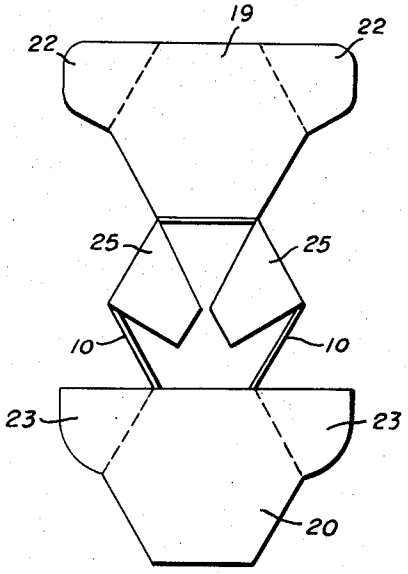


FIG. 6

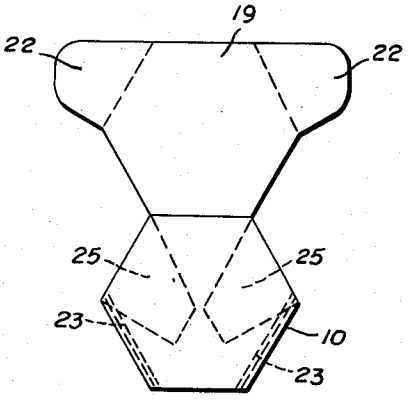


FIG. 7

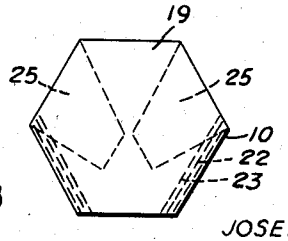


FIG. 8

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FOLDABLE CARTONS

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Application January 26, 1954, Serial No. 406,238

1 Claim. (Cl. 229—39)

This invention relates to collapsible cartons of the type which are shipped to the user in flat folded form and are then expanded to receive the merchandise to be placed therein, the invention more particularly relating to cartons which are designed to contain a single articles such as a bottle. The carton in this invention is generally of regular polygon shape and made up in either hexagonal or octagonal form.

A particular object of the invention is to so design the bottom of the carton that it is formed of a plurality of tabs integral with the bottom straight crease line edges, which series of such adjacent tabs, when the carton is in flat folded form, overlap to a sufficient extent, and in a proper sequence to swing downwardly to interengage with one another to form a bottom closure on the insertion of an article therein.

By "flat folded form" we mean the form wherein the carton is folded so that all sides are substantially parallel so that the carton, although more than one layer in thickness, is in a form which might be generally described as laminar.

Overlapping is achieved by providing that the angle between the crease lines of adjacent tabs extending from adjacent sides which are not folded with respect to one another in the flat folded form is less than 180° measured on the angle which includes the carton side material.

A further and particular object of the invention is to provide two groups of tabs which are of quadrangular shape and inclined in relation to the bottom edges of the carton sides, the remaining tabs being of triangular shape and located in alignment with the two side edges of the carton when it is in its folded flat form; the quadrangular tabs being preferably separated from one another by thin cuts in the carton material and wherein substantially no carton material is removed in making the cuts.

The principle of using interengaging tabs swingably formed on the bottom edges of a carton of the type shown in this application and which constitute the carton bottom closure is not new, but in the constructions heretofore used the carton tabs were so designed that it was necessary to leave the tabs protruding from the bottom of the carton when it was in its flat folded form, which necessitated the operator in filling the carton to press the carton from its folded flat tubular form into its box form and then bend the bottom tabs upwardly one by one in a certain pattern so that they interengaged in the proper manner to form the bottom closure, the tabs being numbered to guide the operator.

As will be apparent from the previous and the following description, we have overcome the disadvantages in the cartons used heretofore by so designing and arranging the tabs that they project into the carton when in its flat tubular form and automatically swing downwardly into their proper closure forming interengagement when an article of merchandise is placed within the carton to press the tabs downwardly.

With the foregoing and other objects in view as shall appear, our invention consists of a carton formed and arranged all as hereinafter described and illustrated in the accompanying drawings, in which:

Figure 1 is a plan view of a carton blank cut in accordance with our invention and formed to produce a carton of hexagonal shape, the bottom closure forming tabs extending downwardly from the bottom edges of the carton sides.

Figure 2 is a plan view of the lower portion of the carton blank and showing the tabs bent upwardly into the position in which they will remain until the bottom closure is formed by the insertion of the merchandise.

Figure 3 is a reduced slightly perspective view of the carton in flat tubular form as it is shipped to the user.

Figure 4 is a side elevational view of the lower portion of the carton expanded to receive a piece of merchandise, such as a bottle, the tabs being upwardly inclined within the carton.

Figure 5 is a similar view to Figure 4 and showing a bottle in place within the carton, the weight of the bottle having bent the tabs downwardly into their proper interengaging relationship to form the bottom closure.

Figures 6, 7 and 8 illustrate the various positions of the top flaps of the carton during the carton top closing operation.

Like characters of reference indicate corresponding parts in the different views of the drawings.

The hexagonal carton blank, as shown in Figure 1, comprises six side pieces **10** which are integrally connected to each other along side forming crease lines **11**, the side piece **10** on one side of the blank being furnished with an integral flap **12** which is cemented to the inner face of the side piece **10** on the other side of the blank when the carton is folded into collapsed tubular form for shipment to the user. The carton is folded about the crease line **11***a* so that it assumes the form as shown in Figure 3.

The bottom of each side piece is formed with an integral tab adapted to be swung or bent about its bottom edge forming a crease line, as will be readily appreciated upon reference to Figures 1 and 2, the tabs **13** being of quadrangular shape and the tabs **14** of triangular shape, each pair of three tabs **13**, **13** and **14** being preferably separated from one another by thin cuts **15** which have removed little or no material from the carton blank.

In order to carry out our invention in having the inwardly projecting tabs so positioned that they properly interengage to form the bottom closure, we so position the crease lines between the side pieces and the tabs that the angle between the crease lines of adjacent tabs extending from adjacent side pieces **10** which are not folded with respect to one another in the flat folded form is less than 180° measured on the angle A which includes the carton side material. In Figures 1 and 2 of the drawings it will be seen that looking along the line **17** from the left of the sheet, the line **16** is at a slight angle to the left and following along the line **16** the line **18** is at a further such slight angle B relative thereto. If an octagonal container were to be constructed then a fourth side would be attached with its edge extending at an angle C (not shown) less than 180°. Since the tabs are, in the blank separated by thin cuts **15**, only, the edges of the tabs when folded upwardly, overlap when the carton is in the flat folded form as shown in Figure 2.

In order that the progressive angle changes between adjacent sets will not substantially affect the length of the sides the angle D between the crease lines of sides joined by the crease line **11** by which the carton is folded in flat folded form is greater than 180° on the angle including the carton material.

The folded carton is shipped to the user substantially in the form shown in Figure 3, and in inserting the merchandise it is only necessary to press the carton from its flat tubular form to its hexagonal form wherein the overlapping tabs which project into the carton will assume a sloping position as illustrated in Figure 4. When a piece of merchandise, such as a bottle, is dropped into the carton, its weight presses the tabs downwardly, and as they have the proper overlapping relationship in respect to one another, they move into the proper interengagement wherein a solid bottom closure is formed. It will also be apparent that the bottom forming tab arrangement may be used in an octagonal, or similar multi-sided form of carton.

The top of the carton can carry any suitable type of flap, and in the drawings we show an arrangement which provides a heat closure presenting a plain unbroken top surface. Two of the opposite side walls **10** carry integral hexagonal flaps **19** and **20** which are bendable along crease line **21**. The flap **19** is formed with two bendable tabs **22** located along its two inclined edges remote from the carton top and the hexagonal flap **20** carries two bendable tabs **23** located along its inclined edges adjacent to the top of the carton, the tabs **23** being separated from the side walls of the carton by slits **24**. The tops of the two carton sides positioned on either side of the carton side carrying the flap **19** are formed at their outer edges with two bendable tabs **25** which are separated from the flap **19** by slits **26**.

When the carton has been filled, the first step in forming the top closure is to bend the tabs **25** into the horizontal position shown in Figure 6, after which the tabs **23** on the flap **20** are bent at right angles thereto and the flap swung into a horizontal position across the top of the carton, the tabs **23** extending downwardly into the carton alongside the inner faces of two of the carton sides. The tabs **22** on the flap **19** are then swung at right

angles to the flap and the flap bent over to rest upon the top of the flap **20**, the tabs **22** being inserted into the carton between the tabs **25** and the adjacent side walls, whereby an easily opened top of plain pleasing appearance is presented.

From the foregoing description it will be appreciated that a carton constructed in accordance with our invention consumes very little of the operator's time in placing merchandise therein as it is not necessary for the operator to handle or arrange the bottom closure flaps other than by letting the weight of the merchandise press them into place, and that the top forming closure flaps can be positioned in place by a couple of quick movements on the part of the operator.

What we claim as our invention is:

A carton blank adapted to be put in flat folded form, sets of foldably connected side walls, a plurality of carton bottom forming tabs each adapted to be folded upwardly within the flat folded carton from a respective side wall and defined therefrom by a straight crease line, said crease lines of adjacent side walls of a set being at an angle of less than 180° to one another measured on the angle which includes the carton side material; wherein the tab-defining crease lines of adjacent walls which are joined by a crease line by which the carton is folded in flat folded form, form an angle of greater than 180° to one another on the angle including the carton material.

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