March 17, 1970 J. H. LOCK 3,501,082

PANEL INTERLOCKING MEANS

Original Filed Aug. 28, 1967

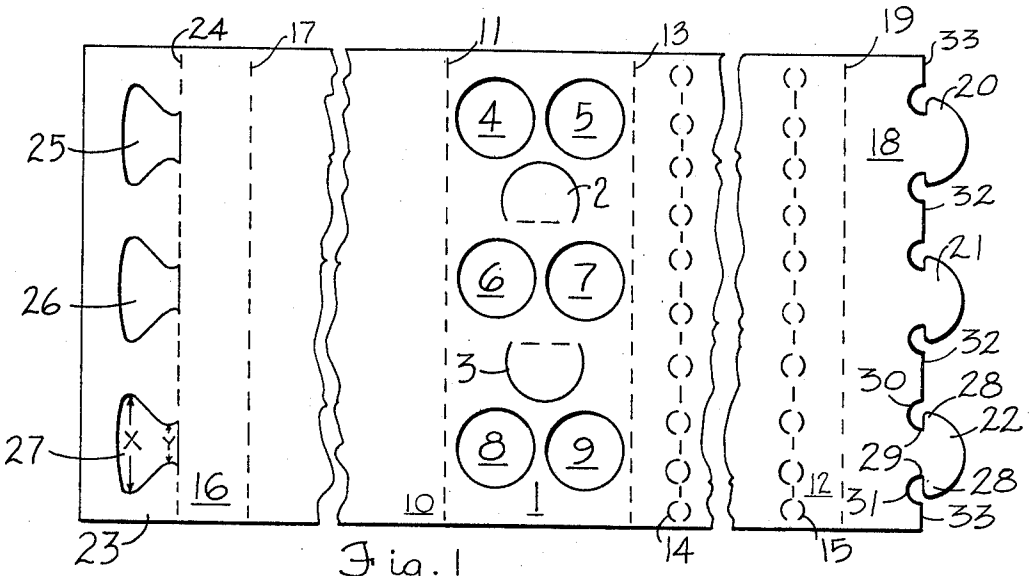


Fig. 1

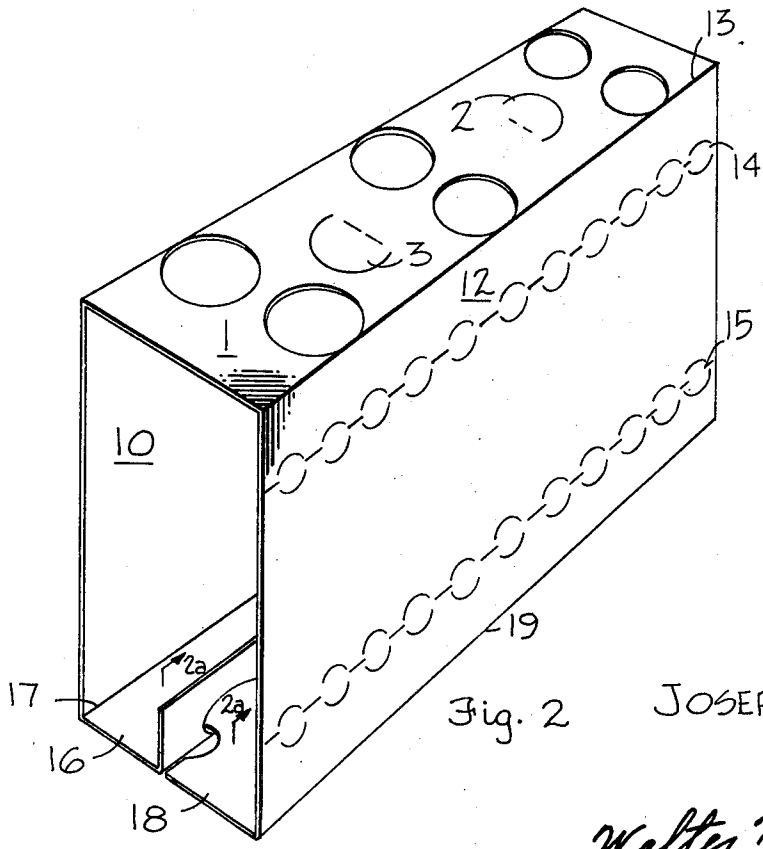


Fig. 2

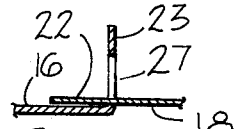


Fig. 2a

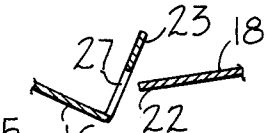


Fig. 2b

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PANEL INTERLOCKING MEANS

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Continuation of application Ser. No. 663,730, Aug. 28, 1967. This application Sept. 18, 1968, Ser. No. 768,593
Int. Cl. B65d 5/04
U.S. Cl. 229—40 4 Claims

ABSTRACT OF THE DISCLOSURE

An open ended tubular type article carrier having top, bottom and side wall panels is disclosed wherein the bottom panel is a composite panel in which locking tabs are formed along an edge of one bottom panel and inserted through locking apertures formed in a locking panel foldably joined to the other bottom panel and disposed medially of the wrapper and in perpendicular relation to the bottom panel. The locking tabs are arranged with a wide shoulder portion and with a narrow throat portion for cooperating with the locking apertures which in turn are provided with a wide entry portion and a narrow locking portion.

This case is a continuation of Ser. No. 663,730 filed Aug. 28, 1967, now abandoned.

The invention is particularly well adapted for use in article carriers in which the primary packaged articles are yieldable although the invention is not limited to such articles. Thus according to a principal feature of this invention, the locking panel is folded into a position of angular relationship with respect to its associated bottom panel and simultaneously the locking tab is moved transversely underneath the packaged items and into the large entry portion of the locking aperture formed in the locking panel. After the narrow throat portion of the locking tab enters the locking aperture, the bottom panel **16** is swung bodily upwardly toward a position of flat face contacting relationship with the locking tab **22** to occupy a position between the two rows of articles. Thus in order to form the lock according to this invention, it is not necessary to provide for overtravel of the locking elements and their associated panels due in part to the fact that the locking panel is arranged to move easily between the rows of bottles because of the dimensions of the parts and if yieldable primary packages are employed, such packages are adapted to become depressed and thus to allow easy entry of the locking panel.

For a better understanding of the invention reference may be had to the following detailed description taken in conjunction with the accompanying drawing in which FIG. 1 is a plan view of a blank constructed according to the invention; FIG. 2 is a perspective view of the blank depicted in FIG. 1 and shown in set-up condition but with the packaged articles removed; FIG. 2A is an enlarged sectional view taken along the line designated 2A—2A in FIG. 2 and in which FIG. 2B is a view of the lock depicted in FIG. 2A but showing the lock in a preliminary stage of formation.

With reference to the drawings, the numeral **1** is used to designate the top panel of the carrier. A pair of finger gripping tabs **2** and **3** are struck out of top panel **1** and normally are folded inwardly so as to provide finger gripping apertures. Openings **4, 5, 6, 7, 8** and **9** are formed in top panel **1** and are for the purpose of receiving the necks of primary packages which are disposed within the wrapper. Of course the apertures **4–9** may be omitted for certain applications of the invention. A side wall **10** is foldably joined to top panel **1** along fold line **11** while a similar side wall **12** is foldably joined to the other side edge of top panel **1** along fold line **13**. A pair of tear

lines are formed in side wall **12** and define a tear panel therebetween and are designated by the numerals **14** and **15**.

The bottom panel of the carrier is a composite panel and comprises a bottom panel **16** which is foldably joined to the side wall **10** along a fold line **17** together with a bottom panel **18** which is foldably joined to side wall **12** along a fold line **19**.

In order to interlock the substantially coplanar bottom panels **16** and **18** in accordance with this invention, one or more locking tabs such as are designated at **20, 21** and **22** are formed along an edge of bottom panel **18**. These locking tabs cooperate with corresponding locking apertures formed in a locking panel **23** which is foldably joined to bottom panel **16** along fold line **24**, the locking apertures being designated by the numerals **25, 26** and **27**.

When the carton is fully set-up with its bottom panels disposed in interlocking relation as depicted in FIGS. 2 and 2A, the locking tabs **20–22** are disposed within the openings of locking apertures **25–27** respectively and the locking panel **23** is disposed vertically and functions as a medial keel for the carrier whereby articles in one row are separated at the bottoms thereof from adjacent articles in the other row.

The locking tabs and locking apertures are specially constructed according to this invention and preferably are identical. For example and with reference to locking tab **22** it is obvious that this tab is constructed with a wide shoulder portion constituting a pair of shoulders **28** and a narrow throat portion designated by the numeral **29**. Cutaway areas **30** and **31** are formed adjacent the throat portion **29**. Similarly each locking aperture such as **27** is provided with a relatively wide entry portion designated by the letter "X" and by a narrow locking portion designated by the letter "Y."

During the formation of the carton the articles to be packaged within the wrapper are arranged in a group of two rows in rectilinear relationship. The top panel **1** is placed atop the group of articles and the side walls **10** and **12** are subsequently folded downwardly alongside the article group. Thereafter the bottom panels **16** and **18** are folded inwardly simultaneously with the inward folding of locking panel **23** so that at some stage during the formation of the lock the bottom panels **16** and **18** will occupy positions substantially as represented in FIG. 2B. The wide shoulder portions **28** of the locking tabs are inserted through the wide entry portions designated X of the locking apertures until the narrow throat portion **29** of each locking tab is approximately aligned with the plane of locking panel **23**. Thereafter the bottom panel **16** is swung upwardly so that the locking panel **23** moves between the two rows of articles and of course simultaneously the locks **20, 21** and **22** ultimately occupy positions of flat face contacting relation with the upper surface of the bottom panel **16** as shown in FIG. 2A wherein the interlocking arrangement of this invention is shown in its fully locked condition.

It will be understood from the description above that there is no necessity to provide for overtravel in a locking direction of the bottom panels **18, 16** and **23** during the period when the lock is being formed.

The invention is thus well adapted for packaging yieldable primary packages such as plastic bottles. Where items such as glass bottles are placed in individual paperboard containers, such containers afford a measure of yieldability and hence can be well packaged according to this invention.

The cutaway areas **30** and **31** formed adjacent the throat of each locking tab simply provide clearance areas for facilitating the formation of the lock and facilitate scrapping material adjacent the tabs **20–22**. At such time

as the panels assume their fully locked positions, the edge portions of bottom panel **18** which are immediately adjacent to the cutaway portions **30** and **31** and which are designated by the numerals **32** and **33** come into direct abutting relation with the adjacent edge of the other bottom panel **16** as defined by the fold line **24**. Thus the bottom panels **16** and **18** are fully secured according to this invention against relative movement in the planes thereof after the lock is formed. Stated otherwise, and since the locking panel **23** is in reality a continuation of panel **16** and is of substantially the same thickness as panel **16**, the shoulder portions of the locking tabs **20, 21** and **22** are closely adjacent to the edge portions **32** and **33** of panel **18** and are spaced therefrom by a small distance in the direction of the major axes of the locking tabs **20, 21** and **22**. This relationship accounts for the snug locking action as is apparent from FIGS. 1 and 2 whereby the panels such as **16** and **18** are held against substantial movement relative to each other.

While a particular embodiment of the invention has been shown and described, the invention is not limited thereto and it is intended in the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the invention.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. An arrangement for interlocking a pair of substantially coplanar panels, said arrangement comprising a locking tab formed on an edge of one of said coplanar panels and having a wide shoulder portion and a narrow throat portion, a locking panel secured to the other of said coplanar panels and disposed in substantially normal relation with respect thereto, and a locking aperture formed in said locking panel and having a wide entry portion for receiving the wide shoulder portion of said locking tab and a narrow locking portion for receiving the narrow throat portion of said locking tab thereby to secure said coplanar panels against substantial relative movement in the planes thereof, portions of said edge of said one panel which are adjacent said throat portion of said locking tab being cut away and other portions of said edge of said one panel being disposed in abutting relation to said locking panel.

2. An arrangement according to claim **1** wherein said locking aperture is arranged with its narrow throat portion adjacent said other coplanar panel and with its wide entry portion remote from said other coplanar panel.

3. An arrangement according to claim **1** wherein said coplanar panels constitute one wall of a tubular container for a plurality of articles arranged in two rows in side-by-side rectilinear relation with their adjacent ends disposed in flat substantially parallel contacting relation to the inside surface of said one wall and wherein said locking panel constitutes a keel interposed between the two rows of articles.

4. An arrangement for interlocking a pair of panels, said arrangement comprising a locking tab formed on an edge of one of said panels and having a shoulder portion and a throat portion, the shoulder portion of said locking tab being disposed closely adjacent said edge of said one panel and being spaced therefrom in the direction of the major axis of said locking tab by a small distance, a locking panel secured to the other of said panels along a fold line and disposed in substantially normal relation to said other panel and with the edge of said locking panel which is opposite said fold line spaced from said other panel by approximately the width of said locking panel, said locking panel being of substantially the same thickness as said other panel, and a locking aperture formed in said locking panel and having a wide entry portion adjacent said edge of said locking panel which is opposite from said fold line for receiving the shoulder portion of said locking tab and a narrow locking portion adjacent said edge of said locking panel which is adjacent said fold line for receiving the throat portion of said locking tab, the spacing of said shoulder portion from said edge being small so that said locking panel is gripped between said edge of said one panel and the shoulder portion of said locking tab so as to secure said panels against substantial relative movement.

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DAVID M. BOCKENER, Primary Examiner

U.S. Cl. X.R.

206—65; 229—39