

PATENT SPECIFICATION

(11) 1408 691

- 1408 691 (21) Application No. 19918/73 (22) Filed 26 April 1973
 (31) Convention Application No. 249062 (32) Filed 1 May 1972
 (31) Convention Application No. 305728 (32) Filed 13 Nov. 1972 in
 (33) United States of America (US)
 (44) Complete Specification published 1 Oct. 1975
 (51) INT CL² B65D 65/12//65/24
 (52) Index at acceptance

B8C 12D2 19G 26 29A

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(54) BOTTLE CARRIERS

(71) We, ILLINOIS TOOL WORKS INC., a corporation organized under the laws of the State of Delaware, United States of America, of 8501 West Higgins Road, Chicago, Illinois 60631, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention is primarily directed to carriers for groups of relatively large beverage bottles such, for example, as those of a one quart size, and particularly such beverage bottles which have enlarged cap or crown portions and downwardly diverging neck portions beneath the cap portions. The invention is further directed to such carriers in which the bottles are held by the neck portions thereof and depend from the carrier when the package is being carried. Paper-board carriers have been made for packaging a group of such beverage bottles together in a depending condition. To support the relatively heavy weight of a number of such bottles has generally required positive paper-board gripping means which must generally be torn or otherwise destroyed to remove bottles from the carrier, with the result that the carrier cannot be used again for carrying the empty bottles when their return to a store is desirable or necessary. Various moulded or formed bifurcated clips are also known for carrying a group of bottles in a depending condition. While reusable, such carriers are generally expensive and do not hold the bottles against pivoting in the carrier. Also, reusable carriers generally have separate handle structures attached to the carrier to facilitate carrying the heavy weight of quart size bottles. However, these separate handle structures increase the overall cost of such carriers.

The present invention concerns simple and economical carriers that can be used and

reused for carrying returnable or non-returnable bottles and are intended for use with a plurality of bottles arranged in a row. The carriers firmly hold the bottles against pivoting in the carriers.

According to one aspect of this invention a blank, for forming a carrier for a plurality of bottles arranged in a row, consists of resiliently deformable plastics sheet material having four fold lines therein, in parallel spaced-apart relationship defining first to fifth panel sections in succession across the blank, there being a series of apertures arranged in a row extending longitudinally of the third panel section, a second series of apertures or cut outs arranged in a row longitudinally of the first and second sections, and intersecting the fold line between the first and second sections, a third series of apertures or cut outs arranged in a row longitudinally of the fourth and fifth sections, and intersecting the fold line between the fourth and fifth sections, and means capable of releasably securing the outer edge of the first panel section to the fourth panel section, the apertures or cut outs in each series being of similar number and substantially in transverse alignment, whereby the blank can be folded into the configuration of a prism, with the first and second sections overlying the fourth and fifth sections and the apertures or cut outs of the second series overlapping respective apertures or cut outs of the third series.

The expression "fold lines" is used throughout this specification to include lines along which panel sections meet at an abrupt angle, and also lines along which panel sections are connected by a curve in the material. This is illustrated by Figure 3 of the accompanying drawings, described below.

According to another aspect of this invention, a package comprises a row of bottles each having an enlarged cap portion associated with its open end, assembled with a carrier formed from a blank of a sheet

material, having a bight portion extending through the middle of the blank, in which are a plurality of apertures in predetermined spaced relation accepting and engaging a portion of the neck of a respective one of the bottles below its open end, opposed margins on opposite sides of the bight portion having predetermined spaced apertures or cut outs larger than the enlarged cap portions, the margins being placed in overlapping relation and cooperating to form openings grippingly engaging and trapping the bottle necks immediately beneath the enlarged cap portions, and means for releasably retaining the overlapping margins relatively to each other.

Preferably the proportions are such that the sides of the carrier are bowed outwards.

Preferably there is an integral handle extending from the second panel section.

The invention will be explained in more detail with reference to the embodiments shown by way of example in the accompanying drawings. In these drawings:—

Figure 1 is a plan view of a carrier blank; Figure 2 is a side elevation of a package, showing the blank of Figure 1 in an assembled condition and applied to three bottles in a row;

Figure 3 is a fragmentary end view of the package, substantially from the line 3—3 in Figure 2;

Figure 4 is a plan view of a second blank;

Figure 5 is a side elevation of a package showing the blank of Figure 4 in an assembled condition and applied to three bottles in a row;

Figure 6 is a fragmentary end view of the package shown in Figure 5, substantially from the line 6—6 in Figure 5;

Figure 7 is a plan view of a third blank;

Figure 8 is a side elevation of a package, showing the blank of Figure 7 in an assembled condition and applied to three bottles in a row; and

Figure 9 is a fragmentary end view of the package shown in Figure 5, substantially from the line 9—9 in Figure 5.

The carrier blank 10 shown in Figure 1 is punched or otherwise formed from a sheet of a plastics material of uniform thickness. One suitable material has been found to be high density polyethylene in a 0.04 inch thickness. High density polyethylene has the proper resilience and deformability to permit the carrier blank 10 to be folded and locked into an assembled condition, thus becoming a carrier which is able to effectively interlock with a plurality of heavy beverage bottles, to be easily disassembled and removed from the bottles, and to be easily reassembled for repeated use.

The bottles are shown at 46 in Figures 2 and 3. Each bottle has an enlarged cap portion 48. Beneath the cap portion, each

bottle has a downwardly diverging neck 50.

The carrier blank 10 is formed with four spaced-apart and parallel fold lines 12, 14, 16 and 18, which define five panel sections 20, 22, 24, 26 and 28. In use, the material is abruptly folded on the lines 14 and 16, and given a curvature on the lines 12 and 18, as appears in Figure 3.

The first panel section 20 includes one longitudinal edge of the blank and is contiguous the panel section 22 on the fold line 12. The outer longitudinal edge of the panel section 20 has a pair of integral tabs 30 which extend outwardly therefrom in the plane of the panel section 20. Each tab 30 has opposed ears 32 which extend in directions longitudinal of the panel section 20.

The panel section 20 further includes the major portions of three apertures 34. The apertures 34 intersect the fold line 12 and make it discontinuous. Portions of the apertures 34, about one-fourth of the width thereof measured transversely of the panel sections 20 and 22, extend into the panel section 22. The apertures 34 are substantially square in shape and the length of a side thereof is greater than the largest diameter of the cap portion 48 of the bottle intended to be associated therewith.

The fifth panel section 28 is substantially a mirror image of the first panel section 20, but without the tabs 30. The fifth panel section 28 includes one longitudinal edge of the carrier blank 10 and is contiguous to the fourth panel section 26 on the fold line 18. The panel sections 28 and 26 have apertures 36 similar to the apertures 34 in the first and second panel sections 20 and 22. Preferably the fifth panel section 28 has a width which is narrower than the width of the first panel section 20, disregarding the tabs 30, by a distance substantially equal to the thickness of the blank 10.

The fourth panel section 26 is also narrower than the second panel section 22 by about the thickness of the blank 10. This width relationship of the panel sections 20, 22, 26 and 28 provides for proper relative positioning of the first panel section 20 over the fourth panel section 26 with the fold line 12 at the apex of the defined prism, as may be seen in Figure 3.

The panel section 22 is contiguous to the third panel section 24 along the fold line 14 and the panel section 26 is contiguous to the panel section 24 along the fold line 16. The third panel section 24 has three circular apertures 38 which are arranged in a spaced-apart relationship longitudinally of the panel section 24 and substantially in transverse alignment with the apertures 34 and 36. The apertures 38 are tangent to the fold lines 14 and 16. The apertures 38 have a diameter less than the diameter of the bottle 46 intended to be associated there-

with at a point measured axially downward of the bottle from the underside of the enlarged cap portion, a distance substantially equal to the vertically projected width of the panel section 22.

The second and fourth panel sections 22 and 26 also have longitudinally extending finger-gripping slots 40. The finger-gripping slots 40 are arranged as mirror images of each other in the panel sections 22 and 26 and are positioned respectively, one between centre aperture 34 and centre aperture 38, and the other between centre aperture 36 and centre aperture 38. Each of the finger-gripping slots 40 has a flap 42 extending along the longitudinal edge thereof closest to the apertures 34 and 36 and foldable from the plane of the panel sections 22 and 26 to provide a substantially wider finger engaging area than is provided by the thickness of the material of the blank 10.

The fourth panel section 26 has a further pair of apertures 44. The apertures 44 are positioned in a spaced-apart relationship longitudinally of the panel section 26, on opposite sides of the finger-gripping slot 40 therein, and substantially in transverse alignment with the tabs 30. The apertures 44 have widths measured in a direction longitudinally of the panel section 26 which are substantially equal to the width of the tabs 30 without the ears 32.

In assembling the carrier, the second and fourth panel sections 22 and 26 are folded upwards from the third panel section 24, so that the panel section 24 defines the base of the carrier. The first and fifth panel sections 20 and 28 are then folded, along the fold lines 12 and 18 respectively, towards each other, and the fold lines 12 and 18 are brought together in a lapped arrangement, with the fold line 12 over the fold line 18, to cause the second and fourth panel sections 22 and 26 to form the side walls of the carrier with the general shape of a prism having end faces which are triangles. In this condition, the panel sections 20 and 28 extend downwards and outwards from the apex formed by the fold lines 12 and 18 and generally parallel and against the side walls of the carrier formed by the panel sections 26 and 22 respectively. The tabs 30 are then pressed by hand into the apertures 44 until the ears 32 snap through these apertures, thereby securing the first panel section 20 in place against the underlying fourth panel section 26. In this assembled condition of the carrier, openings of a size, measured in a direction transversely of the carrier, substantially smaller than the maximum diameter of the enlarged cap portions 48 of the bottles intended to be associated therewith are formed by the opposed longitudinally extending sides 34a

and 36a of the overlapping apertures 34 and 36.

The carrier having been assembled, in order to form a package it is merely necessary to move the carrier downwards over the three bottles 46 intended to be associated therewith, previously arranged in a row. After an initial movement of the carrier downwards over the bottles 46, the inner periphery of the apertures 38 in the base of the carrier will firmly circumferentially engage the diverging neck portions 50 of the bottles 46. Further downward movement of the carrier by a force applied on the apex of the carrier will cause the side edge 34a of each aperture 34 and the side edge 36a of each aperture 36 to cam over and lock immediately beneath the enlarged cap portions 48. The side edges 34a and 36a are slightly deformed as may be seen in Figures 2 and 3. The resilience of the material of the carrier will cause the side edges 34a and 36a of the apertures 34 and 36 to be firmly urged against the necks of the bottles immediately beneath the enlarged cap portions 48.

When the partially overlapped apertures 34 and 36 are interlocked beneath the enlarged cap portions 48 as described, the side walls of the carrier, constituted by the second and fourth panel sections 22 and 26, will be bowed outwards as shown in Figure 3. This bowing of the side walls of the carrier produces an extremely stable and substantially rigid package. The resilience of the side walls urges the apex of the carrier and the edges of the openings therein into firm locking contact with the necks of the bottles 46 beneath the cap portions 48 and further urges the base portion of the carrier downwards relatively to the bottles 46 to firmly hold the bottles 46 with their longitudinal axes parallel and to resist pivoting thereof. The finger-gripping slots 40 in the side walls of the carrier do not disturb the firm resilient locking and holding arrangement of the carrier on the bottles 46 when the carrier is carrier by a person grasping the carrier with his fingers and thumb in the slots 40 and with the bottles 46 in a depending condition from the carrier.

The carrier is easily removed from the bottles 46 by a person pulling the central portion of each of the tabs 30 out from the fourth panel section 26, i.e. obliquely upwards and to the right in Figure 3, until the ears 32 of the tabs 30 snap out of the apertures 44. When the tabs 30 have been unlocked from the apertures 44, the panel sections 20 and 28 are shiftable relatively to each other to substantially axially align the peripheries of the apertures 34 with the peripheries of the apertures 36, and the carrier may then be merely lifted from the bottles 46.

When it is desired to reuse the carrier, it is merely necessary to lap the panel section 20 over the panel section 26 and snap the tabs 30 into the apertures 44. With the carrier again in an assembled condition, it is merely necessary to move the carrier downwards over the bottles 46 as previously described to reform the package.

The second embodiment, shown in Figures 4 to 6, differs from that shown in Figures 1 to 3 in the presence of an integral handle 21, extending from the second panel section 22. The handle 21 has a bendable lip 23 which is turned under in a manner to make it more comfortable to the hand when carrying heavy loads. Thus the package, when assembled, is provided with an integral upwardly extending handle to facilitate carrying. As best seen in Figure 5, the handle 21 has the bendable lip 23 thereof turned outwards to provide a relatively large surface area for contact with the hand when the carrier and bottles therein are being carried. This lip 23 is turnable in either direction so as to extend to the left as well as to the right as shown in the drawings. The presence of the legs of the handle 21 divides the first panel section 20 into three parts.

A further difference is that the first panel section carries three tabs 30 rather than two, there being one tab on each part of the first panel section.

Moreover, whereas in Figures 1 to 3 each tab 30 has a straight transverse end edge, and lateral ears 32, each tab in Figures 4 to 6 has an end more resembling arrowhead shape.

The construction of the carrier blank 100 shown in Figures 7 to 9 is similar to that of the carrier blank 10 shown in Figures 4 to 6, except that the apertures 36 are now replaced by cut outs 136. However, the edges 134a and 136a function in the same manner as the edges 34a and 36a of Figure 1.

Another difference of the embodiment of Figure 7 as compared with Figure 4 is the double fold line of the handle portion 121. In this instance there are two fold portions 123 and 125 to provide a U-shaped handle grip as best seen in Figure 6.

In the examples shown, there are three apertures in each of the series of apertures 34, 36, 38, or cut outs 136, so as to accommodate three bottles. However, the invention includes carriers having a greater or lesser number of apertures or cut outs in each series, for a corresponding number of bottles.

WHAT WE CLAIM IS:—

1. A blank for forming a carrier for a plurality of bottles arranged in a row, the blank consisting of resiliently deformable plastics sheet material having four fold lines therein, in parallel spaced-apart relationship

defining first to fifth panel sections in succession across the blank, there being a series of apertures arranged in a row extending longitudinally of the third panel section, a second series of apertures or cut outs arranged in a row longitudinally of the first and second sections, and intersecting the fold line between the first and second sections, a third series of apertures or cut outs arranged in a row longitudinally of the fourth and fifth sections, and intersecting the fold line between the fourth and fifth sections, and means capable of releasably securing the outer edge of the first panel section to the fourth panel section, the apertures or cut outs in each series being of similar number and substantially in transverse alignment, whereby the blank can be folded into the configuration of a prism, with the first and second sections overlying the fourth and fifth sections and the apertures or cut outs of the second series overlapping respective apertures or cut outs of the third series.

2. A blank as defined in claim 1, in which the second and third series are of apertures.

3. A blank as defined in claim 1, in which the second series is of apertures and the third series is of cut outs.

4. A blank as defined in any of claims 1 to 3, and finger gripping means formed in the second and fourth panel sections.

5. A blank as defined in claim 4, wherein the finger gripping means comprises a slot formed in each of the second and fourth panel sections, extending longitudinally of the respective panel sections, and flap means integrally formed along the longitudinally extending side of each slot nearer a free edge of the blank.

6. A blank as defined in any of claims 1 to 3, including an integral handle extending from the second panel section.

7. A blank as defined in claim 6, wherein the integral handle includes a bendable transversely extending hand engaging tap portion.

8. A blank as defined in claim 6, wherein the integral handle includes a bendable transversely extending portion capable of forming substantially a U-shaped hand engaging portion.

9. A blank as defined in any of claims 1 to 8, wherein the means capable of releasably securing the outer edge of the first panel section to the fourth panel section comprises a plurality of further apertures formed in the fourth section in a longitudinally spaced apart relationship, and a plurality of tabs integrally formed on the outer edge of the first panel section and shaped to mechanically interlock in the said further apertures when the first panel section is folded over the fourth section and the tabs are projected into the said further apertures.

10. A blank as defined in claim 9, wherein

When it is desired to reuse the carrier, it is merely necessary to lap the panel section 20 over the panel section 26 and snap the tabs 30 into the apertures 44. With the carrier again in an assembled condition, it is merely necessary to move the carrier downwards over the bottles 46 as previously described to reform the package.

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A further difference is that the first panel section carries three tabs 30 rather than two, there being one tab on each part of the first panel section.

Moreover, whereas in Figures 1 to 3 each tab 30 has a straight transverse end edge, and lateral ears 32, each tab in Figures 4 to 6 has an end more resembling arrowhead shape.

The construction of the carrier blank 100 shown in Figures 7 to 9 is similar to that of the carrier blank 10 shown in Figures 4 to 6, except that the apertures 36 are now replaced by cut outs 136. However, the edges 134a and 136a function in the same manner as the edges 34a and 36a of Figure 1.

Another difference of the embodiment of Figure 7 as compared with Figure 4 is the double fold line of the handle portion 121. In this instance there are two fold portions 123 and 125 to provide a U-shaped handle grip as best seen in Figure 6.

In the examples shown, there are three apertures in each of the series of apertures 34, 36, 38, or cut outs 136, so as to accommodate three bottles. However, the invention includes carriers having a greater or lesser number of apertures or cut outs in each series, for a corresponding number of bottles.

WHAT WE CLAIM IS:—

1. A blank for forming a carrier for a plurality of bottles arranged in a row, the blank consisting of resiliently deformable plastics sheet material having four fold lines therein, in parallel spaced-apart relationship

defining first to fifth panel sections in succession across the blank, there being a series of apertures arranged in a row extending longitudinally of the third panel section, a second series of apertures or cut outs arranged in a row longitudinally of the first and second sections, and intersecting the fold line between the first and second sections, a third series of apertures or cut outs arranged in a row longitudinally of the fourth and fifth sections, and intersecting the fold line between the fourth and fifth sections, and means capable of releasably securing the outer edge of the first panel section to the fourth panel section, the apertures or cut outs in each series being of similar number and substantially in transverse alignment, whereby the blank can be folded into the configuration of a prism, with the first and second sections overlying the fourth and fifth sections and the apertures or cut outs of the second series overlapping respective apertures or cut outs of the third series.

2. A blank as defined in claim 1, in which the second and third series are of apertures.

3. A blank as defined in claim 1, in which the second series is of apertures and the third series is of cut outs.

4. A blank as defined in any of claims 1 to 3, and finger gripping means formed in the second and fourth panel sections.

5. A blank as defined in claim 4, wherein the finger gripping means comprises a slot formed in each of the second and fourth panel sections, extending longitudinally of the respective panel sections, and flap means integrally formed along the longitudinally extending side of each slot nearer a free edge of the blank.

6. A blank as defined in any of claims 1 to 3, including an integral handle extending from the second panel section.

7. A blank as defined in claim 6, wherein the integral handle includes a bendable transversely extending hand engaging tap portion.

8. A blank as defined in claim 6, wherein the integral handle includes a bendable transversely extending portion capable of forming substantially a U-shaped hand engaging portion.

9. A blank as defined in any of claims 1 to 8, wherein the means capable of releasably securing the outer edge of the first panel section to the fourth panel section comprises a plurality of further apertures formed in the fourth section in a longitudinally spaced apart relationship, and a plurality of tabs integrally formed on the outer edge of the first panel section and shaped to mechanically interlock in the said further apertures when the first panel section is folded over the fourth section and the tabs are projected into the said further apertures.

10. A blank as defined in claim 9, wherein



the tabs are formed to have ears projecting from opposite sides thereof in directions longitudinally of the first panel section.

- 5 11. A bank as defined in any of claims 1 to 10, wherein the apertures in the third panel section tangentially engage the fold lines along the longitudinal sides of the kind panel section.

- 10 12. A blank as defined in any of claims 1 to 11, wherein the apertures or cut outs of the second and third series have straight sides in directions transverse to the fold lines.

- 15 13. A package comprising a row of bottles each having an enlarged cap portion associated with its open end, assembled with a carrier formed from a blank as defined in any of claims 1 to 12, the blank being folded into the configuration of a prism, with each of the apertures in the third panel section accepting and engaging the neck of a respective one of the bottles below its open neck, and the apertures or cut outs of the second and third series together grippingly engaging and trapping the bottles necks immediately beneath the enlarged cap portions.

- 20 14. A package as defined in claim 13, wherein the width of the second and the fourth panel sections is such that they are bowed outwards.

- 25 15. A package comprising a row of bottles each having an enlarged cap portion asso-

ciated with its open end, assembled with a carrier formed from a blank of a sheet material, having a bight portion extending through the middle of the blank, in which are a plurality of apertures in predetermined spaced relation accepting and engaging a portion of the neck of a respective one of the bottles below its open end, opposed margins on opposite sides of the bight portion having predetermined spaced apertures or cut outs larger than the enlarged cap portions, the margins being placed in overlapping relation and cooperating to form openings grippingly engaging and trapping the bottle necks immediately beneath the enlarged cap portions, and means for releasably retaining the overlapped margins relatively to each other.

16. A blank as defined in claim 1, substantially as described with reference to Figure 1, Figure 4, or Figure 7 of the accompanying drawings.

17. A package as defined in claim 13, substantially as described with reference to Figures 2 and 3, Figures 5 and 6, or Figures 8 and 9 of the accompanying drawings.

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Printed for Her Majesty's Stationery Office, by the Courier Press, Leamington Spa, 1975.
Published by The Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained.

