Sept. 22, 1953 H. V. BOLDING 2,652,968

BOTTLE CARRIER.

Filed July 2, 1948 4 Sheets-Sheet 1

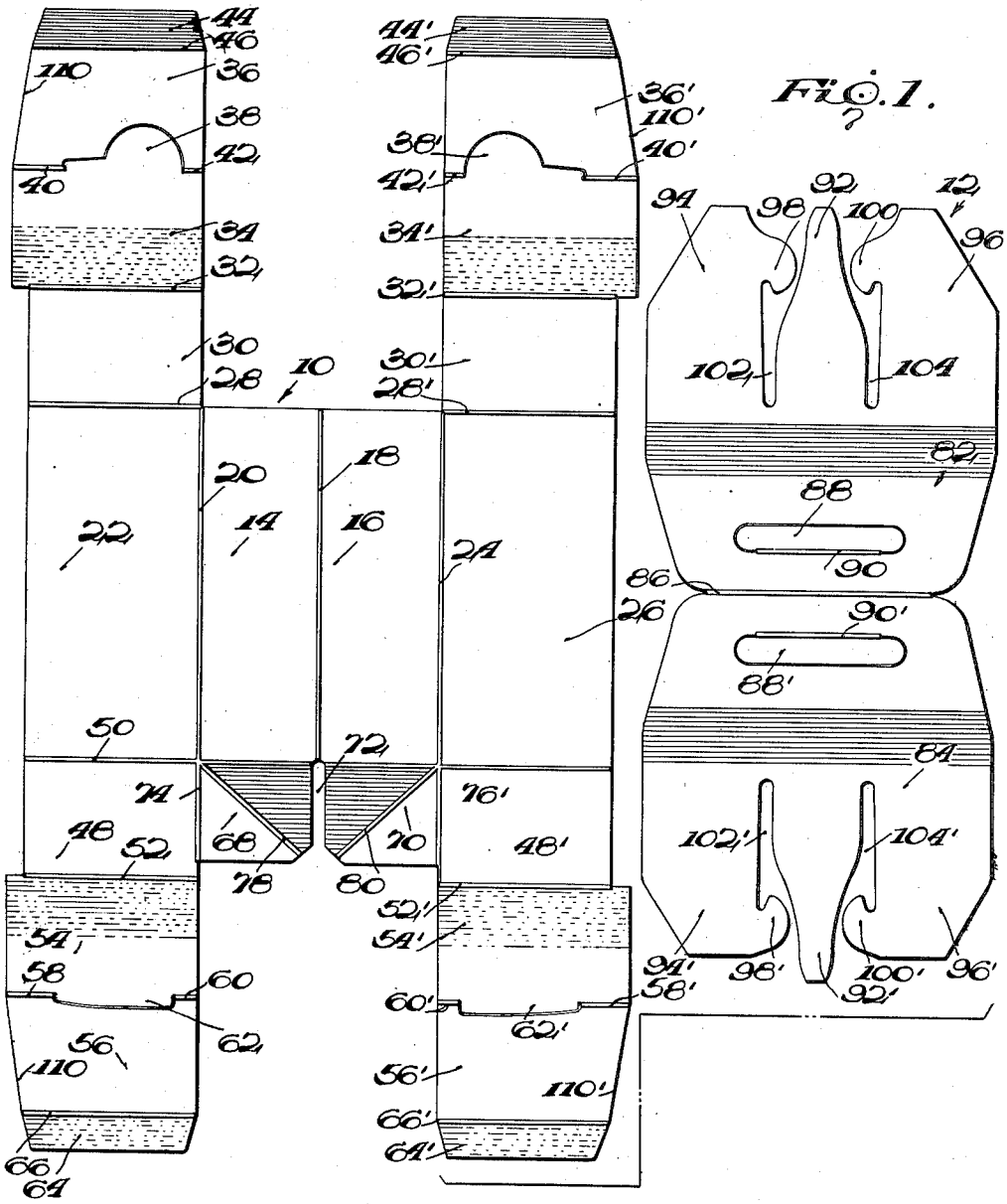


FIG. 1.

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By Richard L. Underwood

Sept. 22, 1953 H. V. BOLDING 2,652,968

BOTTLE CARRIER

Filed July 2, 1948

4 Sheets-Sheet 2

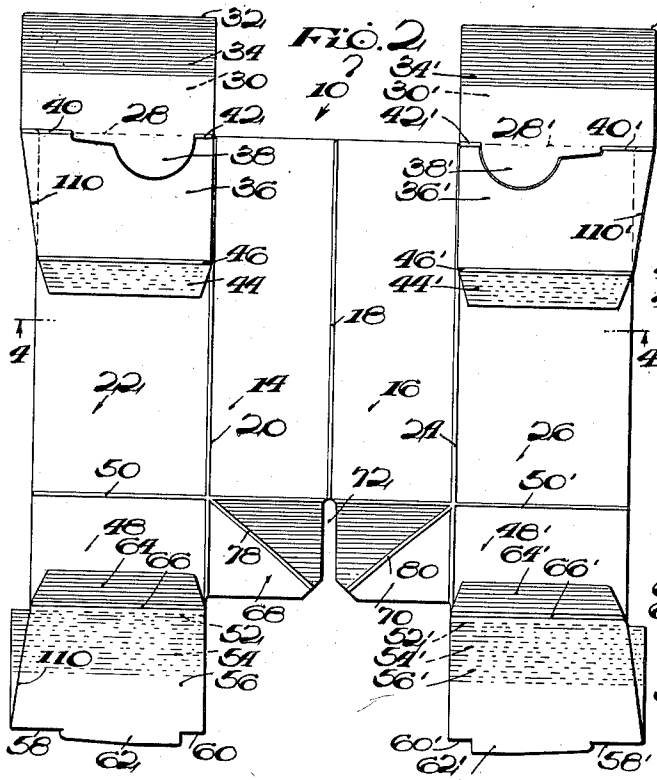

FIG. 2.

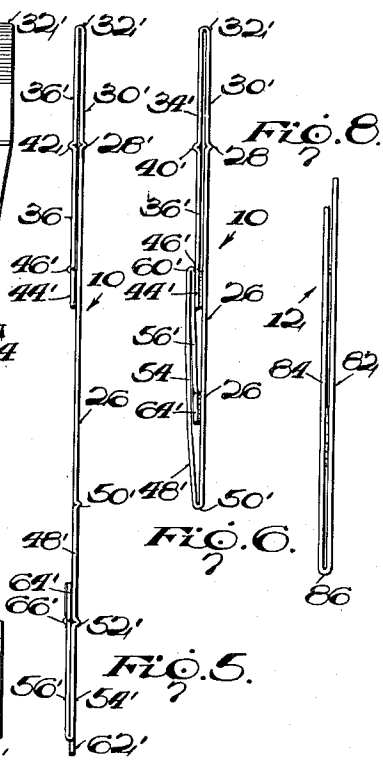

FIG. 8.

FIG. 6.

FIG. 5.

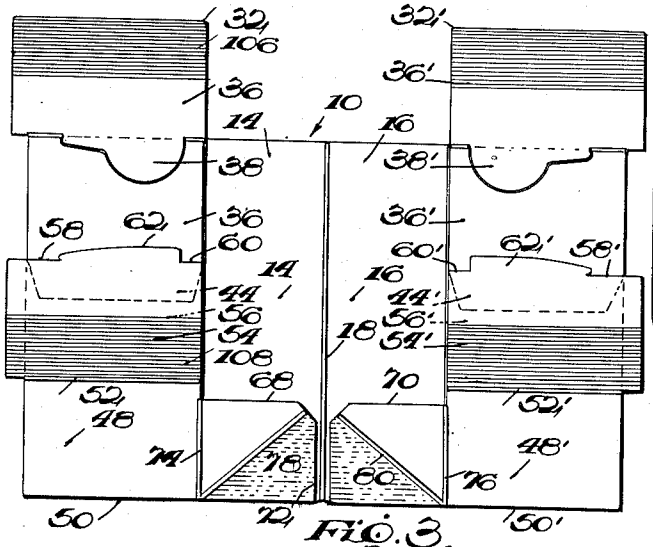

FIG. 3.

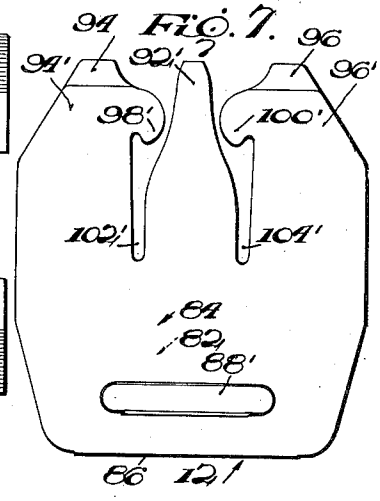

FIG. 7.

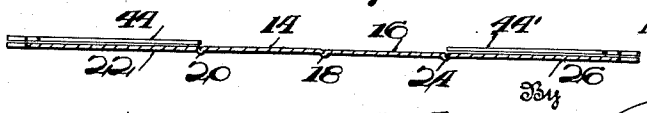

FIG. 4.

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BOTTLE CARRIER

Filed July 2, 1948 4 Sheets-Sheet 3

FIG. 9.

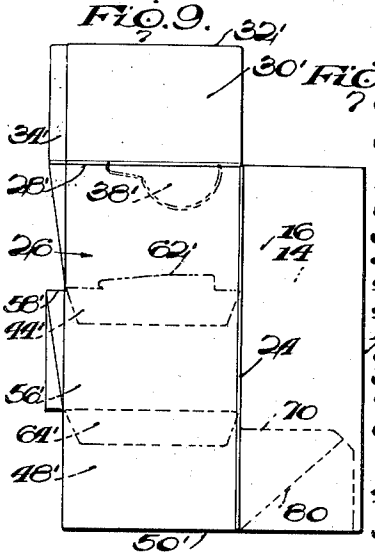
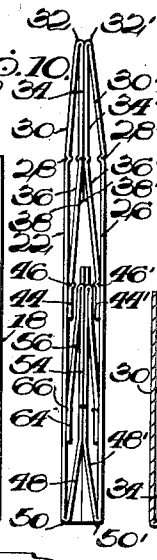


FIG. 10.



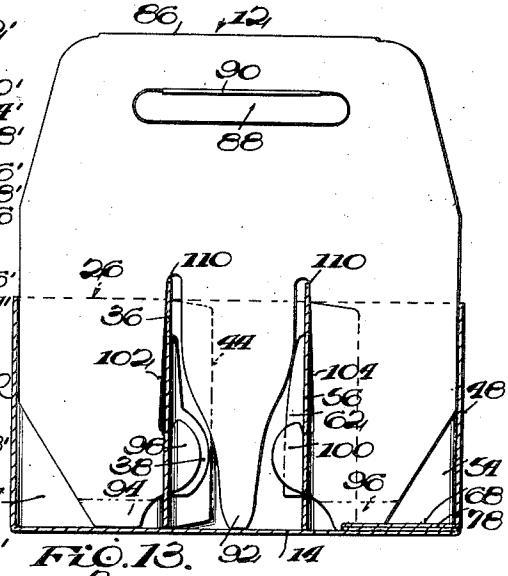


FIG. 13.

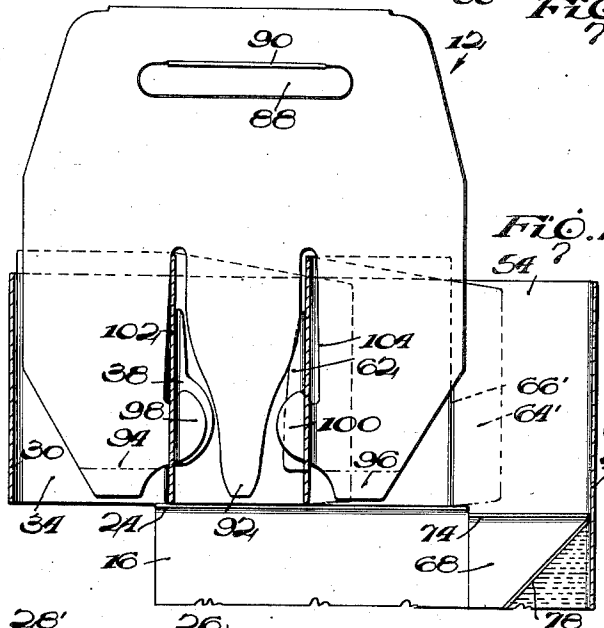


FIG. 11.

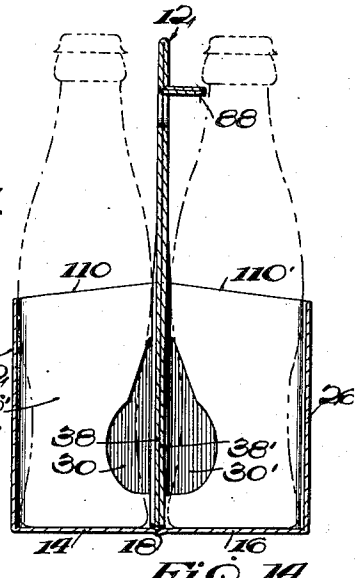


FIG. 14.

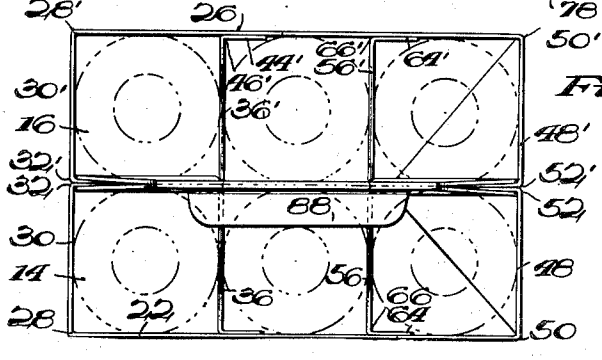


FIG. 12.

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Sept. 22, 1953 H. V. BOLDING 2,652,968

BOTTLE CARRIER

Filed July 2, 1948 4 Sheets-Sheet 4

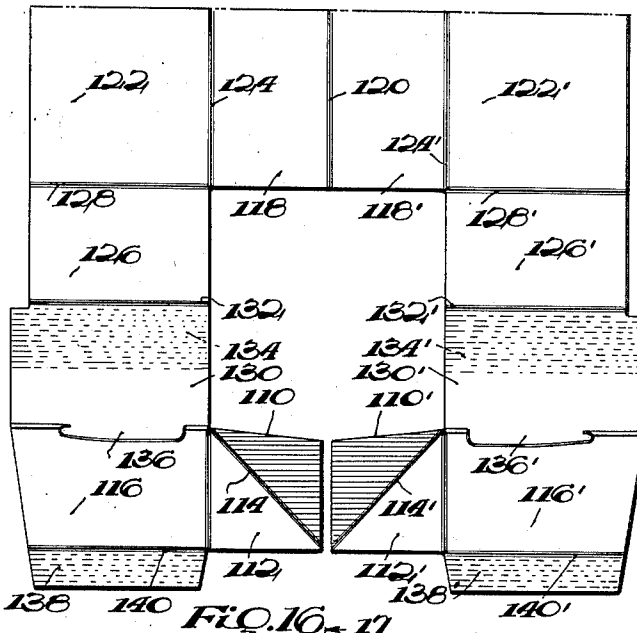


Fig. 15.

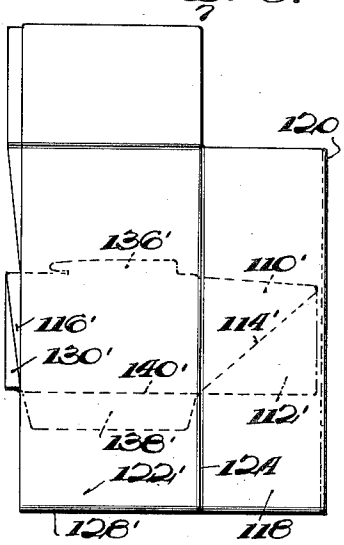


Fig. 18.

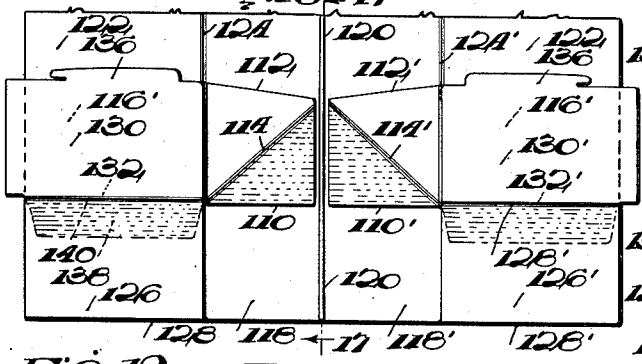


Fig. 16.

Fig. 17.

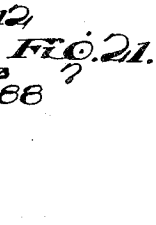


Fig. 21.

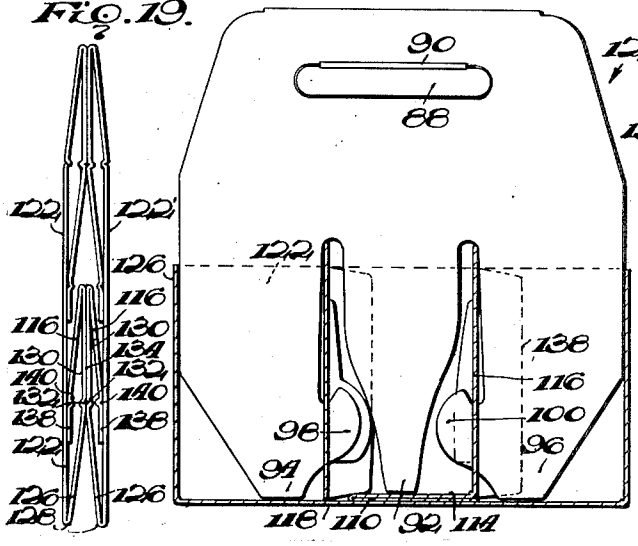


Fig. 19.

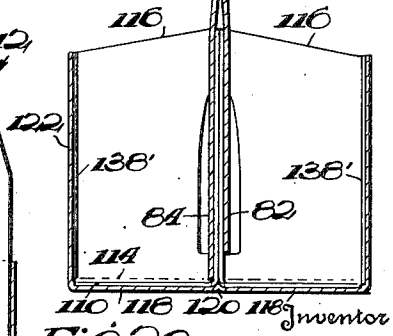


Fig. 20.

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Richard L. Gudenberg

Patented Sept. 22, 1953

2,652,968

# UNITED STATES PATENT OFFICE

2,652,968

## BOTTLE CARRIER

Hubert Velman Bolding, Jeffersonville, Ind., assignor to The Bradley & Gilbert Company, Louisville, Ky., a corporation of Kentucky

Application July 2, 1948, Serial No. 36,613

4 Claims. (Cl. 229—28)

1

This invention relates broadly to collapsible cartons and has particular reference to a carton for use as a bottle carrier.

An object of the invention is to simplify an arrangement of this type from the standpoint of both manufacture and use, providing a carrier formed from a single blank sheet of flexible material which can be quickly and easily assembled on a standard box-making machine.

A further object of the invention is to provide in a carrier of this type, and constituting a portion of the original blank, partition walls which when the carrier is assembled form individual cells for receiving the bottle load for which the carrier is intended. Bearing on this particular phase of the invention, an important feature resides in the fact that the carrier per se and the handle are separate and independent elements, the handle being disconnectedly engageable with the carrier at will and embodying a portion which forms one partition of the cellular tray or carrier arrangement and other portions which reinforce and rigidify other of the partitions forming the individual cells.

An important phase of the invention resides in the manner in which the tray or bottle receiving portion of the carrier is constructed whereby it may be shipped in flattened condition in stacks and readily opened from such collapsed condition by simple pressure on the end walls, such pressure resulting in the transmission of the force to various points of the walls and bottom which insure rapid and accurate opening into cellular form without exerting any undue stress at individual points which would result in possible rupture.

Still a further important desideratum of the invention resides in the manner in which the handle is disengageably connected with the cellular bottle carrying tray, permitting insertion of the handle prior to unfolding the tray from its collapsed condition and subsequent collapse thereof without disengaging the handle. The engaged handle interferes in no way with collapsing or setting up the carton.

Still another phase of the invention resides in the particular manner in which the handle is engaged with the tray so that it is permitted a limited vertical movement, the top of the handle at the lower limit of handle movement occupying a position below the tops of the bottles constituting the tray load, thus facilitating the stacking of loaded carriers one upon the other without interference in any way from a projecting handle and eliminating the need for bending

2

and distorting the same when stacking the trays.

Various other objects and meritorious features of the invention will be apparent from the following description taken in conjunction with the drawings, wherein like numerals refer to like parts throughout the several figures and wherein:

Fig. 1 illustrates the blanks from which the tray and handle portion, respectively, are formed;

Fig. 2 is a plan view showing an initial step in setting up the tray;

Fig. 3 is a similar view illustrating a subsequent step;

Fig. 4 is an end view of Fig. 2;

Fig. 5 is a side view of Fig. 2;

Fig. 6 is a side view of Fig. 3;

Fig. 7 is a plan view of the formed handle member;

Fig. 8 is a side view thereof;

Fig. 9 is a plan view of the tray fully formed and in collapsed condition;

Fig. 10 is an end view of Fig. 9;

Fig. 11 is a section showing the handle member inserted into the collapsed tray;

Fig. 12 is a plan view of a loaded tray with handle inserted;

Fig. 13 is a longitudinal section of the handle and opened tray assembly;

Fig. 14 is a transverse section through a loaded carrier, and

Figs. 15–21 illustrate a somewhat modified form of the carton.

Referring now to Fig. 1, the blank from which the tray or carrier portion of the invention is formed is broadly designated by the numeral 10 and the blank from which the handle is formed is broadly designated by the numeral 12. Both blanks are formed in a single operation which die cuts the full outline of the blank from a strip of flexible material and at the same time forms the score lines by which the various adjacent component sections of the structure are flexibly connected to one another.

The carrier blank 10 comprises a bottom composed of sections 14 and 16 flexibly connected to one another, or separated from one another to describe the structure differently, by a score line 18. Flexibly connected to the outer or side margin of bottom section 14 by score line 20 is a side wall 22 and similarly connected by a score line 24 to the outer or side margin of bottom section 16 is another side wall 26.

It should be noted that the blank is identical in every respect on each side of score line 18 which divides the bottom into component sections, a factor which eliminates considerable

waste in die cutting and forming the blanks from a strip of flexible material. Flexibly connected by score line 28 to one end margin of side wall 22 is an end wall section 30 to which is flexibly connected by score line 32 a longitudinal partition section 34. Adjacent the outer margin of section 34 is a transverse partition section 36 from which a tongue or tab 38 is die cut, score or fold lines 40 and 42 at each end of the tongue 38 flexibly connecting transverse longitudinal partition sections 36 and 34, respectively.

Tongue 38, by virtue of this arrangement of score lines, constitutes an integral portion of the longitudinal partition 34. A lap joint section 44 is flexibly connected by score line 46 to the outer margin of partition 36, one face of the section being coated with adhesive.

To the other end margin of said wall 22 another end wall section is flexibly connected by score line 50, and flexibly joined to the outer margin of such end section by score line 52 is another longitudinal partition section 54. Another transverse partition section 56 is flexibly coupled with section 54 by spaced score lines 58 and 60 between adjacent ends of which is die cut a tab 62 which forms an integral portion of section 54. A lap joint section 64 is flexibly connected by score line 66 with the outer margin of section 56 and, in the view afforded by Fig. 1, the under face of joint section 64 is coated with adhesive. In like manner the under faces of longitudinal partition sections 34 and 54, or at least a portion thereof, are coated with adhesive.

Sections identical in every respect with those which have just been described as extended from and connected flexibly to the opposite end margins of side wall 22 are similarly disposed with reference to opposite end margins of side wall 26 and are designated by corresponding prime numerals. A web is flexibly connected to one end margin of the composite bottom composed of sections 14 and 16, which web is divided into sections 68 and 70 by a slot 72 in alignment with score line 18 which divides the bottom into its component sections. Web sections 68 and 70 are flexibly connected, respectively, to the inner margins of end walls 48 and 48' by score lines 74 and 76. These sections are divided by diagonal score lines 78 and 80, that portion of each section lying between the adjacent bottom section and its score line being coated with adhesive.

Handle member 12 is composed of substantially identical component sections 82 and 84 separated by a score or fold line 86. Flaps 88 and 88' are die cut from each section, but remain flexibly secured thereto by means of score lines 90 and 90'. The lower portion of each section is die cut to provide central tongues 92 and 92' and identical side sections 94, 94' and 96, 96', each side section so formed being provided with hook sections 98 and 100 and 98' and 100'. The central tongues 92 and 92' are separated from their respective adjacent side sections by slots 102 and 104 and 102' and 104', respectively.

The two sections 82 and 84 are folded about score line 86 to form a double-thickness handle element, the two sections being adhered to each other by adhesive deposited across the inner face of one of the sections along a strip lying between the closed ends of slots 102, etc., and the die cut flaps 88, etc. Thus when the handle is formed the two thicknesses of which the same is composed are free from each other except for the adhered strip in the location described, constituting approximately the midsection of the handle element. It will be noted from Fig. 7 that the side sections 94 and 96 project somewhat beyond the ends of corresponding side sections 94' and 96'. The reason for this will be more clearly set forth hereinafter.

Referring now to Fig. 2 wherein an initial step in forming the tray or carrier portion of the assembly is illustrated, the longitudinal and transverse partition sections in the upper portion of the layout are doubled back over fold lines 32 and 32', respectively, and the sections on the lower side of the layout are doubled over fold lines 58, 60 and 58', 60', respectively, to assume the position illustrated in Figs. 2 and 5.

The lower sections as they appear in Fig. 2 are then folded about score lines 50 and 50', the web sections 68 and 70 during this operation folding about the interrupted score line which separates them from bottom sections 14 and 16, to assume the position illustrated in Figs. 3 and 6. In this position it will be noted that the adhesive coated faces of lap joints 44, 44' and 64, 64' lie against what is to be the inside face of side wall sections 22 and 26. These lap joint sections are now adhered by the application of pressure and/or heat and the adhesive-coated portions of sections 68 and 70 are adhered in the same manner to what is to be the inside face of bottom wall sections 14 and 16, respectively.

The portions of the partially assembled tray lying on each side of fold line 18 which separates bottom sections 14 and 16 are then folded about fold line 18. The adhesive-coated portions 106 and 108 of longitudinal partition sections 34 and 54, respectively, are then adhered to corresponding portions of longitudinal partition sections 34' and 54' by the application of heat and/or pressure. The tray or carrier portion of the assembly is then complete and in collapsed position, as it is on completion of the forming operation heretofore described, and assumes the position illustrated in Figs. 9 and 10.

Preferably handles are inserted in the collapsed trays prior to shipment in bundled stacks of such composite units. However, if desired, the trays and handles may be separately stacked and bundled and the handles inserted by the bottler prior to loading. Insertion of the handle into a collapsed tray is most readily accomplished by first bringing the downwardly projecting portions of end sections 94 and 96 into contact with the integrated longitudinal partition sections 34, 34' and 54, 54' and separating adjacent walls 82 and 84 of the composite handle so that sections 94 and 96 move down on one side of the integrated longitudinal partitions and sections 94' and 96' move down the opposite side thereof.

Slots 102 and 104 receive transverse partition sections 36 and 36' and slots 102' and 104' receive transverse partition sections 56 and 56'. The double thickness finger formed by finger sections 92 and 92' moves down between the transverse partition sections and hooks 98 and 98' engage in the openings in the transverse partition sections 36 and 36' formed by the movement of tongues 38 out of the plane of such partitions during the assembling of the tray. The hooks 100 and 100' are received in the slots similarly provided in transverse partitions 56 and 56' by movement of tabs 62 and 62' out of the plane of the partition during the assembling operation.

From the collapsed position illustrated in Figs.

9, 10 and 11 the tray or carrier is readily opened by the exertion of end pressure along the line of juncture between end walls 30 and 30' and the line of juncture of either side wall 22 with end wall 48 or side wall 26 with end wall 48', particular reference for purposes of readily understanding this movement being made to Fig. 10. It should be understood that the handle is preferably inserted in the carton when in collapsed condition, as illustrated in Fig. 11 and heretofore described, prior to opening the carrier for reception of bottles.

The pressure exerted at the juncture of end wall sections 30 and 30' tends to flatten these end wall sections to form a composite end wall. At the same time pressure is transmitted through the adjacent integrated longitudinal partition sections to the adjacent transverse partitions which are, respectively, permanently secured by adhesive to the side walls of the carton. The result is that the side walls spread and the two composite end walls are forced into position simultaneously with the movement of the transverse partitions into proper position and the flattening of the two bottom sections as the side walls are spread, thus forming a single composite bottom. The positive connection between end wall sections 48 and 48' and the composite bottom sections 14 and 16 through web sections 68 and 70 facilitates transmission of force resulting from the aforesaid end pressure to the various elements and, in addition, the web sections hold the tray in "set up" position until bottles are inserted or loaded.

Thus it will be seen that in the form illustrated there is a pair of cells at each end of the carrier formed by the wall structure and partition structure of the carrier itself and a single wide cell extending transversely across the central portion of the tray which is divided into a pair of adjacent cells similar to the end cells by means of the depending finger portions 92, 92' of the handle. The integrated longitudinal partitions of the end cell pairs are reinforced and rigidified by the overlying end sections of the handle.

When the tray with its associated handle is loaded with bottles as indicated in Figs. 12 and 14, collapse of the carrier when the tray is lifted by the handle is precluded. A single bottle in any cell precludes such collapse.

Hooks 98, 98', 100 and 100' of the handle may slide freely in the slots in transverse partitions 36, 36' and 56, 56' heretofore described for receiving the same. The upper limit of sliding movement is reached when the hook portions of the handle are at the upper limit of these slots and sliding movement in a downward direction may be limited either by engagement of the longer end sections 94 and 96 of the handle with the bottom of the tray or by abutment of the transverse partitions against the upper ends of handle slots 102, 102', 104 and 104' of the handle, or by both as clearly illustrated in Fig. 13.

It will be observed from Fig. 14 that the flaps 88 and 88' are adapted to be moved into a plane normal to that of the handle to facilitate engagement of the fingers in the opening provided thereby for lifting a loaded carrier. In Fig. 14 the handle is shown at its lower limit of movement and it will be noted that the upper margin of the handle is below the top level of the bottles which constitute the load. This feature greatly facilitates stacking one loaded carrier on another, since the bottom of each upper loaded carrier finds full support on the tops of the bottles in the lower carrier without in any way requiring deformation or twisting of the handle. Also it is to be noted that the flaps 88, 88' are of such size that, when moved into finger-engaging position as illustrated in Fig. 14, in which the flaps lie in a plane normal to that of the handle, the flap itself is not distorted by contact with the adjacent bottle necks.



It will be noted that the upper margins of transverse partitions 36, 36', 56 and 56' as illustrated are tapered as indicated at 110. By virtue of this taper the longitudinal partition sections 34, 34', 54 and 54' may be somewhat higher than the side and end walls of the carrier. This feature is very desirable for maintaining stability and strength for carrying purposes when the height of the side and end walls must be reduced for some reason, such as to conform the height of the outer carrier walls to that of the walls of a larger container in which a plurality of carriers are to be loaded.

A feature of importance resides in the distribution of stresses when supporting a loaded carrier by the handle. Each of the four hooks 98, 98', 100 and 100' of the handle engages a separate transverse partition to support the load and the stresses so set up are transmitted from them through the integrated composite longitudinal partitions and to the side and end walls and to the bottom. These stresses so transmitted react against the rigidity of the load or bottle and at no point is there a sufficient concentration of stress to cause rupture of the carrier. This stress distribution is an important factor in assuring long and useful life to the assembly as a whole and permits the use of lighter weight material than would otherwise be possible.

Largely by reason of this distribution of stresses it is possible to carry less than a full bottle load, six bottles in the carton shown, without mutilating the carton or tilting to a degree where the bottles would fall out. Thus the carton is serviceable for from one to six bottles, even to the extent of carrying three filled bottles on one side while the opposite side is empty.

In the modified construction shown in Figs. 15–21, the reinforcing and rigidifying web sections composed of adhesive coated portions 110 and 110' and sections 112 and 112' flexibly connected, respectively, by score lines 114 and 114' are joined to the margins of transverse partitions 116 and 116'. Fig. 15 corresponds to the blank of the earlier described modification shown in Fig. 1 of the drawings except that the blank is broken off transversely across the side and bottom walls, the upper and undisclosed half of the blank in Fig. 15 being identical in every respect with the upper half of the blank illustrated in Fig. 1.

As in the earlier described embodiment, the bottom is composed of component sections 118 and 118' separated by a score line 120. To the margins of the component sections constituting the bottom are flexibly connected side walls 122 and 122' separated by score lines 124 and 124'. End walls 126 and 126' are flexibly connected to the margins of the side walls by score lines 128 and 128', respectively. Longitudinal partitions 130 and 130' are flexibly connected to the end wall margins by score lines 132 and 132', a portion of the under faces of these partitions being coated with adhesive as indicated at 134 and 134'.

The transverse partitions 116 and 116' are flexibly connected to the margins of the longitudinal

partitions by separated score lines, a die cut forming the tabs 136 and 136' which are integral with and constitute a portion of the longitudinal partitions 130 and 130' as heretofore described. Lap joint sections 138 and 138' coated with adhesive on one side as indicated are flexibly joined to the margins of the transverse partitions by score lines 140 and 140'.

In Fig. 16 transverse partitions 116 and 116' have been folded about the score lines which flexibly connect them to longitudinal partitions 130 and 130' and the entire section on each side of the blank has been folded about score lines 128 and 128' to thus bring the adhesive coated surfaces of the lap joints 138 and 138' in contact with the inside face of side walls 122 and 122'. As in the case of the earlier described embodiment, the lap joints 138 and 138', together with the lap joints at the opposite ends of the blank, and not described herein because of their identity with Fig. 1, are pressure and/or heat sealed. The arrangement of the sections as described in connection with Fig. 16 is clearly shown by the end view in Fig. 17. At the same time the adhesive coated surfaces 110 and 110' of the web sections are pressure and/or heat sealed to an intermediate portion of the component sections 118 and 118' of the bottom at points intermediate their lengths.

The duplicate side sections lying on opposite sides of the score line 126 which flexibly connects the component sections forming the bottom are then folded about score line 126. The adhesive coated portions 134 and 134' on longitudinal partitions 130 and 130' are brought into contact, as are the adhesive coated portions of the longitudinal partition sections on the upper and undisclosed portions of the blank, and are pressure and/or heat sealed. The resultant carton in collapsed form is illustrated in elevation in Fig. 18 and in section in Fig. 19.

The unfolded or uncollapsed carton, with handle inserted as described in conjunction with the embodiment illustrated in Figs. 1–14, has been shown in longitudinal section and transverse section, respectively, in Figs. 20 and 21. As will be seen particularly from Fig. 20, the reinforcing and rigidifying webs are secured flexibly to transverse partitions rather than end walls and are secured to the component bottom sections at points approximately central with respect to their lengths. Under some circumstances the rigidifying and strengthening effect of the web so located is to be preferred rather than the arrangement illustrated in Figs. 1–14.

While I have described the use of simple score lines about which the various sections of the blank are folded, it will be understood that interrupted die cuts or any other suitable means of weakening the lines of juncture may be used.

Various modifications of the arrangement described and illustrated herein which embody the basic principles of this invention may be readily apparent to those skilled in the art and for that reason I wish to limit myself only within the scope of the appended claims.

What I claim is:

1. A collapsible cellular bottle carrier formed from a single blank of sheet material, said carrier comprising a rectangular bottom consisting of two sections foldable into inside face-to-face relation along an intermediate score line, side walls hingedly connected to opposed margins of the bottom, end walls composed of two rectangular sections hingedly connected to end margins, respectively, of said side walls, independent web sections each hinged on one edge to the bottom margin of one end wall section and on a transverse edge to the margin of the adjacent bottom section, each web section being scored diagonally from the corner formed by the intersection of said web edges, that portion of each web section between the bottom section and the diagonal score line being permanently attached in face-to-face relation to the inner face of said bottom section whereby collapsing movement of the bottom and end walls is resisted after erection of the carton, and partitions between said side walls.

2. A collapsible cellular bottle carrier formed from a single blank of flexible sheet material, said carrier comprising a rectangular bottom consisting of two sections foldable into inside face-to-face relation along an intermediate score line, side walls hingedly connected to opposed margins of the bottom, transverse members in the form of end walls each composed of two rectangular sections hingedly connected to end margins, respectively, of said side walls, other transverse members in the form of rectangular partitions integral with and hingedly connected to opposite side walls, and independent web sections each hinged along one edge to the bottom margin of one transverse member and scored diagonally from one end of said hinge connection at an angle of approximately 45° thereto, that portion of each web section on the side of the diagonal score line remote from the hinge connection with the transverse member being permanently attached in face-to-face relation to the inner face of a bottom section whereby collapsing movement of the bottom and transverse members is resisted after erection of the carton.

3. A collapsible cellular bottle carrier formed from a single blank of flexible sheet material, said carrier comprising a rectangular bottom consisting of two sections foldable into inside face-to-face relation along an intermediate score line, side walls hingedly connected to opposed margins of the bottom, end walls composed of two rectangular sections hingedly connected to end margins, respectively, of said side walls, rectangular transverse partitions integral with and hingedly connected to opposite side walls, and independent web sections each hinged along one edge to the bottom margin of one transverse partition member and scored diagonally from one end of said hinge connection at an angle of approximately 45° thereto, that portion of each web section on the side of the diagonal score line remote from the hinge connection with the transverse partition member being permanently attached in face-to-face relation to the inner face of a bottom section whereby collapsing movement of the bottom and transverse partitions is resisted after erection of the carton.

4. A collapsible bottle carrier comprising a rectangular bottle receiving tray comprising a bottom, side and end walls, said tray being divided by longitudinal and transverse partition walls into transversely paired cells at opposite ends of the tray and a single central transverse cell equal in transverse dimension to the sum of a pair, the transverse wall of each cell of each end pair being slotted adjacent its longitudinal partition, and a dual thickness handle approximating the length of the tray comprising laminations separable across their lower expanse straddling the longitudinal partitions of said transversely paired end cells, each lamination being slotted to re-

ceive said transverse partitions and provided near its bottom with hooks extending through the transverse partition slots, the central portion of each lamination between its slots being adapted when the hooks are engaged in said transverse partition slots to form a dual thickness longitudinal partition for said single transverse cell, said handle including a gripping portion near its top.

HUBERT VELMAN BOLDING.



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