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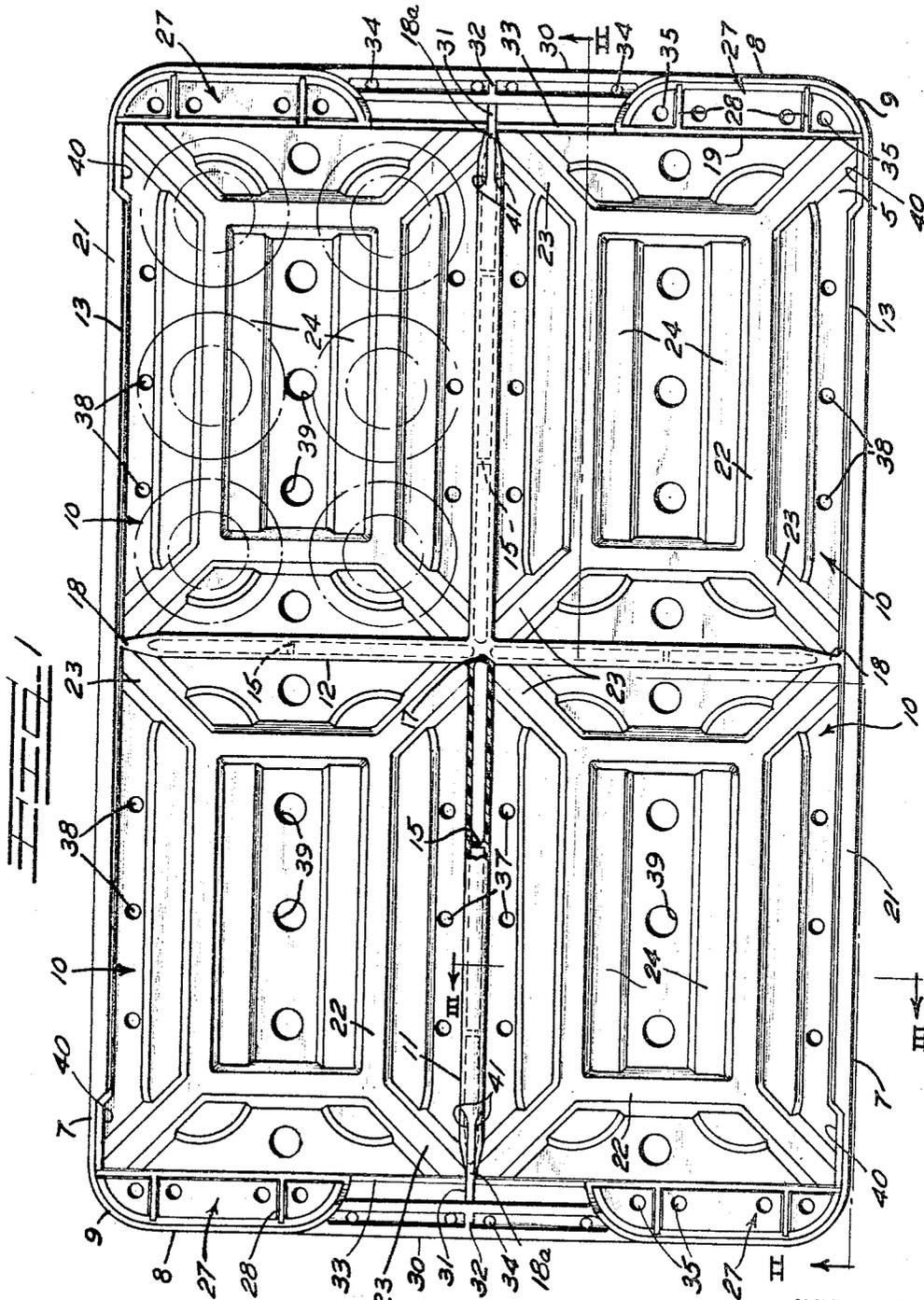
R. T. CORNELIUS ETAL

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BOTTLE CARRIER FOR 6-PACKS

Filed Dec. 28, 1964

2 Sheets-Sheet 1



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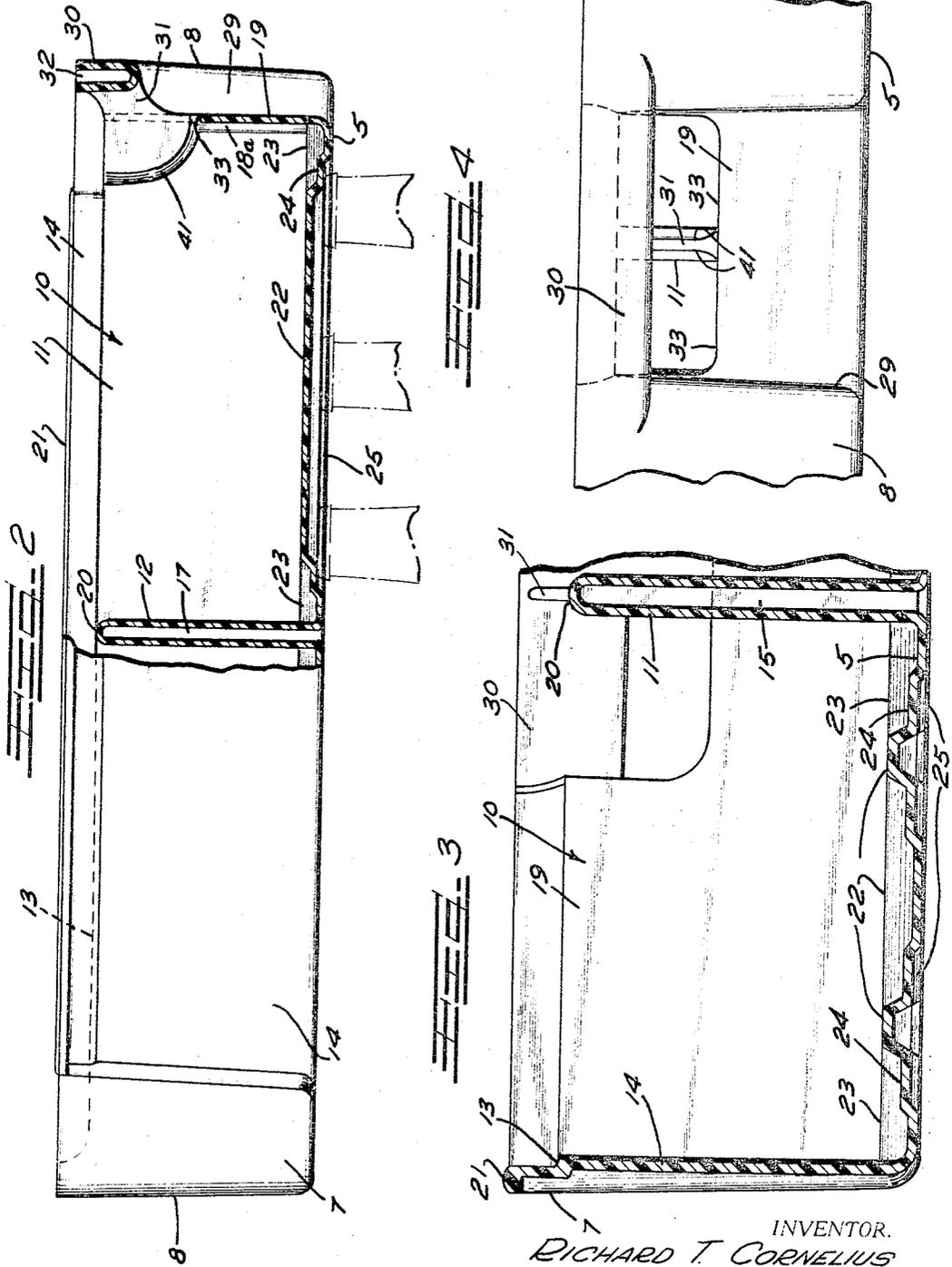
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**BOTTLE CARRIER FOR 6-PACKS**

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Filed Dec. 28, 1964, Ser. No. 421,424  
11 Claims. (Cl. 220—21)

**ABSTRACT OF THE DISCLOSURE**

A one-piece plastic carrier tray having a reinforced bottom wall, side walls and end walls is subdivided into four equal compartments by crossingly related longitudinal and transverse partitions, to receive conventional paperboard 6-packs. Buffer wall structures on the ends of the carrier have manipulating handle bars.

This invention relates to improvements in bottle carriers, and is more particularly concerned with that type of tray-like carriers sometimes referred to as carrying cases and especially adapted for handling, transportation and storage of 6-packs, that is, the popular retail store sales packages of six small size crown-capped beverage filled bottles in conventional paperboard flexibly handled upwardly opening carrying cartons.

Handling of 6-packs for retail store sales is conventionally effected in wooden carriers. Packing and handling equipment in beverage bottling works, supporting racks in transportation conveyances such as delivery trucks, and the like, are all equipped and proportioned to accommodate such wooden 6-pack carriers.

On the other hand, many advantages are inherent in constructing 6-pack carriers from moldable synthetic plastic material such, for example, as high-density polyethylene. Much lighter weight as compared with wood, lack of water absorption, easy cleaning, great durability, and adaptability to shaping and configuration, are among advantages of plastic construction.

Because of the size involved in this type of carrier made from plastic, production costs have been heretofore relatively high due at least in part to die costs and slow production of relatively complex molded structures.

An important object of the present invention is to provide a new and improved carrier for 6-packs constructed entirely as a molded plastic unit utilizing minimum material in a structure which has been especially devised for high speed, economical production between a pair of mating separable forming dies and eliminating any need for slides or other auxiliary die parts in forming any structural feature of the carrier.

Another object of the invention is to provide a new and improved bottle carrier for 6-packs providing in a one piece, unitary molded plastic construction both inside and outside dimensions enabling interchangeable use with conventional wooden carriers for the same purpose while affording a lightweight, substantially thin shell section throughout the structure.

A further object of the invention is to provide a new and improved plastic carrier of the kind described which has a novel structure substantially facilitating loading of paperboard carton-6-packs thereinto.

Still another object of the invention is to provide a new and improved plastic carrier for 6-packs of unusually rugged, reinforced construction comprising an essentially thin-walled shell structure.

Other objects, features and advantages of the present invention will be readily apparent from the following detailed description of a preferred embodiment thereof,

taken in conjunction with the accompanying drawings, in which:

FIGURE 1 is a top plan view of a bottle carrier for 6-packs embodying features of the invention;

FIGURE 2 is a sectional elevational view taken substantially on the line II—II of FIGURE 1;

FIGURE 3 is a fragmentary enlarged sectional detail view taken substantially on the line III—III of FIGURE 1; and

FIGURE 4 is a fragmentary end elevational view of the carrier showing the hand-hole and manipulating handle structure and arrangement.

In the illustrated embodiment of the invention, a structure is provided having ample carrying area for four 6-packs of the conventional paperboard variety placed in generally end-to-end and side-by-side relation two-by-two in either direction within a generally rectangular tray-like structure having outside end and side dimensions as well as over-all height generally corresponding to the same dimensions in conventional wooden carriers for the same purpose. Every feature of the exemplary tray lends itself to one-shot molding in a die consisting of but two opposed complementary die members free from any need for slides or inserts so far as structural features are concerned. All surfaces which face generally toward the ends or the sides of the carrier structure are fully oriented for formation by corresponding die surfaces of either the upper side or the bottom side forming die section of the pair of forming dies, and with ample draft for ready separation of the set molded carrier from the dies. Further, all features of the carrier lend themselves to essentially minimum shell wall section thickness throughout the structure. Plastic material on the order of high density polyethylene is contemplated in the molded, self-sustaining structure, and that is intended to be the connotation of the term "plastic" as used herein.

As shown in FIGURE 1, the carrier comprises a bottom wall structure 5, opposite similar longitudinal side walls 7 and similar opposite end walls 8 rising integrally from the bottom or base wall 5 and with the side and end walls connected by rounded outside corners 9.

Within the receptacle area defined by the side and end walls 7 and 8, four generally rectangular cells or 6-pack receiving pockets 10 are provided by a central longitudinal reinforcing and divider rib 11 and a central transverse divider rib 12 extending upwardly from the base wall 5 to a common height less than the height of the side and end walls and level with an upwardly facing offset longitudinally extending nesting shoulder 13 (FIGS. 1, 2 and 3) on the upper inside portion of an inset panel 14 extending throughout the major extent of the length of each of the side walls 7 and adapted to receive thereon a carrier of like construction having its bottom nested in stacked relation within the upper portions of the side and front walls when the carrier is empty. Each of the crossingly related divider partitions 11 and 12 is of downwardly opening hollow double wall construction having transverse integral reinforcing connector webs 15 at suitable spaced intervals longitudinally therealong, with a solid central connector post 17 at the center joint of the partitions integral with the base wall structure 5. At each of its opposite outer ends the transverse partition 12 is connected by an integral tapering solid web 18 to the respective side wall panel 14. Connection of the opposite ends of the longitudinal divider partition 11 is effected with similar solid-connecting webs 18a to respective transverse inset upstanding compartment-end-defining partition walls 19 having their upper edges in a plane with the tops of the divider partitions and the shoulders 13.

On their upper edges, each of the divider partitions 11 and 12 is provided with a convexly curved rib-like crown

20 (FIGS. 2 and 3), affording cam lead-in surfaces to facilitate loading of the 6-packs into the respective cells 10. These cells are dimensioned between the longitudinal partition 11 and the respective longitudinally parallel inset panels 14 as to width, and between the transverse partition 12 and the outer end defining walls 19 as to length, to receive the respective 6-packs in free sliding relation for insertion and removal. Assistance in stacking empty carriers is afforded by respective convexly crowned longitudinal ribs 21 extending along the upper edges of the panels 14 above the shoulders 13 and providing lead-in cam surfaces as well as affording reinforcement for these edges. It will be noted that the outer sides of the ribs 21 are in a plane with the tops of the opposite end portions of the respective side walls 7 to serve as side buffers for the carrier.

A substantial aggregate area of the underface of the base wall 5 lies in a common supporting plane to afford frictional surface to minimize undesirable slippage on a supporting surface. However, to maintain the base wall 5 of minimum practical section but with such reinforcement as to afford adequate bottle-supporting strength without sagging, and to afford an elevation of the 6-pack supporting upper surfaces of the base wall substantially equal to the thickness of bottom boards of wooden carriers, a pattern of reinforcing and elevating ribs is provided in the respective compartment area of the base wall. To this end, each of the compartment areas has a centered elongated rectangular upwardly raised reinforcing and supporting rib 22 with corner extensions 23 joining the inside or re-entrant corner angles between the crossing divider partitions of the center of the carrier, between the ends of the transverse partition and the side wall panels 14, between the side walls 7 and the end wall panels 19, and between the longitudinal divider partition and the end wall panels 19.

As will be observed in FIGURES 1-3, the narrow top surfaces of the quadrangular ribs 22 and the corner extension rib portions 23 are in a common plane and afford a flat supporting surface, while the sides of the ribs taper toward juncture with the base wall 5 in strut-like reinforcing relation. This thoroughly stiffens the base wall 5, and by the tie-in of the reinforcing ribs with the side and end walls assures thorough resistance to torsional stresses or twisting warpage. The ribs 22, 23 afford a generally criss-cross reinforcing pattern all over the plane of the base wall 5 and in each of the compartment areas 10. This taken together with the juncture ribs which integrally join the side and end walls to the bottom wall and the substantial reinforcement provided by the crossing partition dividers 11 and 12 enables the bottom wall 5 to withstand with a high margin of safety stress or warpage pressures from any direction toward its perimeter.

As indicated schematically by dash-outline circles in the upper right compartment 10 in FIGURE 1, the position of each longitudinally extending section of the rib 22 advantageously centrally underlies a row of the 6-pack bottles. Juncture of the transverse sections of the rib 22 and the generally radiating or diagonal rib extensions 23 efficiently underlies the opposite end bottles in each row.

Additional reinforcement in the compartment sections of the base wall 5 is afforded by respective pairs of shallower raised downwardly hollow bottle crown receiving recess ribs 24 longitudinally centered with respect to the longitudinal portions of the quadrangular rib 22 but of greater width and length. These shallow ribs 24 afford downwardly opening longitudinal shallow recesses 25 in the base wall 5 nestably receptive of the cap crowns of the bottles in a subjacent one of the carriers to enable stacking of a plurality of the loaded carriers for storage or sales display purposes with freedom from accidental sliding displacement of the superposed carriers either longitudinally or laterally from the stack. The width of the shallow groove recess 25 is only slightly greater than the crown diameter of the bottle caps and the length of

such recess groove is only slightly greater than the distance between the outer edges of the cap crowns of the endmost of any three aligned bottles in the 6-pack. The lateral spacing of the recesses 25 is such as to accommodate both rows of three bottles in the 6-pack.

By virtue of the upwardly stepped relation and narrower width of the reinforcing and supporting or floor ribs 22, 23 on the shallower ribs 24, substantial and adequate stiffening of the respective bottle-crown-engaging areas of the ribs 24 is afforded to sustain the weight of dead load thrusting downwardly from contents of the carrier and any superimposed loaded carriers. Further, the hollow raised ribs 22, 23, due to the inherent resilience of the plastic material provide protective cushioning or shock absorption for the bottle load against vertical jolts and jarring whether or not the carrier and contents are in a stacked relation with one or more other loaded carriers.

Another advantage of the relatively, narrow, raised, and symmetrically disposed ribs 22, 23 resides in limiting to a minimum supporting contact of the bottom of the paperboard 6-pack cartons with the base of the carrier and above any water that may for any reason be on the major surface area of the upper face of the base wall 5. Also, if the bottom of the carton is damp because of condensate runoff or other moisture, drying air circulation is permitted under the carton.

Not only are the ends of the carrier strongly reinforced and of a cushioning buffer construction, but to facilitate manipulation improved finger holes and gripping means are provided. For this purpose, each of the end walls 8 provides with the contiguous compartment-defining spacer partition wall 19 and the base wall 5 a generally cellular hollow reinforced end buffer structure 27 which, for efficient molding purposes opens upwardly and includes a series of longitudinally parallel transversely spaced vertical reinforcing and connecting buffer webs 28 joining the end walls 8 and the spacer wall panels 19. Thus, the ends of the carrier are well reinforced and cushioned against thrusting shocks of loaded carriers against one another in following relation on bottling works conveyor, or during other handling.

Further, by upward opening of the end buffer cells 27, they afford convenient finger hold or grip pockets into which a plurality of fingers of one hand can be inserted for pulling the carrier loaded or unloaded, and even for carrying it, if desired. By having the two vertical webs 28 in each of the buffer pocket areas of thin section and properly spaced, as shown, a center pocket is provided receptive of the index and ring finger of the hand while two side pockets are provided for respectively receiving the index and little finger of the hand, for manipulation purposes.

To facilitate lifting the carrier, each of the end walls 8 is centrally inset to the outer face of the adjacent inner end wall panel 19 to provide a clearance recess 29 (FIGS. 1, 2 and 4) below an upper continuous finger gripping handle bar portion 30 bridging thereacross, and of a length to accommodate all of the four-phalange fingers of the hand. On top, the handle portion 30 is level with the top edge of the end wall 8 and for stiffness and to facilitate underhand gripping is of downwardly facing transversely rounded rib formation, comprising a double wall structure opening upwardly for convenience in molding. For reinforcement, an integral fin web 31 centrally connects the inner wall portion of the handle bar 30 with the adjacent end of the longitudinal divider partition 11. This web 31 is as thin as practicable to be received between the middle and ring fingers of a handle-grasping hand without crowding. In line with the reinforcing web 31, a connecting web 32 joins the two walls of the handle bar 30.

To provide ample gripping access clearance to the handle bar 30 either from the top or the bottom, the wall panel 19 is downwardly recessed at each side of the web

31 in line with the inset 29, affording finger clearance openings 33 at an elevation substantially lower than the lower edge of the handle bar. Further convenient finger clearance is afforded above the edges defining the cut-outs 33 by having the adjacent upper part of the end portion of the partition 11 constructed as a longitudinally centered predetermined area single thickness extension portion of the web 31 and the end connecting web 18a. Outwardly from the plane of the partition 19, the lower edge of the web 31 extends upwardly and outwardly to converge with the lower edge of the handle bar 30. On its upper edge, the web 31 similarly extends upwardly and outwardly to converge with the inner side of the handle bar 30 adjacent the upper edge thereof. Through this arrangement, in addition to its function as a handle, the bar 30 serves as an efficient central end wall buffer portion with direct impact and deformation resistance buttress connection centrally to the longitudinal divider and reinforcing partition 11.

For drainage purposes, all upwardly opening depressions in the carrier are provided with suitable drain holes. To this end, in the bottom edge of the upwardly opening hollow handle bar 30 drain holes 34 are provided. Within the bottom of the pockets in the hollow end buffer portions 27 drain holes 35 are provided. Within the upwardly opening depressions in the base of each of the compartments 10 are provided drain holes 37 adjacent to the longitudinal divider 11, drain holes 38 adjacent to the side walls 7, and drain holes 39 in a series along the longitudinal center of each of the compartments affording drainage from the areas between the adjacent generally inwardly extending extension ribs 23 and the area within the rectangular rib 22. Not only for efficient drainage, but for drying air circulation the drain holes 39 are preferably of substantial size, and as shown are of substantially larger size than the remaining drain holes, as is feasible in view of the larger base wall areas available for such holes 39.

For loading paperboard carton 6-packs into the respective cells 10 of the carrier in each instance, one vertical corner of a filled carton is canted into the vertical inside corner of the respective cell nearest the rounded vertical end corner 9 of the carrier. Here an offset clearance 40 between the adjacent end of the inset panel 14 and the end partition 19 provides a convenient carton-corner-receiving pocket for this purpose. Then, by moving the 6-pack carton downwardly the edges and sides thereof contiguous to the dividers 11 and 12 will be cammed by the rounded crown surfaces 20 thereof smoothly into the well or recess afforded within the receiving cell or compartment 10. Additional clearance for those corners of the carton adjacent to the ends of the partitions 11 and 12 is afforded by the tapering convergence of the respective end webs 18 and 18a toward the contiguous vertical wall surfaces of the carrier. Catching of any possible tag end or projection of the carton on the longitudinal divider partition 11 adjacent to the web extension 31 is avoided by respective smooth ramp-like lead-in surfaces 41 on both sides of the juncture of the web 31 with the partition 11. Thus, loading of the carrier is effected speedily and without any need for manual easing of tucking in of uneven, bulging carton panels or walls since there is complete freedom from corners or edges on which they may get caught during loading in the manner outlined.

When loaded in the carrier, the 6-packs are located with respect to the outer sides and ends of the carrier substantially the same as in a conventional wooden carrier, with the hollow dividers 11 and 12 cooperating with the bottom, side and end walls of the carrier to compensate for the thicknesses customarily afforded by the wooden boards, slats and dividers of wooden carriers, whereby this plastic carrier is fully interchangeable with the wooden carriers.

It will be understood that modifications and variations

may be effected without departing from the scope of the novel concepts of the present invention.

We claim as our invention:

1. A molded plastic carrier for 6-packs comprising a generally rectangular tray-like structure having a bottom wall with integral side and end walls, integral centrally crossing longitudinal and transverse divider partitions subdividing the carrier into four equal generally rectangular 6-pack receiving compartments, said end walls having end buffer structure with an inset central finger clearance, a handle bar integrally bridging across said finger clearance, a reinforcing and connecting web flange integral with each of said handle bars and joined to the adjacent respective ends of the longitudinal divider, and a pattern of generally criss-cross raised downwardly hollow reinforcing and 6-pack carton supporting ribs on said bottom wall in said compartments and joining said front walls and said longitudinal divider as well as said side walls and said transverse divider and cooperating in maintaining said bottom wall against deformation from stresses and warpage forces thereagainst along the bottom wall perimeter.
2. A four 6-pack carrier of molded plastic comprising, a base wall having side and end walls integral therewith and defining a generally rectangular tray area, a longitudinal divider partition and a transverse divider partition rising integrally from said base wall and joined at the center of the tray area, the ends of said longitudinal divider partition being integrally joined to said end walls and the opposite ends of the transverse partition being integrally joined to said side walls, said partitions being of double wall construction having the upper edges closed by a crown ridge and hollow spaces between the double walls opening downwardly through the bottom wall, transverse reinforcing webs joining the double walls of the partitions at spaced intervals therealong, a solid vertical center post at the juncture of said partitions, and the ends of said partitions being of solid structure closing the ends of the hollow spaces and tapering to juncture with the respective side and end walls.
3. A plastic 6-pack carrier comprising a bottom wall having side and end walls and crossing partitions all integral in one piece and defining four 6-pack receiving compartments, a rectangular raised reinforcing and supporting rib on each compartment area of the base wall disposed for supportingly underlying the bottles of a 6-pack, and extension ribs extending between and integrally joined to the corners of the rectangular rib and to the side and end walls in the corners defining said compartments.
4. A plastic 6-pack carrier comprising a bottom wall having side and end walls and crossing partitions all integral in one piece and defining four 6-pack receiving compartments, a rectangular raised reinforcing and supporting rib on each compartment area of the base wall disposed for supportingly underlying the bottles of a 6-pack, extension ribs between the corners of the rectangular rib and the corners defining said compartments, and longitudinally extending shallower ribs along but wider than the longitudinally extending portions of said rectangular rib and defining downwardly opening bottle crown receiving grooves for stacking retention against endwise or lateral displacement from supporting bottle crowns of underlying 6-packs.
5. A molded shell plastic 6-pack carrier comprising a base wall having end and side walls and crossing dividers defining a plurality of 6-pack receiving compartments, each area of the base wall within a 6-pack compartment having a raised relatively narrow reinforcing and 6 pack carton supporting rib structure and a pair

of longitudinally extending parallel relatively wider and shallower ribs affording downwardly opening shallow bottle crown receiving grooves for stacking interengagement with the crowns of bottles of 6-packs on which the carrier may be stacked, said shallow ribs being reinforced by the relatively narrow ribs.

6. A molded shell plastic 6-pack carrier comprising a base wall having end and side walls and crossing dividers defining a plurality of 6-pack receiving compartments, each area of the base wall within a 6-pack compartment having a raised hollow reinforcing and 6-pack carton supporting rib structure and affording a pair of longitudinally extending parallel downwardly opening shallow bottle crown receiving grooves for stacking interengagement with the crowns of bottles of 6-packs on which the carrier may be stacked, said rib structure including substantially narrower reinforcing ribs over said grooves and providing cushioning and reinforcing limited contact support for the bottom of 6-pack cartons received in said compartments.

7. A plastic carrier comprising, a bottom wall structure, end and side wall structures rising integrally from the perimeter of the bottom wall structure and integrally joined at vertical corners, vertical dividers extending between respectively the end and side walls and integrally joined at crossing junctures, said dividers being integral with the bottom wall structure and being of double wall hollow construction, and the dividers which are joined to the side walls but closed at their ends and having tapered solid end juncture webs.

8. A plastic 6-pack carrier comprising, a bottom wall, side walls rising from said bottom wall, end walls rising from said bottom wall and joined to the ends of the side walls, integral partition means between said walls including a longitudinal hollow double wall divider partition between and connected to said end walls and having a carton-camming upper edge, said end walls having finger clearance openings adjacent to the ends of said longitudinal partition, respective handle bars bridging across said openings, respective thin web extensions from said longitudinal partition corresponding to about the thickness of one wall thereof and joined to said handle bars, said web extensions having respective junctures with said longitudinal partition including marginal camming lead-in surfaces cooperative with said camming upper edge in easing 6-pack cartons thereby while being loaded into the carrier.

9. In a 6-pack carrier comprising molded plastic shell construction, a bottom wall, side and end walls rising integrally from the perimeter of said bottom wall and integrally joined to one another, integral longitudinally and transversely extending crossing reinforcing divider partitions subdividing the area of said bottom wall between said end and side walls into 6-pack receiving compartments,

said divider partitions being of thin double wall downwardly opening hollow structure, a solid connector post joining said divider partitions at their crossing,

5 and the ends of said partitions being closed and having solid webs respectively integrally joining the end and side walls and said bottom wall.

10. A 6-pack carrier as defined in claim 9, in which said side walls diagonally opposite to said center post having inwardly opening recesses to facilitate loading of the 6-packs into said compartments by canting a vertical corner of a 6-pack in each instance into the recess and then moving the 6-pack down past the partitions into the compartment.

11. In a plastic carrier of substantially shell-like construction,

a bottom wall structure, side and end wall structures defining with the bottom wall structure a tray area,

20 each of said end wall structures including an inner end wall which extends continuously from side-to-side across and integral with said bottom wall structure and between and integral with said side walls, and an outer end wall which is integral with the bottom wall structure and is spaced from said inner end wall and is integral at opposite ends with said side walls and is intermediately interrupted by an indentation affording a hand hole with said inner wall and providing a handle bar extending across the indentations comprising a continuation of said outer wall, said inner wall and said outer wall defining with said bottom wall structure upwardly opening hollow spaces between said indentation and said sidewalls, said spaces opening upwardly and each having thereacross and joining the inner and outer walls a pair of spaced parallel thin reinforcing webs which extend entirely from the top of the inner wall to the bottom wall structure,

said reinforcing webs defining therebetween an upwardly opening finger-receiving pocket of sufficient width to receive the middle and ring fingers of one hand,

and said spaces affording at the opposite sides of said reinforcing webs smaller pockets one of which is large enough to receive the little finger of the hand and the other of which is large enough to receive the index finger of the hand,

whereby said handle bar enables manipulating the carrier by an underhand gripping of the handle bar, and said spaces enable grasping and manipulating the carrier by an overhand engagement of the fingers into said pockets adjacent to any end of either of the end wall structures.

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