HIGH-IMPACT PLASTIC CARRYING AND STACKING CASE WITH HINGED COVER

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References Cited

UNITED STATES PATENTS
3,463,345 8/1969 Bockenstette ......................... 220/31 S
2,897,999 8/1959 Bishop .................................. 220/29
3,394,835 7/1968 Peterson .............................. 220/31 S
3,282,462 11/1966 Box .................................. 220/29

FOREIGN PATENTS OR APPLICATIONS

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ABSTRACT

An integrally molded high-impact plastic carrying and stacking case, having first and second pairs of opposed vertical walls and a bottom wall, is fitted with a hinged cover comprised of two equal-sized rectangular molded panels spaced from the inner top edges of the vertical walls and occupying the inner space enclosed by said walls in the horizontal and closed position. The panels are provided at their edges adjoining the vertical walls of one of said pairs and parallel to the inner meeting edges of the panels with pairs of spaced upwardly and angularly outwardly extending lugs projecting into corresponding vertical slots in the top edges of the adjacent vertical walls and connected thereto by hinge joints integrally molded with the respective slots and lugs.

8 Claims, 4 Drawing Figures
The present invention relates to plastic carrying and stacking cases, more particularly cases for the storage and/or transport of beverage bottles and the like containers as commonly used for the distribution of milk, beer, and other beverages and related products.

Cases of the foregoing type produced by molding in a single operation from a suitable high-impact plastic, such as polyethylene, polypropylene, polyvinylchloride and the like, while exhibiting an adequate mechanical strength and stability to enable large numbers of cases to be stacked both for storage and transport, nevertheless possess a resiliency sufficient to absorb shocks and other mechanical impact or vibrational forces, to in turn prevent danger to or breakage of the bottles or other containers, not to mention the considerably reduced weight of the cases compared with wooden and/or metallic cases heretofore known and used in the art.

In the practical use of plastic storage and transport cases of the foregoing type, it is frequently required to close the top of the cases in an effort to shade or protect the liquids or the like contents stored in the bottles or containers from the effect of incident light, particularly in the case of light-sensitive bottles for beer and the like beverages. Besides, a closing of the cases may be desirable or necessary for other reasons in combination with existing conditions and requirements in the storage, transport and distribution of the beverages or products. For this reason, the cases have heretofore been provided with a hinged cover preferably integrally molded therewith through a so-called "live" hinge, as shown and described for instance in my U.S. Pat. No. 3,282,462.

While a case of the referred to type without cover or having an open top may be readily stacked in sufficient numbers with the bottom wall of one case resting upon the preferably reinforced upper edges of the vertical or side walls of the case below in the stack, difficulties have been encountered in the past in the stacking of cases fitted with a hinged cover in that the stacking pressure, in particular the pressure exerted upon the lower cases of the stack, may assume excessive values to an extent as to have a destructive effect on the cover or hinges connecting the same with the walls of the case. As a consequence, the number of cases which can be safely stacked is limited where a hinged cover is required constructed according to previous practice in the art.

Thus, in the case of the prior patent mentioned hereinafter, the "live" hinge or part of the cover overlying the top edges of the walls of the case are subjected to the full stacking pressure assuming a maximum for the lower cases in the stack. As a consequence, the cover and hinge joints are liable to rapid wear and early destruction, especially during transport when the stacks are exposed to considerable and continued impact and vibrational forces.

Accordingly, an important object of the present invention is the provision of a stackable plastic carrying and transport case of the referred to type being fitted with a hinged cover and capable of stacking with similar cases, substantially without effect upon the stacking pressure upon the covers or hinged structures connecting the same with the cases.

While a cover is desirable or required for the storage and transport of certain beverages, in particular beer or carbonaceous liquids, it may be dispensed with for other liquids or products distributed in similar bottles or containers. This makes it necessary to produce and stock two different types of cases, one type with and another type without cover, increasing thereby the manufacturing, storage and handling costs.

It is therefore another object of the invention to provide a unitary stackable plastic case and hinged cover therefore which cover may be assembled and disassembled readily by unskilled persons and without the use of special tools or implements.

Yet another object of the invention is the provision of plastic carrying and stacking case of the referred to type fitted with a hinged removable cover with the cooperating hinge elements being integrally molded with the case and cover respectively for ready assembly and disassembly by unskilled labor.

The invention, both as to the foregoing and ancillary objects as well as novel aspects thereof, will be better understood from the following detailed description, taken in conjunction with the accompanying drawings forming part of this disclosure and in which:

FIG. 1 is an isometric view of a plastic carrying and stacking case fitted with a hinged cover constructed in accordance with the principles of the invention;

FIG. 2 is a top view of the case;

FIG. 3 is a fragmentary cross-section taken on line 3—3 of FIG. 2; and

FIG. 4 is an isometric view more clearly showing the bottom construction of the case.

Like reference numerals denote like parts in the different views of the drawings.

With the foregoing objects in view, the present invention involves generally the provision of an integrally molded plastic case of the referred to type, having a first pair of opposed vertical or side walls, a second pair of opposed vertical or end walls and a bottom wall, with hinges respectively on at least one panel disposed below and at a distance from the inner top edges of said walls in the horizontal and closed position, said panel being provided at an edge adjoining one of said walls with a pair of spaced upwardly and angularly outwardly extending lugs projecting into and engaging corresponding vertical slots in the top edge of said last-mentioned wall. The engaging outer surfaces of said lugs and slots, in respect to a symmetry line to said slots, are provided respectively with integral pivot pins and bores engaged thereby, in such a manner as to enable the panel to be swung, through substantially 270° from its closed horizontal position in a direction upwardly and outwardly to an open or vertical position adjoining the respective outer surface of said wall. Where two panels are provided, as shown by the drawings, they substantially occupy the entire inner space enclosed by the vertical walls of the case with the inner meeting edges of the panels being slightly spaced from one another and with the opposite outer edges connected to the adjacent vertical walls by pairs of integral hinge joints, in the manner described hereinafter.

This construction enables the stacking, in the conventional manner, of a first case upon the preferably reinforced top edges of a second case without in any way effecting or interfering with the cover or joints of the hinges, on the one hand, while enabling assembly and disassembly of the cover by the utilization of the resiliency of the plastic by simply bending the panels outwardly, on the other hand, in the manner as will become more apparent as the description proceeds in reference to the drawings.

Referring to FIGS. 1—3 there is shown an integrally molded beverage of the like carrying and stacking case 10 comprising a first pair of opposed vertical or side walls 11a, 11b, a second pair of opposed vertical or end walls 12a, 12b, and a bottom wall 13. The top edges of the vertical walls are reinforced in a known manner by the provision of outwardly projecting flanges 14a, 14b, 15a, 15b and stiffening ribs behind said flanges as shown at 16a and 17a, FIG. 1, to increase the mechanical stability and strength of the case and to enable the safe stacking of a greater number of cases, in a manner well known and indicated in dot-dash lines in FIG. 3, wherein the overlying flanges 14a, 16a and 15a, 17a are shown in the form of solid reinforcements or rims 14c and 14d respectively.

Disposed below and spaced from the inner top edges of the walls 11a, 11b, 12a, 12b are a pair of equal-sized rectangular panels 18a and 18b of a two-part hinged cover, said panels occupying the entire inner space enclosed by said walls with their inner meeting edges, in the example shown, slightly spaced from a horizontal symmetry line x—x to the side walls 11a, 11b, as more clearly shown in FIG. 3. These panels 18a and 18b are provided, at least at their outer edges adjoining the side walls 11a and 11b, with stiffening flanges 19a and 19b extending transversely and downwardly from said edges in the
closed position of the cover, FIG. 3, for the further purpose as will become more apparent as the description proceeds.

Extending upwardly and angularly outwardly from each of the outer edges of the panels 18a and 18b adjoining the walls 11a and 11b are pairs of spaced lugs 25a and 25b, respectively, said lugs projecting into and engaging corresponding vertical slots in the upper edges of the walls 11a and 11b or rims 14a and 14b, respectively. The outer wall surfaces of the slots 20a and 21a, in respect to a symmetry line y — y to the walls 12a and 12b, are provided, in the example shown, with integrally molded pivot pins 22a, 22b, 23a, 23b projecting into the slots and having axes parallel to the symmetry line x — x of the walls 12a and 12b. The pins 22a and 23b, FIG. 2, engage corresponding bores in the lugs 25a and 25b. With the axes of the pins being equally spaced from the adjacent inner and outer edges of the slots parallel to the line x — x, as shown at c, FIG. 3, it follows that the panels 18a and 18b may be swung or rotated, from the horizontal or closed position shown, upwardly and outwardly through angles of 270°, as indicated by the circular arrows and in dot-dash lines in FIGS. 1 and 2, to a vertical or open position adjoining the outer surfaces of the walls 11a and 11b, respectively.

As can be seen, the additional effects of the flanges 19a and 19b of the panels 18a and 18b is to arrest the panels in the closed or horizontal position upon rotation from the open or retracted position in a direction opposite to the arrows. Finger holes 18c are advantageously provided in the panels to facilitate the opening of the cover.

The improved hinged cover construction described in the foregoing has the advantage that two or more cases may be stacked with the bottom wall of one case, as indicated in dot-dash lines in FIG. 2, resting upon the top edges and reinforcing flanges of the case below is the stack, substantially without effecting or interfering with the cover or hinge joints. In other words, the cases may be stacked and handled in exactly the same manner with or without the cover, in a manner becoming more apparent as the description proceeds.

In order to facilitate alignment and stacking of the cases and to improve the stability of the stack, the bottom wall 13 is shown provided in a known manner with an outwardly projecting flange substantially rectangular 24 spaced from the outer surfaces of the vertical walls by a distance slightly in excess of the wall thickness, whereby the flange 24 engages the inner surfaces adjoining the top edges of the case below in the stack at a safe distance from the cover or panels 18a and 18b, as shown in FIG. 3.

The improved cover and hinge structure according to the invention has the further advantage of enabling an easy and ready assembly and disassembly of the cover, to suit existing conditions or requirements. With the outer walls of the lugs 25a and 25b engaging the outer side walls of the slots 21a and 21b, FIG. 2, all that is necessary to remove the panel 18b is to slightly bend the portion between the lugs 25a and 25b in the outward direction, to cause the pins 23a and 23b to slip out of the bores in the side walls of the slots 21a and 21b and to thereby enable removal of the panels or cover, substantially without the requirement of special tools or skilled labor. In the same manner, the panels may be assembled again by bending the same made possible by the resiliency of the molded plastic.

In order to facilitate the assembly and disassembly operations, the width of the lugs is less than the width of the slots and/or the lugs are formed with inner outwardly tapering surfaces on the side opposite to the walls engaging the slots, in the manner as shown in FIG. 2.

While a two-panel cover is shown by the drawing, a single panel occupying the entire space between the walls 11a, 11b, 12a, 12b with a pair of hinge joints connecting the same with one of the vertical walls, may be used in the manner readily understood from the foregoing.

While the pivot pins 22a, 22b, 23a and 23b are shown integral with the side alls of the slots 21a and 21b and engaging bores in the lugs 25a and 25b, it is understood that the pins may be part of the lugs and engage bores in the side walls of the slots, without affecting the basic construction and operation of the cover.

Where the case is to be used in conjunction with wheel-type conveyors and numbers of cases are to be stacked both in relative aligned and crosswise position, as shown and described for instance in my copending application, Ser. No. 804,145 filed Mar. 4, 1969, entitled PLASTIC TRANSPORT CASE, the flange 24 extending from the bottom wall 13 is preferably subdivided into inner and outer rectangular sections 26 and 27, to provide interlocking stacking channels of width a and b, with the outer sections 26 having a more or less solid outer surface, interrupted only by relatively small recesses or openings in the manner shown, whereby to provide a stable support for the cases by the wheels of the conveyor and to prevent locking of the cases with the conveyor wheels, in the manner described in greater detail in said copending application which is herewith embodied in this application by reference.

In the foregoing, the invention has been described in reference to a specific exemplary device or embodiment. It will be evident, however, that variations and modifications, as well as the substitution of equivalent parts for those shown herein for illustration, may be made without departing from the broader scope and spirit of the invention.

I claim:

1. A high-impact plastic case comprising in combination:
   a. an integrally molded rectangular unit having a first pair of opposed vertical walls, a second pair of opposed vertical walls, said walls having upwardly extending reinforcing flanges and rims adapted to support an identical case stacked thereon, and a bottom wall, and
   b. a cover for said unit comprised of
      a. a pair of molded rectangular panels spaced from the inner top edges of said vertical walls and occupying substantially the entire inner space of said unit in the closed horizontal position of said cover,
      b. a pair of spaced integral lugs projecting upwardly and angularly outwardly from each of the edges of said panels said lugs extending into vertical slots in the upper edges of said walls, the outer surfaces of said lugs engaging the outer side walls of the corresponding slots along a horizontal symmetry line on said second pair of vertical walls, said lugs adapted to form a pair of hinge joints at the outer surfaces of each pair of lugs and slots, said lugs further adapted to rest against said outer walls to support said cover in the closed position, and
      c. integral pivot pins on each of said pairs of mating surfaces extending in a direction parallel to said first symmetry line and engaging bores in the adjoining mating surfaces,
   3. said combination adapted to enable rotation of said panels about said pins upwardly and outwardly through angles of 270° from the horizontal closed position to a vertical open position adjoining the outside surfaces of said first pair of vertical walls, and vice versa and to enable vertical stacking of said cases with said upper case resting upon the top edges and reinforcing flanges of the lower case thereby avoiding any contact with said cover.

2. A plastic case as claimed in claim 1, wherein said panels are provided with at least one right-angular flange projecting downwardly from an edge thereof and engaging the inner surface of the adjoining one of said first pair of vertical walls.

3. A plastic case as claimed in claim 1, including a substantially rectangular flange projecting outwardly from said bottom wall and spaced from the outer edges of said wall by a distance slightly in excess of the width of the upper edges of said vertical walls, whereby to enable stacking and locking of a first case upon a second case by said flange engaging the inner top edges of said vertical walls, substantially without interference with said cover.

4. A plastic case as claimed in claim 1, wherein the pivot axes of said pins are equally spaced from the inner and outer edges of the respective slots parallel to said first symmetry line.
5. A plastic case as claimed in claim 1, wherein said slots have a width in excess of the width of said lugs, to enable assembly and disassembly of said panels by temporary outward bending thereof.

6. A high-impact plastic case comprising in combination:
1. an integrally molded rectangular unit having a first pair of opposed vertical walls, a second pair of opposed vertical walls, said walls having upwardly extending reinforcing flanges and rims adapted to support an identical case stacked thereon, and a bottom wall, and
2. a cover for said unit comprised of
   a. at least one rectangular molded panel spaced from the inner top edges of said vertical walls and occupying the inner space enclosed by said walls in the horizontal and closed position of the cover,
   b. a pair of spaced integral lugs projecting upwardly and outwardly from the edge of said panel adjoining one of said first pair of vertical walls and extending into vertical slots in the upper edges of said last mentioned vertical wall, the outer surfaces of said lugs engaging the outer side walls of said slots, along a horizontal symmetry line on said second pair of vertical walls, said lugs adapted to form two hinge joints at the outer walls of said lugs and slots, said lugs further adapted to rest against said outer walls to support said cover when placed in the closed position, and
   c. integral pivot pins on each of said pairs of mating surfaces extending in the direction parallel to a horizontal symmetry line to said first pair of vertical walls and engaging bores in the adjoining mating surfaces,
   d. said combination adapted to enable rotation of said panel about said pins upwardly and outwardly through an angle of 270° from said closed position to an open position adjoining the outside of said predetermined vertical wall, and vice versa and to enable vertical stacking of said cases with said upper case resting upon the top edges and reinforcing flanges of the case below and thereby avoiding any contact with said cover.

7. A plastic case as claimed in claim 6, wherein said panel is provided with at least one right-angular flange projecting downwardly from said edge and adjoining the inside of said first vertical wall in the closed position.

8. A plastic case as claimed in claim 6, wherein said slots have a width in excess of said lugs, to enable assembly and disassembly of said cover by temporary outward bending of said panel.

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CERTIFICATE OF CORRECTION

Patent No. 3,655,088 Dated April 11, 1972

Inventor(s) Theodor Box

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Col. 2, line 57, change "tope" to -- top -- ;
Col. 3, line 73, change "alls" to -- walls -- ;
Col. 4, line 73, change "form" to -- from -- .

Signed and sealed this 18th day of July 1972.

(SEAL)
Attest:

EDWARD M. FLETCHER, JR. ROBERT GOTTSCALK
Attesting Officer Commissioner of Patents