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3,005,572

PLASTIC CASE CONSTRUCTION

Filed Sept. 28, 1959

Fig. 1.

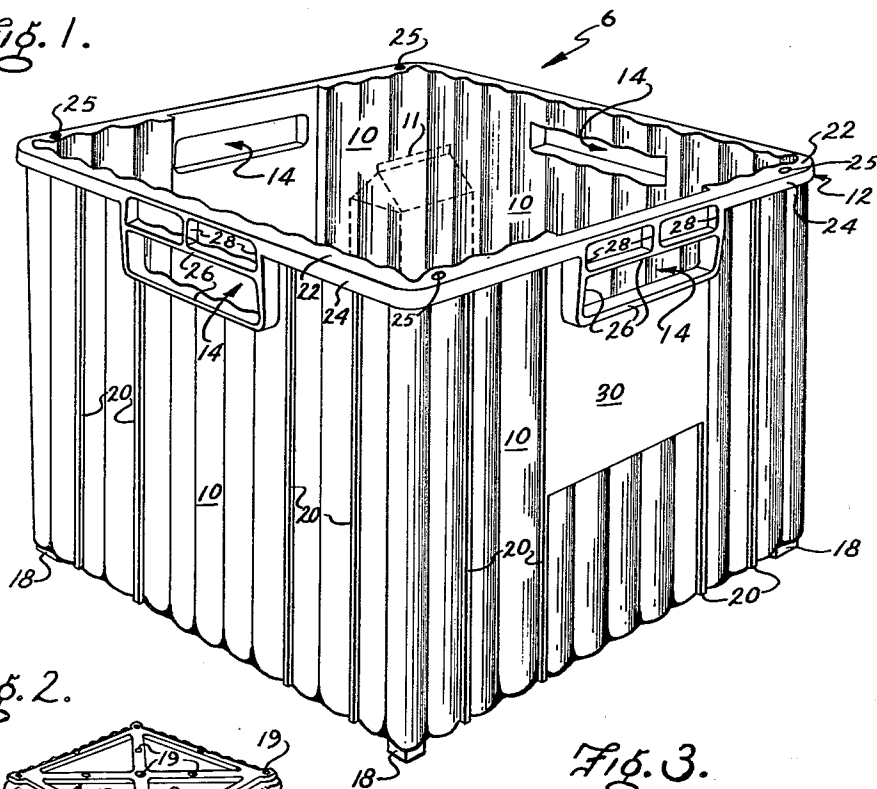


Fig. 2.

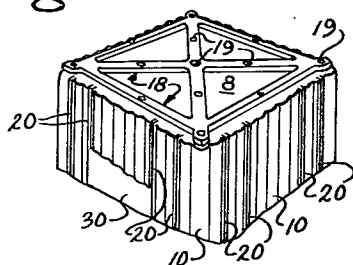


Fig. 3.

Fig. 5.

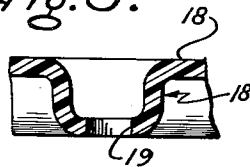
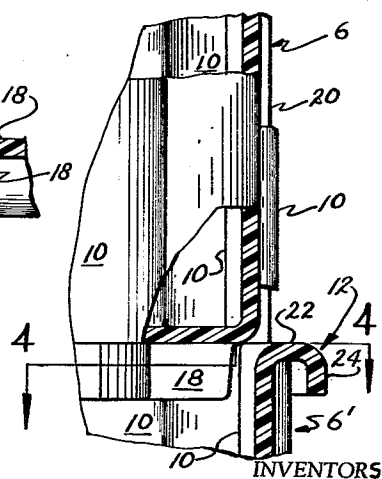
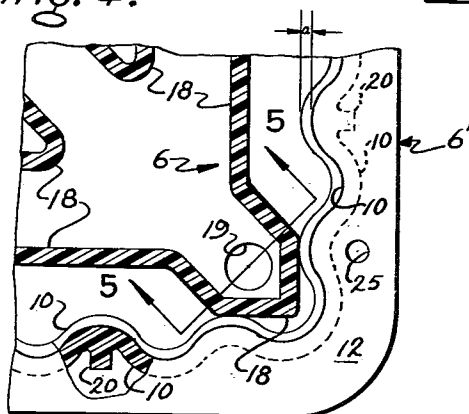


Fig. 4.



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PLASTIC CASE CONSTRUCTION

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4 Claims. (Cl. 220-72)

This invention relates to cases for the transportation and display of various types of products.

The case embodying this invention is of a construction particularly suited for handling products of a relatively fragile nature or which are subject to damage by scuffing, such as paper board liquid containers in which milk, orange juice and the like are commonly distributed. The presently available milk cases are commonly made of wood or metal having a tendency to abrade or scuff portions of the wax coating from the containers which rub against rough surfaces or sharp edges of the case. When this occurs the result is damaged and unsightly containers which are unattractive to prospective customers. Frequently the abrasions are sufficient to cause leakage from the containers of their liquid contents. The unsalability of liquid in damaged or leaking containers results in financial loss to the seller. In addition, the abrasion of liquid containers creates serious problems not only from the financial standpoint, but also in the handling and sale of liquids in such containers. If a leaking container is carelessly placed in a sales display case, the escaping liquid gives the case a disagreeable and unsightly appearance. Furthermore, if a container having an undetected leak is placed in a customer's grocery bag, other articles in the bag may be damaged, the clothes of the customer may be soiled, and the bottom of the bag so soaked by the liquid as to render it incapable of supporting its contents.

It is the principal object of this invention to provide an improved case construction having characteristics which minimize the possibility of damage to its contents.

It is another object of this invention to provide an improved case construction having characteristics enabling the case to be rapidly stacked with other cases in relative stable condition.

It is a further object of this invention to provide an improved case construction which may be readily cleaned and sterilized without deleterious effect on its appearance and which is relatively stain and odor proof.

It is still another object of this invention to provide an improved case construction which is light weight and of sufficient strength to be stacked with other cases enabling the shipment of greater loads in a given vehicle for transport.

The increasing use of wax coated or impregnated containers for milk and other beverages, particularly in the distribution and sale of such products in local retail outlets, has presented further problems. The containers are filled and distributed from a distribution center in trucks, and the area served by such a center may cover a radius of many miles. The retail outlets to which distribution is made may vary from small outlets which require relatively few cases, to large supermarkets requiring several truck loads. Load size and weight, as well as ease and speed in handling, have become substantial economic factors.

The relative lightness of the paper containers over glass bottles has substantial economic value in reducing distribution costs, and it has been recognized that a reduction in the weight of the carrying cases could effect further economies. The sanitary advantages of plastic over wood as a material for the cases has been recog-

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nized, but the problems of providing adequate strength and lightness, the relative high cost of the suitable plastic materials available, and the molding problems involved have, up to the present, prevented the realization of such advantages.

It is a further and important object of the invention to provide a case structure which can be economically molded from a plastic material such as rigid polyethylene, which will have the strength to withstand the rough handling to which such cases are subject, and which at the same time will be sufficiently light in weight to substantially increase the distribution capacity of the trucks or other vehicles employed, while realizing the other objects and advantages above pointed out.

A more specific advantage resides, as later pointed out, in a wall structure providing high strength with a minimum weight of material.

The above and other objects and advantages of this invention will be apparent from the following description and with reference to the accompanying drawings in which:

FIG. 1 is a perspective view of a case embodying this invention;

FIG. 2 is a fragmentary view of the bottom portion of the case, on a reduced scale;

FIG. 3 is a fragmentary view, partly in section, showing corner portions of two cases disposed in stacked relation;

FIG. 4 is a section taken along line 4-4 of FIG. 3; and

FIG. 5 is a section taken along line 5-5 of FIG. 4.

Referring in detail to the drawing, a case 6 embodying this invention is shown in FIG. 1. The case is an integral structure molded of a synthetic plastic material such as rigid polyethylene. The case includes a bottom 8, FIG. 2; upwardly extending side walls 10; and a flange 12 extending outwardly of the upper edge portions of the walls 10. The walls 10 extend to a height preferably greater than the height of milk containers to be carried in the case. One type of milk container 11 is shown by dotted lines in FIG. 1. Walls 10 include oppositely disposed hand openings 14 for carrying and otherwise handling the case.

The walls 10 are preferably smoothly curved and of cylindrical curvature. The walls taper inwardly from the top to the bottom of the case only sufficiently to permit removal of the case from the mold in which it is formed; this taper or draft is indicated at *a* in FIG. 4. The corners of the case are of conical configuration also tapering inwardly from top to bottom sufficiently to compensate for the taper of the sides. The walls are relatively thin, but their corrugated construction in combination with the flanges 12 and ribs 20 makes them, as later described, sufficiently rigid to enable a plurality of loaded cases to be stacked one on top of another and at the same time minimizes the overall weight of the case. These corrugations are arranged to provide relatively small surface areas within the case which are engageable by containers or other articles carried in the case. The liquid containers come into contact with only the inner crown portions of the corrugations, and since these portions are smoothly curved, the possibility of scuffing the containers is substantially eliminated. It will be readily appreciated that the scuff-free characteristic of the wall construction of this case has substantial advantages in various forms of case structure where such characteristic is desired. Furthermore, the plastic material of which this case is fabricated, is inherently smooth and the containers will slide easily on the surface of the plastic with little friction and without being scuffed or damaged. The plastic will retain these beneficial qualities throughout the life of the case, and unlike many

of the cases now available, will remain smooth despite washing, sterilizing, and other hard usage. For example, wooden cases tend to become discolored and roughened by such treatment. The plastic material is impervious to moisture enabling effective and complete cleansing of the case, and unlike absorbent wooden cases, will not become stained or retain offensive odors often produced by spoiled milk or other produce.

The bottom of the case is ridged by downwardly extending channels 18 which open into the case. The channels are provided with a plurality of drain holes 19. The channels reinforce the bottom of the case and insure drainage of liquid from the case even when it is loaded. Since the holes 19 are spaced from the bottom of the case (FIG. 5) they are not blocked or closed off by the bottom of the containers. The channels 18 include rectangularly disposed portions parallel to the side edges of the bottom 8, corner portions which are disposed inwardly of the corners of the case and portions which extend diagonally across the bottom of the case. The corner portions are adapted to be received within the corners of an underlying case for stacking purposes, such as shown in FIG. 3 in which the case 6 is stacked in bottom-to-top relation on another case 6'. The corner portions of the channels 18 provide means for rapidly guiding the case into stacked position on an underlying case and for interlocking the stacked cases to prevent relative shifting thereof.

The rectangularly disposed portions of the channels 18 provide a stable support for the case as well as increasing the rigidity of its bottom 8. These channel portions enable the case to be carried on conveyors without tipping or tilting. The diagonal portions of channels 18 add to the strength of the case bottom 8 and insure proper drainage of liquid from the case. In the illustrated embodiment of this invention, the corner portions of the channels are of right-angle configuration adapted to be received within the corners of the presently available square-cornered milk cases. This construction enables the case disclosed herein to be stacked with the currently available milk cases. However, the corner portions of the channels 18 may be made of conical or cylindrical configuration to fit more snugly within the corner portions of the underlying case. This construction would increase the stability of a relatively high stack of cases.

Means for supporting the cases in stacked relation include vertically extending ribs 20 located on each side wall of the case. The ribs 20 extend from the undersurface of the upper flange 12 to the undersurface of the bottom 8. The ribs extend a sufficient distance outwardly of the walls 10 so that their lower ends engage the upper surface of the flange 12 of the underlying case 6' (FIG. 3) supporting the case 6 in stacked relation on top of the case 6'. In addition to providing a means for stacking the cases, the ribs 20 provide supports for the flange 12 and increased rigidity for the side walls 10. In stacked relation the lower ends of the ribs 20 of the case 6 rest on portions of the flange 12 of the case 6' which are supported by ribs 20. The ribs 20 also taper inwardly from the top to the bottom of the case enabling the case to be removed from its mold. The ribs 20 are located on the outer surface of the walls 10 and in the concave portion of the corrugations. The ribs 20 are preferably recessed inwardly of the outer crown portions of the walls 10 and thus protected from being struck and damaged. With this construction the ribs 20 do not add to the overall size of the case or its mold even though they extend outwardly of the walls 10 sufficiently for stacking. Location of the ribs 20 in the concave portions of the walls 10 provide a molded structure of great strength with a minimum of material.

The flange 12 is approximately the same thickness as the side walls 10 and includes an outwardly extending portion 22 and a downwardly extending rim portion 24.

This construction provides a flange of sufficient strength to enable a plurality of loaded milk cases to be stacked one on top of another. The flange 12 includes a plurality of drain holes 25 similar to the holes 19 in the channels 18.

The wall construction described provides higher strength and rigidity for a given volume of plastic than prior construction. The combination in a wall structure of the flange 12 with the ribs 20 and the corrugate formation provides the needed strength and rigidity with a wall thickness much less than would be required if reliance were placed on wall corrugations alone.

The hand openings 14 are defined by flanges 26 which extends outwardly from the edge portions of the openings. Vertical webs 28 extend from the upper flange to the underside of the flange 12 strengthening the side wall and enabling a loaded case to be lifted without destructive stress on the case.

This integral plastic case may be quickly and inexpensively manufactured by injection molding and possesses many advantages over wood or metal cases. The case is relatively light weight per unit of capacity, thereby permitting an increased number of cases to be carried in a truck of given weight capacity thus reducing the transportation cost of products loaded in these cases. The case is preferably molded with planar surfaces, such as indicated at 30, which provide areas for copy such as trademarks and other indicia. Two of the ribs 20 which are located on the sides of the case having planar surfaces extend downwardly from the outer lower end portions of these surfaces.

Having thus described this invention what is claimed is:

1. A carrying case comprising an integrally molded structure of synthetic plastic material including a bottom, corrugated side walls, a flange extending around the top of said case, openings in opposite side walls and spaced from the top flange, a flange around each of said openings extending outwardly of said side walls, and webs extending between said top flange and the flange around said openings forming means for handling and lifting said case.

2. A carrying case comprising an integrally molded structure of synthetic plastic material including a bottom having downwardly extending channels opening upwardly into said case and including drain openings there-through, side walls of corrugated construction tapering inwardly from top to bottom of said case, a flange extending outwardly from the upper ends of said side walls and including a downwardly extending rim portion, ribs disposed in the inner portions of said side walls extending from the undersurface of said flange to the bottom of said case and outwardly of said side walls a sufficient distance to engage the flange of an underlying case for stacking said cases, said channels including portions disposed parallel to said side walls for supporting said case and corner portions disposed inwardly of the corners of said case for interlocking said cases in stacked relation.

3. A carrying case comprising an integrally molded structure of synthetic plastic material including a bottom having downwardly extending channels opening upwardly into said case and including drain openings there-through, side walls of cylindrically corrugated construction tapering inwardly from top to bottom, a flange extending outwardly from the upper ends of said side walls and including a downwardly extending rim portion, ribs disposed in the concavely curved portions of said side walls extending from the undersurface of said flange to the bottom of said case and outwardly of said side walls a sufficient distance to engage the flange of an underlying case for stacking said cases, said channels including portions rectangularly disposed and generally parallel to said side walls for supporting said case on an underlying surface and corner portions disposed inwardly of the corners of said case and of a configuration receivable

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by the corners of an underlying case for interlocking said cases in stacked relation.

4. A carrying case comprising an integrally molded structure of synthetic plastic material including a bottom having downwardly extending channels opening upwardly into said case and including drain openings there-through, side walls of cylindrically corrugated construction tapering inwardly from top to bottom, a flange extending outwardly from the upper ends of said side walls and including a downwardly extending rim portion, ribs disposed in the concavely curved portions of said side walls and recessed inwardly of the outer portions of said side walls, said ribs extending from the undersurface of said flange to the bottom of said case, and outwardly of said side walls a sufficient distance to engage the flange of an underlying case for stacking said cases, said chan-

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nels including portions disposed parallel to said side walls for supporting said case, and corner portions disposed inwardly of the corners of said case and of right-angle configuration receivable by the corners of an underlying case for interlocking said cases in stacked relation, hand openings through opposite portions of said side walls spaced below the top flange, a flange surrounding said opening, and webs extending between said top flange and the flange around said openings.

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