United States Patent

[11] 3,587,910

[72] Inventor **Donal Edward McCarthy**
9104 Chickawane Court, Alexandria, Va. 22309

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[45] Patented **June 28, 1971**

[54] **DISPOSABLE INTEGRAL BOTTLE AND STACKING CASES**
4 Claims, 18 Drawing Figs.

[52] **U.S. Cl.** **220/23.4,** 206/56, 215/10, 220/23.6, 220/23.8, 220/97
[51] **Int. Cl.** **B65d 21/02,** B65d 11/04
[50] **Field of Search** ..... 220/23.4, 23.6, 23.8, 9 (F), 97; 215/10; 206/56 (A), (UTD)

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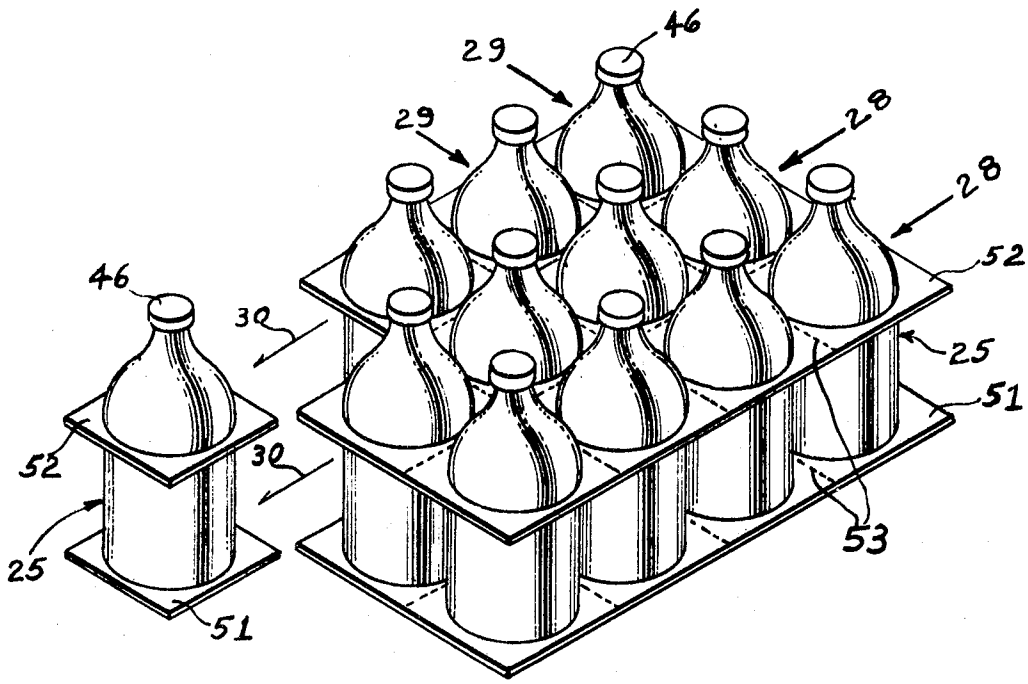
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Primary Examiner—George E. Lowrance
Attorney—McCarthy, Depaoli, O'Brien & Price

ABSTRACT: A multiplicity of disposable plastic containers are structurally interconnected in a unitary, severable assemblage to form a package from which the containers can be selectively removed by a simple manual tearing action.



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Fig 1.

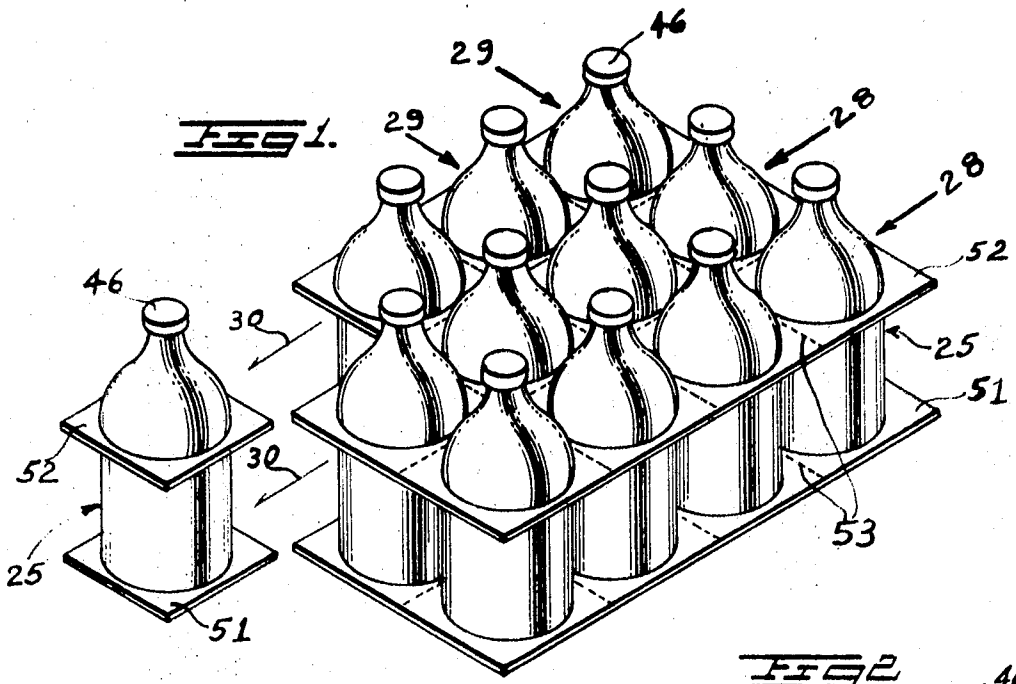


Fig 2

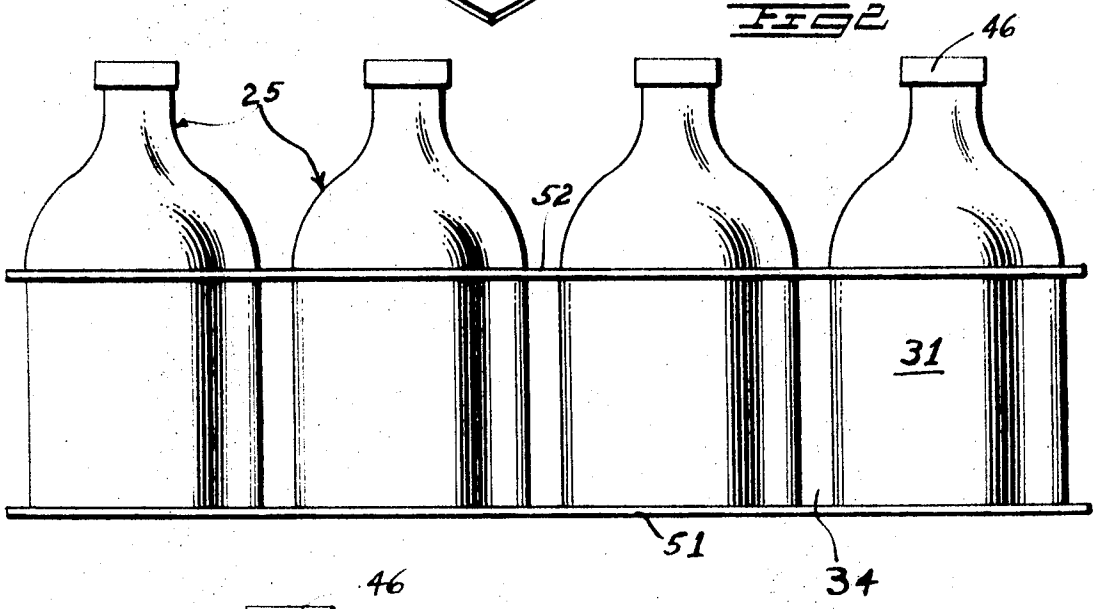
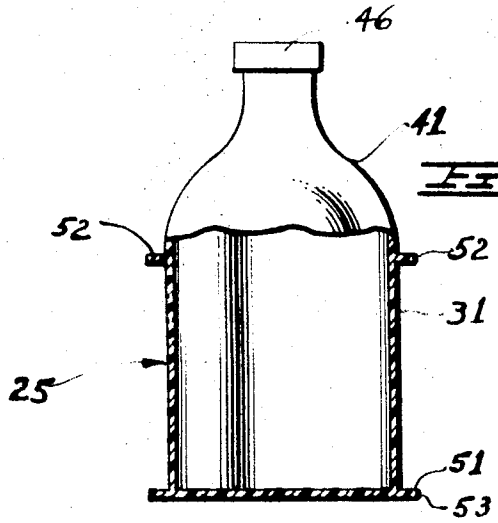


Fig 3.



INVENTOR

DONAL EDWARD McCARTHY

BY McCarthy, Pagnotti & O'Brien

ATTORNEY

Fig 5



Fig 6

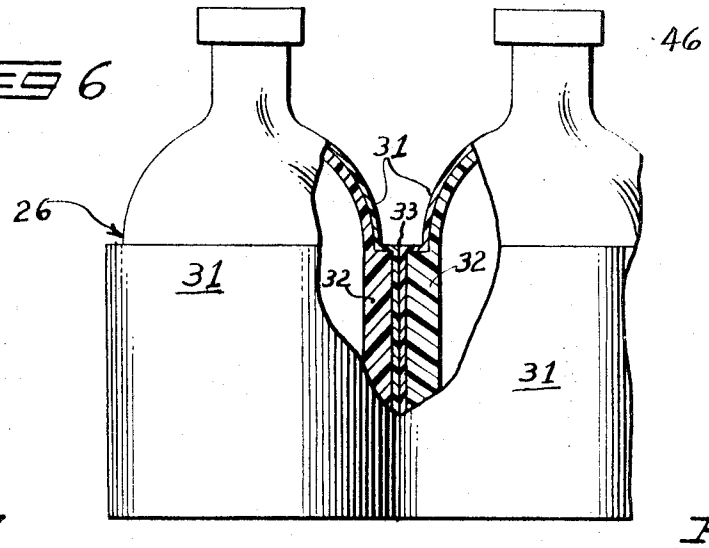


Fig 7

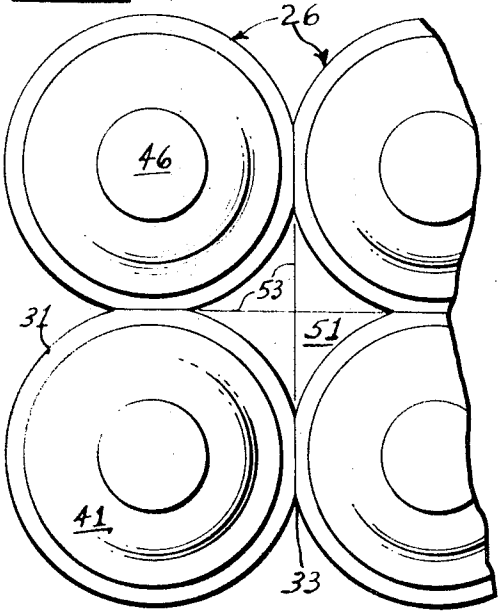
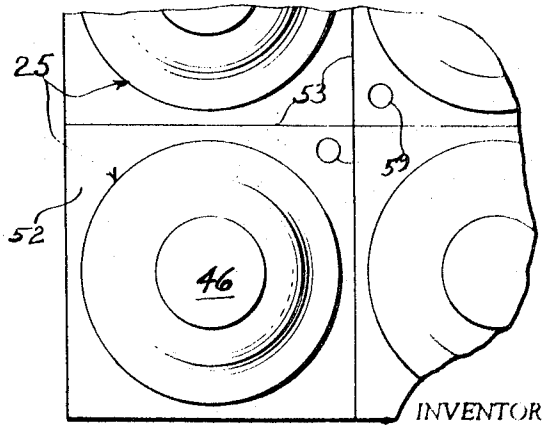


Fig 4



INVENTOR

DONAL EDWARD McCARTHY

BY McCarthy, Hagaski & O'Brien

ATTORNEY

FIG 8

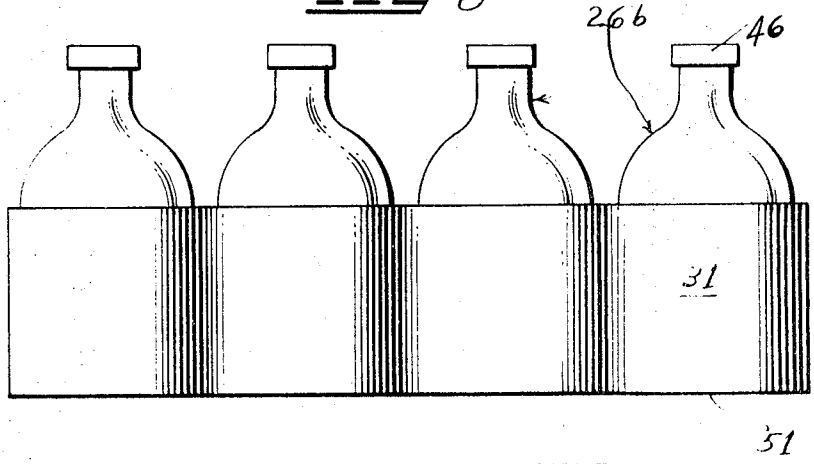


FIG 9

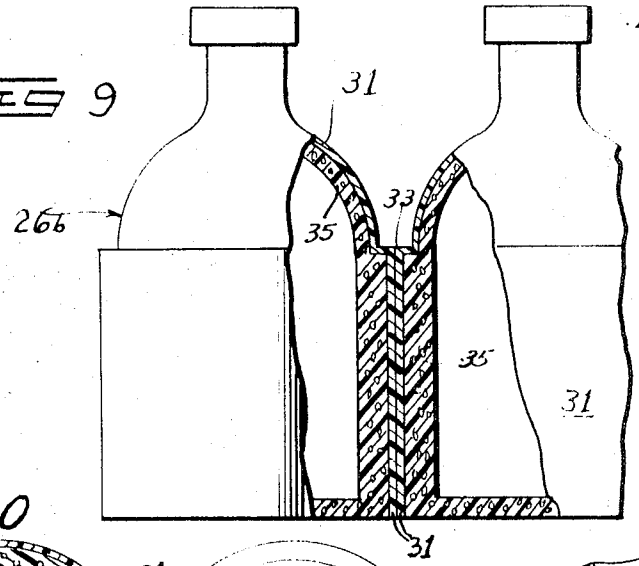


FIG 10

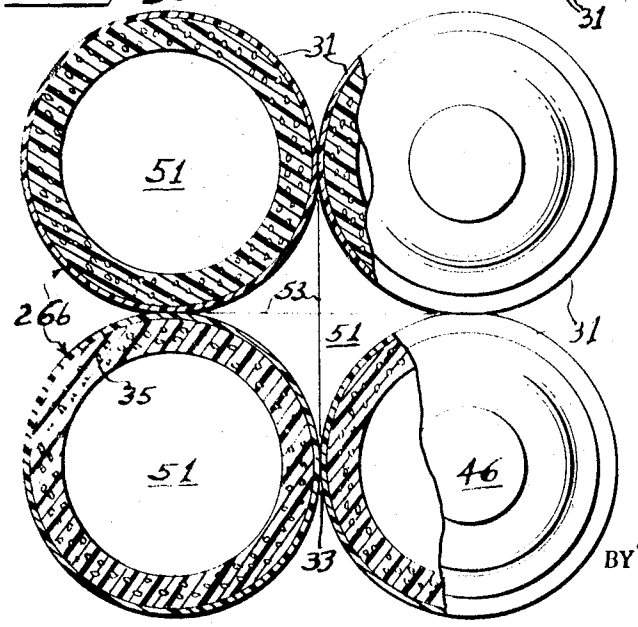
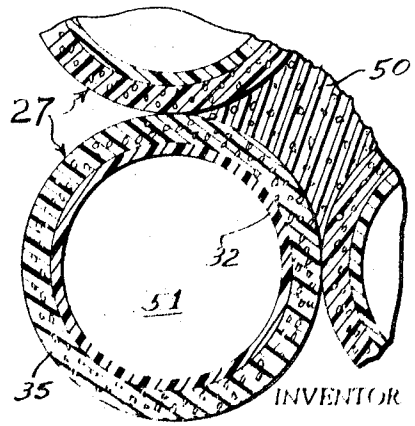


FIG 11



INVENTOR

DONAL EDWARD McCARTHY

BY McCarthy, Reynolds & Williams

ATTORNEY

FIG 12

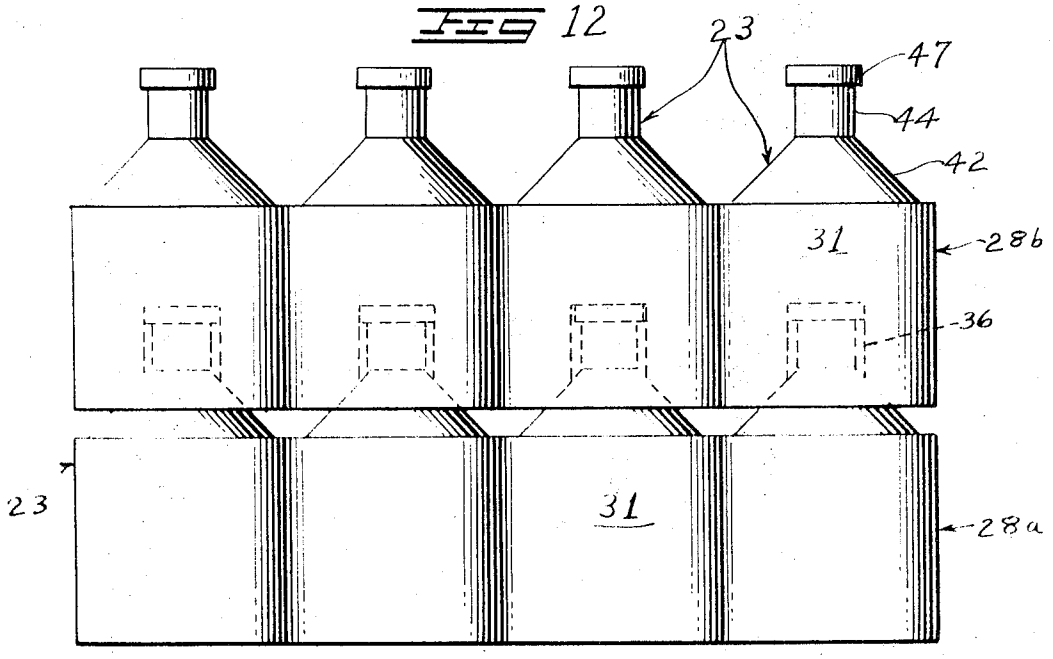


FIG 13

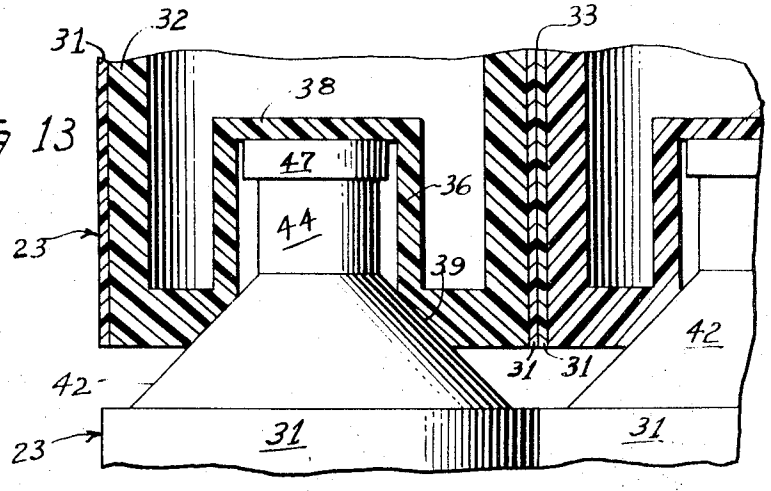
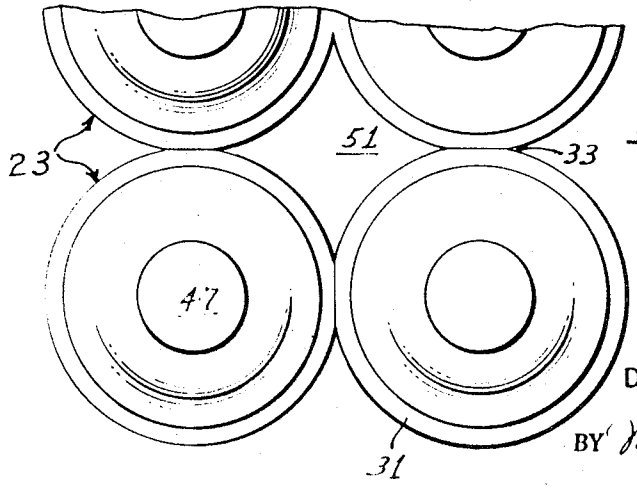


FIG 14



INVENTOR

DONAL EDWARD McCARTHY

BY McCarthy, Hoppe & Kane

ATTORNEY

FIG 15

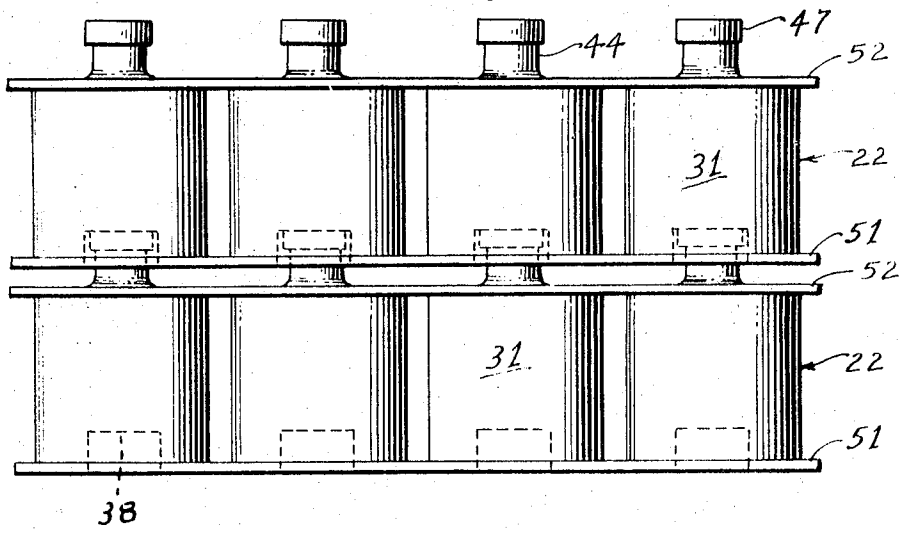


FIG 16

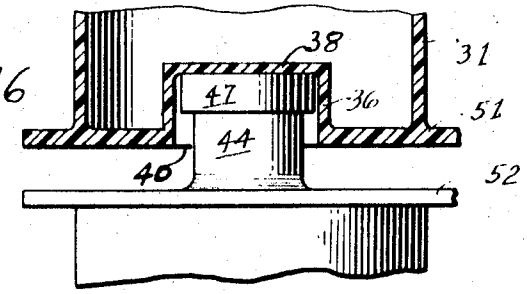
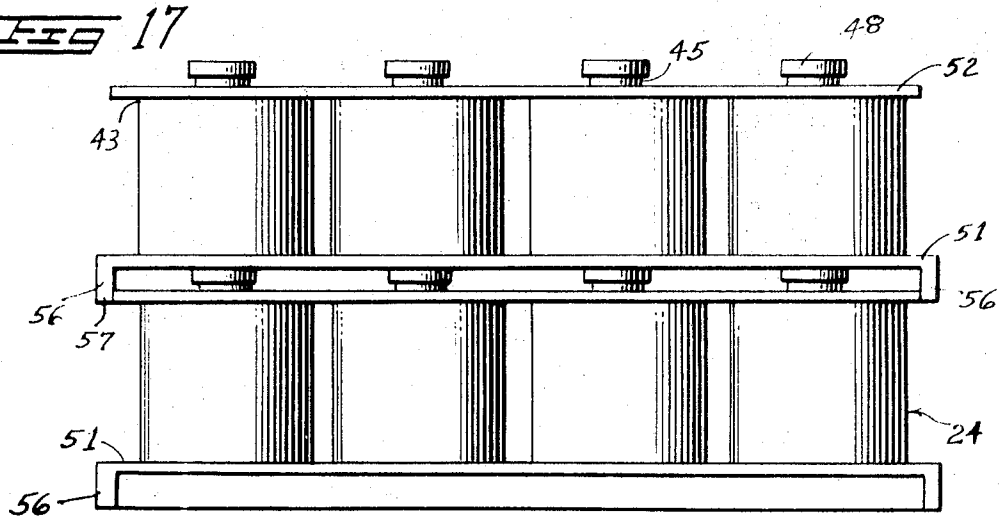


FIG 17



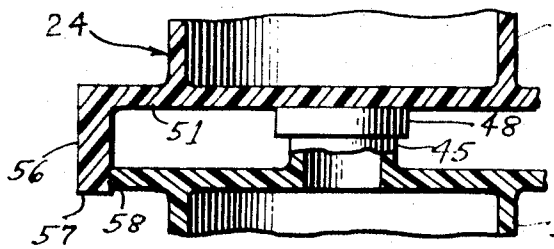


FIG 18

INVENTOR

DONAL EDWARD McCARTHY

BY McCarthy, Hepperle, & O'Brien

ATTORNEY

DISPOSABLE INTEGRAL BOTTLE AND STACKING CASES

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to new and novel improvements in containers and particularly relates to disposable containers of the can or bottle variety. It especially relates to rigidly conjoined containers which form a mutually supporting and structurally interrelated unitary assemblage. This invention additionally relates to rigid packages of container-wall construction which are stackable and transportable with an added strap or handle means and which may be selectively ruptured into a plurality of components, each component comprising at least and usually only one of the containers.

2. Description of the Prior Art

The broad concept of a disposable container and packing case, which are formed simultaneously and integrally from thermoplastic, is known in the art, such being disclosed in U.S. Pat. No. 3,295,710, which shows a multiple container package having a plurality of individual containers, joined by integral connecters and arranged in a circular package configuration. The connecters are thin plastic strips which are easily severed by twisting one container relative to adjacent containers. The package inherently loses its rigidity and structural identity when a single container is detached.

This concept provides a suitable "six-pack" type of container for a supermarket customer who may not require further transportability and rigidity after detaching the first container. It is of no use for shipment to the supermarket unless packed in larger cases, however. It has no flexibility as to lateral dimensions; it is not vertically stackable; it lacks an insulation means; and it is not adapted to be selectively separated into subcombinations of varying numbers of individual containers to meet the multifarious activities involved in warehousing, truck shipment, jobber handling, retail distribution, restaurant purchase, and individual home-use purchase involving transportation and storage of various quantities for occasional use, parties, and picnics, for example.

SUMMARY OF THE INVENTION

The instant invention is intended to meet these needs by providing a package assemblage which comprises a plurality of containers which are arranged in a side-by-side row pattern, the bottoms of all containers being in coplanar arrangement and the containers being rigidly conjoined, whereby the containers are structurally interrelated into a unitary assemblage which can be handled like any other package, the walls of the outer containers being the sidewalls of the package and the bottoms of the containers being the bottom of the package.

The object of this invention is to provide an integrally molded package consisting of rigidly conjoined containers.

Another object of this invention is to provide means for selectively rupturing the bonds between the containers in the areas of conjuncture.

An additional object is to provide self-aligning stacking means for a plurality of integrally molded packages.

A further object is to provide an integrally molded package consisting of rigidly conjoined containers having tops and bottoms formed by coplanar top and bottom panels which are mutually parallel.

A still further object of this invention is to provide a package consisting of rigidly conjoined containers which are formed of differing thermoplastic materials.

In general, the package assemblage of this invention comprises a plurality of individual containers of identical geometrical form and shape, each container having a bottom, sidewalls, and a top and constituting an individual, self-sufficient, product-containing entity, the containers being conjoined in side-by-side fashion into a unitary package case having a geometrical shape constituted by the sum total of the shapes of the assembled and conjoined containers, the package case having a bottom, top, and sides, the bottom being continuous and being defined by the coplanar-arranged bottom walls of the conjoined containers, the top being defined by the coplanar-arranged tops of the containers, and the sides being constituted by the outermost containers in the assemblage, and means for conjoining these containers so that the sidewalls thereof are in connected and reinforcing relationship, this conjoining means being rupturable by manual power whereby a selected outermost container can be removed from the package case without impairing the rigidity of the package case and without damage to a sidewall of a selected container.

The various embodiments vary as to conjoining means, severing means, stacking means, and container construction. Some embodiments comprise means for selective rupture of the bonds between adjacent containers. Other embodiments comprise the use of two thermoplastic materials for container construction.

In one embodiment of the invention, each can-type container has a flat bottom wall, sidewall, and flat top, the flat top and flat bottom being mutually parallel and formed of flat panels which are coextensive with the side boundaries of the package. Another embodiment differs therefrom by having an inwardly tapered shoulder terminating in a neck portion instead of a flat top. In both embodiments, a plurality of the containers are formed in a rectangular spaced grouping with the containers being arranged in a side-by-side row pattern, the bottom walls being coplanar and formed as a part of a flat bottom panel which has a planar shape corresponding to the overall geometrical shape of the package, i.e., containers and packing case. A specific embodiment comprises a top panel which is formed parallel to and spaced from the bottom panel and aligned normal to the sidewalls of the containers. In the embodiment comprising can-type containers, the top panel defines the tops of the cans in the same way that the bottom panel defines the bottoms of the cans and of the bottle-type containers. The cans or bottles may be adjacent or spaced apart by a relatively small distance, such as one-fourth of an inch. The panels are formed with scored breakaway lines, such lines extending in crossed relation longitudinally and transversely of the panels and between adjacent containers, whereby adjacent containers can be removed individually or in groups or subpackages by means of a manual movement.

In a further embodiment, the adjacent containers are placed in touching relationship and conjoined along the line of contact. This embodiment requires no top panel for adequate rigidity.

In an additional embodiment, one thermoplastic composition forms the inner wall of each container while another thermoplastic composition forms an encompassing skin on each container, the containers being integrally conjoined by the interadherence of the skin. The skin formations are capable of being severed by means of breakaway lines or other severing means therein along the lines of contact between adjacent containers, such lines extending parallel to the longitudinal axes of the containers. In a variation of this embodiment, one of the thermoplastic compositions is capable of forming each container with a multicellular inner or outer wall structure. In another variation thereof, the multicellular wall structure is on the outside of the container and fills the hypocycloidal voids therebetween.

In each of these embodiments, means are provided for selective rupturing of the conjoined containers. The embodiments in which the containers are spaced a small distance apart provide scored breakaway lines in crossed relation longitudinally and transversely between adjoining containers in the top and bottom panels. The embodiments in which the containers are conjoined along the lines of contact of their adjacent sides provide severing means which are susceptible to twisting motions of the containers relative to each other. The embodiments in which a multicellular composition fills the hypocycloidal void need not have special severing means, but a severing means may be added for aesthetic reasons, compris-

ing sheets of perforated paper or high-bulk paper, such as newsprint, extending transversely and longitudinally in crossed-relationship between adjacent walls of the containers.

In an additional embodiment, a plurality of the packages of this invention are stackable. For this purpose, the bottom panels have a peripheral overhanging skirt for packages made of short-necked cans. For packages made of bottles, the bottom walls of the containers in each package are formed with axially disposed recesses or cavities in which the tops or neck portions of the underlying containers in a lower package are nestingly receivable.

It is a basic concept of this invention that the containers and conjoining means which form the novel package are simultaneously formed by injection molding of one or more thermoplastic materials. However, the invention comprises the use of molds or jigs which become part of the finished package. For example, if perforated paper or high-bulk paper is used as the severing means in the areas of conjunctures, this paper is held in position as the thermoplastic material is injected and is left there when the molding is complete. As another example, a multicellular composition, such as foamed styrene or rigid polyurethene foam, may be molded as female molds in the voids and between the containers, with or without paper severing means, and the thermoplastic composition forming the wall of each container may then be molded within each hollow space formed by the multicellular molds, whereby the finished product is an integral unit of both compositions and of a severing means, if used.

This invention comprises the concept, known in the art, of simultaneous molding of all parts of the invention as a single, coherent, indivisible piece, except that where two or more plastics are to be used, the molding operation may be in two or more sequential stages. A preferred embodiment comprises the use of a multicellular plastic, which may be rigid or semirigid or, in some instances, even flexible, as the first stage for forming a female mold in all void spaces between the containers, whatever their shape may be, and subsequently molding the second plastic, which is usually a thermoplastic, as adjacent structural material to complete the package assemblage.

Foamable polymeric materials are generally suitable for use as this multicellular plastic, such as the polymers and copolymers of olefinically unsaturated compounds and their derivatives, comprising polyethylene, polypropylene, polystyrene, vinyl resins, nylons, polycarbonates, polyhydroxyethers, phenolics, polyurethanes, and epoxies.

Foamed polystyrene and foamed polyurethane are preferred plastic materials for the multicellular inner or outer wall structure. Any conventional method of laminating two plastic materials, using polyethylene, polypropylene, polyvinyl chloride, and others known to the art, may be employed to obtain the structural dual walls of the package assemblage of this invention.

A preferred molding method is coextrusion, using such coextruded dual walls as ionomer/low-intensity polyethylene, polypropylene/polyethylene, polyethylene/ethylene-vinyl acetate copolymer, and ionomer/nylon. This coextruded dual wall may also be formed within a female mold formed of multicellular plastic material. The multicellular plastic preferably possesses a lower tensile strength than either of the plastics in the dual wall, as an inherent severing means.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention may be more clearly understood and is fully described in the accompanying drawings showing some of the preferred embodiments.

FIG. **1** is an isometric view of a rectangular bottle-type container package of this invention in which the bottles are slightly spaced apart.

FIG. **2** is an elevation of a row of four bottles.

FIG. **3** is an elevation of a single bottle, partially cut away to show wall and panel construction.

FIG. **4** is a partial top view of a group of four bottles as shown in FIG. **1**.

FIG. **5** is an elevation similar to FIG. **2** in which the bottles are conjoined along the lines of contact of their sides.

FIG. **6** is an elevation of the bottles shown in FIG. **5**, partially cutaway, to show the double construction with two thermoplastic materials and the line of conjoined contact.

FIG. **7** is a partial top view of a group of four conjoined bottles which show the flattened line of conjoined contact.

FIG. **8** is an elevation of a row of four bottles, similar to FIG. **5**.

FIG. **9** is an elevation of two of the bottles shown in FIG. **8**, partially cut away, to show the area of line-of-contact juncture and the use of two thermoplastic materials for wall construction, the inner material being a multicellular plastic.

FIG. **10** is a top view of four of the bottles shown in FIGS. **8** and **9**, partially cut away, to show two-layer wall construction and the scored bottom panel which is visible in the hypocycloidal void therebetween.

FIG. **11** is a partially sectioned top view of a group of three bottles to show the lines of conjoined contact and the use of two thermoplastic materials of which the outer is multicellular.

FIG. **12** is an elevation of a two-layer, can-type package comprising four cans in each row, the necks of the bottom cans being nestingly received in recesses in the upper cans.

FIG. **13** is a partially sectioned detailed view of the nesting means for two of the long-neck shoulder-type cans shown in FIG. **12**.

FIG. **14** is a partial top view of a group of the long-neck, shoulder-type cans shown in FIGS. **12** and **13**.

FIG. **15** is an elevation of a two-layer package comprising rows of four short-neck, flat-top cans which are nestingly stacked.

FIG. **16** is a partially sectioned, detailed elevation of two of the cans shown in FIG. **15**.

FIG. **17** is a two-layer elevation of two stacked rows of flat-topped cans having very short necks so that nesting means are not necessary and a side skirt on the bottom panel is the alignment means for the package.

FIG. **18** is a sectioned, detailed view of two of the cans shown in FIG. **17**.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring specifically to the drawings, the package concept of this invention is shown clearly in FIG. **1**. A bottle-type container **25** has a flat panel **51** which is a single sheet and is the continuous coplanar bottom for all other containers in the package. Bottom panel **51** is molded integrally with sidewalls **31** and top panel **52** as shown clearly in FIG. **3**. This bottle-type container also has shoulders **41** and a screw-type cap **46**.

Bottles **25** are aligned in longitudinal rows **28** and transverse rows **29**. Severing means, such as the score lines **53** in the top and bottom panels **51** and **52**, can be used for selective separation of the bottle-type containers. The isolated container **25** at the left side of FIG. **1** has been removed from the package by movement in direction **30**. The bottles are spaced apart in a typical row **28** by distance **34**, as shown in FIG. **2**. Finger holes in top panel **52**, as shown in FIG. **4**, are a convenient means for carrying a subcombination package such as four to six bottles.

The integrally molded bottles shown in FIGS. **1**—**4** create a package which is essentially rigid though capable of slight movement because of distance **34** between the bottles. FIGS. **5**—**11** show conjoined bottles which form a completely rigid package because no open areas **34** remain between adjacent bottles. The contacts **33** between cylindrical containers are areas of conjuncture, as shown in FIG. **7**, or lines of conjuncture, as shown in FIG. **10**.

In FIGS. **5**—**7**, the bottle-type containers **26***a* have a double-wall construction. The outer wall **31** is backed up by the inner wall **32** which may be of any suitable plastic material,

usually a thermoplastic, and preferably one possessing desirable barrier properties, rigidity properties, flavor inertness properties, or clarity. In FIG. 7, the bottom panel **51**, with its score lines **53**, is clearly visible in the hypocycloidal void area thereamong.

In FIGS. **8—11**, a similar row of bottle-type containers **26***b* of double-wall construction is shown in elevation and in section in which a multicellular plastic material is the inner layer. In the hypocycloidal void **50**, shown in FIG. **10**, the bottom panel **51** is visible with the score lines **53** thereon. FIG. **11** shows a cross section of similar bottles **27** having a multicellular plastic as the outer layer **35** which completely fills void **50** therewith so that its top surface is essentially a top panel **52**.

The can-type containers shown in FIGS. **12—18** are usable in several distinctive embodiments of this invention. The shoulder-type cans **23** with the long necks **44**, which are shown in FIGS. **12—14**, are eminently suitable for secure nesting by means of recesses having the beveled edges **39** which match the load-bearing shoulders **42** of the cans **23** therebeneath in parallel relationship. As clearly shown in FIG. **13**, recesses having the bottoms **38**, the sides **36** and the bevels **39** form a rigid alignment means for keeping a plurality of stacked rows **28***a*, **28***b* in alignment. These shoulder-type cans **23** are conjoined along the lines of contact **33** and have the hypocycloidal voids **50** therebetween, if the cans **23** are cylindrical, which are covered by the bottom panel **51** for ease in molding and added rigidity. As shown in FIG. **13**, the recess bottom **38** and the bevel **39** are the load-bearing areas for the upper row **28***b* of the cans **23** and the top of the cap **47**, and the shoulder **42** are the load-bearing areas for the lower row **28***a* of the cans **23**.

The flat-topped, medium-necked cans **22**, which are shown in FIGS. **15** and **16**, also are desirably nested in recesses having the bottoms **38** and the walls **36** which receive the can tops **47** in load-bearing and alignment relationship. The flexible tabs **40** project laterally and inwardly from the inner sides of the walls **36** to define an opening of larger diameter than the neck **44** and of smaller diameter than the top **47**, so that the tops **47** can be snapped past the tabs **40** into nesting contact with the bottoms **38** of the recesses; yet the tabs **40** resist incidental shaking movements which might disengage the stacked rows of the cans **22**, so that a plurality of stacked package cases are held in secure relationship.

The hypocycloidal voids **50** substantially vanish into corner voids if square or hexagonal containers are used in this invention. Cans of square, rectangular, trapezoidal, hexagonal, or like shape, whereby packing without wastage of space in void areas is possible, are preferred for this invention.

FIGS. **17** and **18** show the flat-topped, short-necked cans **24** which are desirably stacked by resting the bottom panels **51** squarely onto the tops **48**. To prevent sidewise motion and toppling of the stacked cans **24**, the bottom panels **51** are equipped with the skirts **56** at the edges thereof which project downwardly a distance greater than the combined length of the top **48** and the neck **45** and past the projecting edge **58** of the top panel **52**. When the skirt **56** is on the bottom panel of a stacked package, the bottom edge **57** serves to contact the ground or a loading platform, for example, and support the weight of the package of the cans **24**. The top panel **52** may project no farther than the outer edges of the outside containers **22, 23, 24, 25, 26, 27**. If so, the skirt **56** is aligningly juxtaposed to the outer edges **43** of the cans, as indicated in FIG. **17**.

The packages of this invention, whether made up of flat-topped cans, shoulder-type cans, or bottles, are capable of withstanding handling and shipment in reasonably large sizes, as, for example, handling with fork-lift trucks. When split apart along selected score lines to obtain subcombination packages such as 12-packs, a simple strap means may be used for manual transportation or finger-holds **59** may be employed for carrying with one or two hands. For use in special commercial circumstances, such as in vending machines, cafeteria lines, and grocery stores, for example, the containers of this invention can be severed row-by-row along score lines **53** or by use of such other severing means as are provided to obtain a typical row **28** which may be of any convenient length for processing in a chilling and vending machine or in some other means of offering the containers of this invention to the public. For this purpose, the type of container having a dual wall with the outer wall being multicellular and capable of simple splitting along the line of conjoined contact, such as is shown in FIG. **11**, is preferred. Such a construction, of course, may be similar to the bottle-type containers **26** or **27** or the can-type containers **22, 23, 24**, of any suitable cross-sectional shape.

The novel concepts and structures of this invention may be varied in many ways, but the boundaries of the invention are defined in the accompanying claims and should be solely construed therewith.

I claim:

1. An integral stacking and transporting container package assemblage molded from plastic and comprising a plurality of individual containers of identical geometrical form and shape, each container having a bottom, sidewalls, and top and constituting an individual, self-sufficient, product-containing entity, said containers being disposed in parallel spaced apart, side-by-side fashion into an integral package case having a geometrical shape constituted by the sum total of the shapes of the assembled and spacedly conjoined containers, said package assemblage having a bottom, top, and sides, said bottom being a flat sheet that constitutes the bottom wall for each of the conjoined containers and having peripheral edges extending laterally beyond and outermost containers, said outermost containers defining the sides of said package assemblage, said top being in the form of a flat sheet disposed parallel with and spaced upwardly from the bottom sheet and of a geometrical shape and size identical thereto and being disposed below the tops of the containers and integral therewith in a manner to encompass the containers below their tops, said top and bottom sheet constituting a means for conjoining said containers so that the containers are in rigid, connected and reinforcing relationship, and said top and bottom sheets having score lines provided in vertical alignment thereon and constituting means rupturable by manual power whereby a selected outermost container or group thereof can be removed from the package case without impairing the rigidity of the package case and without damage to a sidewall of the selected container.

2. The package assemblage of claim **1** wherein said containers are disposed in a rectangular pattern and the top and bottom sheets are rectangular and have opposing longitudinal side edges and transverse end edges, said score lines being arranged longitudinally and transversely of the sheets in the intersecting fashion along the sides of the containers.

3. The package assemblage of claim **1** wherein said bottom sheet has an integral depending skirt formed on its edges, said skirt depending downwardly for a greater distance than the height of the tops above the top sheet and having an inner surface for engaging the edges of the top sheet of an underneath package assemblage.

4. The package assemblage of claim **1** wherein said top sheet is provided with hand holds.