COLLAPSIBLE SOLUTION TRAY

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References Cited
UNITED STATES PATENTS
930,953 8/1909 Freund 229/31 FS
2,823,847 2/1958 Barnes et al. 229/31 R
3,091,381 5/1963 Conescu 229/31 FS
3,386,644 6/1968 Zackheim 229/41 B

ABSTRACT

A collapsible box-like liquid retaining tray. The retaining tray is constructed for example from a cardboard blank which has a rectangular outline having pull panels or handles at the ends for easy stacking. The blank when manufactured into a collapsible tray in the collapsed position is again in the rectangular form for easy stacking and has the exposed pull panels or handles ready for easy grasping whereby the tray can be expanded or erected into a set-up position. The pull panels have notches and tabs which hold the sides of the tray in the expanded position against collapsing. The tray can be used in various institutional environments where a sterile tray is desired for handling various solutions and the like.

4 Claims, 5 Drawing Figures
COLLAPSIBLE SOLUTION TRAY

BACKGROUND OF THE INVENTION

In the past various types of collapsible and expandable containers have been employed. Such containers as typified by the Zuckheim U.S. Pat. No. 3,386,644 have been constructed of fairly complicated blanks which are uneconomical in configuration and in which the setup requires some degree of expertise.

By means of this invention there has been provided a leak proof box-like solution tray which can be easily manufactured from a substantially rectangular blank. The rectangular blank lends itself to easy and simple manufacture and facilitates stacking. The tray is adapted for use in various institutional environments such as hospitals, pharmacies, chemical testing laboratories and the like, where sterile inexpensive tray like containers are desired for various types of solutions.

In the use of this tray the blank is manufactured into a rectangular collapsible tray in which a number of trays can be conveniently stored in a box or the like. When desired to be employed a collapsed tray is simply pulled apart by grasping readily accessible pull panels. By means of a biasing panel connecting the end and side panels of the tray the sides and the ends are caused to be erected vertically to a box-like position. The pull panels are connected to the ends of the end panels and have tabs or flanges which engage the outside of the side panels and lock them in place and prevent them from moving outwardly. Because of the fold line connecting the side panels with the bottom panel the side panels are urged into locking engagement against the extension tabs and the tray presents a firmly erected box-like structure for use in a leak proof environment.

The above features are objects of this invention and further objects will appear in the detailed description which follows and will otherwise be apparent to those skilled in the art.

For the purpose of illustration of this invention there is shown in the accompanying drawings a preferred embodiment thereof. It is to be understood that these drawings are for the purpose of example only and that the invention is not limited thereto.

In the Drawings:

FIG. 1, is an enlarged pictorial view of the box like tray in the erected position.

FIG. 2, is a top plan view of the blank before it is cemented to form the collapsed tray.

FIG. 3, is a top plan view of the tray in the collapsed position.

FIG. 4, is a pictorial view showing the position of a partially erected tray after the pull panels have been pulled apart.

FIG. 5, is a pictorial view of the box turned 90° showing a further stage of erection intermediate the positions shown in FIG. 1, and FIG. 4.

DESCRIPTION OF THE INVENTION

The tray of this invention is generally identified by the reference numeral 10 in erected position in FIG. 1. It is constructed from a rectangular blank 12 shown in FIG. 2.

The blank 12 is constructed of a bottom panel 14 to which are connected at the sides, side panels 16 and 18 with the dotted lines therebetween indicating fold lines. End panels 20 and 22 are connected in a similar fashion to the ends of the bottom panels by fold lines.

Pull panels 24 and 26 are connected by fold lines to the ends of the end panels and are provided with a pair of opposed extension tabs 28 and 30. These tabs define an intermediate slot 32 within which the tops of the side panels are retained in bearing relation against the extension tabs 28 and 30 as will more fully appear herein below.

Biasing panels generally indicated by the reference numerals 34, 36, 38 and 40 and adapted to connect the side and end panels for automatic erection are formed at the four corners of the blank. These panels are each formed of a pair triangular panels, a first such triangular panel 42 being connected to the side panel 16 by a fold line and the second triangular panel 44 being connected to the end panel 20 by a fold line and separated from the adjacent triangular panel 42 by a common bias fold line 45. The panel 42 is provided with an adhesive whereby it may be cemented to the side panel 16 in the manufacture of the tray leaving panel 44 connected on the bias fold line 45 to the side panel. In the manufacture of the tray from the blank 12 shown in FIG. 1, the end panel 20 and bias panels 34 and 40 are simply folded over along the common fold lines at the end of the bottom panel 14 and the side panels 16 and 18 in such a manner that the bias panels 42 are cemented to the side panel 16 and 18. The pull panel or handle 26 is bent backwardly so as to lay on top of the end panel 20. The other end panel 22 and bias panels 36 and 38 and pull panel 24 are then formed in a similar fashion to present a collapsed tray in the position shown in FIG. 3. This tray can be stacked conveniently because of its flat rectangular nature. The tray is further ready for instant use with the pull panels exposed for ready grasping by the user.

Use

The collapsed tray of FIG. 3, is simply erected when desired for use. The erection is effected by simply grasping the pull panels or handles and pulling them apart. The bias panels connected between the end and side panels cause the side and end panels to assume the partially erected position as shown in FIG. 4. Further pulling apart of the pull panels causes the side panels to follow the end panels in the vertical set-up position shown in FIG. 5. For final assembly the operator simply presses the side panels together which may be facilitated by bending the pull panels downwardly in such a fashion that the tops or side panels are forced at the end into the notch 32 in the relationship shown in FIG. 1. The extension tabs then hold the upper ends of the side panels in locking engagement in the notch and the tray is ready for use.

The tray has on the exterior a simplified and neat appearance as continuous side and end panels are exposed. Thus no protruberances are present which might catch dirt or the like or accidently catch on an object to cause damage of any type. The tray when erected is completely leak proof and provides a simple and inexpensive means for containing various types of chemical or pharmaceutical solutions, specimens and the like in a sterile package in which the interior of the tray is not touched by the user.

Various changes and modifications may be made within this invention as will be readily apparent to those skilled in the art. Such changes and modifications are within the scope and teaching of this invention as defined by the claims appended hereto.
What is claimed is:

1. A collapsible box-like liquid retaining tray adapted to be erected from a foldable blank, said tray in the collapsed position comprising a bottom panel, a pair of end panels hingedly connected to and overlying opposite ends of said bottom panel; a pair of side panels hingedly connected to opposite sides of and lying in the same plane as said bottom panel, biasing panels connecting one side of the end panels to an intermediate bias line on the interior of the adjacent side panels at each corner of the tray, a pair of pull panels hingedly connected to the top of said end panels, said pull panels being operable upon being pulled away from one another to cause the end panels to assume an erected position and through the biasing panels connecting the end panels to the side panels cause the side panels to be pulled to the vertical position and locking means on said pull panels engageable with said side panels to lock said panels together.

2. The tray of claim 1, in which said locking means comprises extension tabs on the end panels bearable against the outside of the side panels and restraining said side panels from outward movement.

3. The tray of claim 1, in which the outside surface of the side and end panels present a smooth and uninterrupted exterior surface when the tray is erected.

4. The tray of claim 2, in which said extension tabs define a slot into which said side panels are interfitted.

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