Aug. 2, 1955 P. A. NEMOEDE 2,714,445

TRAY FOR CERTAIN TYPES OF FRAGILE AND OTHER ARTICLES

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Fig. 1

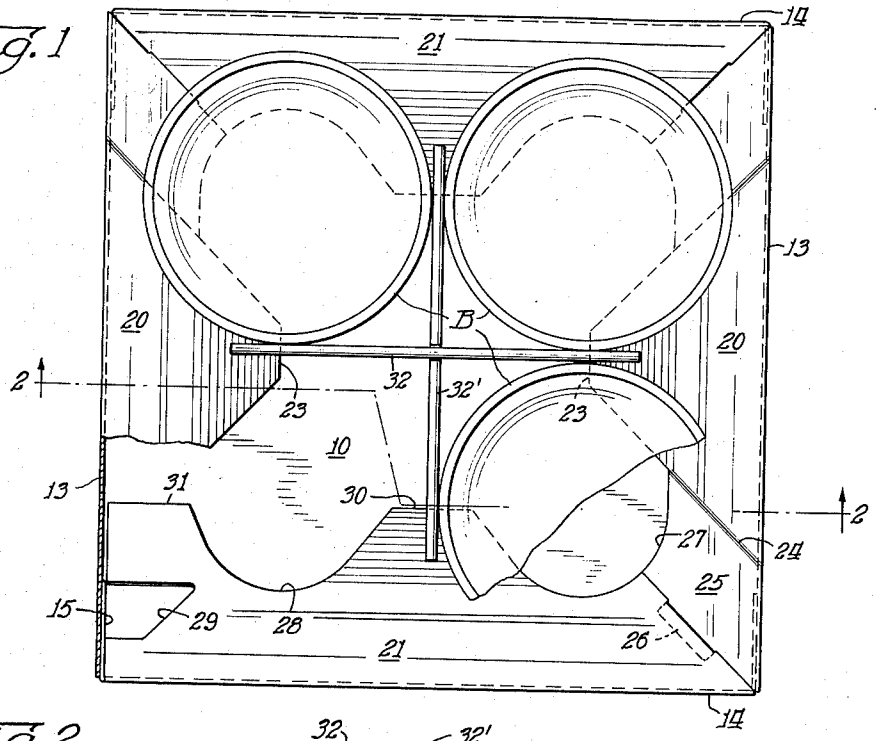


Fig. 2

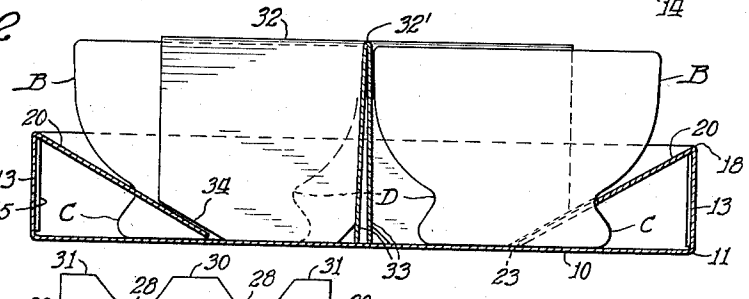


Fig. 3

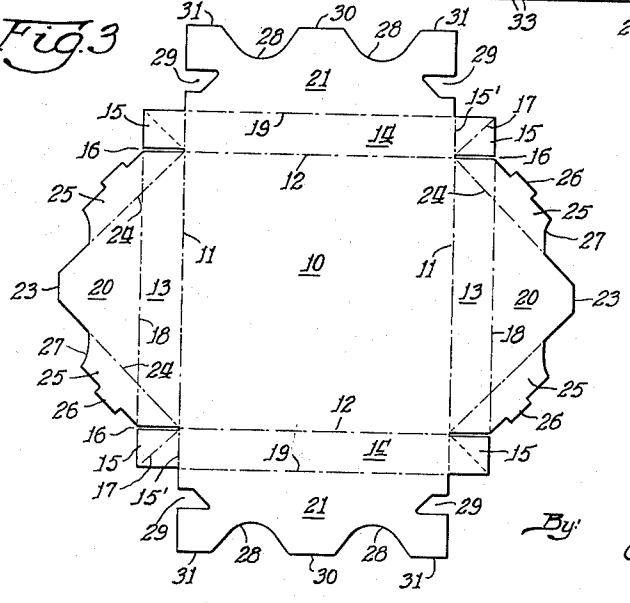
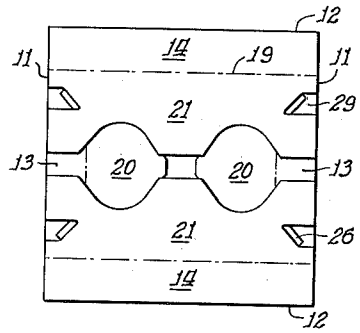


Fig. 4



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TRAY FOR CERTAIN TYPES OF FRAGILE AND OTHER ARTICLES

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7 Claims. (Cl. 206—45.14)

The invention is concerned with tray type containers especially adapted for packaging fragile articles such as glassware although adapted for packaging other articles for shipment, storage, display and other purposes. In a more particular sense the invention is primarily concerned with a tray container construction specially adapted to manufacture from a one-piece blank of foldable material such as paperboard cut and scored for immediate or later folding into the final and fully erected tray, and to a construction adapted to cooperate with indentations or other external physical features of the articles to be packaged for securing the articles in predetermined positions in and against accidental displacement from the tray.

One of the principal objects of the invention therefore, lies in the provision of a simple and relatively inexpensive tray for the support, shipment and display of various articles, especially those of a fragile nature, with maximum protection for the packaged articles while affording an attractive display thereof.

Another of the principal objects resides in the provision of an arrangement whereby the tray is equipped with top panels of such construction and relationship to one another and the other parts of the tray and to some external characteristic or physical feature of the articles to be packaged that the tray and packaged articles may cooperate with one another not only to position and protect the articles but also to secure the articles against accidental displacement, the articles themselves being cooperative with one another (directly or indirectly) to hold the tray in erected and article retaining condition.

Still another important object is to provide a tray of such construction and arrangement that it may be made from a simple, one-piece blank of paperboard and the like so cut and scored that it may be stacked in flat blank form later to be set-up or erected for use, or, partially erected and then collapsed or folded down into compact flat condition ready for complete erection, or fully and finally erected and put into use immediately or otherwise, as desired.

A further object is to provide a tray having three or more sides and a corresponding number of compartments or cells for the reception of articles or items of the same or similar type and partition means, also composed of paperboard or the like, for cooperative relationship with the packaged articles and the tray to aid in retaining the articles in their positions and to serve as stay or strut means between the tray walls and to support a cover.

Among many other objects are those to provide a tray construction wherein there are top flaps or panels that extend inward of the tray side walls not only to position and retain the packaged articles but also to provide an attractive framing or setting for display purposes, to provide an arrangement whereby the top flaps or panels may be interlocked or secured by the packaged articles or by direct means or both, to provide a top flap or panel arrangement adapted to adjust to different articles to be packaged or to different sizes of the same article,

and to provide a tray readily adapted to receive a complementary top or cover or to be enclosed within a larger container.

A presently preferred embodiment of the invention is illustrated in the drawings in which:

Fig. 1 is a top plan view of a four-compartment or cell tray in its set-up or erected condition, the view illustrating three of four similar articles, in this instance sherbet glasses, occupying three of the compartments, and a cross-shaped partition disposed in position separating the glasses from one another;

Fig. 2 is a vertical section taken through the tray shown in Fig. 1, the view being taken substantially along the section line 2—2 of Fig. 1;

Fig. 3 is a plan view of a one-piece blank from which the tray of Figs. 1 and 2 may be constructed; and

Fig. 4 is a top plan view of the tray in its folded but collapsed or flattened condition ready to be expanded or erected to appear as in Figs. 1 and 2.

Trays constructed after the manner of this invention may have their principal use as a low cost display tray and packaging unit for relatively inexpensive glassware, plastic ware and other fragile items such as the sherbet glasses shown in the drawings. The tray minimizes chance of breakage whether employed alone or with a cover or as an insert within an enclosing container or carton. Any of various types of cover may be utilized with the tray in telescoping relationship therewith and, if desired the tray and its contents may be covered by any transparent wrapping material for protected display purposes.

The blank illustrated in Fig. 3 may be cut as a single piece or unit from a suitable sheet of paperboard of requisite strength, thickness or gauge and other specifications. The illustration in Fig. 3 shows the blank in its condition as cut and scored ready for folding or erecting into the final product. As so cut and scored the blank provides a square bottom wall panel **10** delineated by score lines **11**, **11** and **12**, **12** from side wall panels **13**, **13** and **14**, **14**, respectively. At each of the opposite ends of each of side wall panels **14** is a corner glue flap **15** connected with its panel along a scored hinge line **15'**, a slot **16** separating each flap **15** from the adjacent side wall panel **13**. Each flap **15** is also provided with a diagonally extending score **17** running from the innermost to the outermost corner of the flap, for a purpose later appearing.

The outer or upper edges of the side wall panels **13** and **14** are defined by cut-scores **18** and **19**, respectively, spaced equal distances from the scores **11** and **12**, respectively, so that the side walls may all be of the same height in the final tray. Attached to the side wall panels **13** and **14** along the cut-scores **18** and **19**, respectively, are what may be termed "dust" or top flaps **20** and **21** of which opposite pairs are similar in size and configuration although each of the flaps of flap pair **20**, **20** differs from the flaps of flap pair **21**, **21** in a number of particular respects partly because the instant embodiment employs an automatic interlock between the top flaps.

Top flaps **20**, **20** are so cut as to form slightly truncated isosceles triangles the bases of which are defined by the cut scores **18**. The truncation edges **23**, **23** of these triangular flaps preferably are parallel to the bases and preferably are spaced therefrom such distance as will bring each of the truncated edges **23** into contact with the bottom wall panel **10** at or about a 30° angle thereto when the tray is erected and the packaged articles illustrated are in proper positions, as indicated in Figs. 1 and 2. Along each side of each top flap **20** adjacent to the flap base (score **11**) and connected thereto along a score **24** is an auxiliary flap **25** and projecting stiffly from the central portions of that free edge of each flap **25** which is

substantially parallel to score 24, is a locking tab 26. The outer lateral edge 27 of each auxiliary flap 25 is cut concavely on an arc so located and of such radius that it will register eventually with and along a portion of one of the arcuate notches 28 cut in the outer edge of top flaps 21. In each of the side edges of each of flaps 21 is a locking notch 29 defined (as may be seen in Fig. 3) by parallel edges the outer one of which is deeper cut than the other and which are joined by a slanting edge at their inner ends.

The blank thus cut and scored is erected by folding the side walls 13 and 14 with their top flaps 20 and 21, upward along scores 11 and 12 to positions where their planes are normal to the plane of the bottom wall. The corner glue flaps 15 are folded to lie in planes normal to the side walls to which they are attached and to lie against and parallel to either the inside (preferable) or outside face of the adjacent ends of the adjacent side walls. Adhesive is applied over only that half of each corner glue flap 15 as lies between fold score line 17 and score line 15' and on that surface which will contact the adjacent side wall surface portion that lies within the triangular area defined by the score lines 18 and 24 and the slot 16, the other half of each such glue flap being free to move toward or from that portion of the side wall to which it lies adjacent. In this connection it will be noted that since the side walls are normal to one another as well as to the bottom wall and since the corner glue flap scores 17 are at right angles to the scores 24, the scores 17 and 24 will register with one another in the erected and secured state. The purpose of this will appear.

After the side walls have been erected as above described the next step requires the top or dust flaps to be folded inward over the bottom wall. First the flaps 21 bearing the notches 29 are folded inward and down about the cut scores 19 and thereafter flaps 20 are similarly folded inward about cut scores 18 bringing the auxiliary flaps 25 and locking tabs 26 into positions overlying the adjacent marginal end edges of flaps 21. In this relationship of the top flaps pressure directed downward on the auxiliary flaps 25 will cause the tabs 26 to snap downward through the notches 29 and to underlie the flaps 21 as indicated in Fig. 1, thereby effectively locking the top flaps in their infolded relationships.

In the thus folded condition the edges 23 of top flaps 20 may engage the upper surface of the bottom wall 10 as indicated in Fig. 2 and, similarly, the free edges 30, 31 of top flaps 21 may engage the upper surface of bottom wall 10 when the articles to be placed in the tray are of such conformation as to permit such to happen as is usually desirable. In Fig. 2 the sherbet cups have more or less hemispherical bowls B which merge with more or less conical stands or bases C to provide a circumferentially extending groove or indentation D to which the arcuate edges 27 and 28 are cut substantially to conform with such minimum of play as manufacturing tolerances may dictate. By reason of the design of the cups and tray of the instant illustrations, the top flap edges 23 and 30, 31 may contact the upwardly facing surface of the bottom wall when the cups are nested in their cells or compartments of the tray but if the circular indentation D should be formed at some higher elevation above the bottom of the cup base, then the top flaps might incline downward at a lesser angle to the bottom wall or, possibly parallel thereto or they might even incline inward and upward relative to the bottom wall.

In order that the cup bowls B may not contact one another and to aid in holding each cup within its cell or compartment and firmly against the edges 27—28 as well as to serve as compression struts between the bottom wall and a top or cover or another superimposed tray, a cross-shaped partition member is provided. This member consists of two partition elements 32 and 32' each of which may be composed of a single piece of paperboard folded along a median line to provide a pair of similar panels 33 each of a height such as to bring the fold to an elevation slightly above the top edges of the cup. Equidistantly between its ends each of the partition elements is slotted vertically for approximately one-half of its vertical dimensions, one from the fold or top edge and the other from the other edge, to permit them to nest together as illustrated. The corners of the panels 33 at the junctures of the bottom and end edges thereof are cut as indicated at 34 to conform to the slope of the top flaps. In use the partition member will be supported on the bottom wall 10 and, to an extent, upon the sloping surfaces of the top flaps 20—21 by which it is also centered in part. In turn the partition lends strength and rigidity to the tray especially when the tray is provided with a cover or wrapper.

Under some circumstances it may be desirable to prepare the trays in erected or set-up condition and then to collapse them to a relatively flat state for storage or shipment, the trays to be restored to their set-up or erected state by expansion at the time and place of use. It is for such purpose that the scores 17 are provided across the corner flaps 15, the scores 24 extend between the auxiliary flaps 25 and top flaps 20, and the portions of corner (glue) flaps 15 that lie between the scores 17 and slots 16 are left unattached to the inside faces of the side wall panels 13, 13. With the partition member omitted and the top flaps unlocked from one another and projecting upward, pressure directed simultaneously against the outer faces of the top flaps 20 will cause those flaps to fold inward relative to the auxiliary flaps 25 which swing about the scores 24 and finally lie flat upon the outer (upper faces of flaps 20 which in turn will wind up in face to face contact with the upper surface of bottom wall 10. The same movements plus pressure directed simultaneously against the outer faces of top flaps 21 will cause the corner flaps 15 to swing toward and finally into contact with the inside faces of side walls 14 to which they are integrally and directly connected and, will cause the top flaps 21 to fold inward to a more or less horizontal position over the top flaps 20, after the manner indicated in Fig. 4.

The invention is susceptible of other embodiments and many variations as will be appreciated. It may be applied to a triangular or three side wall tray or to trays of five or more side walls and a corresponding number of corners. The automatic lock may be omitted and reliance placed upon the interrelationship between the tray, the articles carried within it and the partition member with or without a lid or cover. Instead of employing adhesive to secure the flaps 15 to the adjacent side walls they may be secured thereto by one of a number of other expedients such as the tongue and slot. Other changes too may be effected without departing from the spirit of the invention and the scope of the appended claims.

I claim:

1. A tray for fragile articles comprising a single piece of material such as paperboard cut, scored and folded to provide a polygonal bottom wall, a side wall extending upward from each edge of the bottom wall, means securing the side walls in their upwardly extending relationship, and a flap inclining inwardly over and downwardly toward the bottom wall from the upper edge of each side wall, the inner terminal edge of each flap being substantially in contact with the bottom wall, each flap at each of its ends extending substantially into conjunction with the adjacent flap end at the tray corners, each of flap edges adjacent to each corner end and at a place spaced from the tray corner being notched, the adjacent notches of adjacent flaps at each corner being complementary to one another.

2. A tray for fragile articles comprising a single piece of material such as paperboard cut, scored and folded to provide a polygonal bottom wall, a side wall extending upward from each edge of the bottom wall, a flap inclining

inwardly over and downwardly toward the bottom wall from the upper edge of each side wall, the inner terminal edge of each flap being substantially in contact with the bottom wall, each flap at each of its ends extending substantially into conjunction with the adjacent flap end at the tray corners, each of the flap edges adjacent to each corner end and at a place spaced from the tray corner being notched, the adjacent notches of adjacent flaps at each corner being complementary to one another.

3. A polygonal sided tray for fragible articles comprising a single piece of material such as paperboard cut, scored and folded to provide a bottom wall the marginal edges of which define a polygon, a side wall rising from each marginal edge of the bottom wall, a flap extending from the upper edge of each side wall over the bottom wall, each flap having an edge portion at each end extending into interlocking relationship with the corresponding edge portion of the adjacent end of each of the adjacent flaps, each flap having a notch in another portion of each of its end edges inwardly of the tray from the first said edge portions, the notches being disposed adjacent to the tray corners and the notches of adjacent edge portions of adjacent flaps being complementary to one another.

4. A polygonal sided tray for fragile articles comprising a single piece of material such as paperboard cut, scored and folded to provide a bottom wall the marginal edges of which define a polygon, a side wall rising from each marginal edge of the bottom wall, a flap extending from the upper edge of each side wall inwardly over and inclined downwardly toward the bottom wall, each flap having an edge portion at each end extending into lapping relationship with the corresponding adjacent edge portion of the adjacent end edge of each of the adjacent flaps at each corner, each flap having a notch in another portion of each of its end edges inwardly of the tray from the first said edge portions, the notches being disposed adjacent to the tray corners and the notches of adjacent edge portions of adjacent flaps being complementary to one another, and means securing the flaps against accidental displacement from one another.

5. In combination, at least three similar articles and a polygonal tray for such articles, the tray having a bottom wall, side walls and top flaps together forming corners in number equal to the number of articles for retention and display of the articles, each of said articles having a horizontally extending indentation located within the limits of the vertical dimension of the tray, each side wall having one of the top flaps attached thereto along its upper edge, each of said top flaps extending inward of the tray from its side wall and having edge portions extending into

juxtaposition to the corresponding edge portions of adjacent top flaps at the tray corners, the juxtaposed edge portions of the top flaps having complementary notches, one of the articles being disposed in each of a pair of complementary notches with the flap edges defining the notches disposed within the indentation of the article therein.

6. In combination, at least three similar articles and a polygonal tray for such articles, the tray having a bottom wall, side walls and top flaps together forming corners in number equal to the number of articles for retention and display of the articles, each of said articles having a horizontally extending indentation located within the limits of the vertical dimension of the tray, each side wall having one of the top flaps attached thereto along its upper edge, each of said top flaps being inclined downward and inward of the tray from its side wall and having edge portions extending into lapping relationship with the corresponding edge portions of adjacent top flaps at the tray corners, portions of the top flap edge portions inward of the tray from each corner having complementary notches, one of the articles being disposed in each of a pair of complementary notches with the flap edges defining the notches disposed within the indentation of the article therein.

7. In combination, at least three similar articles and a polygonal tray for such articles, the tray having a bottom wall, side walls and top flaps together forming corners in number equal to the number of articles for retention and display of the articles, each of said articles having a horizontally extending indentation located within the limits of the vertical dimension of the tray, each side wall having one of the top flaps attached thereto along its upper edge, each of said top flaps extending inward of the tray from its side wall and having edge portions extending into juxtaposition to the corresponding edge portions of adjacent top flaps at the tray corners, the juxtaposed edge portions of the top flaps having complementary notches, one of the articles being disposed in each of a pair of complementary notches with the flap edges defining the notches disposed within the indentation of the article therein, and partition means supported upon the bottom wall and disposed between adjacent portions of the articles.

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