Oct. 25, 1966

A. PESUT, JR

3,281,003

PACKAGING TRAY

Filed Dec. 9, 1964

2 Sheets-Sheet 1

Fig. 1

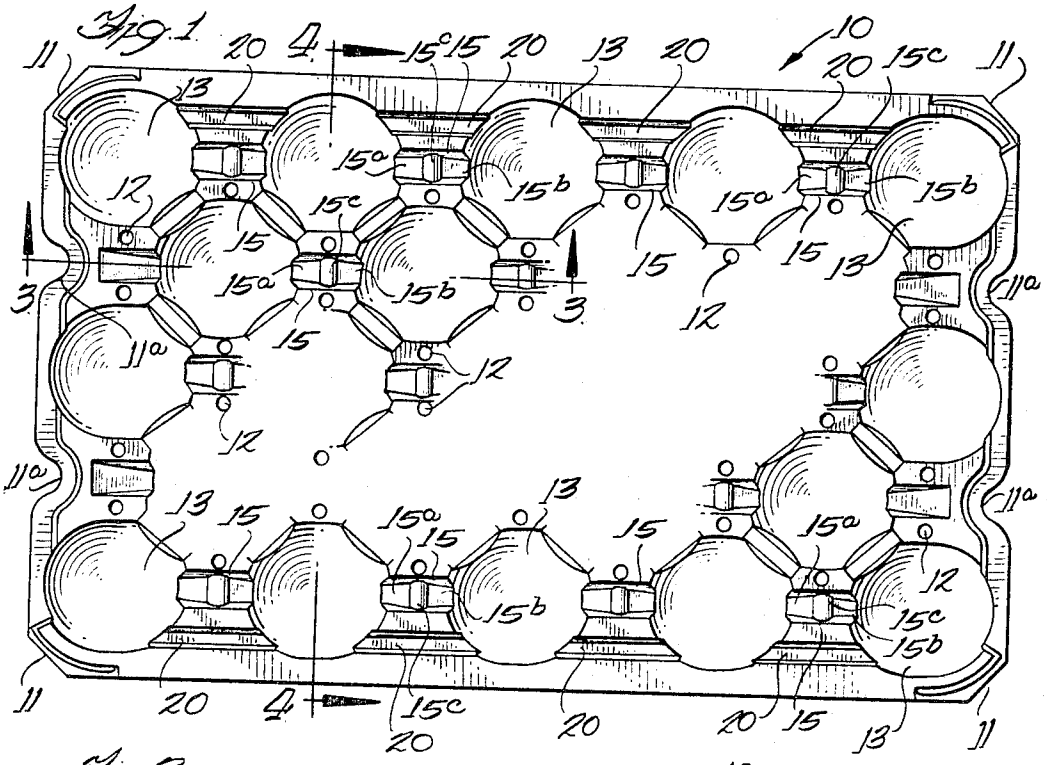


Fig. 2

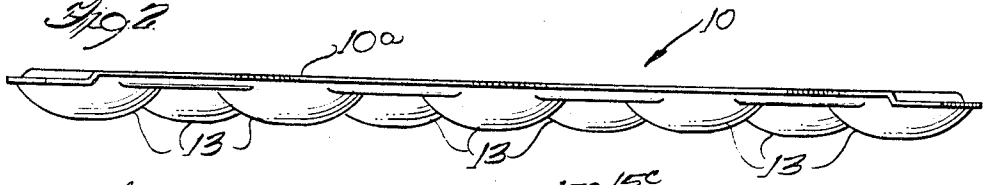


Fig. 3

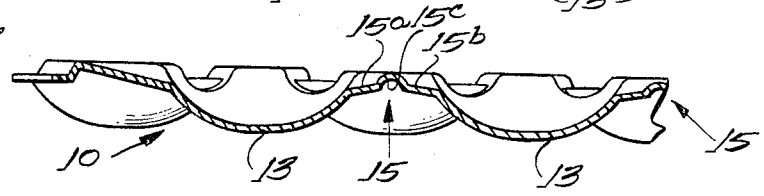
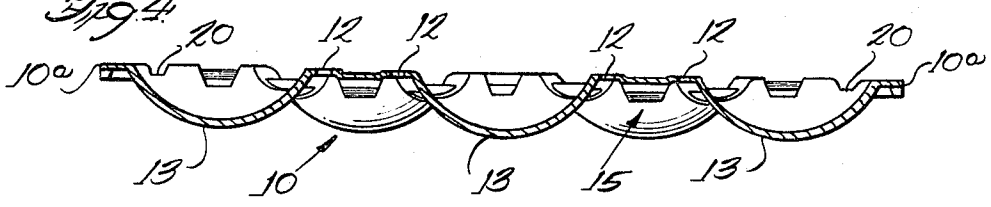


Fig. 4



Inventor
Anton Pesut, Jr.
Pendleton, Neuman
Seibold & Williams
Attorneys

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Fig. 5

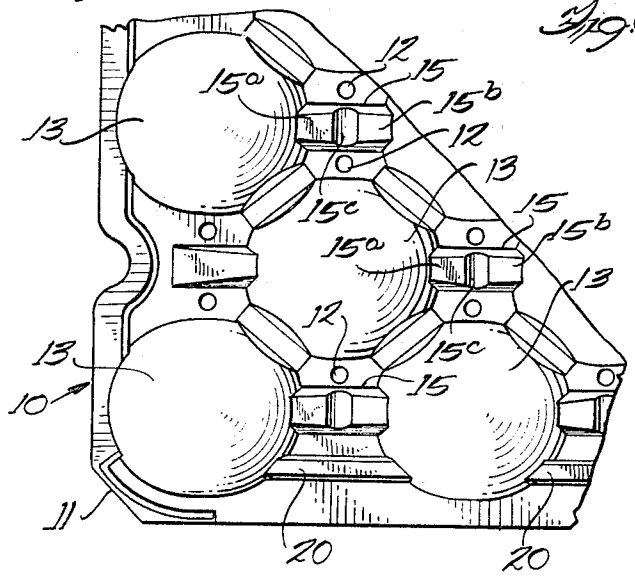


Fig. 6

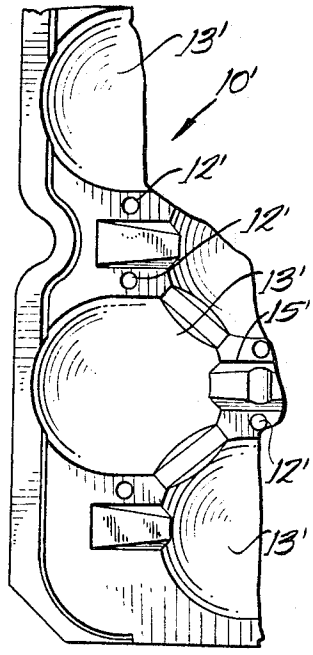


Fig. 7

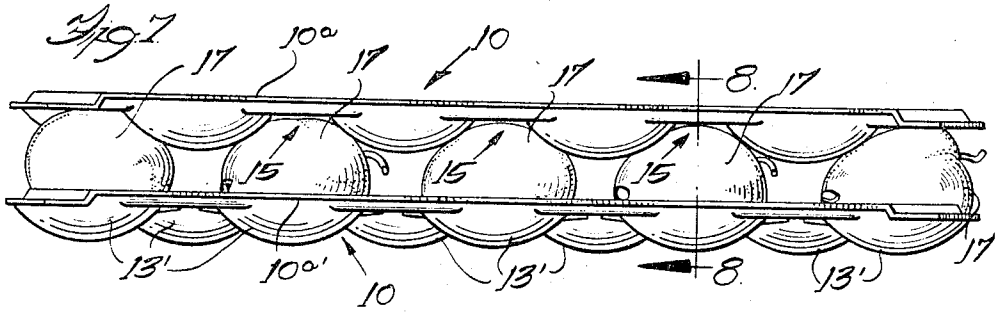
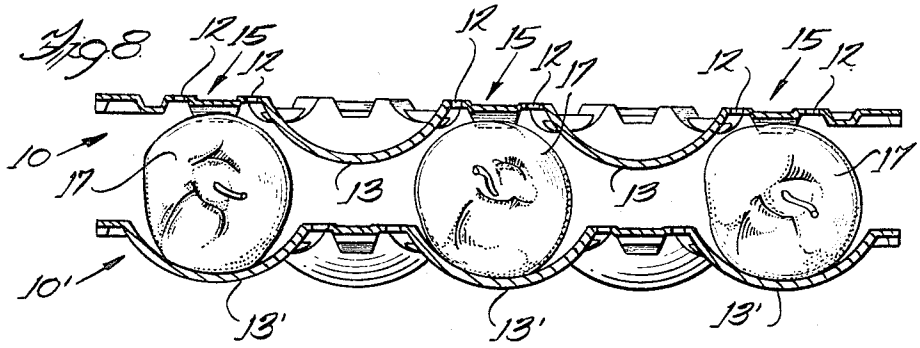


Fig. 8



Inventor
Anton Pesut, Jr
Pendleton, Neuman
Seibold & Williams
Attorneys

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PACKAGING TRAY

Anton Pesut, Jr., Griffith, Ind., assignor, by mesne assignments, to Packaging Corporation of America, a corporation of Delaware

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5 Claims. (Cl. 217—26.5)

The present invention relates in general to packaging trays for articles and, more specifically, to molded paper pulp packaging trays for fragile articles such as fruit.

In the packaging of fragile articles, such as fruit, in containers, the fruit is placed in molded paper pulp trays or the like which are stacked on top of one another within the container. The trays are designed to reduce bruising of the fruit. In present conventional trays of this type wherein it is desired to compactly package the fruit within a container, point contact exists between the fruit and a tray disposed thereabove which may result in bruising of the fruit. For the purpose of reducing such a bruising to a minimum, it has been desirable to provide trays which do away with such point contact and distribute the weight of the above trays across a greater area of the fruit.

A primary object of the present invention is to provide a new and improved packaging tray. More specifically, an object is to provide a molded paper pulp packaging tray for fragile articles such as fruit.

Another object is to provide a new and improved packaging tray for fragile articles which reduces the damage to such articles to a minimum. A related object is to provide such a tray for fruit or the like which reduces the bruising thereof to a minimum. In accomplishing the foregoing, it is an object to provide a new and improved packaging tray which is adapted to conform substantially to the contour of articles in a tray positioned therebelow. Still another object is to provide such a packaging tray wherein the articles are softly but firmly held in position and do not engage sharp or unyielding portions of a tray disposed thereabove.

Still another object of the present invention is to provide a new and improved packaging tray which allows for more compact packaging of articles within a container and thereby does away with wasted space between such trays.

A further object of the present invention is to provide a packaging tray of the foregoing character which may be made of softer, less compacted pulp than heretofore possible, while retaining rigidity so that the loaded tray may be picked up by its ends or sides and deposited in or removed from a packing container without having the tray collapse and drop its load.

An additional object is to provide a new and improved packaging tray which has vent holes formed therein in a desired pattern to allow for desired circulation between trays stacked within a container.

A general object of the present invention is to provide a new and improved packaging tray characterized in its simplicity, lightweightness, rigidity and economy.

In a preferred form of the invention, a packaging tray is provided which includes a sheet of material, such as molded paper pulp, having a plurality of rows of similar rounded pockets displaced out of the general plane of the tray which define article-receiving surfaces. Saddle-like struts are also displaced out of the general plane of the tray between adjacent pockets and are adapted to conform substantially to the contour of articles disposed in another tray positioned below the tray for supporting the tray when the tray is stacked on top of the other tray. Ribs may be formed adjacent the outer rows of pockets which extend between the side walls of adjacent pockets in the

outer rows for increasing the stiffness and rigidity of the sheet. Additionally, vent holes may be formed in the sheet to allow for desired air circulation between stacked trays.

Other objects and advantages of the present invention will become apparent upon reading the attached detailed description, taken in connection with the drawings, wherein:

FIGURE 1 is a partial top plan view of a packaging tray constructed in accordance with the teachings of the present invention;

FIG. 2 is a side elevational view of the packaging tray shown in FIG. 1;

FIG. 3 is a cross-sectional view taken along line 3—3 in FIG. 1;

FIG. 4 is a cross-sectional view taken along line 4—4 in FIG. 1;

FIG. 5 is a partial bottom plan view of the packaging tray shown in FIG. 1;

FIG. 6 is a partial top plan view of a mating packaging tray for the tray shown in FIGS. 1–5;

FIG. 7 is an enlarged partial section through a pair of mating, superimposed loaded packaging trays constructed in accordance with the present invention; and

FIG. 8 is a vertical section taken substantially along line 8—8 in FIG. 7.

While the invention has been shown and will be described in some detail with reference to a particular, exemplary embodiment thereof, there is no intention that it be limited to such detail. Quite to the contrary, it is intended here to embrace all modifications, alternatives and equivalents falling within the spirit and scope of the invention as defined by the appended claims.

Referring now to the drawings, a packaging tray **10** constructed in accordance with the teachings of the present invention is shown which is substantially rectangular in shape and has parallel sides and parallel ends, the sides being longer than the ends in the exemplary arrangement. In a preferred form thereof, the packaging tray **10** is constructed of a sheet of molded paper pulp. The corners of the tray are preferably cut off as indicated at **11** to facilitate the removal of the tray from a container (not shown) in which articles are packed in a plurality of corresponding superimposed trays and to aid in providing vertical circulation of air. Additionally, the tray may be provided with finger-engaging recesses **11***a* to facilitate the insertion thereof in and removal thereof from a container. In order to allow for additional vertical circulation of air between superimposed trays whereby the container is ventilated, a plurality of vent holes **12** are provided in the tray. The vent holes **12** are positioned in a desired pattern to allow for a balanced circulation of air between superimposed trays.

For the purpose of receiving articles to be packaged, such as fruit, the tray **10** is provided with a plurality of similar rounded pockets **13** which are displaced out of the general plane **10***a* of the tray in the same direction. The pockets **13** are substantially in the shape of a section of a sphere, less than a hemisphere, and define article-receiving surfaces. In the exemplary arrangement, the pockets **13** are arranged in longitudinal rows with diagonally adjacent pockets being disposed fairly close together. Additionally, the numbers of pockets in the alternate longitudinal rows are odd and even.

In accordance with a principal aspect of the present invention, saddle-like struts **15** are displaced out of the general plane **10***a* of the tray **10**, between longitudinally adjacent pockets **13** in each row, in the same direction as the pockets. As may best be seen by reference to FIGS. 1, 3 and 5, each saddle-like strut **15** includes a pair of converging ribs **15***a* and **15***b* which flare outwardly from

longitudinally adjacent pockets along a common center line therefor and which are separated by a transverse groove **15***c* so that the strut is semi-flexible. The struts **15** are adapted to conform substantially to the contour of articles **17** within a corresponding tray **10'** positioned below the tray **10** when a plurality of such trays are superimposed so that continuous, nonlinear article-engaging surfaces are provided, as may be seen by reference to FIGS. 7 and 8. The corresponding tray **10'** is shown in FIG. 6. As may be seen, the pockets **13'** in tray **10'** are disposed such that the struts **15** of tray **10** are superimposed over the pockets **13'**. It will be apparent that each strut **15** provides a semi-flexible contact with an article **17** located directly therebeneath and thereby supports the articles mounted in pockets **13**, between which the strut extends, in a saddle-like manner. Consequently, the weight of trays superimposed on top of a given tray is distributed across a substantial, continuous area, i.e., the area engaged by struts **15** of a tray directly thereabove, of the articles in the tray. Additionally, with this arrangement, the trays are disposed in as close proximity as is possible so that compact packaging of a plurality of superimposed trays within a container is facilitated. In other words, wasted space is minimized since the trays are only separated a distance determined by the thickness of the articles **17**. As will be readily appreciated, the struts **15** also add stiffness to the tray **10**.

In keeping with the present invention, ribs **20** are formed in the tray **10** to increase the stiffness and rigidity thereof. More specifically, ribs **20** are formed adjacent the outer longitudinal rows of pockets **13**, the ribs being spaced from and parallel to the peripheral edges of the tray **10**. The ribs **20** extend between the side walls of longitudinally adjacent pockets **13** in the outer rows and provide edge stiffness and rigidity to the tray for supporting the articles **17** within a shipping container and for allowing for removal of the loaded tray without the tray collapsing. Thus, the ribs **20** aid in preventing the spilling of the articles **17** during a tray removing or inserting operation which would result from collapsing thereof. As may be seen, the ribs **20** are also displaced out of the general plane of the tray **10** in the same direction as the pockets **13**.

In view of the foregoing, it will be apparent that a packaging tray has been provided which reduces damage to fragile articles, such as fruit, carried thereby when a plurality of such trays are superimposed. This is true since the disclosed tray **10** does away with point contact between the tray and articles **17** disposed therebelow, the struts **15** conforming substantially to the contour of the articles **17** disposed therebelow. Consequently, a substantial, continuous area of contact, in lieu of point contact, is provided between a given tray and the articles disposed therebelow so that the weight of trays positioned above the articles is distributed across a greater area of the articles. Additionally, it may be seen that a tray has been provided which has substantial stiffness and rigidity so that the tray may be handled without fear of collapsing and spilling of the articles carried thereby. Finally, it will be appreciated that the vent holes **12** may be positioned to allow for a balanced circulation of air between superimposed trays whereby a desired ventilation of a shipping container is provided which is required when fruit or the like is packaged in such containers. However, for those packaging operations wherein balanced circulation of air is not required, the disclosed tray may be formed without the vent holes **12** and the invention is intended to cover either such arrangement.

While it has been set forth that the tray **10** may be constructed of molded paper pulp, it will be readily apparent that it may be constructed of various other materials, such as plastics or styrofoam. Additionally, it will be apparent that the pockets **13** may be formed in various shapes other than the disclosed circular shapes. Finally, it will be apparent that the arrangement of the pockets in FIG. 1 is merely illustrative of one such arrangement and the pockets may be arranged in any desired configuration.

What is claimed is:

1. A packaging tray for a plurality of articles, which is adapted, when loaded with such articles, to be arranged in stacked relation with a second tray loaded with a plurality of articles in a like manner, said first mentioned tray comprising a plurality of spaced article-accommodating pockets recessed downwardly from a predetermined plane of said tray, said pockets being arranged in substantially parallel rows, and saddle-like struts interconnecting adjacent pockets of a row; each strut including a pair of inclined yieldable broad rib surfaces recessed downwardly from said predetermined plane, said rib surfaces extending from the sides of adjacent pockets of a row and intersecting one another intermediate said adjacent pockets to form an elongated hingelike portion spaced from the periphery of said adjacent pockets and disposed substantially transversely of said row of pockets; said rib surfaces cooperating with said hingelike portion and the sides of said adjacent pockets to form an inverted recessed portion, each recessed portion of said first mentioned tray, when the latter is in stacked relation with the second tray, being in registered relation with a pocket of the second tray so that the inclined rib surfaces of said recessed portion yield about said hingelike portion as an axis and substantially conform to the upper exterior surface configuration of an article accommodated in the second tray pocket and make an elongated bandlike contact therewith.

2. The packaging tray of claim **1** wherein said inverted recessed portion is an inverted article-accommodating pocket defined in part by the under surface of the sides of said adjacent pockets of a row and the undersurface of the sides of adjoining pockets of adjacent rows.

3. The packaging tray of claim **2** wherein the pockets of one row are diagonally offset with respect to the pockets of an adjacent row.

4. The packaging tray of claim **2** wherein the ends of each hingelike portion is spaced from the sides of adjoining pockets of adjacent rows, and the width of each rib surface is substantially coextensive with the length of said hingelike portion.

5. The packaging tray of claim **2** wherein the depth of said inverted pocket is no greater than the depth of said first mentioned pocket.

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THERON E. CONDON, *Primary Examiner.*

RAPHAEL H. SCHWARTZ, *Examiner.*