May 17, 1960 P. M. WILLIAMS 2,936,922

MOLDED PULP PACKING TRAY

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Fig. 1.

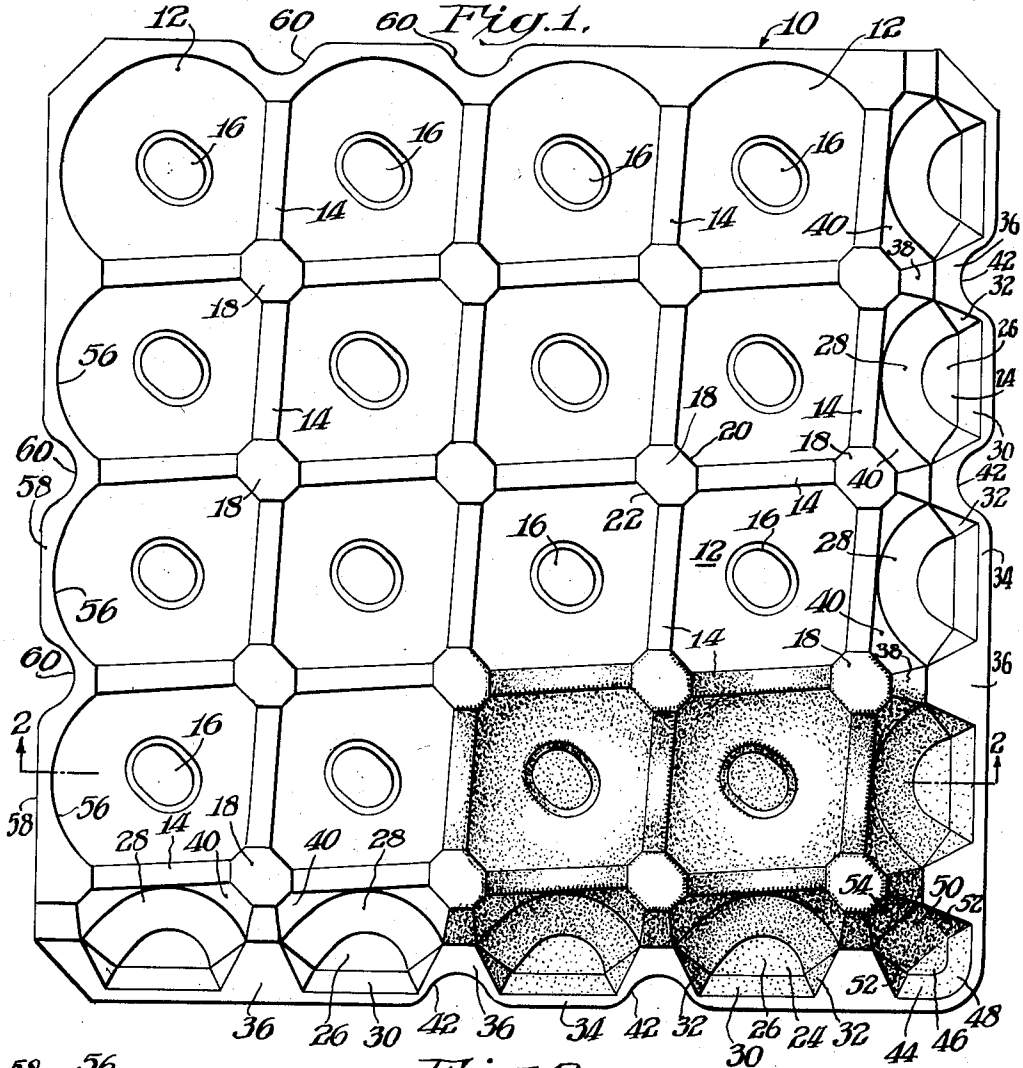
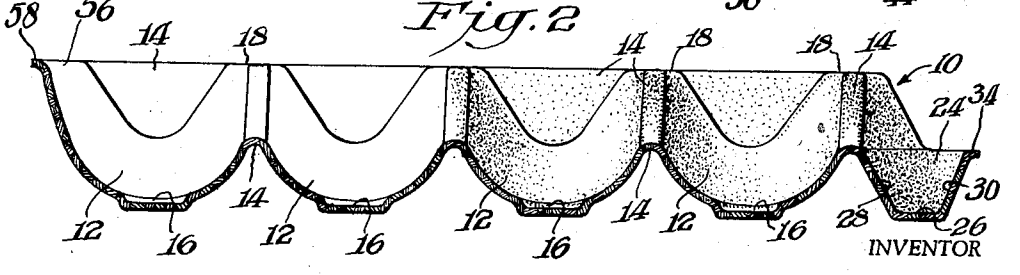


Fig. 2



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Fig. 3.

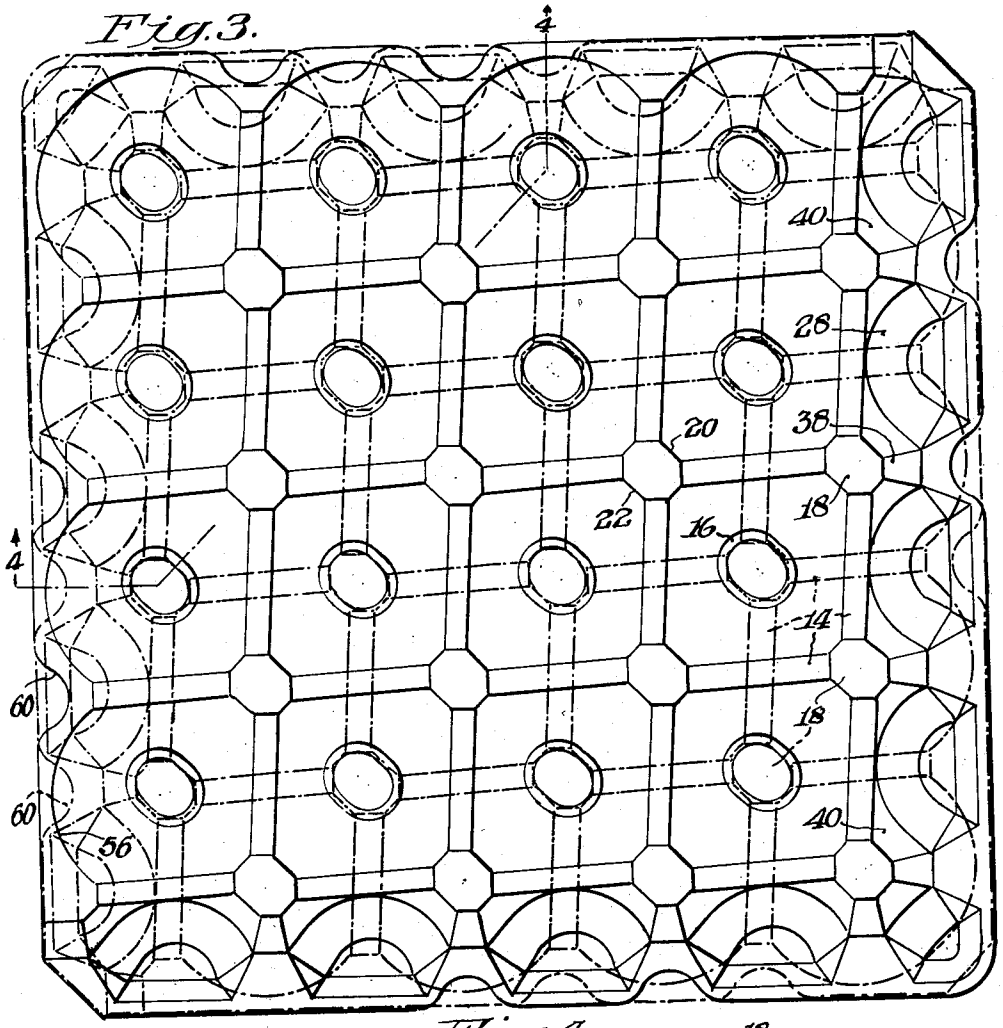
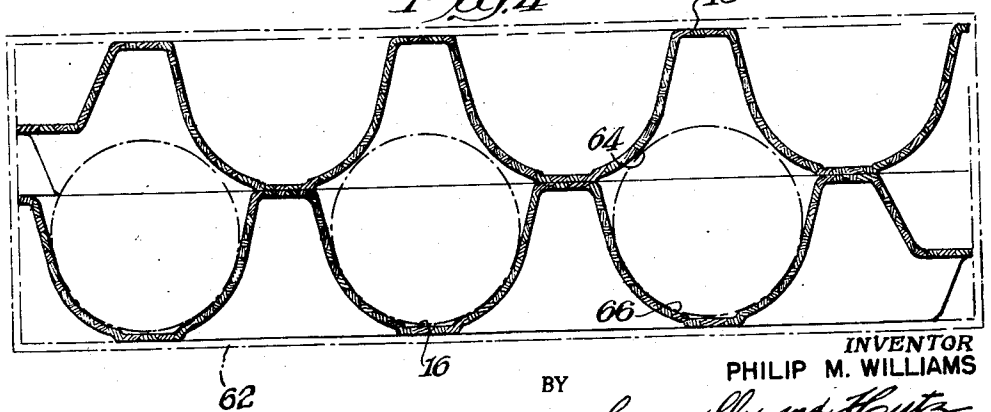


Fig. 4



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Fig. 5

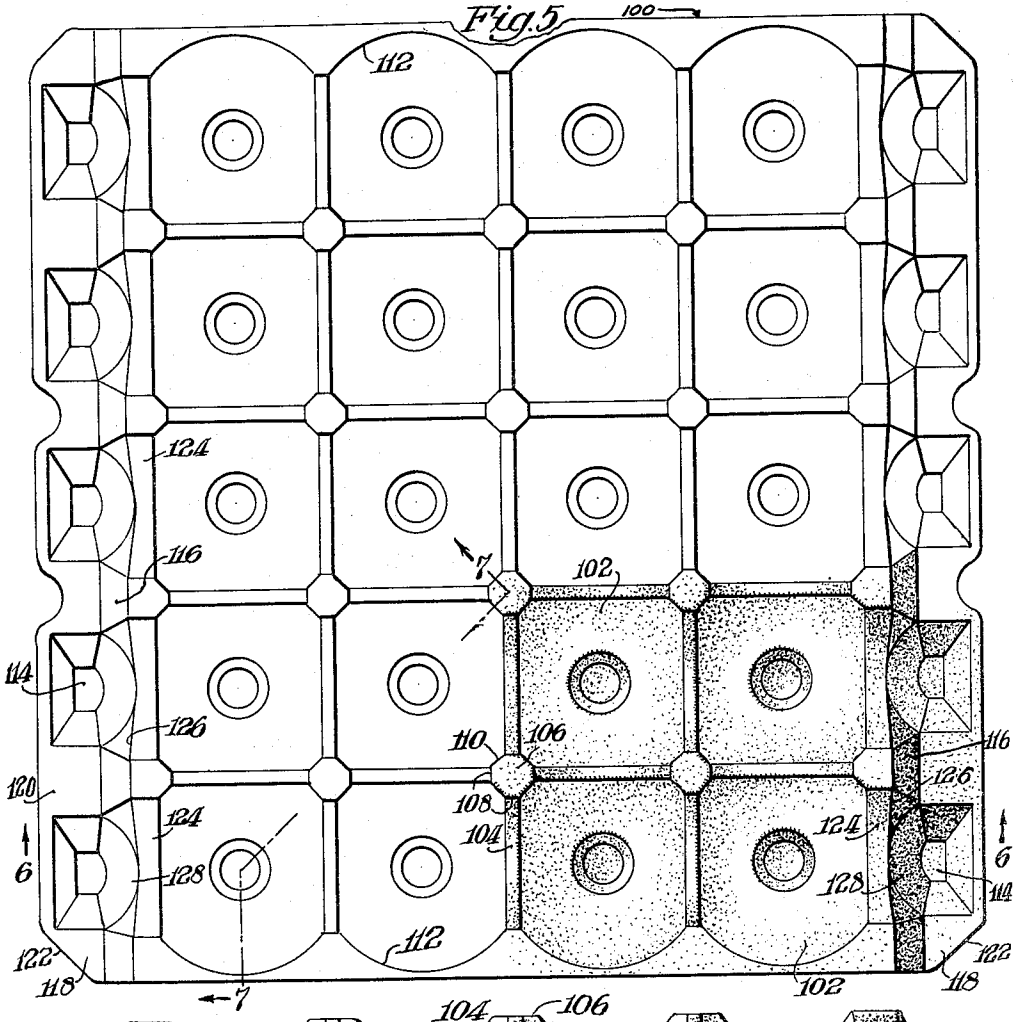


Fig. 6

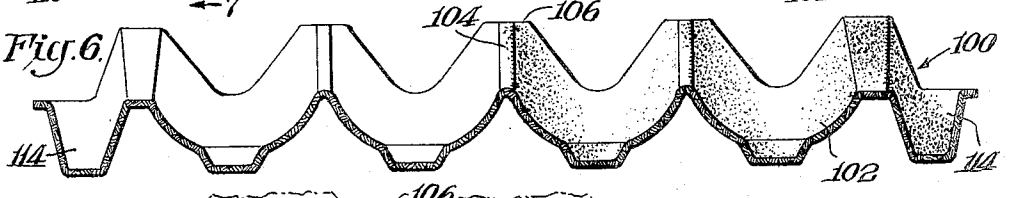
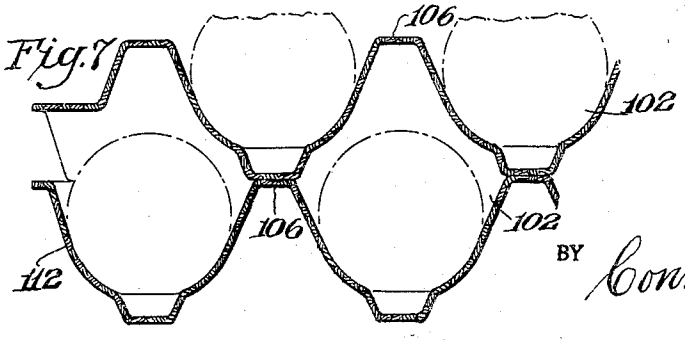


Fig. 7



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2,936,922

MOLDED PULP PACKING TRAY

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Application March 7, 1958, Serial No. 719,780

18 Claims. (Cl. 217—26.5)

This invention relates to molded pulp packing trays, and it particularly relates to trays which are adapted to be disposed between layers of fruit in a packing case in such manner as to cushion each individual fruit from those adjacent thereto either vertically or horizontally.

Although various types of molded pulp trays for packing fruits or the like in layers within a packing case have heretofore been produced, these prior trays had various defects, for example, some trays were so constructed that they could either be used only at the bottom or only at the top of a layer; consequently it was necessary to use two different kinds of trays in one packing case. Other trays were capable of being used either at the top or bottom of a layer. However, these trays were usually so constructed that more fruits were arranged along one edge than another; consequently, there was an uneven distribution of weight which tended to distort and even tear the trays after only a short period of use. In addition, few, if any, of these prior trays made accommodation for the particular shapes of certain fruits such as apples or pears but were made with pockets of generally hemispherical shape; consequently, these pockets had to be large enough to accommodate such oblong fruit, resulting in a great waste of fruit-holding capacity.

It is one object of the present invention to provide a packing tray for fruit or similar articles which is adapted for use either at the top or bottom of a layer of fruit within a packing case.

Another object of the present invention is to provide a packing tray for fruit or similar articles which, although capable of use at either the top or bottom of a layer, is adapted to retain an equal number of articles at each side of the tray whereby the weight distribution of the articles is kept substantially even.

Another object of the present invention is to provide a packing tray of the above type which is adapted to retain articles of both spherical and oblong shape with the greatest utilization of available space.

Another object of the present invention is to provide a tray of the above type which can be easily nested for shipping or storage.

Other objects and many of the attendant advantages of this invention will be readily appreciated as the same become better understood by reference to the following detailed description when considered in connection with the accompanying drawings wherein:

Fig. 1 is a top plan view of a tray embodying the present invention;

Fig. 2 is a cross-sectional view taken on line 2—2 of Fig. 1;

Fig. 3 is a top plan view of two trays wherein one overlies the other and is rotated 180° relative thereto; the top tray being shown in dotted outline;

Fig. 4 is a sectional view taken on line 4—4 of Fig. 3 and illustrating the trays arranged in a packing case with fruits packed therein;

Fig. 5 is a top plan view of a second embodiment of the present invention;

Fig. 6 is a sectional view taken on line 6—6 of Fig. 5; and

Fig. 7 is a sectional view of two trays such as shown in Fig. 5, wherein one overlies the other and is rotated 90° relative thereto, the view being taken on a line which would correspond to line 7—7 of Fig. 5.

Referring now in greater detail to the various figures of the drawings wherein similar reference characters refer to similar parts, there is shown a molded pulp tray, generally designated **10**, comprising four rows of pockets **12**, there being four pockets in each row whereby the pockets are simultaneously arranged in four rows and four columns intersecting the rows.

The pockets **12** are generally hemispherical in cross-sectional shape (as best shown in Fig. 2) and are each separated from the pockets adjacent thereto by relatively low ribs **14**. Each pocket **12** is further provided with a centrally-located oblong recess **16** which is elongated in a diagonal direction relative to the sheet.

As clearly shown in Fig. 1, each pocket **12** is somewhat oblong in that one diagonal axis from one corner to the opposite corner is longer than the transverse axis between the other two corners. This effect is obtained by making each rib **14** extend in a diagonal direction in the horizontal plane.

At each of the four horizontal corners of each pocket **12** there is provided a post **18** which extends well above the horizontal plane of the ribs **14**. These posts **18** are octagonal in shape with two opposite side walls **20** and **22** being wider than the other side walls so that the post is elongated in a diagonal direction generally parallel to that of the oblong recesses.

At the peripheral portions of the tray, two adjacent peripheral portions are provided with semi-circular or half-pockets **24**, each half-pocket **24** comprising a bottom wall **26**, a horizontally semi-circular and vertically upward and outwardly inclined inner wall **28**, a straight, vertically upward and outwardly inclined outer wall **30**, and upward and outwardly inclined, triangular corner walls **32** connecting the walls **28** and **30**. These half-pockets extend up to the level of the ribs **14** and are defined by a peripheral rim **34** at this level, while at their lower ends, the bottom walls **26** are in a common horizontal plane with the bottom of recesses **16**.

Between adjacent half-pockets, the rim **34** is provided with inward extensions **36** from the inner ends of which extend upwardly and inwardly inclined walls **38** which define one side wall of the adjacent octagonal post **18**. The adjacent walls of the post, on either side of wall **38**, comprise upwardly and outwardly inclined walls **40** extending up from the arcuate upper edge of the adjacent walls **28**.

At each half-pocketed side, a pair of finger-grip notches **42** are provided in adjacent rim extensions **36**.

At the corner, between the two half-pocketed edges of the tray, there is provided a corner pocket **44** comprising a bottom wall **46**, in the same plane as bottom walls **26**, a horizontally-curved and vertically upward and outwardly extending outer wall **48**, an upwardly and outwardly inclined inner wall **50** and triangular shaped corner walls **52** similar to walls **32**. An upwardly inclined wall **54** extends up from the wall **50** to form one of the walls of the corner post.

The other two peripheral portions of the tray are not provided with half-pockets; instead, the pockets **12** adjacent these other peripheral portions are provided with arcuately-curved side walls **56**, these walls being curved in both the horizontal and the vertical directions. These arcuately-curved end walls **56** extend up to the level of the tops of the posts **18**. The periphery at each of these portions of the tray is defined by a peripheral rim **58** at the level of the posts **18**. A pair of finger-grip notches

60 are provided on each portion of the rim 58; these notches 60 being offset from the notches 42 in the opposite side of the tray.

When the trays 10 are in use, one tray 10 is provided on the bottom of a packing case 62 and the fruits or other objects to be packed are placed in the pockets 12, then a second tray 10 is rotatably reversed 180° and placed over the filled lower tray 10, as shown in Fig. 4. In this position, the fruits are individually cushioned in spaced relation to the other fruits, this cushioning being effected not only laterally but also vertically at the top and bottom as indicated at 64 and 66. The recesses 16 on the bottom tray further cushion the entire layer from the bottom of the case while the recesses 16 on the upper tray coact with the posts 18 to take the pressure off the fruits packed between the two trays. The posts 18 on the upper tray meanwhile abut against the top of the packing case to provide a cushioning effect at those areas while the rims 34 and 58 laterally cushion the fruits from the side walls of the packing case.

Although only one layer of fruits defined by two trays 10 are illustrated in Fig. 4, in practice, a number of layers are usually provided one above the other.

In the above manner, a standard size packing case and standard size packing trays may be used even though the pockets are elongated to accommodate the different shapes of the fruits being packed; this is due to the somewhat stepped arrangement of the pockets in each row.

When the trays 10 are not in use, they may be easily and securely nested for storage or shipment so as to occupy a minimum of storage space. This is accomplished by placing the trays one upon the other with the half-pockets in the same plane. The half-pockets of each upper tray thereby are snugly received in those of the next lower tray to maintain the trays securely in the stack.

In Figs. 5, 6 and 7 there is shown a modified form of the tray, such modified tray being generally designated 100. In the main portion of the tray are provided pockets 102 arranged in intersecting rows and columns similarly to tray 10 except that although there are four pockets in each row, there are five instead of four rows, so that each intersecting column consists of five pockets, these pockets being designated 102.

The pockets 102 are generally similar to pockets 12 of tray 10 in that they are also generally hemispherical and are separated from the adjacent pockets by ribs 104. The ribs 104 resemble ribs 14 except that, instead of being diagonal, they are parallel with the corresponding edges of the tray. Similarly to ribs 14, the ribs 104 connect with octagonal hollow posts 106. In contradistinction to posts 18 of tray 10, the posts 106 are defined in the horizontal plane by alternating short sides 108 and longer sides 110, the sides 108 being all of a similar size and shape and the sides 110 being also of a similar size and shape. Consequently, the posts 106 are symmetrical rather than diagonally elongated in the horizontal plane as in the case of posts 18.

The end pockets 102 in each column forming the opposite end rows of pockets are slightly different from the other pockets 102 in that they are provided with walls 112 adjacent the rim of the tray which are arcuately curved in similar manner to walls 56 of tray 10.

On each of the two peripheral edges of the tray adjacent the two end columns of pockets 102 is provided a column of half-pockets 114 similar in almost every way to half-pockets 24 of tray 10, the only significant difference being a somewhat larger spacing therebetween due to the somewhat larger walls 116 as compared to the walls 38 of tray 10. In addition there are no corner pockets such as provided at 44 in tray 10, the corners 118 of tray 100 being flat portions of the rim 120 and being defined by cut-off edges 122. There is also a slight difference in the end columns of ribs 124, these being somewhat thicker than their counterparts in tray 10 and also having outer

walls 126 which are somewhat inclined from the center outwardly to accommodate the arcuate inner walls 128 of the adjacent half-pockets 114.

These trays 100 are used in similar fashion to trays 10 except that they are rotated 90° rather than 180° relative to each other.

Obviously many modifications and variations of the present invention are possible in the light of the above teachings. It is, therefore, to be understood that within the scope of the appended claims the invention may be practiced otherwise than as specifically described.

What is claimed is:

1. A packing tray comprising a generally rectangular sheet defined by a stepped peripheral rim comprising two upper levels and two lower levels, a plurality of rows of pockets in said sheet, said pockets also being arranged in columns transverse to said rows, each of said pockets being generally rectangular in the horizontal plane of the sheet and generally hemispherical in the vertical plane, said pockets being separated from all the pockets adjacent thereto by ribs, and said ribs being spaced from each other by hollow posts, said posts each being positioned in a corner of a pocket, said ribs being positioned in a common vertical plane substantially lower than the top level of said posts, and two series of half-pockets on the periphery of said sheet, said half-pockets having outer walls the upper ends of which are common with the lower levels of said peripheral rim.

2. The packing tray of claim 1 wherein one series of said half-pockets is arranged in a row substantially parallel with said rows of pockets and the other series of pockets is arranged in a column substantially parallel with said columns of pockets.

3. The packing tray of claim 1 wherein both series of half-pockets are arranged substantially parallel with said columns of pockets, one series of half-pockets being on one side of the sheet and the other series being on the opposite side of the sheet.

4. The packing tray of claim 1 wherein said rows and columns of pockets, said posts and said ribs are aligned diagonally along the horizontal plane of the sheet.

5. The packing tray of claim 1 wherein said rows and columns of pockets, said posts and said ribs are aligned in parallelism with the corresponding edges of the sheet.

6. A packing tray comprising a generally rectangular sheet defined by a stepped peripheral rim comprising two upper levels and two lower levels, a plurality of rows of full pockets in said sheet, the full pockets in said rows also forming transverse columns, each of said full pockets being substantially rectangular in the horizontal plane of the sheet and hemispherical in the vertical plane, a series of half-pockets along two edges of said sheet, said half-pockets having outer walls, the upper ends of which are common with the lower levels of said peripheral rim and a hollow post positioned in each of the corners between adjacent full pockets.

7. The packing tray of claim 6 wherein said full pockets are in diagonally stepped arrangement in the horizontal plane of the sheet, the stepped arrangement being such that the corresponding corners of each pocket are in substantially the same transverse plane.

8. The packing tray of claim 6 wherein each hollow post is diagonally elongated in the horizontal plane of the sheet.

9. The packing tray of claim 6 wherein each pocket is separated from the pocket adjacent thereto by a rib, said ribs being in a vertical plane substantially lower than the top level of said posts.

10. The packing tray of claim 6 wherein a diagonally-elongated recess is provided at the bottom of each pocket.

11. The packing tray of claim 6 wherein said full pockets are separated from each other by ribs extending to substantially the same vertical plane as the upper plane of said half-pockets.

12. A packing tray comprising a generally rectangular

sheet, a row of half-pockets at two adjacent peripheral edges of said sheet, a corner pocket between said rows of half-pockets, a plurality of rows of full pockets generally parallel with one of said rows of half-pockets, said full pockets being so arranged as to simultaneously form transverse columns of full pockets, said columns of full pockets being generally parallel with the other of said rows of half-pockets, hollow posts diagonally positioned between said full and half-pockets, and full pockets adjacent the other two peripheral edges of the tray, said half-pockets being defined by an upper plane substantially lower than the upper plane of said posts, and the full pockets adjacent the other two peripheral edges being defined at said other two edges by side walls extending up to substantially the same plane as the upper plane of said posts.

13. The packing tray of claim 12 wherein said full pockets are generally rectangular in the horizontal plane of the sheet and are defined by a pair of intersecting diagonal axes in said horizontal plane, one of said axes being longer than the other.

14. The packing tray of claim 12 wherein said full pockets are separated from each other by ribs extending to substantially the same vertical plane as the upper plane of said half-pockets.

15. The packing tray of claim 12 wherein said full pockets are defined by side walls which are diagonally inclined in the horizontal plane of the sheet, each side wall of each full pocket being diagonally inclined in a common transverse plane with the corresponding side walls of the other full pockets.

16. A packing tray comprising a generally rectangular sheet, a column of half-pockets at two opposite peripheral edges of said sheet, a plurality of columns of full pockets generally parallel with said columns of half-pockets, said full pockets being arranged to simultaneously form transverse rows of full pockets, the end rows of full pockets at opposite edges of the sheet having arcuate outer walls, a hollow post at each connecting corner between full pockets, said arcuate outer walls of said end rows of full pockets extending up to the top level of said posts, and said half-pockets being defined by outer walls having an upper plane substantially lower than the upper plane of said posts.

17. A pair of packing trays wherein one tray overlies the other and is rotated relative thereto on a vertical axis, each tray comprising a generally rectangular sheet, defined by a stepped peripheral rim comprising two upper levels and two lower levels, a plurality of rows of full pockets in said sheet, the full pockets in said rows also forming transverse columns, each of said full pockets being substantially rectangular in the horizontal plane of the sheet and hemispherical in the vertical plane, a series of half-pockets along two edges of said sheet, said half pockets having outer walls, the upper ends of which are common with the lower levels of said peripheral rim, a hollow post positioned in each of the corners between adjacent full pockets, each post of the lower tray supporting a full pocket of the upper tray, and the half-pockets of the lower tray being vertically spaced from the half-pockets of the upper tray.

18. A package comprising a packing case, a plurality of layers of packed articles within said packing case, each of said layers being defined by a pair of packing trays wherein one tray overlies and is rotated relative to the other, each tray comprising a generally rectangular sheet defined by stepped peripheral rim comprising two upper levels and two lower levels, a plurality of rows of full pockets in said sheet, the full pockets in said rows also forming transverse columns, each of said full pockets being substantially rectangular in the horizontal plane of the sheet and hemispherical in the vertical plane, a series of half-pockets along two edges of said sheet, a hollow post positioned in each of the corners between adjacent full pockets, the top levels of said posts being in substantially the same plane as the upper levels of said stepped peripheral rim, each post of the lower tray supporting a pocket of the upper tray and the half-pockets of the lower tray being vertically spaced from the half-pockets of the upper tray, and an article being positioned within each pocket of the lower tray.

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