May 9, 1944. C. LINDLEY, JR., ET AL 2,348,397

PACKING STRUCTURE AND METHOD OF PACKING

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Fig. 1

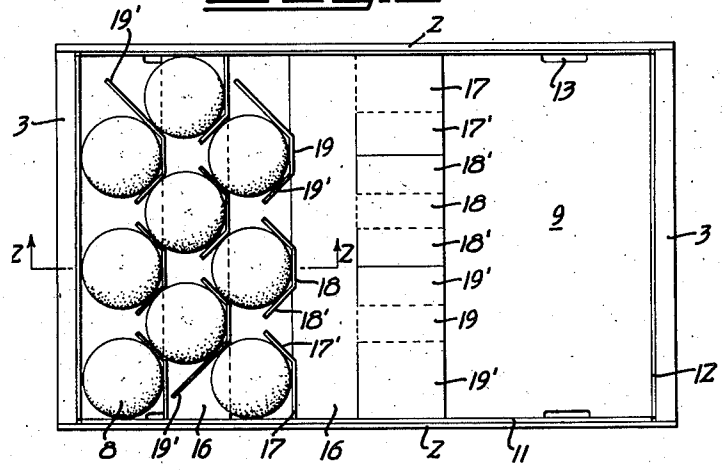


Fig. 3

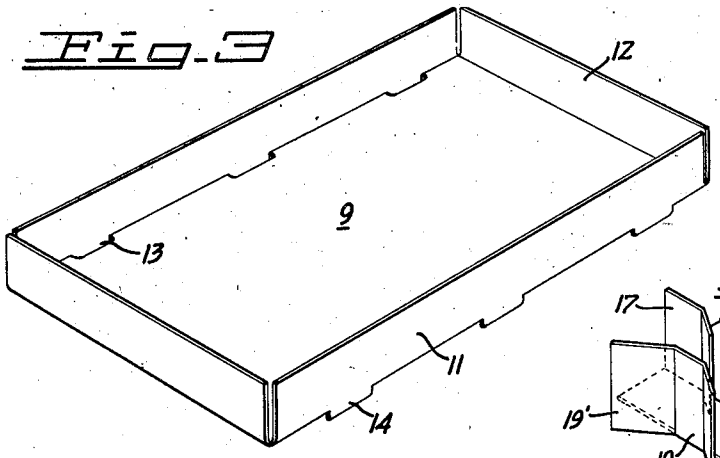


Fig. 4

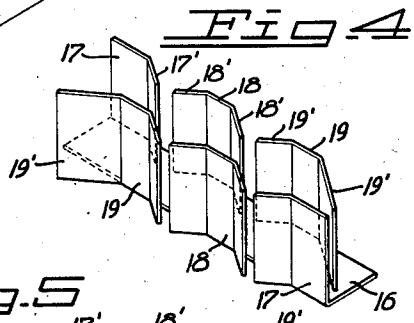


Fig. 5

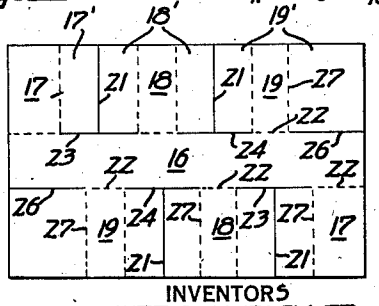
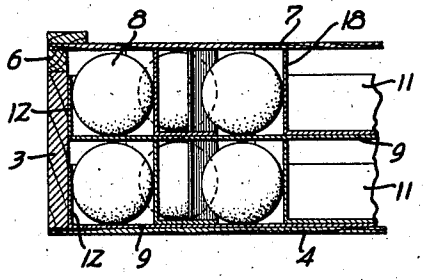


Fig. 2



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Fig. 6

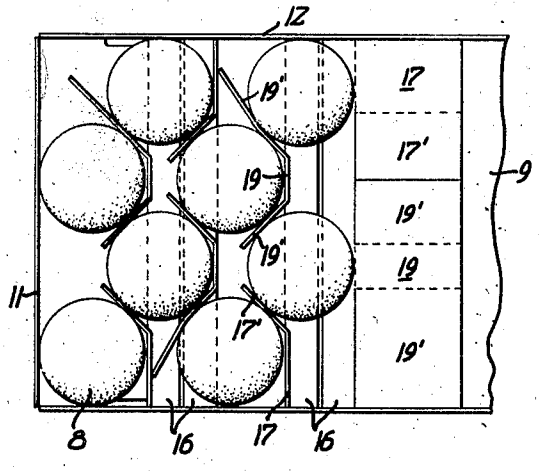


Fig. 7

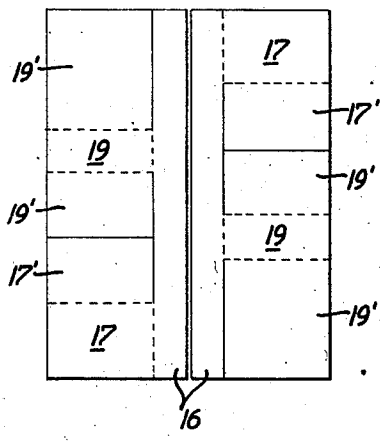


Fig. 8

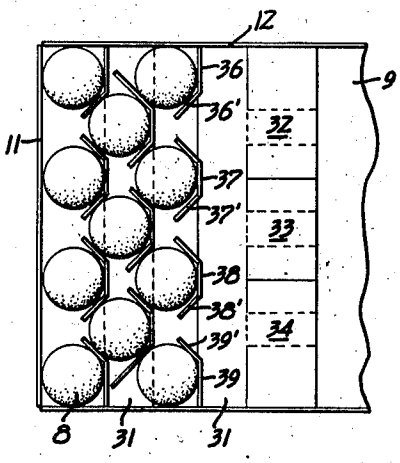


Fig. 9

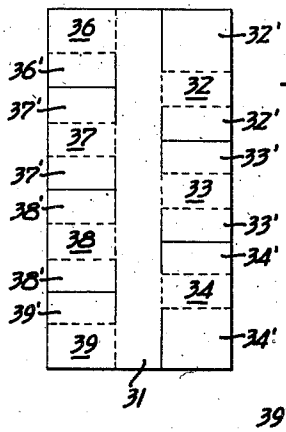
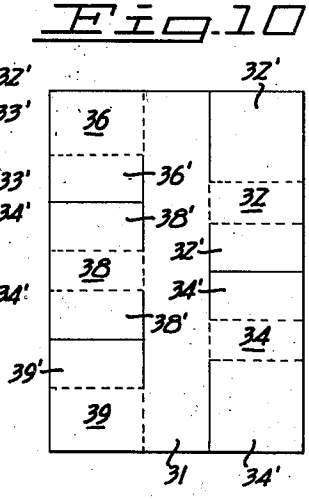


Fig. 10



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PACKING STRUCTURE AND METHOD OF PACKING

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Application May 29, 1940, Serial No. 337,820

2 Claims. (Cl. 206—46)

Our invention relates to the packing of articles for shipment; and more particularly to the packing of fruit, such as oranges.

It is among the objects of our invention to provide a packing structure which gives good protection for articles in a shipping container and insures safe carriage.

Another object is to provide a structure of the character described adapted to accommodate articles of rounded shape and of different size.

Another object is to provide a packing structure which conserves space in a shipping container and insures a firm pack with less likelihood of damage to the packed articles.

Still another object is to provide a packing structure embodying a simplified filler.

A further object is to provide improved means for retaining and separating layers of fillers within a shipping container.

A still further object is to provide an improved method of packing articles.

The invention possesses other objects and features of advantage, some of which, with the foregoing, will be set forth in the following description of our invention. It is to be understood that we do not limit ourselves to this disclosure of species of our invention, as we may adopt variant embodiments thereof within the scope of the claims.

Referring to the drawings:

Figure 1 is a plan view of a container with the lid removed to show the packing structure embodying our invention, certain of the fillers being omitted and one of the fillers being shown partially folded to illustrate the construction more clearly; and

Figure 2 is a fragmentary vertical sectional view of the same with the lid in position, taken in a plane indicated by the line 2—2 of Figure 1.

Figure 3 is a perspective view of one of the trays apart from the remaining structure.

Figure 4 is a perspective view of a folded filler. While the upstanding wall panels of the filler are shown with straight portions meeting at sharp angles, it is understood that actually the portions may be somewhat curved and meet at soft angles since all of the folding may not take place sharply about the vertical crease lines.

Figure 5 is a plan view of the filler blank.

Figures 6 to 10 illustrate modified forms of our filler.

In terms of broad inclusion, our packing structure embodies a filler having a base strip, and wall panels foldably connected to opposite edges of the strip and partially severed therefrom. In folded condition the wall panels extend upwardly from the base strip to provide dividers between the articles being packed, and the partially severed portions are bent along suitable score lines to provide a series of packing cells to accommodate articles of rounded shape, such as oranges. In the packed structure, the trough-shaped fillers are arranged in layers; the fillers in each layer being disposed to receive rows of the articles, and the fillers being spaced to receive other rows of the articles therebetween. Trays are also preferably provided for the filler layers in the container. Our invention also embodies an improved method of packing the articles.

In greater detail, and referring to the drawings, our packing structure comprises a shipping container or box of suitable material, such as wood, having side walls 2, end walls 3 and a bottom 4. Cleats 6 are preferably provided on the end walls to which lid 7 is nailed. These cleats elevate and provide openings along the top for air circulation, and the side boards are also preferably spaced somewhat from the bottom to provide similar openings along the lower edges.

The packed articles 8, such as oranges, are arranged in say two layers, and the oranges in the layers are arranged in rows of say three oranges each, as shown in Figures 1 and 2. The layers are preferably disposed in trays of fibrous sheet material each having a bottom 9 coextensive with the box bottom and having shallow side and end walls 11 and 12 folded upon crease lines along the edges of bottom 9. Ventilating openings 13 are preferably formed by tabs 14 cut out of the bottom. These tabs fold down when the walls are turned up, leaving the desired openings along the side edges of the bottom. In a two-layer pack the first tray rests directly on the box bottom, and the second tray is disposed above it to provide a bottom sheet for the overlying layer. Tabs 14 of the lower tray project downwardly in the openings along the lower edges of the box, allowing the tray to rest flatly on the box bottom. Openings 13 of the lower tray thus register with the box openings for ventilation through the tray, and the openings of the upper tray provide for ventilation past it.

The oranges in the rows are retained by fillers, each folded from a blank of fibrous sheet material cut and scored as illustrated in Figure 5. This blank comprises three sections, the intermediate section of which forms a base strip 16. The outer sections are each divided into three wall panels 17, 18 and 19 by transverse slits 21,

and are foldably connected to opposite edges of the base strip by score lines 22. The panels along a side of the base strip are of different width, and the panels along the opposite side are of similar width but arranged in reversely symmetrical order. Thus, panels 17 at diagonally opposed corners are narrower than panels 18 and 19, and intermediate panels 18 are narrower than corner panels 19. Slits 21 are arranged to stagger the panel edges at one side with those at the opposite side; the slits being preferably aligned with the centers of scores 22 at the opposite side.

Portions of each of these panels are also partially severed from the base strip by longitudinal slits 23, 24 and 26. Slits 23 and 24 intersect with the inner ends of transverse slits 21 at points substantially midway between their ends, and slits 26 extend inwardly from the ends of the blank. This slitted arrangement provides one wing portion 17' on panel 17; two wing portions 18' on panel 18; and two wing portions 19' on panel 19. The outer wing portion 19' which lies at the end of the blank is considerably wider than the others which are of substantially equal width. Score lines 27 are provided between the partially severed wing portions and the body portions of the panels.

Figure 4 shows the trough-shaped filler after the walls have been folded up from the base. After folding up the walls the wing portions of the panels thereof are bent chiefly along creases 27 so that the panel wings at one side extend outwardly of the base strip while the panel wings at the other side extend inwardly thereof. These panel wings assume their folded positions by pressure of the oranges against them when the structure is packed; and whereas the panel portions are shown straight and meeting at sharp angles, it is understood that all the bending may not actually take place at the score lines and that the panel portions may be somewhat curved and meet at soft angles.

Considering that a tray has been positioned on the bottom of the box, the method of packing comprises placing a row of oranges at one end of the box; folding up the wall panels along one edge of the filler base strip and positioning the filler thus folded against the first row; placing a second row of oranges on the base strip of the positioned filler; and then folding up the wall panels along the other edge of the base strip. This procedure is followed with other fillers and rows of oranges until a layer is completed, after which a second tray is inserted and filled.

It will be observed that panel wings 17', 18' and 19' are free to swing away from the direction of packing pressure, and are free to assume positions between the oranges, thus automatically forming packing cells for the fruit as the pack is built up. It is also to be noted that the foldable wings are free to assume varying positions of angularity, depending upon the size of the fruit, thus giving great flexibility. Furthermore, the arrangement of the panels and the associated wing portions readily accommodates articles of rounded shape, such as oranges, with a minimum of lost space and insures a firm pack.

Another feature of the sectional filler structure is that with varying fruit size it allows the packing of a greater or less number of rows to evenly fill up the box. This is not possible with a filler constructed of predetermined size to fit a box and having a definite number of packing cells. Our structure therefore not only shapes its own individual cells to fit the fruit, but also adapts the over-all length of the pack to fit the box.

As shown in Figure 2, the first row of articles rests directly upon the bottom of the tray; the second row rests upon the base strip of the first filler; while the third row again rests directly upon the tray bottom. Alternate rows of the articles thus function to hold the fillers down. Another feature shown in Figure 2 is that the filler walls extend above the tray walls and above the packed articles to provide support for the upper tray and for the lid 7 of the box. The fact that the wall panels are standing on edge and have the angularly disposed wing portions, gives these panels considerable supporting strength.

While we have described our packing structure in connection with fruits, such as oranges, it is understood that the structure may be used for packing electric lamps, golf balls and other articles; and is particularly well adapted for packing fragile articles of varying size and shape such as Christmas tree ornaments. It is also understood that corrugated fibreboard may be employed instead of solid material for the structural parts.

It is also understood that the particular number and arrangement of panels and wing portions in the filler units may be varied to accommodate different numbers of articles in the rows from that shown in Figure 1. Thus, by omitting the intermediate panels 18 a filler unit is provided for accommodating two articles in each row, as illustrated in Figures 6 and 7. It is further understood that the panels may be formed along one edge only of a base strip, so that a separate base strip is provided for each row of panels, as also shown in Figures 6 and 7. Such base strips may be glued to the tray or adapted to rest loosely on the tray bottom, the latter being preferred because it permits shifting the filler units when the pack is built up. When panels are provided on one edge only of a base strip the wing portions may be folded either inwardly over the base strip or outwardly from the edge of the base strip.

Figures 8 and 9 illustrate a filler construction for a pack in which there are four articles in one row and three articles in an adjacent row. The filler comprises a base strip 31 having panels 32, 33 and 34 foldably connected along one edge, and panels 36, 37, 38 and 39 foldably connected along the opposite edge. Panel 32 has wing portions 32', the outer wing being wider than the inner wing. Intermediate panel 33 has wing portions 33' of equal width; and panel 34 has wing portions 34' similar to that of panel 32. End panels 36 and 39 on the opposite edge are also alike, having single inner wing portions 36' and 39'. Intermediate panels 37 and 38 have wing portions 37' and 38' similar to those of panel 33 on the opposite side. In this case diagonally opposed panels are unlike and end panels on the same edge are alike.

If desired, panel 33 and one of the intermediate panels say 37 on the opposite side may be omitted for a pack having three articles in one row and two articles in an adjacent row. Figure 10 shows the blank for such a filler. Thus, by subtracting or adding intermediate panels to the fillers, the numbers of articles to be packed in the rows may be varied.

It will be seen that the fillers for equal numbers of articles in adjacent rows, such as the 3—3 pack of Figure 1, have panels which are reversely

symmetrical about a longitudinal medial line through the base strip; while fillers for unequal numbers of articles in adjacent rows, such as the 4–3 pack of Figure 8, have panels which are symmetrical about a transverse medial line through the base strip. In both cases, however, the fillers have a double wing panel adjacent an end of the base strip and a single wing panel adjacent the same end on the opposite edge. All of the fillers, either with panels along one or two edges, are characterized by panels having one or more wing portions foldably connected thereto and adapted to be disposed at varying angles to the panels, depending upon the shape and size of the articles, to provide packing cells.

We claim:

1. A packing structure comprising a container for articles packed in layers each of which layers includes a plurality of staggered intermeshing rows, a tray overlying each lower layer for supporting the next higher layer thereover and having wall portions foldable upwardly to lie against the adjacent walls of the container, and fillers providing cells for receiving the articles, the fillers comprising base strips underlying alternate rows of articles, a plurality of upwardly foldable cell wall panels upon the edges of the base strips, each panel having a main portion positioned for alinement with an article of a row upon one side thereof and with a space between adjacent articles of a row upon the opposite side thereof, and wing portions upon the main cell wall portions extending between the adjacent articles of adjacent rows at obtuse angles to the main wall portions, the erected cell wall panels being of a height sufficient to provide support for an overlying tray.

2. A packing structure comprising a container for articles packed in a plurality of rows in staggered intermeshing relation, fillers forming cells for receiving the articles and holding the same out of contact with each other, each filler comprising a base strip underlying a row of articles and provided with upwardly extending cell wall panels, each panel comprising a main wall portion positioned for alignment with an article upon one side thereof and for providing a spacer between adjacent articles upon the opposite side thereof, and wing portions extending laterally from the main wall portions and displaced by an article upon one side thereof into the spaces adjacent articles of the row upon the opposite side thereof at obtuse angles to the main wall portions of the panels.

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