United States Patent

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[54] CONTAINERS THAT ARE COMPACTLY NESTABLE WHEN EMPTY AND STACKABLE IN SPACED RELATION WHEN FULL

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[52] **U.S. Cl.** ..... **220/97 B**

[51] **Int. Cl.** **B65d 21/06,** B65d 1/24, B65d 1/36

[58] **Field of Search** ..... 220/97 B, 23.6, 21

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[57] **ABSTRACT**

A container that stacks compactly with like containers when empty and that stacks with them when filled in a way that protects the contents of each container. A facia rim continuous with and integrally formed to the side and end walls of the container at the top thereof is provided with a plurality of removable corner supports. Each corner supports comprises an adapter to engage with the bottom corners of a like container and comprises a horizontal member generally triangular in shape and having on its upper surface an inset generally vertical right angle wall, and having on its lower surface a series of tapered vertical projections, namely, a corner projection and two extreme projections of substantial length and two shorter intermediate projections, one between the corner projection and each extreme projection. Each facia rim has a corresponding series of receptacles, namely, a through opening at the corner to receive the corner projection, a through opening spaced from the corner to receive each extreme projections, and a dead end socket having an end bearing wall to receive the shorter projections so that they can rest in and upon it.

3 Claims, 11 Drawing Figures

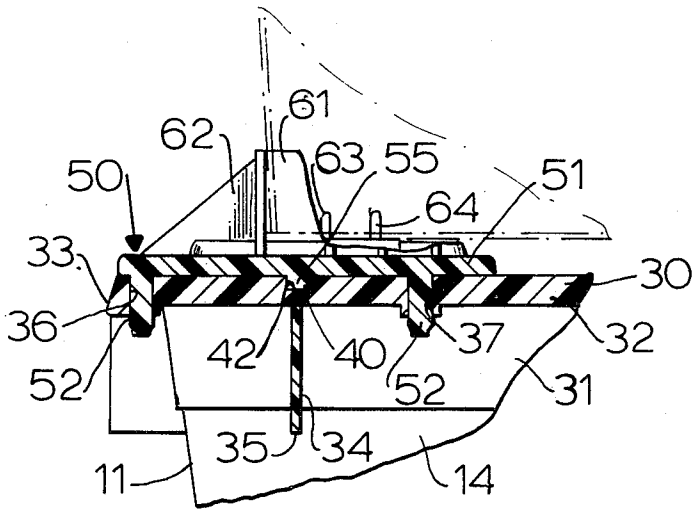
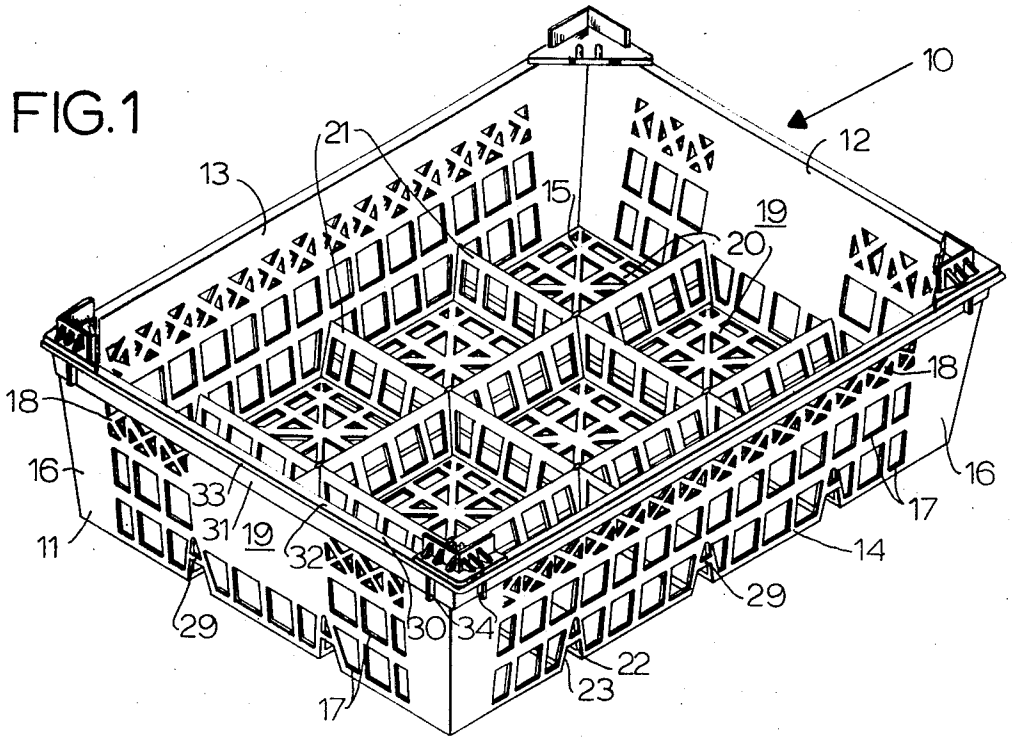


FIG. 1



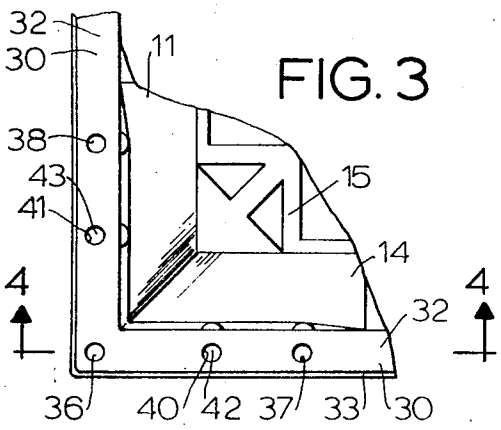


FIG. 3

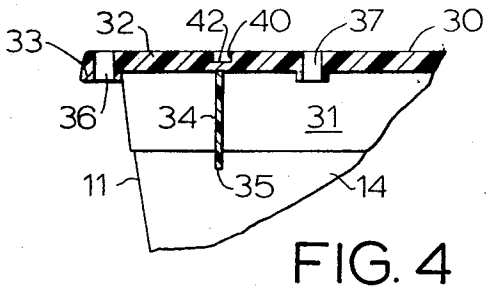


FIG. 4

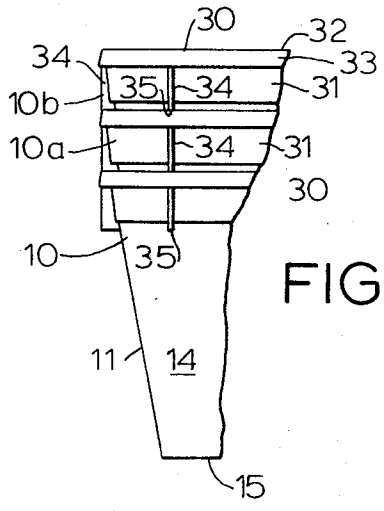


FIG. 2

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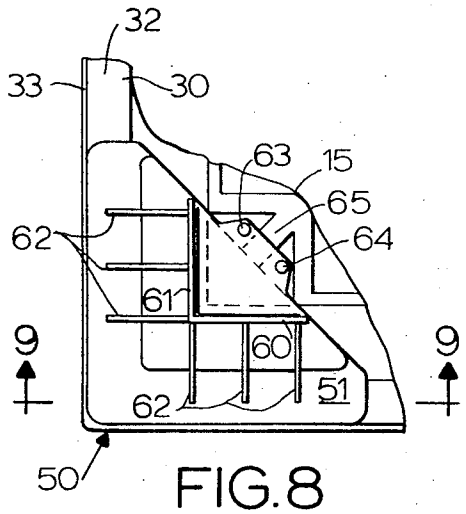


FIG. 8

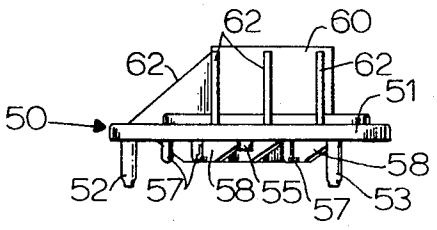


FIG. 6

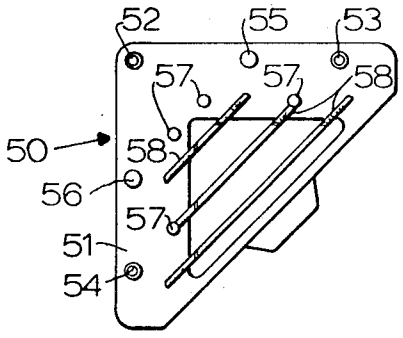


FIG. 7

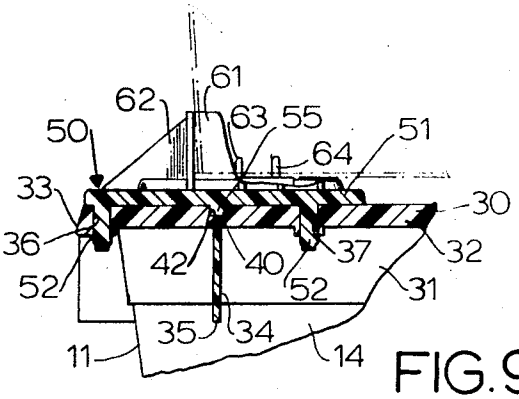
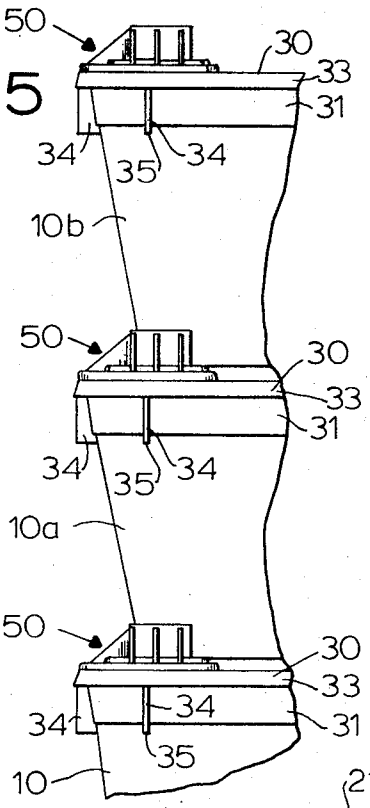


FIG. 9

FIG. 5



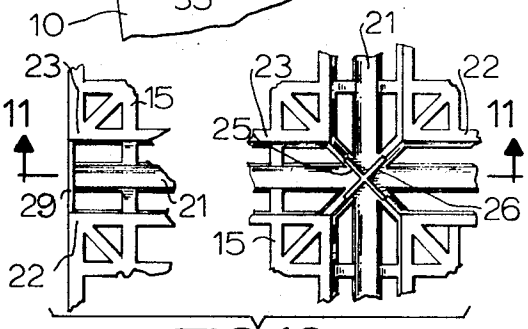


FIG. 10

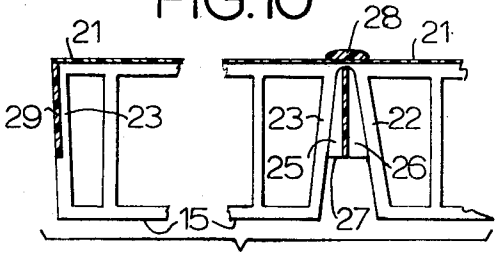


FIG. 11

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CONTAINERS THAT ARE COMPACTLY NESTABLE WHEN EMPTY AND STACKABLE IN SPACED RELATION WHEN FULL

BACKGROUND OF THE INVENTION

This invention relates to containers that are compactly nestable when empty and stackable in spaced relation when full.

The container is especially useful for shipping fresh fruit such as strawberries, blackberries, raspberries, blueberries, cherries, figs, peaches, tomatoes, and others that are frequently sold in baskets. Typically, these are sold in a standard 1-pint basket, usually made from plastic and formed with netlike perforate walls to give adequate access by air. The present invention relates to a larger container capable of carrying a plurality, for example a dozen, of the smaller baskets, thereby enabling the packing of the baskets without damage to the fruit and enabling the transport of the fruit with good aeration and without unwanted contact of the small baskets with each other. This type of basket has great advantages over shipping cartons made from corrugated board, where there is an inadequate amount of air circulation unless the carton is unduly weakened.

In the present invention, the shipping container is perforate, so that the walls are more open than closed and the fresh fruit is thereby given a longer shelf life; also, mold spoilage is reduced. There is visibility from all sides, and the containers and fruit can be cleaned by dipping. The shipping weight is reduced, and it is possible to get approximately 25 percent more fruit into a truck or shipping car than when cardboard cartons are used.

The present containers are compactly stackable when there is no fruit in them and also are stackable when fruit is in them, without damage to the fruit. The much more compact stackability of the empty containers is quite significant.

An important problem with such containers is to reconcile the adequate aeration of the fruit with adequate strength and protection of the containers from breakage, especially when the full containers are stacked on each other. There are many places at which such a container tends to be strained, and the present invention provides structure that gives support where that support is needed without losing the aeration of an open-work structure or requiring large amounts of extra material overall.

BRIEF SUMMARY OF THE INVENTION

The invention comprises a tray-like plastic compartmented container able to contain a plurality of small baskets on an open network type of base and having open network side walls and divider walls. At the upper corners, novel removable brackets or supports are provided, which may be put on or taken off. When they are not in place, the tray-like plastic compartmented containers can be stacked very compactly as empty containers. When put in place, as when the fruit in baskets is in the container, the containers can be stacked in spaced relation while protecting the contained fruit.

In the present invention the support members or brackets are generally triangular in shape and have five depending prongs. The prongs at the two extremities that go along the side edge of the container and the prong at the corner are relatively long. The container itself is provided with a facia rim that is continuous with and integrally formed with the container's side and end walls, and this rim is provided with three corresponding openings that extend all the way through to receive the three long prongs of the corner support members. In addition, however, the facia rim is provided with two additional sockets, which are not through openings but are dead end depressions with bottom bearing walls, and the corner support members are provided with two short prongs which extend only into the sockets and rest on the bearing walls. These prongs and sockets are located approximately midway between the corner receptible and prong and the end receptacle and prong, and they provide the very important advantage

of considerably strengthening the prongs in the corners where the weight bears. These shorter prongs and sockets are only about one-eighth of an inch long or deep, as distinguished from the longer prongs, which are about three-eighths inch long. These short prongs and bearing sockets serve to distribute the shock, and it has been found that they have solved the breakage problems that were encountered before they were installed, by relieving the pressure on the corner prong. The new prong-socket combination has doubled the amount of pressure that the container can take without damage.

Other objects and advantages of the invention will appear from the following description of the preferred embodiment.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. **1** is a view in perspective of a container embodying the principles of the invention. Two corner support members are shown installed in solid lines, whereas in the other two corners they are shown in broken lines, to indicate their removability.

FIG. **2** is a fragmentary view in side elevation of three containers of the type of FIG. **1** stacked compactly for shipping them empty.

FIG. **3** is a top plan enlarged fragmentary view of one corner portion of the container of FIG. **1** with the support clip removed to show the receptacles and sockets that receive the prongs of the support member.

FIG. **4** is a view in section taken along the line **4—4** in FIG. **3**.

FIG. **5** is a view similar to FIG. **2** showing three containers, stacked as when fruit is in them to space the containers above each other.

FIG. **6** is a view in side elevation of the support clip.

FIG. **7** is a bottom plan view of the corner clip.

FIG. **8** is a view similar to FIG. **3** with the support clip in place.

FIG. **9** is a view in section taken along the line **9—9** in FIG. **8**, with a portion of another like container shown in broken lines.

FIG. **10** is a fragmentary enlarged bottom plan view of a portion of the container.

FIG. **11** is a view in section taken along the line **11—11** in FIG. **10**.

DESCRIPTION OF A PREFERRED EMBODIMENT

A container **10** embodying the principles of the invention is shown in FIG. **1**. It has perforate end walls **11** and **12** and perforate side walls **13** and **14**, all of which slope outwardly from a bottom wall **15** which is likewise perforate, to enable the compact stacking shown in FIG. **2**. Each wall **11**, **12**, **13**, and **14** may have solid end portions **16** to increase strength at the corners and otherwise the wall may be mostly perforate, the perforated area being greater than the plastic area in preferred forms. There may be two lower rows **17** of square or rectangular perforation and an upper row of diagonal ribbing **18** to add strength and there may be solid end upper portions **19** for the same purpose.

Preferably, the bottom wall **15**, which is also perforate with both rectilinear and diagonal ribs, is subdivided into a plurality of compartments **20**, each to receive a smaller basket such as a 1-pint fruit basket for strawberries, blueberries, etc. The subdivision into the compartments **20** is preferably provided by lateral and longitudinal rows of V-shaped partitions **21** which extend up a short distance from the bottom wall **15**. The partitions **21** comprise two sloping perforate portions **22** and **23** both preferably made up of vertical ribs between horizontal extremities with large perforations between the ribs. The V-shape helps to enable compact stacking, but to avoid over-compact stacking with resultant damage to the containers and also inconvenience in separating them from each other, a special reinforcement member **24** is provided at each intersection of the partitions **22** and **23**, this reinforcement member **24** comprising reinforcing ribs **25** and **26** extending diagonally

across the corners from the top down and end a little more than halfway down at an edge 27. Also, at the top of each intersection a round pad 28 is molded, rising above the partitions 22 and 23 so that when the containers 10 are stacked, the edge 27 of the reinforcement member 24 rests on the pad 28, and this supports the upper container 10*a* or 10*b* without placing stress on the weaker remainder of the V-shaped channel portions 21.

In addition, the present invention provides cross supports 29 across the inverted V-shaped gap between the partitions 22 and 23, so that along the outside edge they resemble the letter A. These are at the same level as the edges 27, and they add strength where it is needed at the separation between partitions along the outer edges.

Support is also provided by a facia rim 30 which surrounds the upper ends of the walls 11, 12, 13, and 14. The rim 30 preferably comprises a thickened vertical wall portion 31, a thick horizontal portion 32, and a depending portion 33, giving the rim 30 a channel shape for greater strength. Near the corners, depending ribs 34 extend below the channel portions to about the same height as the edges 27 of the reinforcing members so that when the containers 10, 10*a*, 10*b* are stacked compactly, the lower edges 35 of these ribs 34 rest on the horizontal portion 32, and these eight engagements plus those of the members 24 with the pads 28 are preferably the only areas of contact between an upper container 10*a* and a lower container 10. Thus strength is conserved.

At each corner (FIGS. 3 and 4) there is a through opening 36 through the horizontal portion 32 of the facia rim 30. And spaced outwardly from the opening 30 along each of the two horizontal converging rim portions 32 that meet at the corner are additional through openings 37 and 38. A feature of the present invention is that approximately halfway between the corner opening 36 and each of these two openings 37 and 38, though they may be somewhat nearer the openings at the extremities, are a pair of sockets 40 and 41 formed in the plastic by depressing the plastic so that there is a solid bottom wall 42, 43 instead of a through opening. Each of these sockets 40, 41 has its bottom wall 42, 43 thick enough to provide bearing strength. These openings 36, 37, 38 and sockets 40 and 41 are adapted to receive depending pins from the corner members 50.

Each corner member 50 (FIGS. 6 and 7) is identical to the others, having a horizontal portion 51 from which the projections or pins 52, 53, 54, 55 and 56 depend, as well as auxiliary gripping projections 57 that engage the edge surface of the rim portion 31 and aid in stability of the corner member 50 in relation to the rim 30 of the lower container 10. The lower surface of the corner member 50 may also have strengthening ribs 58 to aid in supporting the trays 10*a* and 10*b* which are stacked above it. Corner retention for the tray 10*a* above is provided by two generally vertical walls 60 and 61 that preferably slope at the same angle as the walls 11, 12, 13, and 14. These walls may be reinforced by ribs 62. A pair of projections 63 and 64 on the upper surface of the corner member 50 serve to engage opposite edges of a rib 65 (See FIG. 8) of a superimposed container. These serve to add further stability to the corner, and they give an important hold by the corner of the member on the lower corner of each container and thereby aid in locking each layer of containers to the ones below. In other words, the walls 60 and 61 hold each upper container 10*a* against outward movement in relation to the corner member and the projections 63 and 64 being locked to the rib 65 of the upper container 10*a* hold each upper container 10*a* against lateral movement in either direction in relation to the corner member.

The depending projections 52, 53, 54, 55, and 56 from the corner member 50 are of two types. The corner projection 52 and the projections 53 and 54 at the extremities are longer, preferably about three-eighths of an inch long, and are tapered cylindrical pins that enter and pass through the openings 36, 37, and 38. They taper to a size larger than the openings 36, 37, 38 to provide a desired interference fit. In addition, there are the important intermediate projections 55 and 56 which are short supporting studs that extend down into the sockets 40 and 41 and engage the base wall 42, 43 of each socket. These projections 55 and 56 cooperate with the sockets 40 and 41 to provide additional lateral stability and additional bearing strength. In fact, it has been found that a basket 10 could withstand only 900 pounds stacked weight before breaking in a structure where the corner members 50 did not have the short projections 55 and 56 and the rim 30 did not have the sockets 40 and 41. When a basket of identical construction had these sockets 40, 41 and pins 55, 56, it could then withstand a weight of 1,800 pounds before collapsing. This additional strength means that stacking can be carried much higher and that the full space of the transporting truck can be used more efficiently.

To those skilled in the art to which this invention relates, many changes in construction and widely differing embodiments and applications of the invention will suggest themselves without departing from the spirit and scope of the invention. The disclosures and the description herein are purely illustrative and are not intended to be in any sense limiting.

I claim:

1. A container that stacks compactly with like containers when empty and that stacks with them when filled in a way that protects the contents of each container, each container having side walls, end walls, and a bottom integrally formed together, a facia rim continuous with and integrally formed to said side walls and end walls at the top thereof, a plurality of freely removable corner supports, means for securing said corner supports to said facia rim, and a plurality of integral divider walls, each said corner support comprising an adapter to engage with the bottom corner of the side walls, end walls, and a bottom of a like container set thereon, each adapter having mating means on its under side for joining the same to the corner of the supporting container,

each said corner support comprising a horizontal portion generally triangular in shape and having an inset generally vertical upstanding wall adapted to fit a bottom corner of a like container, said side walls, end walls, and said bottom, said container being characterized by

each said corner support having a series of tapered projections depending perpendicularly down from said horizontal section and comprising a corner projection and two extreme projections, these three projections being of substantial length, and two shorter intermediate projections, one between the corner projection and each extreme projection, and

each corner portion of said container having along its said facia rim a series of receptacles, namely, a through opening at the corner to receive the corner projection, two through openings along said facia rim, each spaced from the corner, to receive the extreme projections, and a pair of dead end sockets each approximately midway between said corner projection and an extreme projection and having an end bearing wall to receive a said shorter projection so that the shorter projection can rest upon it, thereby strengthening the stacking strength of said container.

2. A container comprising:

side walls, end walls, and a bottom formed integrally,

a facia rim continuous with and integrally formed to said side walls and end walls at the top thereof,

a plurality of corner supports, and

mounting means for removably affixing said corner supports to said facia rim,

each of said corner supports comprising an angle section adapted to fit a bottom corner of said side walls, end walls, and said bottom,

said mounting means including three long projections depending from said corner support and three through openings defined in said facia rim, one at the corner, one atop a side wall near the corner, and one atop an end wall near the corner, each said opening being adapted to receive a said projection,

said mounting means also including two short projections, each located approximately midway between the corner projection and one of the other long projections, and a matching dead end socket between said corner opening and each of the other said openings, each said socket having a bearing bottom wall supporting said short projection and strengthening the stacking strength of said container.

3. A container as defined in claim 2 wherein there are divider walls at the bottom, some extending parallel to the side walls and some parallel to the end walls and said side walls, end walls, and divider walls slope to enable nesting of a plurality of said containers, the intersection of said divider walls defining the corners of a pyramidal volume with its apex at the point where the tops of said divider walls intersect, a cap over each intersection and a support structure provided in said volume, said structure being affixed to said divider walls at said apex and at the diagonally opposed corners, and having a lower edge adapted to rest on the cap of a lower like container, then also being a reinforcing rib across said divider walls level with said lower edge along said end and side walls.

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