

Filed Aug. 21, 1967

FOOD CONTAINER

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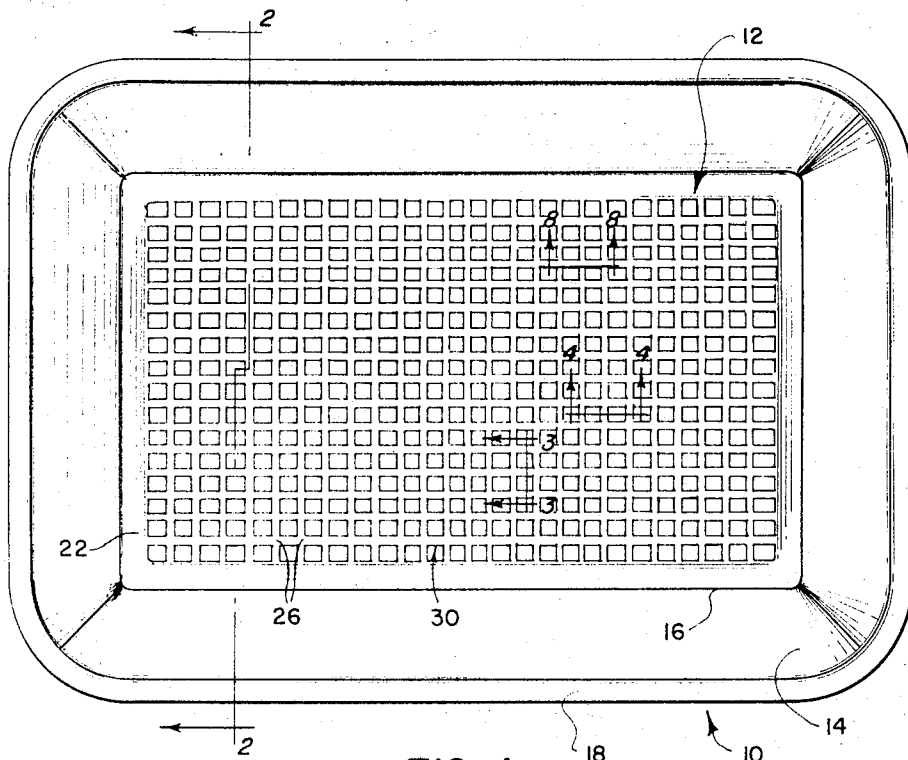


FIG. 1

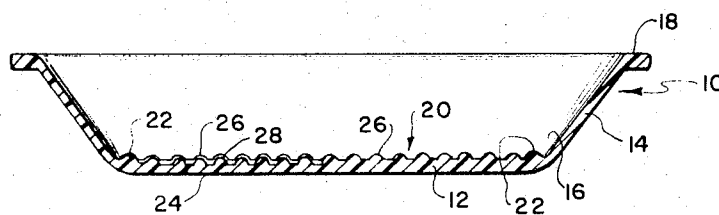


FIG. 2

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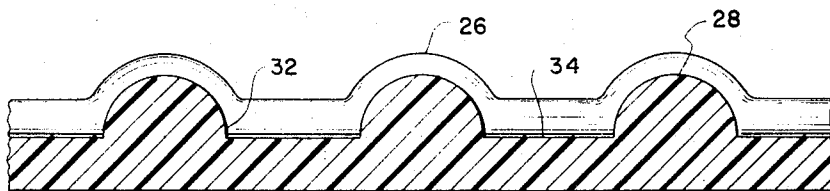


FIG. 3

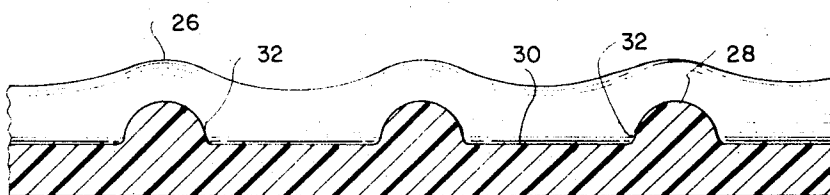


FIG. 4

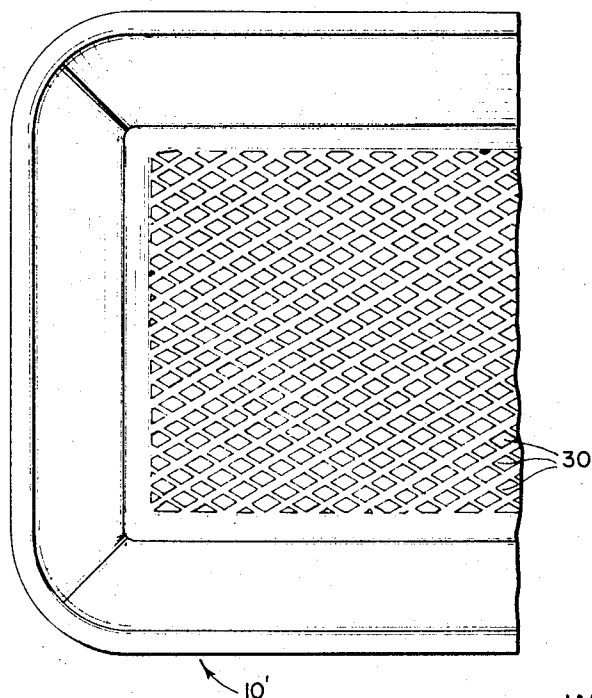


FIG. 5

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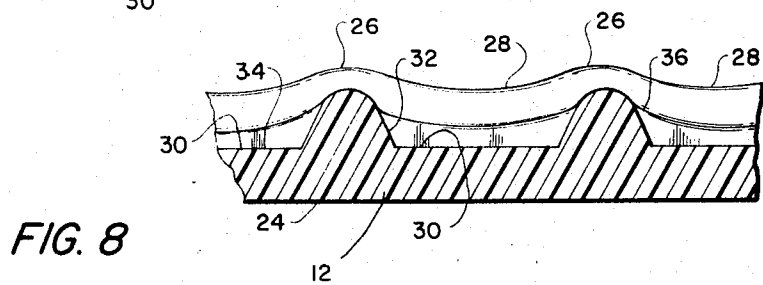
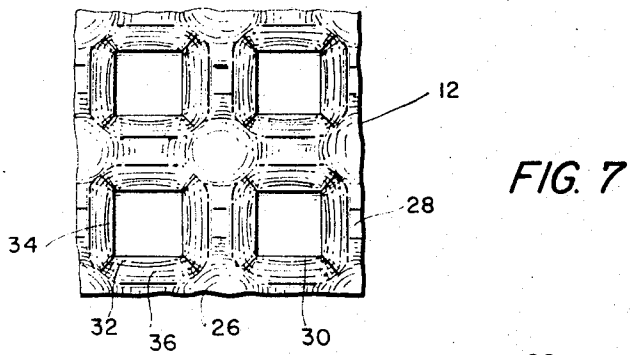
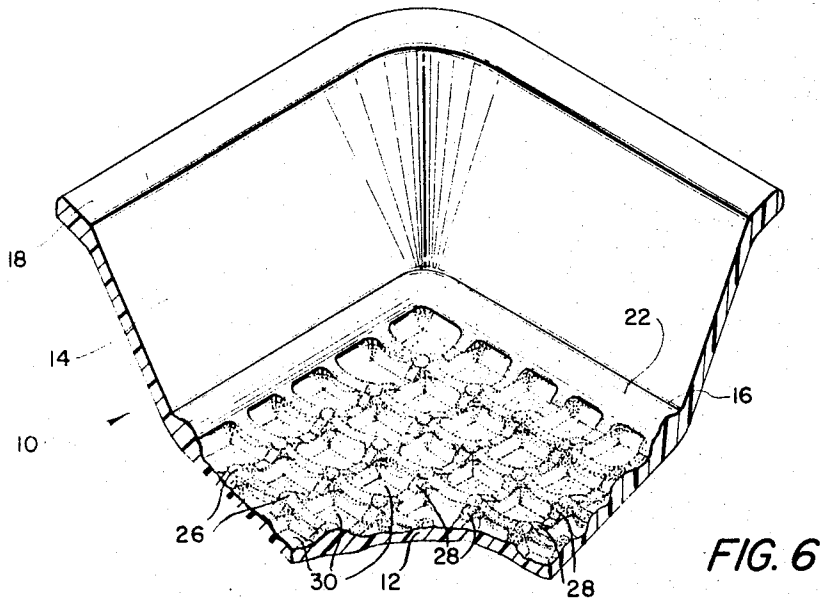
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FOOD CONTAINER

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Filed Aug. 21, 1967, Ser. No. 662,053

Int. Cl. B65d 1/48; B65f 25/06

U.S. Cl. 229—2.5

7 Claims

ABSTRACT OF THE DISCLOSURE

The present disclosure relates to a molded foamed polystyrene food tray for the packaging of liquid exuding foods, which tray has a reenforcing peripheral bead extending upwardly from the bottom thereof, a thickened bottom for denesting, and a particular bottom configuration to both retain exuded liquid and provide air circulation under the packaged food product. The particular bottom section accomplishing these results has upwardly upstanding nubs which are located at the corners of polygonal depressions, the polygonal depressions serving to retain the exuded liquid, and being separated from adjacent depressions by saddle-shaped rib portions.

The present invention relates to a food container, and, more particularly, to a molded and nestable foamed plastic food tray to hold meats and other liquid exuding materials.

Containers made of molded pulp or paper board are customarily used in most retail food markets today for packaging fresh meats, poultry, fish, and other liquid exuding commodities. These containers are usually in the form of a shallow generally rectangular tray, or an oval shaped tray and also are generally used with a transparent covering sheet of cellophane or polyethylene which may be wrapped around the tray and sealed around the bottom thereof to form a complete package. Such containers present a highly attractive display while providing adequate protection during the sale and temporary storage of the packaged food stuff, particularly for naturally juicy fresh poultry and the like, from which some blood or water may exude.

However, in spite of the many advantages of such paper product trays, particularly the molded pulp trays, some users and purchasers have indicated a preference for packaging trays formed of a nonabsorbent medium from which there may be a lesser problem of removal of frozen foods therefrom. Accordingly, in recent years certain plastic trays have appeared on the market in spite of their higher cost and inferior strength properties. Beside the possible advantage of frozen release, these plastic trays have had the added feature of never becoming soggy, whereas under extreme conditions the paper product trays may become soggy.

In addition to the aforementioned disadvantages of poor strength and higher cost, the plastic trays have not in general had adequate moisture retention properties. In addition, such plastic trays have had a tendency to inhibit circulation of air to the meat packaged therein which, in general, causes the meat to turn an unattractive brownish color; in other words, the plastic trays inhibit "breathing," which is essential to maintaining good meat color. Discoloration of the meat will result in customer complaints and/or rendering the packaged meat unsaleable.

It is, according, an object of the present invention to obviate the deficiencies of the prior art, such as indicated above.

It is another object of the present invention to provide a foamed plastic food packaging tray which meets the desired criteria for such a product.

It is another object of the present invention to provide a molded and nestable foamed plastic food tray which may be easily denested.

It is another object of the present invention to provide a foamed plastic food tray having greater strength than that normally available in such products.

It is another object of the present invention to provide a foamed plastic food tray for the packaging of liquid exuding materials which, in spite of the natural hydrophobic nature of the material, is capable of retaining such exuded liquid therein, and without itself becoming wetted or weakened.

It is another object of the present invention to provide a foamed plastic food container from which frozen food may be stripped without difficulty.

It is another object of the present invention to provide a foamed plastic food container which permits breathing of the food supported therein and thereby inhibits discoloration of the so packaged food.

These and other objects and the nature and advantages of the instant invention will be apparent from the following descriptions taken in conjunction with the accompanying drawings wherein:

FIG. 1 is a plan view of a food container in accordance with the present invention;

FIG. 2 is a section taken along line 2—2 of FIG. 1;

FIG. 3 is a section taken along lines 3—3 of FIG. 1;

FIG. 4 is a section taken along lines 4—4 of FIG. 1;

FIG. 5 is a partially broken away plan view of another embodiment of the present invention;

FIG. 6 is a partially broken away perspective of the container of FIG. 1;

FIG. 7 is a detail of the bottom structure of the container of FIG. 1; and

FIG. 8 is a section taken along line 8—8 of FIG. 1.

As illustrated in the drawings, a food container 10 in accordance with the present invention, shown in the form of a generally rectangular tray, comprises a bottom wall 12 and an upstanding side wall 14 which extends generally upwardly and outwardly from the periphery 16 of the bottom wall 12. Since the tray 10 as illustrated has a rectangular shape, the side wall 14 exists as four generally planar portions extending from each edge of the rectangular bottom 12, and four generally radial or quarter-conical portions which connect the planar portions, all of which together form the annular upwardly and outwardly extending side wall 14. The side wall preferably terminates in a generally outwardly extending peripheral lip or flange 18. Such lip or flange preferably extends only a very short distance beyond the side wall 14, and in fact may be completely eliminated, if desired. If present, however, it is performed to provide the lip 18 with substantial thickness to give the tray additional rigidity and strength.

As can be seen, particularly from FIG. 2, the bottom wall 12 has a materially greater thickness than the side wall 14. This greater thickness accomplishes three primary results. Thus, in the first place, the greater bottom thickness strengthens the tray; secondly, it permits the formation of depressions in the upper surface 20 of the bottom wall 12, which depressions are discussed below, without causing an undue reduction of thickness in the bottom wall below the depressions; and thirdly, the greater thickness of the bottom wall 12 provides a denesting feature so that after the trays have been stacked in one another for shipping, they may be easily separated or denested prior to their use without having become tightly interlocked.

The tray 10, in order to provide greater flexible strength and inhibit the tendency to rupture inherent in certain foam plastic materials, is provided with an upstanding bead 22 projecting from the top surface 20 of the bottom wall 12 which bead 22 extends annularly around the

bottom wall 12. The bead 22 is located adjacent and partially over the zone 16 of merger of the bottom wall 12 and the side wall 14.

As pointed out above, the bottom wall 12 has an upper surface 20 which has a relatively complex configuration. The bottom wall 12 has, on the other hand, a substantially flat bottom surface 24, upon which the tray 10 normally rests.

The upper surface 20 of the bottom wall 12 is provided with a number of upwardly projecting nubs 26. These nubs are separated from one another by saddle-like separation portions 28. In turn, the nubs 26 and the separating portions 28 form series of vertically undulating ribs extending across the bottom wall 12 and projecting upwardly therefrom. As can be seen best from FIGS 1 and 7, the upstanding vertically undulating ribs extend in two directions to form a grid-like or "waffle-like" pattern. The upwardly projecting nubs 26 are located where the ribs cross one another.

Located between the vertically undulating upwardly projecting ribs are a plurality of downwardly extending generally polygonally shaped depressions 30. Adjacent depressions 30 are separated from one another by the saddle-like rib portions 28, and those depressions 30 located diagonally from one another are separated by the upwardly projecting nubs 26.

As can best be seen in FIG. 6, a section taken adjacent one of the vertically undulating ribs, each depression 30 has relatively straight side walls 32 extending upwardly for a short distance from the flat bottom surface 34 of each depression; however, once above such flat side wall portions 32, the ribs extend upwardly with curved wall portions 36 which contribute to the saddle-like shape of the separating portions 28. FIGS. 3 and 4, which correspond to sections taken through the centers of depressions 30 and also through the lowest point of the saddle portions 28 of the ribs separating the depressions 30, show that the flat side wall portions 32 are very small below the lowest point of the saddle 28 and do not extend upwardly to the height at which they are apparent in FIG. 6.

A comparison of FIGS 3 and 4 also show that the vertically undulating ribs extending in one direction need not be the same height and thickness as the vertically undulating ribs extending in the other direction.

As pointed out above, the tray 10 may be of any desired shape although the rectangular shape is shown. Where the rectangular tray 10 is used, it is desirable to dispose the vertically undulating ribs parallel to the side walls of the container as shown in FIG. 1, i.e., at right angles. This provides rectangular depressions 30. It is also preferable to space the vertically undulating ribs extending in both directions equal distance from one another so that the depressions 30 are square as shown in FIG. 1. An alternate configuration is shown in FIG. 5 wherein the vertically undulating ribs are disposed at an angle other than 90° to the sides of the tray 10'. Here the depressions 30' are diamond shaped.

While water retaining depressions in meat trays have been known in the prior art, these have been used in connection with trays formed of hydrophilic material, namely molded pulp. Thus, while some degree of physical retention of water was relied on in meat trays of the prior art formed of molded pulp, because of the hydrophilic nature of the material, the exuded liquid retained physically in the depressions was capable of wetting the sides of the depressions thereby forming a concave meniscus which had a tendency to retain the liquid in the depressions. In the present invention, on the other hand, the tray is formed of a hydrophobic material, namely plastic (preferably polystyrene) foam which has a closed cellular structure. Water flowing into the depressions 30 forms a convex meniscus. However it has surprisingly been found that water is retained within the depressions 30, if of proper size, in spite of that the surface of the

polystyrene is not wetted and the meniscus formed is convex.

The optimum area of the surface 34 of the depressions 30 is approximately $\frac{1}{4}$ of a square inch; thus, where the depressions 30 are square as in FIG. 1, their dimensions are preferably $\frac{1}{8}$ " by $\frac{1}{8}$ ". These dimensions may vary by about 15%. The ribs also have a width of about $\frac{1}{8}$ " and their width also may vary by about 15%. The distance from the bottom of a depression 30, i.e., surface 34, to the top of a nub 26 is preferably $\frac{3}{32}$ ". The distance from the bottom of a depression 30 to the top of the lowest point of a saddle-like separation 28 is about $\frac{1}{16}$ ". These dimensions also may vary as much as 15%.

It is desirable that the projecting nubs 26 constitute only about 15-25% of the total horizontal surface area of the bottom wall 12; this insures adequate circulation of air beneath the meat which is supported by such nubs 26. The depressions 30 should constitute about 25-40% of the total horizontal surface area of the bottom wall 12 to provide the desired degree of exuded liquid retention.

A tray in accordance with the present invention is preferably formed by a two step molding process which comprises first vacuum thermoforming a sheet of plastic foam and then die pressing the so formed tray between matched dies which imparts the pattern to the inner surface of the bottom wall 12 and compresses the side wall 14. The tray could be formed by other known molding procedures.

As pointed out above the tray 10 is preferably formed of polystyrene foam although such a tray may be formed of any plastic foam material, such as a foamed polyolefin, e.g., polyethylene or polypropylene. Polystyrene is preferred because it is inexpensive and readily available or producible in the form of foam sheeting.

It will be obvious to those skilled in the art that various changes may be made without departing from the scope of the invention and the invention is not to be considered limited to what is shown in the drawings and described in the specification.

What is claimed is:

1. A molded and nestable food container for the packaging of meat, poultry, fish and other liquid exuding materials comprising:
 - a tray of foamed plastic material, the surface of which has a natural hydrophobic character,
 - said tray having a bottom wall and an annular upwardly and outwardly extending side wall merging with the periphery of said bottom wall, said side wall terminating in a generally outwardly extending peripheral lip,
 - said tray having denesting means wherein said bottom wall is materially thicker than said side wall,
 - said tray having reinforcing means comprising an upstanding bead projecting upwardly from said bottom wall adjacent the zone of merger of said bottom wall and side wall and extending annularly about said bottom wall,
 - said bottom wall having a substantially flat bottom surface and an upper surface lying within said upstanding annular bead provided with a first plurality of vertically undulating ribs projecting upwardly from the plane of said bottom wall, the upper surface of said bottom wall being provided with a second plurality of vertically undulating ribs projecting upwardly and extending at an angle to said first plurality of vertically undulating ribs, said ribs thereby crossing and defining therebetween a plurality of liquid retaining essentially polygonal depressions, and wherein said undulating ribs cross one another at their respective high points to provide upstanding nubs which are separated from one another by the lower portions of said undulating ribs, said undulating rib lower portions defining saddle-like separations between adjacent depressions.
2. A container in accordance with claim 1 wherein said

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depressions have straight side walls at the lower portions thereof.

3. A container in accordance with claim 1 wherein said second plurality of undulating ribs is disposed at right angles to said first plurality of undulating ribs to provide said depressions with a rectangular configuration.

4. A container in accordance with claim 3 wherein said ribs are spaced equal distance apart to provide said rectangular depressions with a square configuration.

5. A container in accordance with claim 1 wherein said tray is rectangular.

6. A container in accordance with claim 1 wherein said depressions are diamond shaped.

7. A container in accordance with claim 1 wherein said foamed plastic material consists essentially of cellular polystyrene.

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U.S. Cl. X.R.

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