United States Patent

Reifers

[15] **3,700,096**

[45] **Dec. 24, 1972**

[54] FOOD PACKAGING TRAY

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[22] Filed: **March 30, 1970**

[21] Appl. No.: **23,776**

[52] **U.S. Cl.** .....**206/45.33,** 206/45.31, 206/46 F, 220/72, 229/2.5

[51] **Int. Cl.** **B65d 65/16**

[58] **Field of Search** .....229/2.5; 220/72, 62; 206/45.33, 46 F

[56] **References Cited**

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Assistant Examiner—Stephen P. Garbe
Attorney—Karl W. Flocks

[57] **ABSTRACT**

A tray of molded pulp or the like is provided for the packaging of meat, poultry and fish in conjunction with an overwrapped plastic film. The tray is constructed with a corrugated series of bowed portions projecting convexly toward the interior of the tray along the edge joining the bottom of the tray to the four side walls.

11 Claims, 16 Drawing Figures

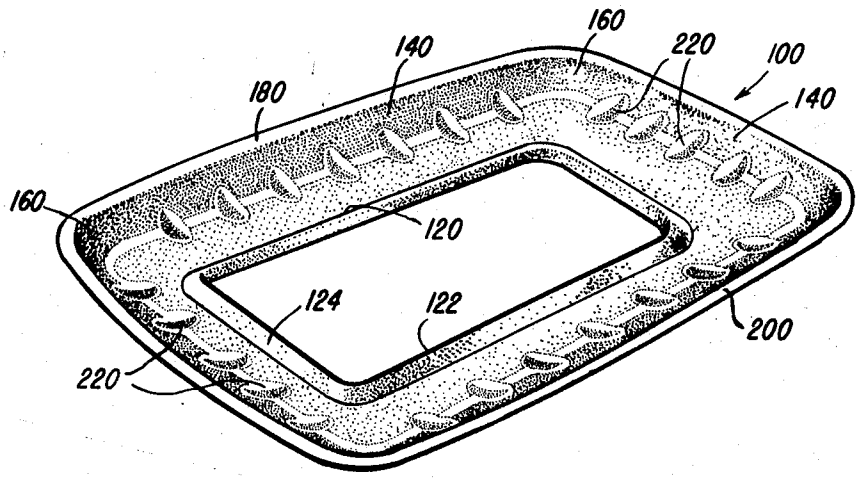


FIG. 1

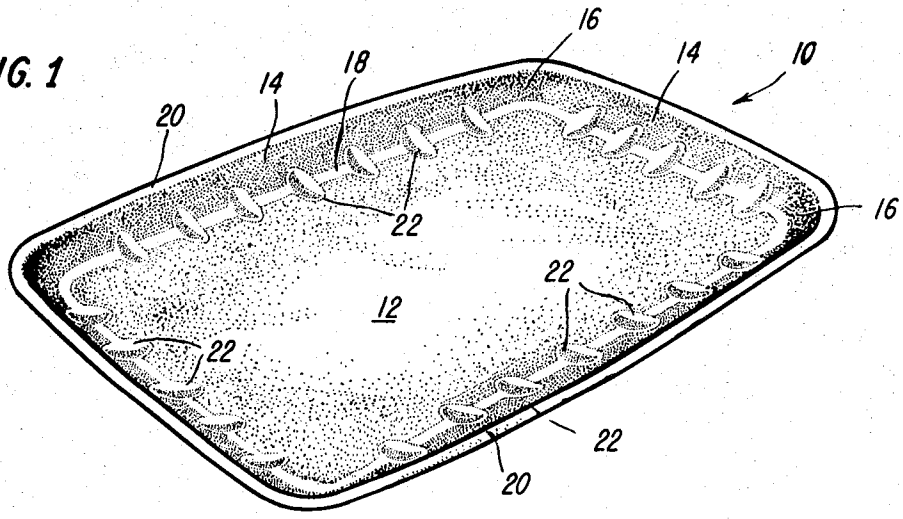


FIG. 2

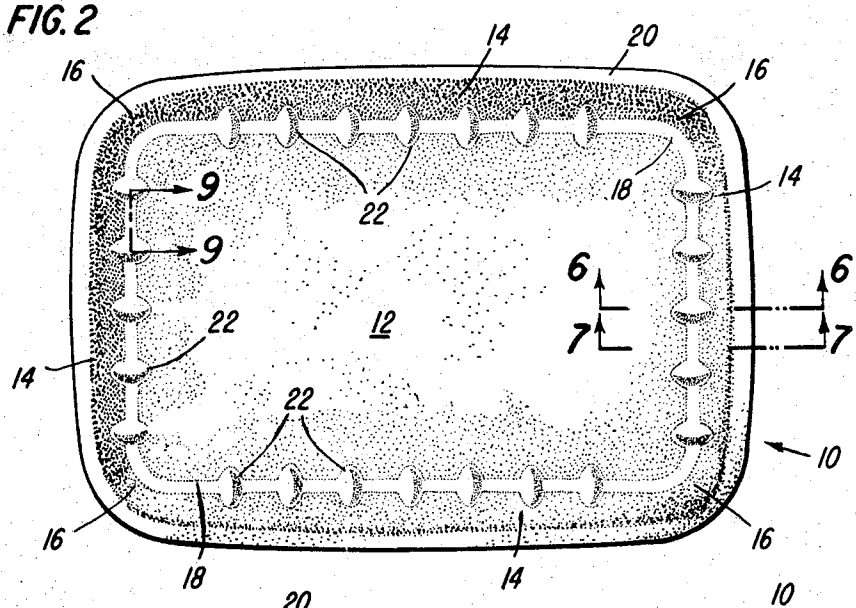


FIG. 3

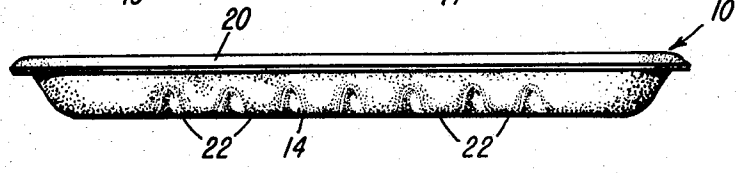
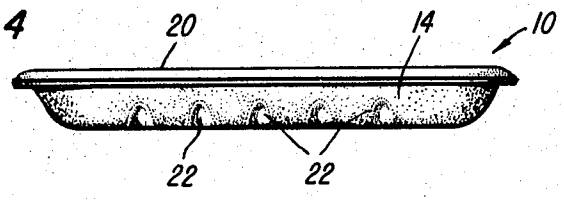


FIG. 4



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FIG. 5

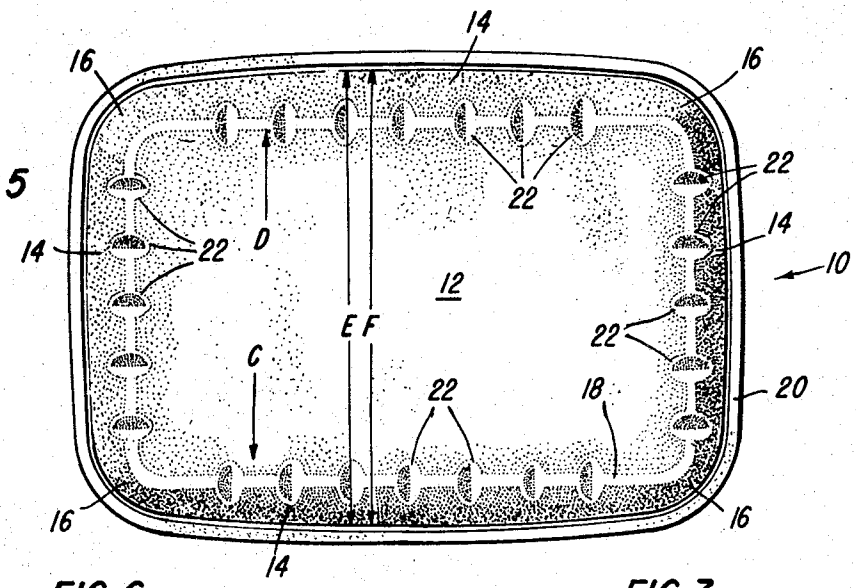


FIG. 6

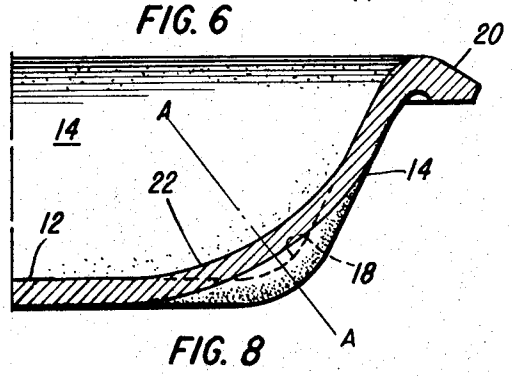


FIG. 7

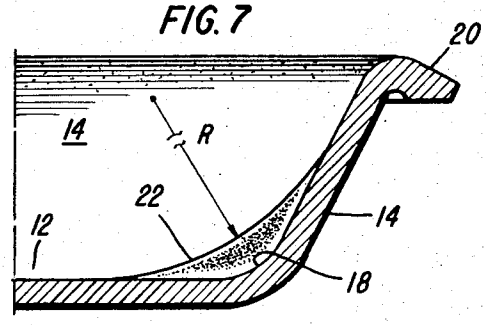


FIG. 8

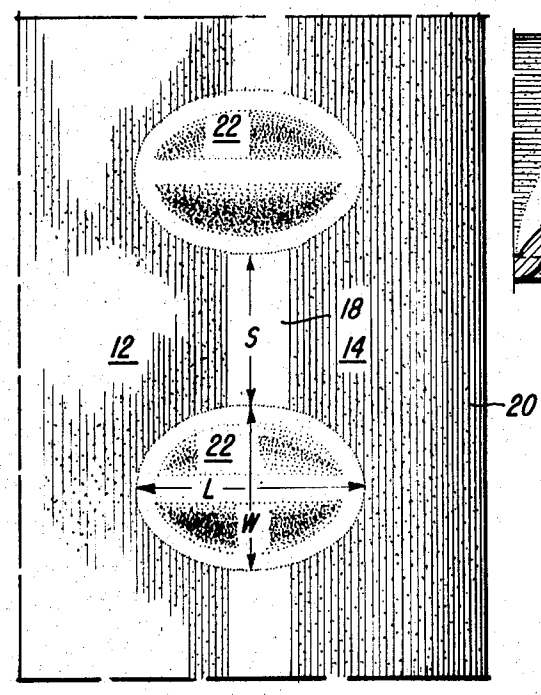
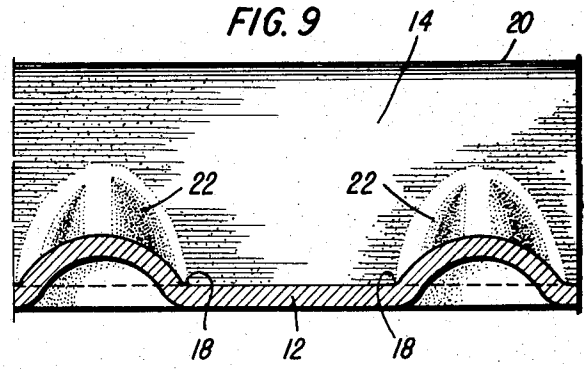


FIG. 9



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FIG. 10

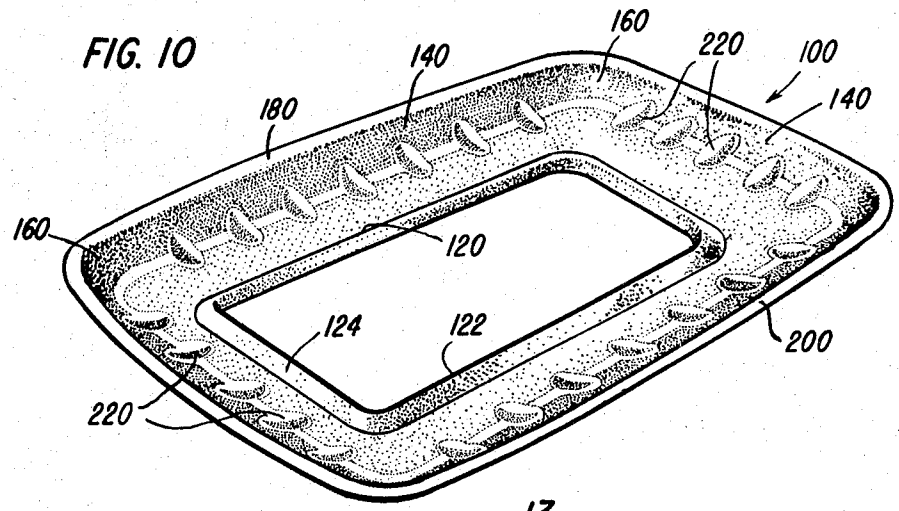


FIG. 11

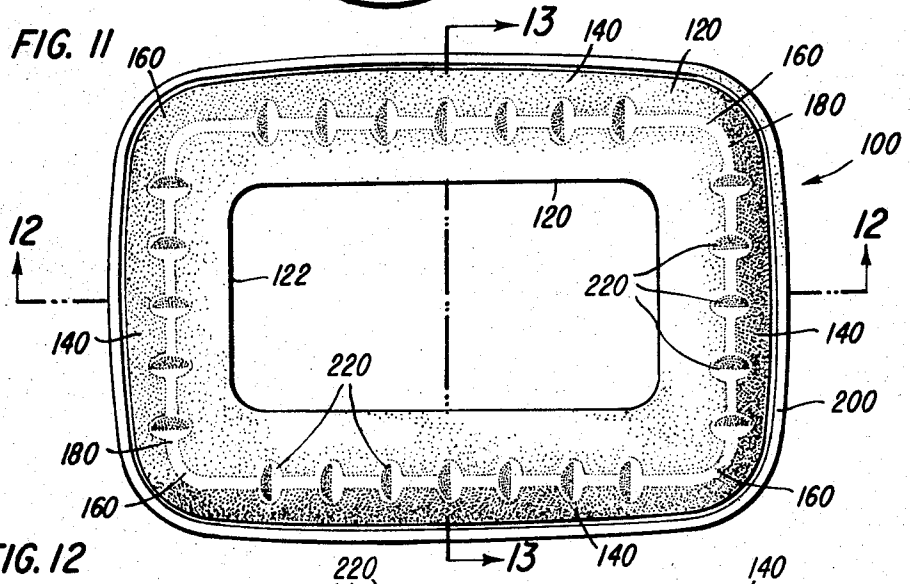


FIG. 12

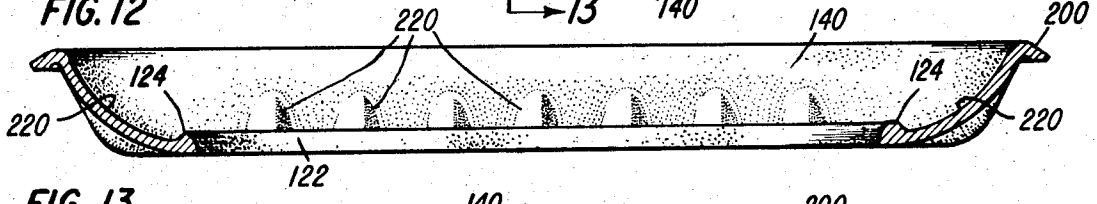
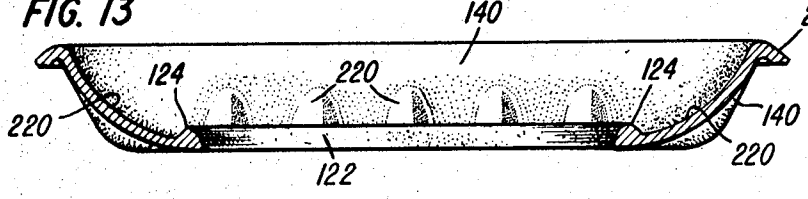


FIG. 13



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FIG. 14

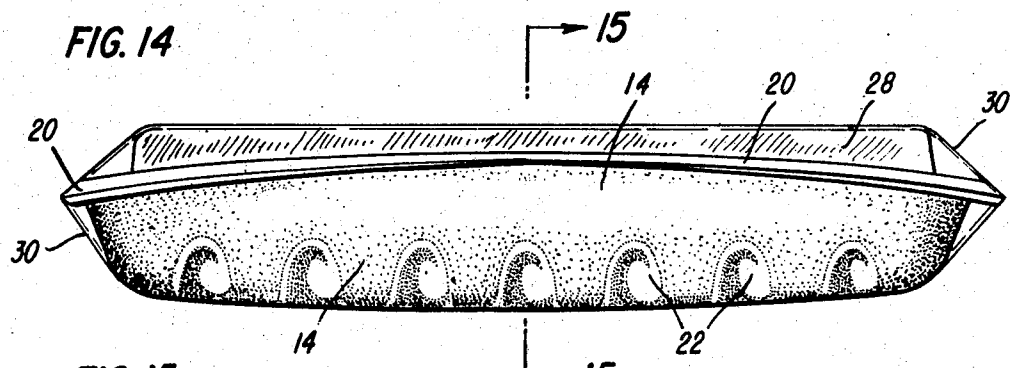


FIG. 15

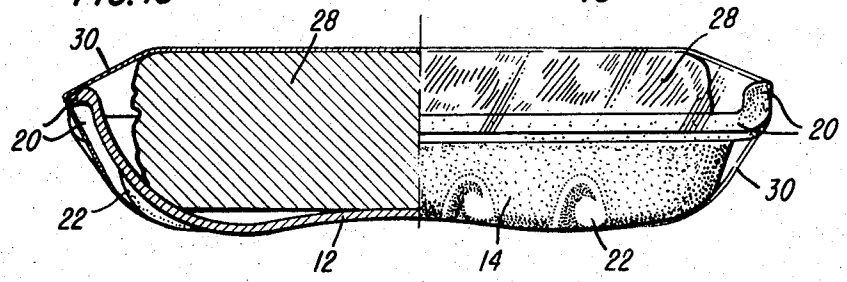
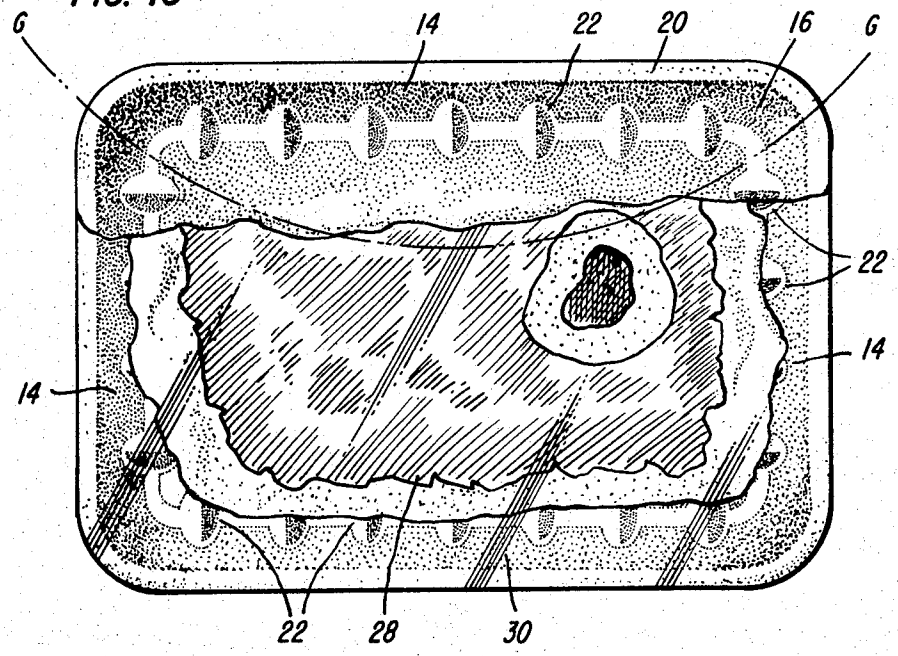


FIG. 16



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FOOD PACKAGING TRAY

The present invention relates to a package, and more particularly to a reinforced package for meat or other food including a tray of improved construction formed of molded pulp, plastic or other moldable materials together with an overwrap plastic film or similar material.

To meet commercial requirements, a food tray must usually be generally rectangular in order to accommodate the bottom area of the food product with economy and efficiency; furthermore, because of the limited space available in the self-service open meat refrigerators of most modern supermarkets, the meat packaging tray must be able to contain a maximum quantity of meat for its size and, consequently, substantially the entire bottom area between the long side walls must be available for containing the meat product.

Simple rectangular meat trays formed of molded pulp have served the industry well for a number of years, but it has been found desirable to provide improved trays with reinforcing, consistent with the above objectives, which will hold up in a superior manner when used in conjunction with an overwrapped and heat-sealed or stretch plastic film which applies compression urging inward distortion or even collapse of the side walls of the tray. While for many years the bowed side wall construction provided by Reifers U.S. Pat. No. 3,185,371 served to resist such inward collapse with conventional non-shrinking or non-stretching overwrap film, it has recently been more difficult to provide satisfactory appearance of an overwrapped tray as desired — because of new contracting plastic films used and tight wrapping techniques requiring stronger trays — without cutting down on the available space within the tray and without causing certain other undesirable effects.

Another fault with the earlier attempts at improving side wall strength was the failure under "pick-up" compression, resulting from a person picking up the tray containing meat, because of an abrupt "fault line" at the sharp rib locations in the side wall of the tray. This "fault line" defect was accentuated in some prior constructions because the ribs extended all the way to the top of the tray. Furthermore, such attempted prior art reinforcing sometimes resulted in trays having less favorable nesting or denesting characteristics. On the other hand, some prior designs provided such small ribs that they were essentially ineffectual to strengthen the tray.

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

It is another object of the present invention to provide a new and improved packaging tray of greater strength per unit weight than has heretofore been known when overwrapped with heat shrink, stretch, or conventional film tightly overwrapped.

It is another object of the present invention to provide a food package using a tray of improved side wall construction which does not cause any cutting, bruising or indentations in the food products packaged therewithin and which has improved side wall compression strength and excellent nesting and denesting properties.

It is another object of the present invention to provide superior food packaging containers which are

stronger and/or lighter than those of the prior art, and which may be less expensive because less raw material is required for a given side wall strength and which may be produced more efficiently.

It is another object of the present invention to provide a meat package using a tray having side walls of higher resultant strength and rigidity when used in combination with an overwrap plastic film which results in a much greater resistance to rupture and distortion caused by the tight overwrap film.

It is another object of the present invention to provide a package of increased beam strength when overwrapped because of its limited and controlled inward deflection and its use of inward deflection to cause a slight increase of wall height that in turn gives new usable strength along its length.

It is another object of the present invention to provide a meat packaging tray which, while generally rectangular, has varying gentle convex curvatures defining an irregular marginal bottom wall profile enclosing about the same area, and which tray when overwrapped maintains a relatively large capacity, the internal irregularity of the marginal profile increasing the strength of the tray and increasing its manufacturing efficiency thereby reducing cost.

It is another object of the present invention to provide a meat packaging tray used in conjunction with a stretch or shrink film overwrap, the construction of the tray— being subjected to uneven tension during wrapping — preventing overstressing of the tray and film while the tray is being wrapped and to provide a "shock absorber effect" during the wrapping operation.

It is another object of the present invention to provide a food packaging tray of increased strength having fluted indentations of a particular character which provide a greater external surface area, thereby providing slightly increased surface area of a "breathable" tray to preserve freshness of meat or produce and to provide a greater heat exchange surface area to provide increased cooling after packaging.

These and other objects and the nature and advantages of the instant invention will be more apparent from the embodiments described. Such specific embodiments will so fully reveal the general nature of the invention that others can, by applying current knowledge, readily modify such embodiments and/or adapt them for various applications without departing from the generic concept and, therefore, such adaptations and modifications should and are intended to be comprehended within the meaning and range of equivalents of the invention.

The food packaging trays of the present invention are characterized in that they are provided with internally projecting convex-concave fluted indentations. These fluted indentations or inwardly projecting bulges are of a particular character as will be described in more detail below. However, one result from their provision, in combination with generally bowed side walls, is an increased stability in the side wall structure of the tray which improves resistance to and controls inward deflection due to overwrapping with transparent, opaque or printed packaging film or other overwrapping material. In fact, one result of the new film wrapping techniques and new type plastic films is that

the film continues to tighten after wrapping. The combination of the present invention is capable of withstanding the resultant compression. The stability results in a maintained resistance to inward deflection even after the product is overwrapped.

Also, the fluted structure permits the molding of a food tray at a lighter weight while maintaining better stability; alternatively, the tray can be molded at conventional weight which will provide strength which is substantially greater than in any other known construction and still meet all marketing and functional requirements. If desired, the increase in side wall strength makes it possible to reduce the caliper of the side wall in general, retaining the inward bulges of fluted portions at normal caliper. This can be accomplished by suitable mold design so as to control the deposition of the pulp during formation of the tray, or it can be done in a later step by calendering the inclined side wall portions to a thinner dimension. In the latter case, the side wall will have a higher mullen and higher tensile strength, which in turn results in a much greater resistance to rupture caused by tensile force, or resistance to cracking of the upper edge of the tray caused by an inward or outward deflection of the side wall as it is picked up by the customer.

The increased calendering or reduction in thickness of the flat side wall surfaces also permits a reduction in nesting interval that saves shipping costs, storage space and outer container costs. This economy was not previously possible because of the functional need of side wall stiffness at the store level, such side wall stiffness having previously been obtained through increased weight of the product and thicker caliper, along with the use of high strength stock, coupled with the improved bowed out wall construction shown in the Reifers U.S. Pat. No. 3,185,371.

While the aforementioned caliper differential offers a number of structural and procedural advantages, it is also possible to have a much superior product than heretofore known if all of the side wall and bottom areas are of the same caliper, and the trays of the present invention having a uniform wall thickness will have substantial advantages over the prior art whether formed of molded pulp or of clear or foam plastic.

One of the prime advantages and most surprising results of the present invention involves the increased beam strength resulting from the combination of the bowed side walls, the fluted indentations and the overwrap plastic film. By means of this combination, the side walls deflect inwardly upon wrapping about a radius of flexure or a radius of gyration of increased length, i.e., the radius is not along the corner joining the side wall to the bottom wall as would be expected, but it extends along a greater length in an arc from the corners of the tray to near the center of the bottom wall, and this substantially reduces beam deflection during subsequent handling of the package.

Viewing a tray in accordance with the present invention from the bottom side, it will be observed that the flat portion of the tray is bounded by a generally corrugated periphery which is of greater length than a typical rectangular periphery. It is readily seen that this marginal profile contains a lesser area than the typical rectangular profile. The effect of reducing the bottom flat area in the manufacture and drying cycle of the tray may result in accelerated drying when a drying form is used since the tray in contact with the metal drying from means a smaller bottom area to be dried. If the trays are free dried, which is more usual, the fluted indentations serve to maintain the bowed-out side walls during drying and inhibit warpage. Also, because the periphery is longer, the curvature provided at this periphery over the longer distance provides for increased strength.

The above-described corrugated periphery of the bottom wall also gives rise to certain advantages in the tray during its use. Thus, this factor in conjunction with the fluted indentations expose more surface of the tray to outside refrigeration and more surface to external air circulation around the bottom periphery of the tray when such a tray is placed on top of another tray or in any flat surface, such as in the refrigerated showcase of a supermarket. It is known that air circulation is an advantage from the standpoint of oxygen transmission, and that oxygen supply is necessary to preserve freshness of the newly cut fresh meat.

Associated with the above phenomenon is the fact that heat transmission is also improved to the tray contents in the present invention due to the greater surface area of the side wall provided by the fluted indentations and the increased internal air circulation described above. Thus, the fluted surface acts as a more effective heat exchange surface when the tray is in a stacked position in the refrigerated showcase. This is important for rapid cooling of the meat which is normally cut in a meat room of higher temperature, normally around 55° F. as compared with the showcase temperature of approximately 29° F. under ideal conditions. Increased rate of cooling of the freshly packaged meat in the refrigerated showcase of the supermarket assists in the preservation of the freshness of the meat.

One of the primary advantages of the present construction is, as alluded above, the concept of increased strength, both beam and compressive. There is a certain amount of pressive force that is always applied to the tray edges during wrapping process with an overwrap plastic film. Depending on the various sizes and depth of the trays and height and weight of the contents, and whether the tray is hand wrapped or machine wrapped, variable forces will always cause some inward deflection of the side walls of the tray. The fluted indentations are provided to maintain the trays's rigidity and give high resistance to inward (compressive) deflection to a substantially greater extent than previous constructions which might, under unfavorable circumstances, continually yield under the constant force of the stretch or heat shrinkable film while the package is wrapped and under high humidity and refrigeration conditions, which could tend to soften the pulp. And, as indicated above, the beam strength is also increased after overwrapping.

The objects, nature and advantages of the instant invention will be more apparent from the following more detailed description of the invention taken in conjunction with the drawings, wherein:

FIG. 1 is a perspective view of an embodiment of a tray used in the present invention;

FIG. 2 is a plan view of the tray of FIG. 1;

FIG. 3 is a front elevation of the embodiment of FIGS. 1 and 2;

FIG. 4 is a side elevation of the embodiment of FIGS. 1 and 2;

FIG. 5 is a bottom view of the embodiment of FIGS. 1–4;

FIG. 6 is a sectional view taken on line 6—6 of FIG. 2;

FIG. 7 is a sectional view taken along line 7—7 of FIG. 2;

FIG. 8 is a plan view of the detail shown in FIG. 6;

FIG. 9 is a sectional view taken along line 9—9 of FIG. 2;

FIG. 10 is a perspective view of a second embodiment of a tray used in accordance with the present invention;

FIG. 11 is a bottom view of the embodiment of FIG. 10;

FIGS. 12 and 13 are sectional views taken along lines 12—12 and 13—13, respectively, of FIG. 11;

FIG. 14 is a front elevation of a package in accordance with the present invention using the tray of FIG. 1;

FIG. 15 is a partly sectional view taken along line 15—15 of FIG. 14, and partly in end elevation; and

FIG. 16 is a plan view, partly broken away, of the package of FIGS. 14 and 15.

A molded tray **10**, preferably of molded pulp, is shown in FIG. 1 for the packaging of food in conjunction with a flexible, transparent overwrap film of plastic, cellophane or the like. In general, the tray comprises a generally rectangular bottom wall **12** and four bowed walls **14** (as described in Reifers U.S. Pat. No. 3,185,371) extending upwardly and outwardly from the bottom wall **12**; the end walls are preferably more bowed than the side walls. Rounded corners **16** are provided between adjacent side walls **14** and a generally rounded corner **18** is provided between each side wall **14** and the bottom wall **12**. The tray **10** is preferably provided with a peripheral lip **20**, which extends outwardly from the side wall **14** and also, preferably, slightly downwardly as best seen in FIGS. **6** and **7**.

The tray **10** of the present invention differs from trays of the prior art in that it is provided with a series of smooth bulges of fluted indentations **22** which extend convexly-concavely toward the interior of the tray **10** a maximum of 0.100 inch as measured along line A—A of FIG. **6**; in most cases it will be desirable that such bowed wall portions **22** extend toward the interior of the tray only about 0.060 inch. As is seen from the drawings, the fluted indentations **22** are generally located along the rounded corner **18** between each side wall **14** and the bottom wall **12**.

Careful reference to the drawings will show a number of important characteristics of such fluted indentations **22**. Noting first of all, FIG. **9**, it is seen that the fluted indentations **22** are smooth. The convex nature of the fluted indentations **22** are also most apparent from FIG. **9**, as well as FIG. **1**.

As best seen from FIGS. **1, 2, 8** and **9**, each fluted indentation **22** is of maximum width along the line of said rounded corner **18** located between the side wall **14** and the bottom wall **12**. The bulges **22** taper in each direction from this maximum width, i.e., each fluted indentation **22** becomes increasingly narrower as it extends upwardly and outwardly along the side wall **14** and inwardly along the bottom wall **12** toward the center of the tray; this configuration, when viewed from above as shown in FIG. **2**, provides a generally diamond-shaped pattern. These fluted indentations **22** are of relatively uniform size along the side walls **14** of the tray **10**.

As indicated above, each of the bulges or fluted indentations **22** have a generally convex configuration toward the interior of the tray in the sense that they project inwardly, and particularly as viewed in section along a line parallel to the side wall carrying such bulges **22**, such as in FIG. **9**. However, such bulges **22** are also shaped concavely when viewed along a section passing through their longest dimension, and perpendicular to the rounded corner **18** between the side wall **14** and the bottom wall **12**, as in FIGS. **6** and **7**, such concavity being determined by the radius R which is approximately 2 to 3 times the height of the tray [although it should be understood that the precise convex configuration need not be determined by a single radius but rather by plural radii which generally approximate a single radius R of 2 to 3 times the height of the tray; for example, the upper portion of the fluted indentations may be provided with one radius and a lower portion with another radius and these may merge near the middle]. As an example, in a tray having a height of approximately 0.63 inches, the radius R may be 1.34 inches. The bulges **22**, being convex in one direction, and concave in a direction 90° to the first direction, thereby generally define saddle-like configurations.

When the tray **10** is viewed from the bottom, as shown in FIG. **5**, it is seen that the bulges **22** meet the generally rectangular bottom wall **12** in the plane of the bottom wall in the form of a corrugated configuration. Likewise, each side wall **14** meets the bulges **22** in the plane of the side wall in the form of a corrugated configuration when the tray **10** is viewed from the side, as in FIGS. **3** and **4**, or from the inside, as in FIG. **9**. Noting FIG. **5**, it is seen that the continuous line C, corrugated in the area of the bulges **22**, generally outlines the flat planar portion of the bottom wall **12**. It is readily seen that this marginal profile is substantially different and encloses less area than would be enclosed if the tray were produced without the flutes or bulges **22** as indicated by the dotted line D. This results, as indicated above, in accelerated drying during manufacturing of the tray, increased strength by reason of the curvature at this periphery over a longer distance, and increased air circulation and heat transfer.

The relative size of the bulges **22** is another important consideration in the present invention. To provide the desired advantages, such as improved strength, the indentations **22** must not be too small and, to prevent reduction of interior space, such indentations **22** must not be too large. Accordingly, the bulges **22** should terminate at their upper ends along the side walls about half way up the side walls. Optimumly, the length L [see FIG. **8**] of each flute should be in the range of ¾ to 1¾ times the height of the tray with the maximum width W of each flute being approximately ½ to equal the length thereof. Additionally, each flute **22** should be separated by a distance S from its adjacent flute **22** by approximately 3/5 to equal its maximum width; otherwise the inward projection of the bulges **22** will be required to be too great in order to obtain the desired

strength. For example, in a tray having a height of ⅝ inch, a bulge average length L [see FIG. 8] of ⅝ inch and a width W of ½ inch and a separation S of about ½ inch have been found desirable.

Until the present invention, one of the problems in the use of meat trays has been the prevention of overstressing the tray when wrapping it with the overwrap plastic film. Because of the indented flutes **22**, the stretch film normally used to overwrap the tray **10** will always be subjected to uneven tension during the wrapping process because of the differences in distances that it takes to wrap the film around the tray in the width direction as shown in FIG. **5** by comparing distances E and F. In one embodiment the measured differential is 3/32 inch and this differential in distance around the tray will prevent overstressing the tray with the plastic film while the tray is being wrapped. It also provides a "shock absorber effect" during the wrapping operation.

It has been found that with the techniques of wrapping using the new"soft" overwrap films (e.g., PVC), proportionately more force is exerted on the tray ends during completion of film wrapping than is exerted on the side walls. To resist this increased force, proportionately more bow-out curvature is provided for the end walls compared to the bow-out for the side walls.

As indicated above, in one form of construction of the present invention the density of the side and end walls is greater than the density of the bulged portions, the thickness of the indented flutes **22** being greater than the thickness of the side walls **14**. This is accomplished by pressing the side and end walls during the manufacturing procedure to reduce their thickness and increase their density. This results in the side wall having a higher mullen and a higher tensile strength, which in turn results in a much greater resistance to rupture caused by tension; it also results in a reduction of cracking of the upper edge of the tray, caused by deflection of the side walls during "pick-up." Furthermore, such an operation provides a reduction in nesting intervals that saves shipping costs, storage space and outer container costs, as pointed out above.

The wrapped package of the present invention, containing meat **28**, is shown in FIGS. **14–16** where the deflecting effects of the overwrap film are shown in an exaggerated manner. As is seen, best in FIG. **14**, the overwrap plastic film **30** deflects the side walls **14** inwardly in such a manner as to force the peripheral lip **20** upwardly toward the center portion of each side wall. A corresponding deflection of the center of the bottom wall **12** also occurs as is seen in FIG. **15**. These deflections occur because the side walls pivot or rotate along the radius of gyration G—G, shown exaggerated in FIG. **16**, as a result of the flutes **22** and the initially bowed side walls **14**. Without flutes **22**, the side walls of comparative trays will rotate along the radius **18** thereby providing a substantially shorter radius of gyration; of course, increased length of radius of gyration provides increased beam strength in accordance with known engineering principles.

The force resistance characteristic of the corrugated configuration is that of progressively higher resistance to deflection as external force increases. Initially as force is applied there is a slight side wall deflection whereas in a fluted tray without bow-out, distortion would result. As force continues to be applied, resistance to the force increases and wall curvature stabilizes as the fluted structure transfers force to the tray bottom. At this point, a unique characteristic develops in the fluted construction with the center of the side wall **14** rising, increasing wall dimensions at the center. In actual measurements made, previous tray designs with bow-out, exaggerated far beyond that provided in the fluted tray of the present invention, can exhibit a rise in the center of the side wall equal to that of the present invention, but will fail structurally in doing so. Bow-out construction along is only effective to a point in resisting force — but fluted structure bow-out sets the curvature of bow-out to better resist force.

This increased "beam" strength at center, in conjunction with the new wall form, is resistant to beam breakage forces as filled packages are picked up. This characteristic of the overwrapped package differs from the non-wrapped package and represents a highly important improvement over prior meat packages, which can be subject to breakage under such forces. Thus, beam strength of the present package is increased greatly compared with fluted indentations of the unwrapped tray **10**, or an overwrapped tray without flutes **22**.

Another embodiment of a tray used in the invention is shown in FIGS. **10—13**, wherein a tray **100** is shown constructed similar to the tray **10** in the provision of four walls **140** separated by rounded corners **160** and also separated from the bottom wall **120** by a rounded corner **180**, the tray **100** also being provided with a peripheral lip **200** and a series of fluted wall portions or bulges **220** located along the generally rounded corner **180**. The bulges **220** of the tray **100** have the same requirements as the bulges **22** of the tray **10**, described above in detail.

Tray **100** differs from the tray **10** in the provision of a large opening in the center of the bottom wall **120**, such opening being defined by an inner periphery **122** being provided with an upstanding bead **124**.

The tray **100** of FIGS. **10–13** permits the product packaged in the tray to be viewed through the window or opening in the bottom and, thus, if meat is packaged within the tray, both sides of the meat can be viewed. It is, of course, clear that the tray **100**, like the tray **10**, is to be provided with an overwrap plastic film sealing the product securely therein. Whereas in prior paper-product meat trays it has not been possible to provide a large opening in the bottom wall because of the reduced strength resulting from the elimination of the bottom wall, in the present invention this is possible because of the substantially greater strength added by fluted indentations **220**. The upstanding bead **124**, extending annularly about the inner periphery **122** also serves to increase the strength of the tray **100**.

It is to be understood that the invention is not limited to the embodiment disclosed which is illustratively offered, and that modifications may be made without departing from the invention.

What is claimed is:

1. In a package comprising a tray and a flexible overwrap wherein said tray comprises a bottom wall, side walls extending upwardly and outwardly from said bottom wall, a generally rounded corner between side wall

and said bottom wall, and a peripheral lip extending outwardly from said side walls, the improvement comprising:

means to increase the beam strength of said package comprising a series of smooth bulges extending convexly toward the interior of said tray a maximum of about 0.060 inch, said bulges being located along the generally rounded corner between each side wall and the bottom wall and being spaced from one another by approximately 3/5 to equal the maximum width of each bulge;

each said bulge being of maximum width along said rounded corner between the side wall and bottom wall and becoming uniformly increasingly narrower as it extends upwardly and outwardly along said side wall and inwardly along said bottom wall to define a generally diamond-shaped pattern when viewed from above;

each said convex bulge being shaped concavely when viewed along a section passing therethrough perpendicular to the generally rounded corner between said side wall and bottom wall with the radius of concavity being 2–3 times the height of the tray;

said bottom wall meeting said bulges in the plane of said bottom wall in the form of a corrugated configuration when said tray is viewed from the bottom, each said side wall meeting bulges in the plane of said side wall in the form of a corrugated configuration when said tray is viewed from the side;

the bulges terminating along the side walls about half way to the upper edge thereof and being of length such that each bulge is ¾ to 1 ¾ times the height of the tray with the maximum width being approximately ½ to equal the length thereof;

the interior of said tray being smooth and free from sharp indentations due to said bulges; and

said side walls being flexed inwardly toward said product and upwardly at the center thereof about an axis of gyration extending in an arc across the bottom wall of said tray to near the center of said bottom wall when overwrapped with flexible overwrap.

2. A molded tray in accordance with claim **1** wherein said bottom wall is rectangular, and comprising two said side walls separated by two end walls with rounded corners between adjacent end and side walls.

3. A molded tray in accordance with claim **1** wherein said tray is molded of wood pulp.

4. A tray in accordance with claim **1** wherein said overwrap comprises transparent plastic.

5. A tray in accordance with claim **4** wherein said plastic is heat shrink or stretch plastic.

6. A molded tray in accordance with claim **4**, wherein said bottom wall is provided with an inner peripheral edge defining a large window-like opening, said inner peripheral edge being provided with an annular upstanding bead.

7. In a molded tray adapted to package a product therein in conjunction with a flexible, transparent overwrap, wherein said tray comprises a generally rectangular bottom wall, two bowed opposite end walls and two bowed opposite side walls extending upwardly and outwardly from said bottom wall, rounded corners between adjacent side and end walls, a generally rounded corner between each side and end wall and said bottom wall, and a peripheral lip extending outwardly from said side and end walls, the improvement comprising:

a series of smooth bulges extending convexly toward the interior of said tray a maximum of about 0.100 inch, said bulges being located along the generally rounded corner between each side wall and the bottom wall and each bulge being spaced from its adjacent bulge by approximately 3/5 to equal the maximum width of each said bulge;

each said bulge being of maximum width along said rounded corner between the side wall and bottom wall and becoming uniformly increasingly narrower as it extends upwardly and outwardly along said side wall and inwardly along said bottom wall to define a generally diamond-shaped pattern when viewed from above, the length of each bulge being in the range of ¾ to 1 ¾ times the height of the tray and the maximum width being approximately ½ to equal the length thereof;

each said convex bulge being shaped concavely when viewed along a section passing therethrough perpendicular to the generally rounded corner between said side wall and bottom wall;

said generally rectangular bottom wall meeting said bulges in the plane of said bottom wall in the form of a corrugated configuration when said tray is viewed from the bottom, each said side wall meeting bulges in the plane of said side wall in the form of a corrugated configuration when said tray is viewed from the side;

said bulges being of such size in relation to said tray as to terminate along the side walls at about half way to the upper edge thereof, the concave curvature of each bulge having a radius of approximately 2 to 3 times the height of said tray;

the interior of said tray being smooth and free from sharp indentations due to said bulges; and

said sidewalls being flexed inwardly toward said food product and upwardly at the center thereof about an axis of gyration extending in an arc from the corners of said tray to near the center of said bottom wall when packaged and overwrapped.

8. A molded tray in accordance with claim **7** wherein said bottom wall is provided with an inner peripheral edge defining a large window-like opening, said inner peripheral edge being provided with an annular upstanding bead.

9. In a molded tray adapted to package a product in conjunction with a flexible, transparent overwrap wherein said tray comprises a generally rectangular bottom wall, two bowed opposite end walls and two bowed opposite side walls extending upwardly and outwardly from said bottom wall, rounded corners between adjacent side and end walls, a generally rounded corner between each side and end wall and said bottom wall, and a peripheral lip extending outwardly from said side and end walls, the improvement comprising:

a series of smooth bulges extending convexly toward the interior of said tray, said bulges being located along the generally rounded corner between each side wall and the bottom wall;

each said bulge being of maximum width along said rounded corner between the side wall and bottom wall and becoming uniformly increasingly narrower as it extends upwardly and outwardly along said side wall and inwardly along said bottom wall to define a generally diamond-shaped pattern when viewed from above;

each said convex bulge being shaped concavely when viewed along a section passing therethrough perpendicular to the generally rounded corner between said side wall and bottom wall;

said generally rectangular bottom wall meeting said bulges in the plane of said bottom wall in the form of a corrugated configuration when said tray is viewed from the bottom, each said side wall meeting bulges in the plane of said side wall in the form of a corrugated configuration when said tray is viewed from the side;

said bulges being of such size in relation to said tray as to terminate along the side walls about half way to the upper edge thereof;

said tray being formed of molded pulp wherein the density of said side walls is greater than the density

of said bulges, the thickness of said bulges being greater than the thickness of said side walls;

the interior of said tray being smooth and free from sharp indentations due to said bulges; and

said side walls being flexed inwardly toward said food product and upwardly at the center thereof about an axis of gyration extending in an arc from the corners of said tray to near the center of said bottom wall when packaged and overwrapped.

10. A molded tray in accordance with claim **9** wherein said bottom wall is provided with an inner peripheral edge defining a large window-like opening, said inner peripheral edge being provided with an annular upstanding bead.

11. A molded tray in accordance with claim **9**, the length of each bulge being in the range of ¾ to 1 ¾ times the height of said tray, the maximum width of each bulge being approximately ½ to equal the length thereof, and each bulge being separate from its adjacent bulge by approximately 3/5 to equal the maximum width of each said bulge.

* * * * *

UNITED STATES PATENT OFFICE

CERTIFICATE OF CORRECTION

Patent No. 3,700,096 Dated October 24, 1972

Inventor(s) Richard F.Reifers

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

On the face of the patent at [45] the issue date should read: Oct. 24, 1972

Signed and sealed this 24th day of April 1973.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

ROBERT GOTTSCHALK
Commissioner of Patents

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