United States Patent

Rehrig

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[54] BAKERY TRAY

[72] Inventor: **Houston Rehrig,** 100 Los Altos Drive, Pasadena, Calif. 91105

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[21] Appl. No.: **98,285**

[52] **U.S. Cl.** .....**220/97 D,** 211/126
[51] **Int. Cl.**.....**B65d 21/04**
[58] **Field of Search**.....220/97 R, 97 C, 97 D, 21, 94 A, 220/72, 74; 211/126; 206/45.31

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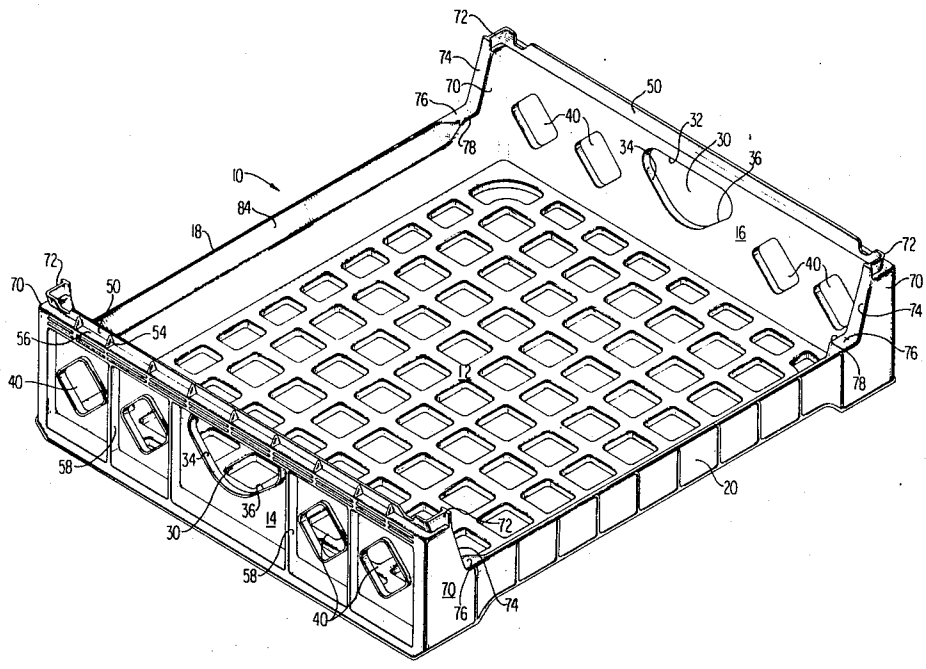
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Primary Examiner—George E. Lowrance
Attorney—Beveridge & De Grandi

[57] **ABSTRACT**

A stacking, cross nesting bakery tray molded from a single homogeneous mass of thermoplastic material and including a rectangular, open grid bottom panel, opposed upwardly extending end walls having vertically registering stacking means along their top and bottom edges, and opposed upwardly extending side walls having a vertical height no greater than half the height of the end walls to permit cross nesting of two vertical stacks of the trays. The end walls and side walls each include means facilitating filling of the tray with packages of bakery products.

8 Claims, 11 Drawing Figures



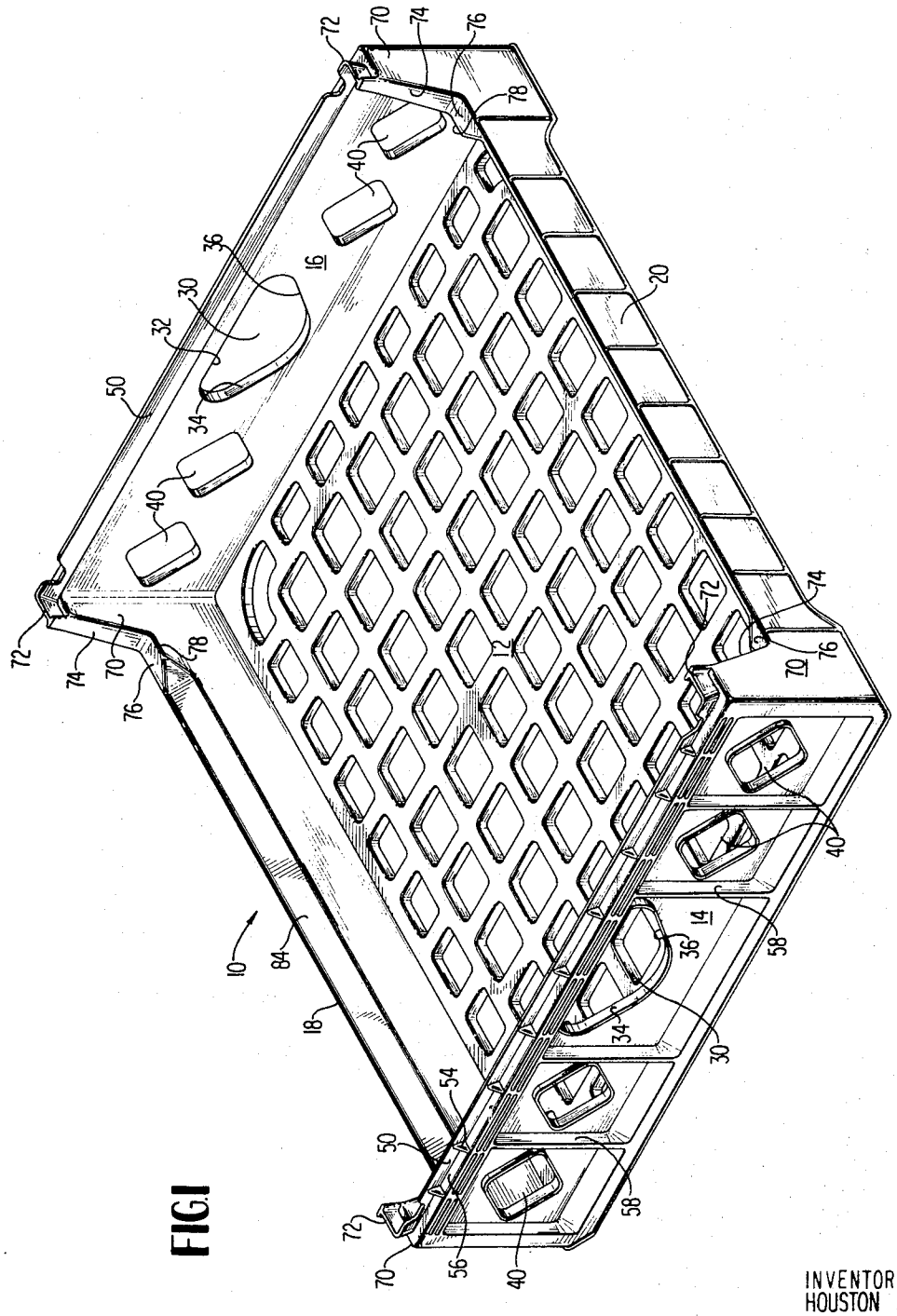


FIG. 1

INVENTOR
HOUSTON REHRIG

BY Beveridge & De Grandi

ATTORNEYS

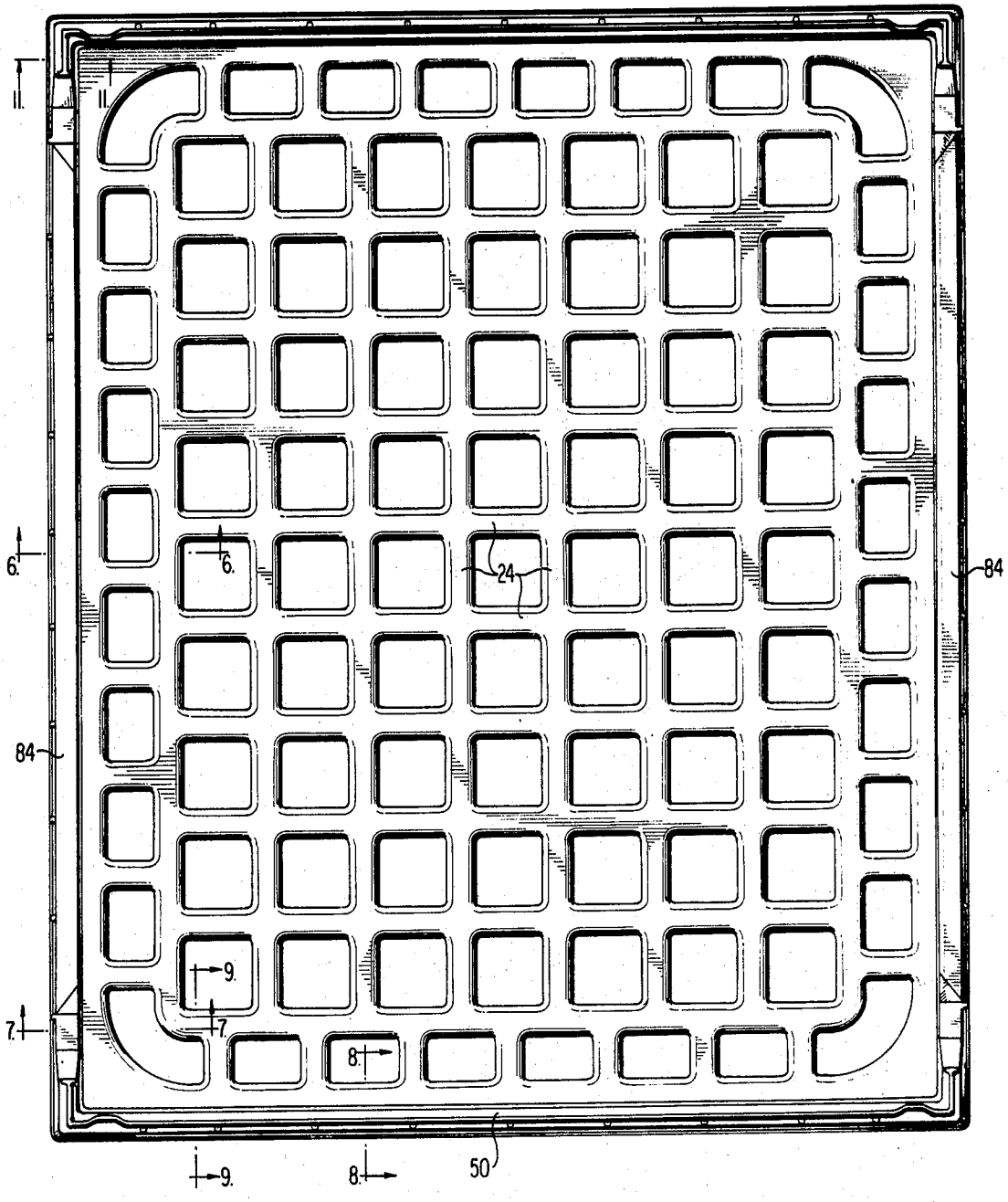


FIG2

INVENTOR
HOUSTON REHRIG

BY Beveridge & De Grandi

ATTORNEYS

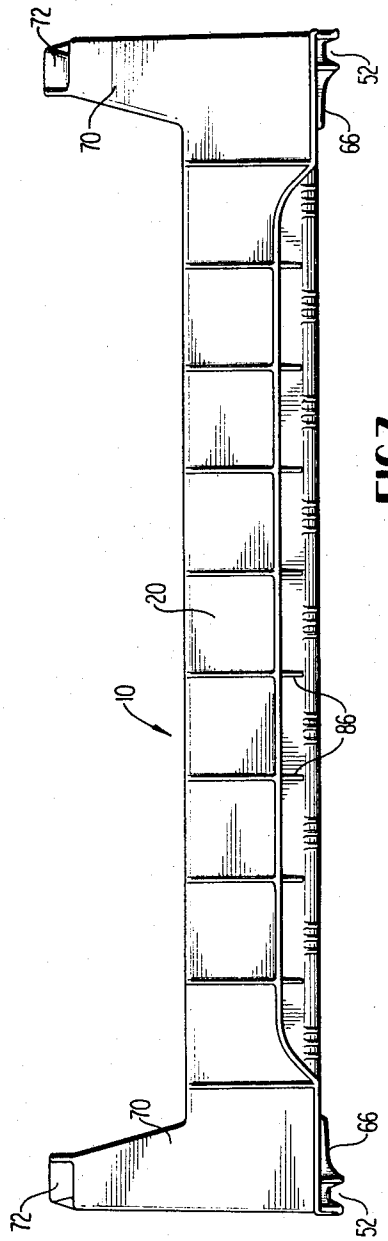


FIG.3

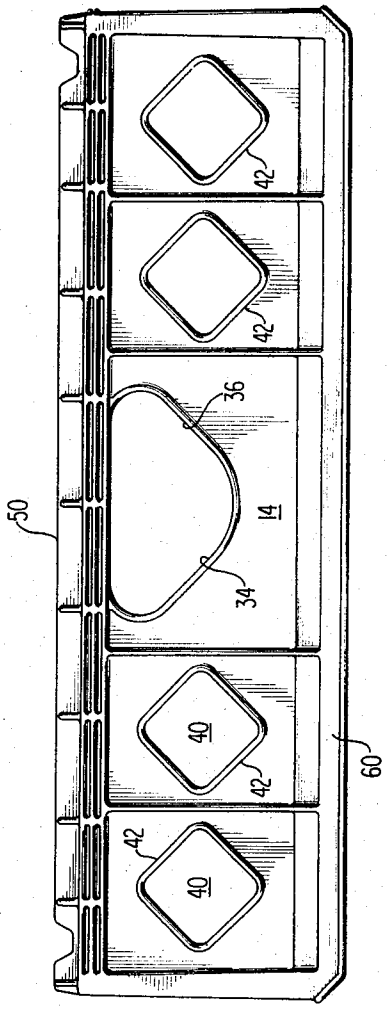


FIG.4

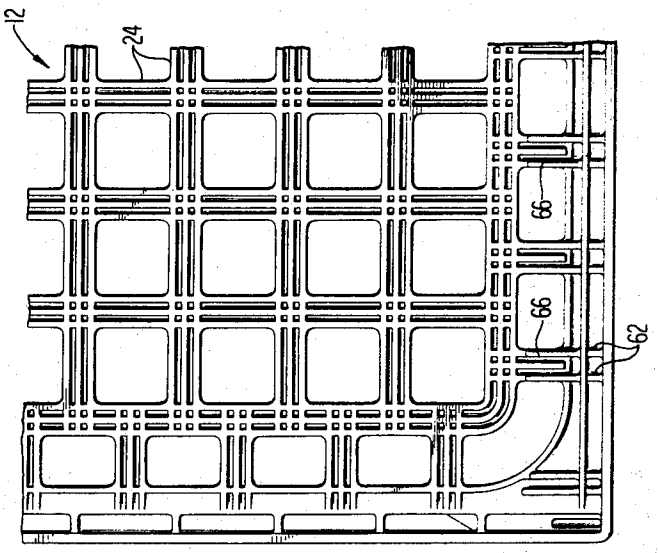


FIG.5

FIG.6

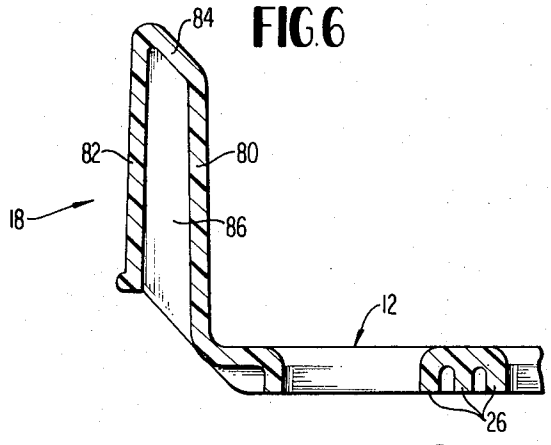


FIG.7

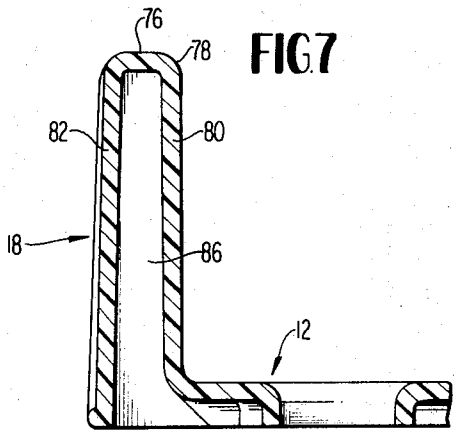


FIG.8

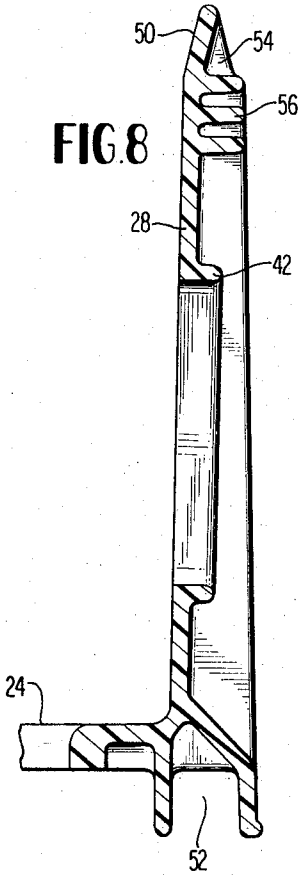
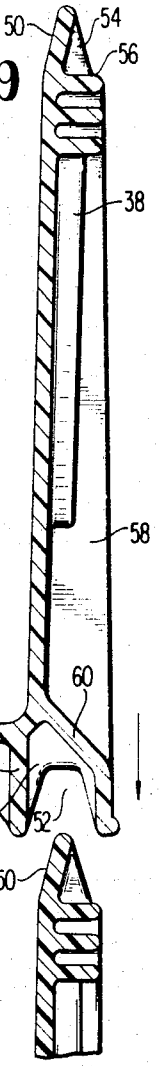


FIG.9



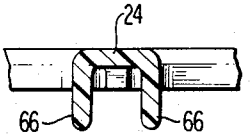


FIG.10

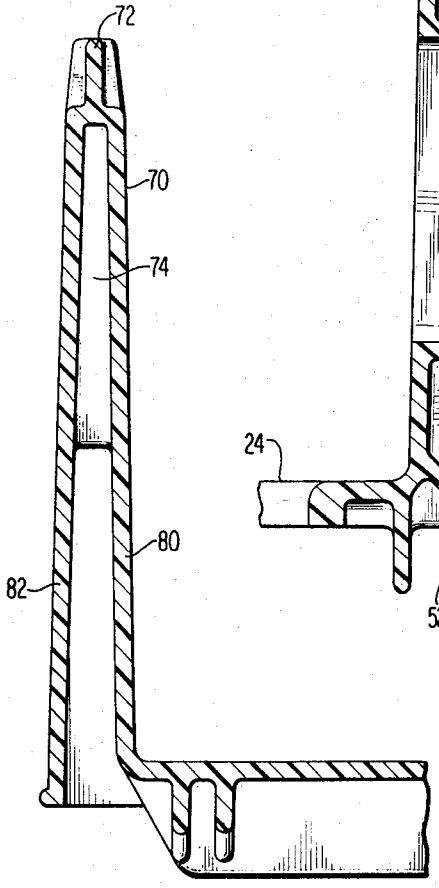


FIG.11

BAKERY TRAY

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates generally to molded plastic tray structures of the type employed to carry a plurality of packages of bakery products such as loads of bread, and more particularly to such a tray which may be stacked with other like trays when filled, and which may be cross nested with like trays when empty.

2. Description of the Prior Art

In the marketing of bakery products, and particularly relatively delicate articles such as loaves of sliced bread which are easily mashed, it is convention practice to employ shallow stackable trays to handle a plurality of the individual packages. One such tray is illustrated, for example, in U.S. Pat. No. 197,672. The prior art trays have conventionally employed a generally rectangular bottom panel with generally vertical opposed end walls incorporating vertically registering stacking means along their top and bottom edges to permit a plurality of the filled trays to be stacked one upon the other. The side walls of the tray, if any are employed, are normally only of sufficient height to prevent the loaves of bread from sliding out of the tray so that the contents of the individual trays in a stack of trays can readily be seen. Also, by rotating alternate empty trays 90°, two vertical stacks may be nested together to occupy only slightly more than one-half the space of the stacks of filled trays.

While these prior art trays have enjoyed substantial commercial success, they have not been entirely satisfactory in that their use has frequently produced the very damage to the bakery products which they are intended to prevent. For example, it is not uncommon for the wrapper of the package such as a loaf of bread to catch on the top edge of one of the walls of the tray, or on a protruding edge surface of an inspection or other opening in a wall of the tray so that the package does not drop completely into the tray. This loaf of bread is then mashed to produce an unsightly and unmarketable product when a second tray is stacked thereon.

SUMMARY OF THE INVENTION

The foregoing and other disadvantages of the prior art are avoided in the bakery tray of the present invention by providing a relatively rigid, strong, yet light weight construction which resists excessive warping upon removal of the tray from the forming mold, resists excessive deflection under normal loads, and which incorporates novel means for preventing the individual packages from becoming caught on the upwardly directed edge surfaces of the end and side walls of the tray. The bottom panel is of an open grid construction, with the openings in the bottom being bounded by perpendicularly arranged bars each having a cross sectional shape substantially in the form of the letter m which provides a very high strength-to-weight factor for the panel to prevent sagging under load to damage a filled tray stacked therebeneath. The top edge surfaces of the end and side walls are inclined outwardly to reduce the tendency of the product to hang thereon, and to act as a cam to assist in loading the tray. Also, handhold and inspection openings in the end, or stacking wall have outwardly directed flanges formed therearound to reduce the tendency or the panel to buckle inward in the area of the openings, and the lower portion of such openings are generally V-shaped to reduce the tendency of these openings to interfere with the free fall of the product into the tray.

BRIEF DESCRIPTION OF THE DRAWINGS

Other objects and advantages of the present invention will become apparent from the accompanying detailed description, taken in conjunction with the drawings, wherein:

FIG. 1 is a perspective view of a bakery tray embodying the invention;

FIG. 2 is a top plan view of the structure shown in FIG. 1;

FIG. 3 is a side elevation view thereof;

FIG. 4 is an end elevation view thereof;

FIG. 5 is a fragmentary bottom plan view thereof;

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

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

FIG. 8 is a fragmentary sectional view taken along line 8—8 of FIG. 2;

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

FIG. 10 is a fragmentary sectional view taken along line 10—10 of FIG. 9; and,

FIG. 11 is a fragmentary sectional view taken along line 11—11 of FIG. 2.

DESCRIPTION OF A PREFERRED EMBODIMENT

Referring now to the drawings in detail, a bakery tray embodying the present invention is indicated generally by the reference numeral **10**, and is illustrated as being molded from a single homogeneous mass of thermoplastic material such, for example, as high density polyethylene. The tray comprises a bottom panel **12**, opposed generally vertical end walls **14**, **16** and opposed side walls **18**, **20**. The bottom panel **12** has a plurality of square or rectangular openings **22** formed therein to define the open grid pattern illustrated in FIG. **2**. The openings **22** are bounded by perpendicularly arranged, integrally joined beam members **24**, each having a substantially smooth top surface and having a cross sectional shape substantially in the configuration of the letter M. The downwardly directed legs **26** of the beam members **24** provide a relatively high moment of inertia, and a correspondingly high strength-to-weight ratio for the bottom panel **12**. Thus, the bottom panel **12** provides adequate support for a full tray load of bakery products without excessive deflection which might cause the bottom surface of the panel to sag sufficiently to engage and depress the top surface of bakery products in a tray stacked thereunder.

As best seen in FIGS. **2** and **5**, the individual beam members **24** positioned around the outer periphery of the bottom panel **12** are offset with respect to other beam members in the grid. This offset relation of the beam members **24** around the periphery of the bottom panel provides, in effect, an expansion joint which accommodates limited differential shrinkage between the bottom panel structure and the side wall structure of the tray to thereby minimize the tendency of the bottom panel to buckle upon removal of the tray from the mold.

The walls **14**, **16** are identical in construction, each comprising a generally vertical, smooth panel **28** having a generally triangular shaped handhold **30** formed therein, with one leg **32** of the triangular opening extending generally parallel to and spaced below the top edge of the panel **28**, and with the other two legs **34**, **36** being included downwardly therefrom. An outwardly directed flange **38** is integrally formed around the periphery of the handhold **30** to provide stiffness to the panel **28** in the vicinity of the handhold opening and to minimize the tendency of the panel to buckle out of its plane in this area.

The panels **28** also have four identical, substantially square inspection openings **40** formed therein to permit the contents of the tray to be viewed through the end walls. The square openings **40** are arranged with their sides inclined at approximately 45° with respect to the plane of the bottom panel **12**, and each opening has an outwardly directed flange **42** formed around its periphery to stiffen and provide strength for the panel **28** and to minimize buckling. Thus, the tendency for the lower edge of the side openings and the handhold openings to buckle inward and thereby interfere with the free fall of bakery products into the tray is minimized, both by the use of the outwardly directed flanges around the openings and by the configuration of the upwardly directed surfaces of the openings which are inclined toward one another and thereby act as a cam urging a dropping product inwardly.

As most clearly seen in FIGS. **8** and **9**, the end panels **14**, **16** terminate at their top edge in an upwardly extending flange **50**

which is adapted to fit within an elongated upwardly directed groove **52** in the lower edge of the respective end walls. Flange **50** is preferably inclined outwardly approximately 15° with respect to the vertical, and a plurality of integrally molded gussets or web members **54** reinforce the flange **50** at spaced intervals therealong. Gussets **54** connect the flange **50** with a substantially E-shaped beam portion extending along the upper edge of the end walls, with the inclined flange **50**, the gussets **54**, and the beam **56** cooperating to provide substantial strength and rigidity to the top of the end walls. Vertical webs **58** extend between the beam **56** and an outwardly and downwardly inclined flange **60** which defines the outer portion of the groove **52**.

As illustrated in FIG. **9**, groove **52** is defined by a plurality of reinforcing webs **62** integrally joining the flange **60** and flange **64**. Also, a plurality of integrally molded gussets **66** connect the bottom edge of flange **64** to adjacent beam members **24** at spaced intervals around the periphery of the bottom panel **12** to reinforce the connection between the bottom panel and the end walls. Gussets **66** terminate at their inner end in a shoulder **68** adapted to engage the outer surface of side walls **18,20** of a similar tray nested therebelow to interlock the nested trays as will be described more fully hereinbelow. Gussets **66** are dimensioned to provide minimum interference with bakery products in a tray stacked therebelow.

As illustrated in FIGS. **1–3**, the side walls **18**, **20** and end walls **14**, **16** are joined together at the respective corners of the tray by a corner post section **70** of the same height as the end walls. The posts **70** act as a lateral brace, adding substantial strength and rigidity to the end walls at the corners of the tray. Also, an upwardly extending web **72** on the top of each post section **70** forms, in effect, a continuation of the stacking flange **50** extending around the corners of the tray in position to project into the open bottom end of a corresponding post **70** when the trays are stacked to interlock the stacked trays against movement in a direction parallel to the end walls.

Each of the corner posts **70** have an inclined lateral surface **74** which facilitates cross nesting of the trays by providing a wider opening at the top of the tray than at the base of the corner post. Inclined surface **74** merges into a short horizontal stacking platform **76** on the top of the respective side walls **18**, **20** at opposed ends thereof, to provide a horizontal support or seat for a nested tray. The inner edge **78** of platform **76** is positioned to engage the shoulder **68** of a tray nested thereon to interlock the trays against relative movement. Support surface **76** extends along the top of side walls **18**, **20** only a distance sufficient to extend beneath and engage one bottom beam **24** at each corner of a tray nested thereon.

As illustrated in FIGS. **6** and **7**, walls **18** and **20** are made up of laterally spaced inner and outer panels **80**, **82**, respectively joined together at their top edges either by the platform **76** or by the inclined web element **84** to define a hollow, inverted channel structure. The side walls are reinforced by a plurality of webs **86** joining the panels **80**, **82** at spaced intervals along their length to provide a light weight, strong beam construction. The top web **84** is illustrated as being inclined at approximately 45° with respect to the plane of the bottom panel **12**, thereby serving to facilitate loading the tray by acting as a cam to guide any package contacting the top of the side wall into the interior of the tray.

From the above, it can be seen that the molded plastic bakery tray according to this invention is a substantial improvement over the known bakery tray. The cam surfaces along the top of the end and side walls provide a very simple, yet effective means for eliminating the perplexing problem of packages of bakery products, particularly loaves of bread, hanging or becoming fouled on the top of the tray during the loading operation and thereafter being mashed by a second tray stacked thereabove. A similar problem is effectively overcome by the V-shaped upwardly directed surfaces of the handholds and inspection openings in combination with the reinforcing flanges around the openings which minimize the tendancy of the pannels to buckle. The adverse effect of any limited inward buckling is overcome by the camming action of the V-shaped openings which tend to urge the packages inward as they drop so that they fall onto the bottom of the tray.

While I have disclosed and described a preferred embodiment of my invention, I wish it understood that I do not intend to be restricted solely thereto, but that I do intend to include all embodiments thereof which would be apparent to one skilled in the art and which, within the spirit of the scope of my invention.

I claim:

1. In a molded plastic bakery tray including a rectangular bottom wall, opposed generally vertical end walls having vertically registering stacking means along their top and bottom edges, and opposed side walls having a height no greater than one-half the height of said end walls to permit cross nesting of two vertical stacks of the trays, the improvement comprising first outwardly inclined camming surface means extending along the top edge surface of said end walls for substantially the full length thereof, said first camming surface means forming an outwardly flaring extension of the inner surface of said end walls, and second outwardly inclined camming surface means on the top of said side walls and extending substantially the full length thereof, said second camming surface means forming an outwardly flaring extension of the inner surface of said side walls, said first and second camming surface means cooperating to cam bakery products inwardly when said products engage the top surface of said end walls and said side walls when the bakery products are being loaded into said tray whereby the tendancy of the bakery products to become fouled on the top of said end and side walls is greatly reduced.

2. In a bakery tray as defined in claim **1**, the further improvement comprising a generally triangular handhold opening in said end walls, said triangular handhold openings each having one side edge extending generally parallel to and spaced below the top edge surface of its associated end panel and its remaining two side edges extending downwardly and inclined inwardly toward one another, and outwardly directed flange means reinforcing said end walls adjacent the periphery of said handhold openings.

3. In a bakery tray as defined in claim **2**, the further improvement comprising a plurality of inspection openings formed in each of said end walls in spaced relation to said handhold opening, said inspection openings each having a pair of lower edges inclined toward one another in the general configuration of an upwardly open V whereby the tendency of bakery products being loaded into said tray adjacent said end walls to become fouled on said inspection openings is reduced.

4. In a bakery tray defined in claim **1**, the further improvement wherein the stacking means extending along the top surface of said end walls comprises an outwardly and upwardly inclined flange, the inner inclined surface of said flange defining said first camming surface, and integrally molded webs reinforcing said flange at spaced intervals along the outer surface thereof.

5. In the bakery tray defined in claim **4**, the further improvement comprising gusset means integrally molded with and extending downwardly from said bottom wall at spaced intervals around the outer periphery thereof, said gusset means connecting said bottom wall with said end walls and said side walls to reinforce said crate.

6. In the bakery tray defined in claim **5**, the further improvement comprising shoulder means on said gussets adapted to engage the tops of said side walls to locate said tray with respect to a similar tray nested therebeneath and rotated 90° with respect thereto.

7. In a bakery tray as defined in claim **6**, the further improvement wherein said bottom wall is of open grid construction and comprises a plurality of longitudinal beams extending parallel to said side walls and a plurality of transverse beams extending parallel to said end walls.

8. The bakery tray defined in claim **7**, wherein said parallel and said transverse beams have a cross section in the general configuration of the letter M, and wherein said bottom walls

are connected to said side walls and said end walls by beams offset with respect to other beams in said bottom wall parallel thereto.

* * * * *