Nov. 30, 1965 R. F. REIFERS 3,220,631

DISPLAY TRAY

Filed April 23, 1964

FIG. 1

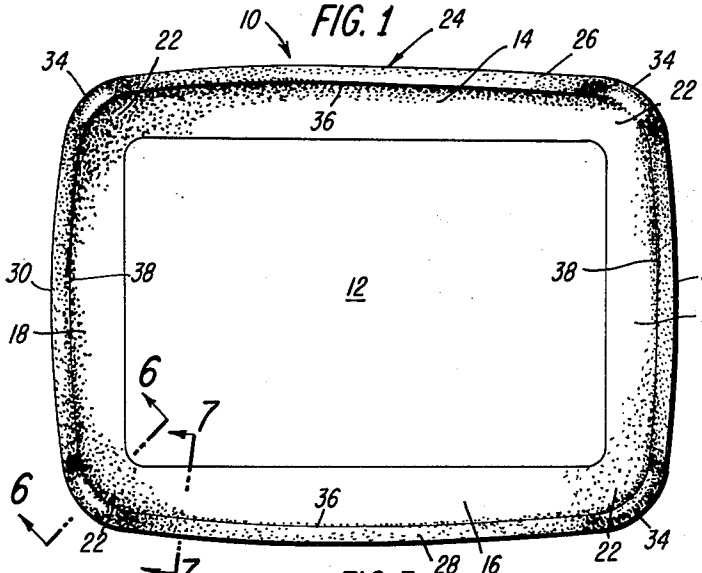


FIG. 2

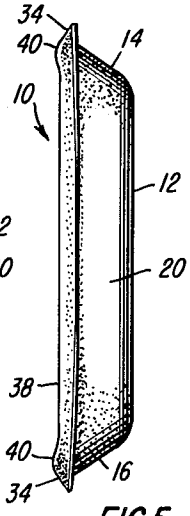


FIG. 3

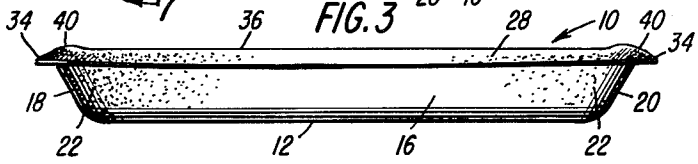


FIG. 5

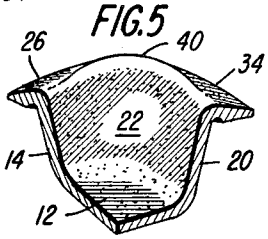


FIG. 4

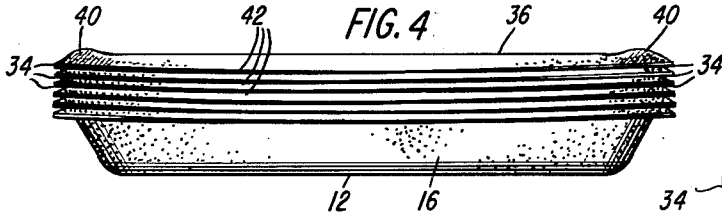


FIG. 6

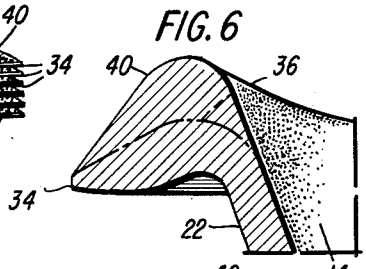


FIG. 8

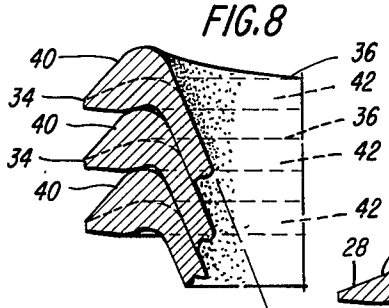


FIG. 9

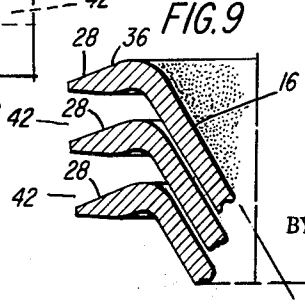
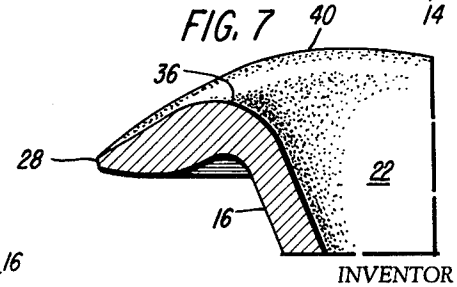


FIG. 7



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DISPLAY TRAY

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5 Claims. (Cl. 229—2.5)

This invention relates to an improved display tray which is produced from molded pulp stock material.

The primary object of the present invention is to provide a novel display tray which includes a construction facilitating uniform stacking; obviates inward side wall deflection on the lower or female end of a stack of trays due to stack weight; provides uniform nesting; substantially frees the trays to facilitate denesting of the trays manually or by means of mechanical apparatus.

Another object of the present invention is to provide in a generally rectangular, low walled display tray the structure affording a constant stacking interval between intermediate side wall flange portions facilitating denesting in automaitc denesting equipment and facilitating efficient hand-denesting, and maintaining dimension control, particularly with respect to the corner portions of the molded tray.

These, together with other and more specific objects and the nature and advantages of the invention will become apparent and more clearly understood from the following description of an exemplary embodiment, reference being made to the accompanying drawings, wherein:

FIG. 1 is a top plan view of a tray including the features of the invention;

FIG. 2 is an end elevation looking from right to left at FIG. 1;

FIG. 3 is a side elevation looking at the lower edge of FIG. 1;

FIG. 4 is a side elevation, similar to FIG. 3 and showing a plurality of the trays in nested relationship;

FIG. 5 is an enlarged fragmentary perspective view looking into the upper right-hand corner of the tray of FIG. 1;

FIG. 6 is an enlarged fragmentary vertical section taken substantially on the plane of line 6—6 of FIG. 1; and showing generally how the modified corners merge into the intermediate adjacent peripheral tray flange portions;

FIG. 7 is a fragmentary enlarged vertical section taken substantially on the plane of line 7—7 of FIG. 1;

FIG. 8 is an enlarged fragmentary vertical section showing a plurality of nested trays in sections similar to FIG. 6, and indicating graphically the denesting interval between adjacent or overlying intermediate peripheral flange portions of the nested trays; and

FIG. 9 is an enlarged fragmentary vertical section showing a plurality of nested trays in section similar to FIG. 7.

Referring to the drawings in detail, and first considering FIGS. 1–3, a molded pulp tray is indicated generally at **10**, the tray generally comprising the type described as a "display" tray eventually used for the purpose of packaging meats, fruits, etc. The tray is produced by means of conventional methods familiar to those skilled in the art.

The tray **10** comprises a substantially planar and rectangularly conformed bottom wall **12** bordered by upwardly and outwardly extending side walls **14** and **16** and end walls **18** and **20**, and adjacent walls are connected by arcuate, upwardly and outwardly extending corners **22**.

The walls **14–20** as well as the corners **22** are integral with an outwardly and downwardly angled peripheral marginal flange **24**. The flange portions bordering side walls

14, **16** and **18**, **20** and corners **22** are respectively identified at **26**, **28**, **30**, **32** and **34**.

The side walls **14**, **16** and end walls **18**, **20** terminate in a substantially linear upper edge **36** and **38**, respectively, which are substantially coplanar, i.e. falling generally within a common horizontal plane parallel to the bottom wall **12**.

Formed integrally at each of the corners **22** is a transversely, or vertically thickened denesting portion or abutment **40** terminating above the upper edges **36** and **38** clearly seen in FIGS. 2–8. The thickened portions **40** comprise an arcuate lip which merges into the adjacent side edges **36** and **38**, and as seen in FIG. 4, and dramatically illustrated in FIG. 8, forms a spacing or denesting interval **42** between adjacent trays which are nested.

Intermediate peripheral side flange portions of the side walls **14**, **16** and **18**, **20** of nested trays are not in contact, however, in a sense the corners of each individual tray, and accordingly a vertical stack of nested trays, have a rigidified and substantially stronger corner that forms a rigid vertical column in the stack of nested trays. This rigid column controls the application or imposition of excessive vertical pressure on the lowermost trays, i.e. the female trays at the lower end of a vertical stack. This expedient, i.e. rigidifying the corners and forming in a sense four vertical columns at the corners of a nested stack, prevents inward deflection that might occur on the lowermost trays when pressure is applied to the bottom panels.

Additionally, the transversely thickened, denesting portions have thereat a vertical angle with the bottom which differs from that at the intermediate peripheral flange portions of the tray, and in this manner minimum frictional contact between adjacent portions of nested tray walls is controlled. Since certain portions are maintained substantially out of nested contact, denesting or separation of the individual trays is facilitated.

The angle of the corners **22** with respect to the bottom wall **12** is between 18 to 28 degrees as compared with a similar angle through the midpoint at the side walls **14–20** which is about 28 to 32 degrees; see FIGS. 8 and 9. Thus, the corners are the load bearing portions of a nested stack of trays and the side walls are substantially "non-load bearing."

This angular relationship of the side walls and corners together with the thickened portions **40** cooperate to provide a corner loaded stack which can be readily denested.

Still further, dimension control of the tray is improved and dimension changes during drying and shrinkage are accurately controlled.

Not only does the tray of the invention facilitate separation or denesting, but this tray enhances package production inasmuch as it lends itself to use on automatic denesting apparatus as well as manually operated denesting apparatus.

Obviously many modfiications and variations of the present invention are apparently possible in the light of the above teachings. It is therefore to be understood that within the scope of the appended claims, the invention may be practiced otherwise than is specifically described.

I claim:

1. A rectangular, molded display tray comprising:

a planar bottom wall integral with upwardly and outwardly extending side and end walls connected by arcuate corners,

said side and end walls including a peripheral marginal flange including an upper edge portion disposed in coplanar relation in a common upper plane, the improvement comprising, at least,

four vertically thickened, integral denesting abutments on said marginal flange spaced at regular intervals about said flange relative to said

corners and including an upper edge portion disposed a substantial distance above said common plane for forming four relatively rigid columns in a vertical stack of nested display trays and eliminating resistance between adjacent portions of said tray flanges and the tray walls and permitting ready separation between adjacent trays and defining a uniform denesting interval between portions intermediate said abutments on a tray and adjacent trays of a stack.

2. The structure as claimed in claim 1 in which each of said abutments are located at the corner of said tray flange.

3. The structure as claimed in claim 1 in which said abutments have an upper arcuate margin merging at opposite ends into said common upper plane.

4. The structure as claimed in claim 1, in which said peripheral margin extends angularly downwardly from the upper edge of said tray,

the angle at said corners being less acute than the angle at comparable intermediate side and end wall portions of said tray.

5. The structure as claimed in claim 1 in which said integral denesting portion comprises a cross section in which the upper surface thereof is more acute than the lower surface thereo.

References Cited by the Examiner

UNITED STATES PATENTS

1,022,882	4/1912	Schwenn	229—97
2,530,124	11/1950	Kieckhefer	220—97 X
2,814,427	11/1957	Emery	220—97 X
2,997,196	8/1961	Emery	220—97 X
3,120,901	2/1964	Boyd	220—97 X

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