March 24, 1959 R. B. NAWMAN 2,878,959

NESTING TRAY CONSTRUCTION

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FIG_1

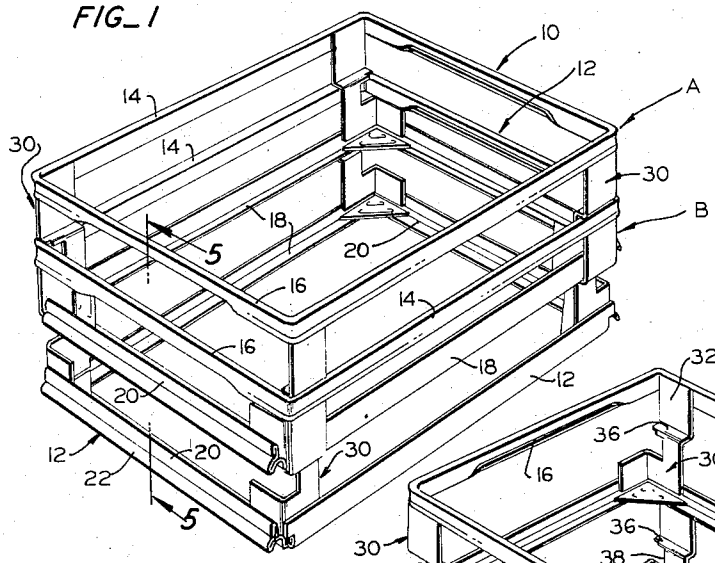


FIG_2

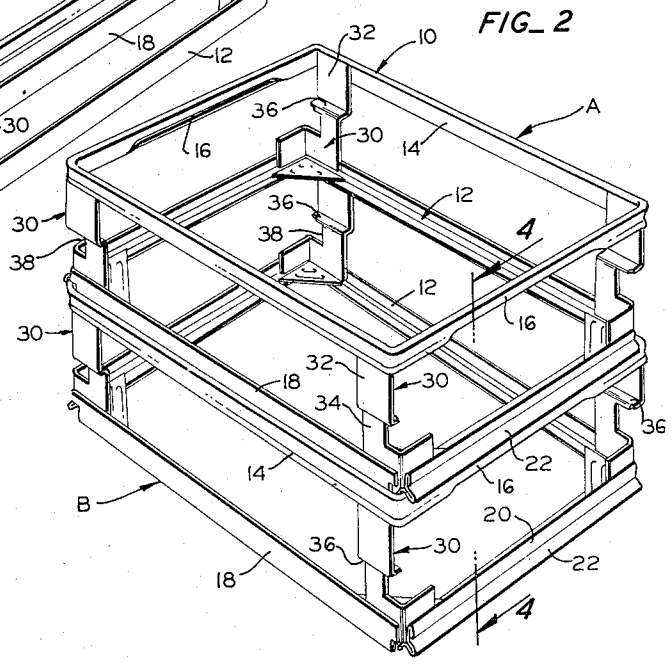
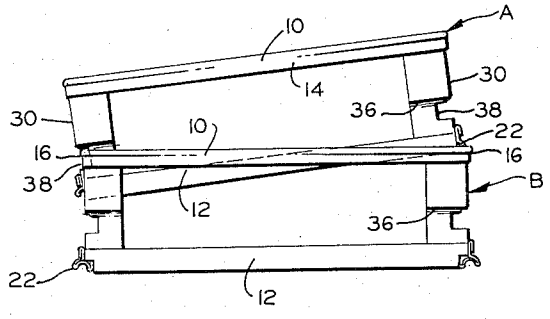


FIG_3



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FIG_4

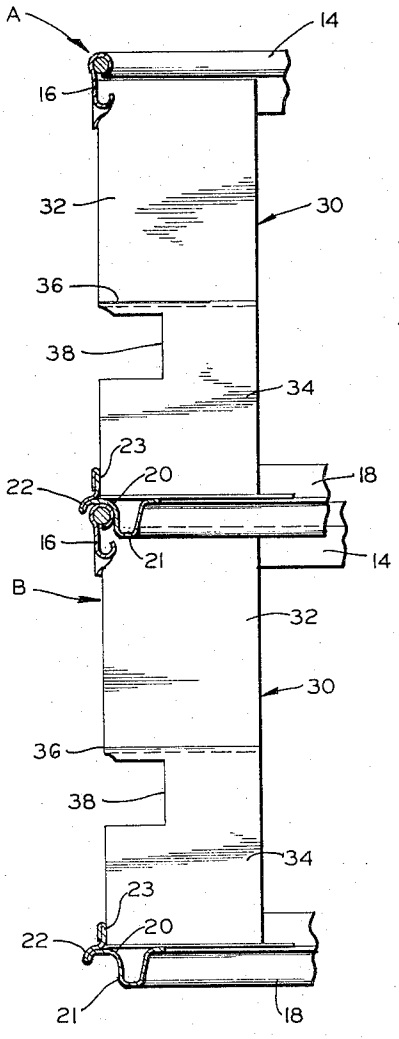


FIG_5

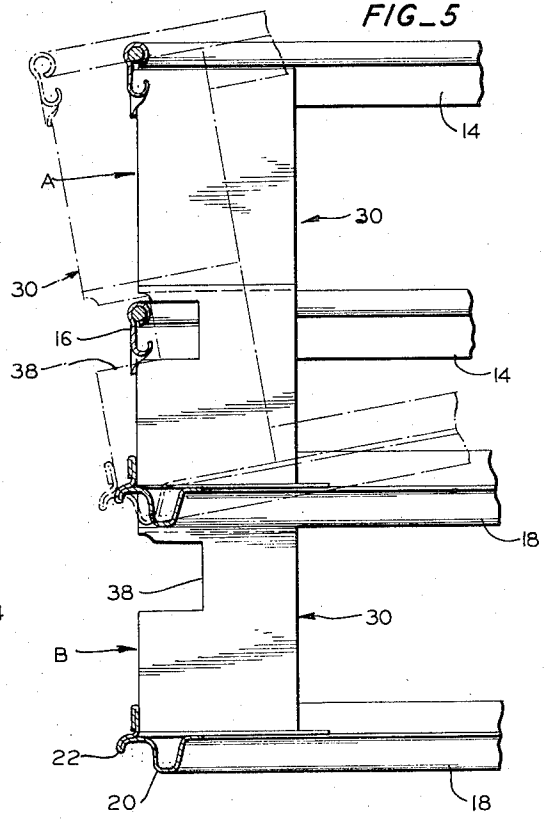


FIG_6

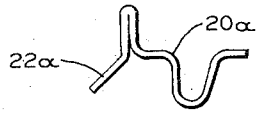
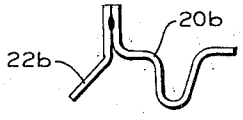


FIG_7



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NESTING TRAY CONSTRUCTION

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8 Claims. (Cl. 220—97)

This invention relates generally to trays and boxes, and particularly to a nesting tray construction for use in the transporting and storage of crushable items of merchandise.

It is frequently desirable, for example in the handling of bakery items such as bread, cake, doughnuts, cookies and the like, to provide a protective basket or tray to prevent crushing or mashing of the merchandise. Such a tray is generally used to protect the merchandise during periods of shipment of storage prior to marketing. Once the merchandise has been delivered to market, however, the trays cease to perform a useful function, and their bulk and size present a considerable problem until such time as the trays are returned to the original shipping point.

In an effort to save valuable warehousing and shipping space, the prior art has provided many different types of collapsible or nesting tray constructions. To date, however, no one of these prior devices has proved completely satisfactory in use; the trays either do not nest properly, or the collapsing mechanism functions improperly or is too expensive of manufacture. A solution to this problem in the art is therefore highly to be desired.

In general, it is an object of the present invention to improve upon the construction of nesting trays, particularly with respect to means permitting a ready nesting of trays having substantially the same rectangular configuration and dimensions.

It is another object of the invention to provide a nesting tray which will act positively to protect merchandise contained within its framework, in a stacked position of the trays.

It is a further object of the invention to provide a nesting tray construction that is rugged, durable, easily manufactured and which employs no moving parts.

Additional objects and advantages of the invention will appear from the following description and from the drawings in which:

Figure 1 is a view in perspective of a pair of trays embodying the invention, the trays being shown in nested position;

Figure 2 is a like view showing the trays in a stacked or carrying position;

Figure 3 is a view in side elevation, illustrating the manner of nesting the trays;

Figure 4 is a view in vertical section along the line 4—4 of Figure 2;

Figure 5 is a view in vertical section along the line 5—5 of Figure 1; and

Figures 6 and 7 are detail views illustrating modifications of the invention.

Generally stated, a nesting tray of the present invention comprises a pair of rectangular subframes joined at their corners by posts to form an open main frame of substantially rectangular configuration. Each of the posts is provided intermediate its ends with a horizontal or inwardly directed offset portion, and with an outwardly directed notch or indentation extending in a vertical

plane below the offset. The lower subframe is provided with a protruding lip means so that engagement with the upper subframe of an adjacent tray will result in a stacked or carrying position of the trays. When it is desired to nest the trays, the notches in one set of posts permit a pivotal manipulation, as in Figure 3, to provide a nested position in which the offset portions of one tray are supported upon the upper subframe of the other.

Referring to the drawings in detail, A and B represent a pair of nesting tray constructions which may be stacked in a carrying position, as illustrated in Figure 2, or in a nested position, as illustrated in Figure 1. Each of the tray constructions comprises an upper subframe **10** and a lower subframe **12**. The upper subframe is substantially rectangular and is preferably bent from a single piece of sheet material or tubing to provide the side rails **14** and end rails **16**. If desired, the upper edge of the frame can be rolled or curled about a reinforcing wire or rod **17** (Figure 4). The lower subframe can be similarly fabricated to provide a rectangular frame having the side rails **18** and end rails **20**. Preferably the side rails **18** of the lower subframe are spaced a lesser distance apart than the side rails **14** of the upper subframe, such construction serving to facilitate the nesting function, as will appear. As best seen in Figure 2, the end rails **20** of the lower subframe are provided with protruding lip means **22** adapted to engage the upper subframe of a lower adjacent tray when the trays are stacked in a carrying position.

The nesting potential of the tray constructions of the invention is due primarily to the novel construction of the corner posts **30**. As illustrated, each of the posts **30** includes two substantially vertical segments **32** and **34** and an intermediate offset portion **36**, the degree of offset preferably corresponding to the narrower width of the lower subframe. As detailed in Figures 4 and 5, the lowermost post segment **34** is provided with an outwardly directed opening or notch **38**. The function of the notch **38** is to telescopingly receive the end rail **16** of the lower adjacent tray during assembly of the trays in a nested position (Figures 3 and 5). It will be understood that the vertical spacing of the segments **32** and **34** can be such that, in a nested position, the offset **36** of an upper tray will be supportingly engaged by the upper rail **14** of a lower tray; in like fashion, its lower rail **18** can be supportingly engaged by the offset of the lower tray.

Figure 4 particularly illustrates a stacked carrying position of a pair of trays, with the lips **22** of tray A being engaged and supported by the end rails **16** of the lower tray B. In the preferred embodiment of Figures 1 to 5, the lips **22** and the end rails **20** are formed as integral units from a single piece of sheet material. Thus the end rail **20** can include a lower U-shaped bend **21** forming an end wall of the lower frame, a curved portion doubling back upon itself to form the lip **22**, and an upstanding portion also doubling back on itself to form a retaining flange **23**. It has been found that this construction not only facilitates a sliding contact of the lip **22** with the rail **16** of the lower tray, but also imparts added strength to the entire unit. The construction is also useful in that the flange **23** cooperates with the inner surface of the guide rail **18** to provide a rigid retaining rim for the disposable cardboard cartons normally positioned in the lower half of a tray.

In the use of the devices just described, the disposable cartons filled with merchandise are positioned in the bottom of the trays taking care that the merchandise does not protrude above the upper rails **14**. The merchandise-filled trays can now be stacked for shipment or storage as illustrated in Figure 2. In the stacked position, the merchandise within the trays is protected from being crushed or damaged during all normal handling by the

rigid framework of the carrying trays. By way of illustration, a stack of loaded trays can be easily lifted and moved about by means of a fork lift truck, or in fact, by any suitable handling device. When the merchandise reaches its ultimate destination, and is unloaded from the trays, the trays may be advantageously nested in the position illustrated in Figure 1. Nesting is easily accomplished by grasping a tray by its upper side rails **14**, and telescoping the end rails **16** of the lower tray within the recesses **38** of a pair of corner posts (Figures 3 and 5). The upper tray can then be pivoted about the end rail **16** with the lip **22** of the opposite end just passing inside the opposite end rail **16** of the lower tray. Thereafter, the tray can be repositioned, as shown in Figures 1 and 5, so that the offsets **36** and side rails supportably engage one another. It will be understood that a stack of nested trays, as in Figure 1, will occupy approximately half the space of a stack of trays in the carrying position of Figure 2. This is a factor of considerable economic importance, since the shipping or storage space saved by the nesting can be employed for additional merchandise, making possible a maximum use of available space.

Although the above description has related to a particular embodiment of the invention, as illustrated in Figures 1 to 5, many different embodiments and widely divergent applications of the invention will suggest themselves to those in this art without departing from the spirit and scope of the invention. For example, Figure 6 illustrates a simplified construction of the end rail **20** in which the lip **22*a*** is formed from a single thickness of material; Figure 7 illustrates a further modification by which a separate lip **22*a*** might be spot welded to an existing end rail construction **20*b***. As another illustration, varying shapes of the notches **38** can also be readily employed without appreciably varying the principles of the invention. Accordingly, it should be understood that the disclosures and the description herein are purely illustrative and are not intended to be in any sense limiting.

I claim:

1. In a nesting tray construction, a pair of rectangular sub-frames, posts joining corresponding corners of said sub-frames to form an open main frame, each of said posts including an offset portion intermediate its ends and a notch formed adjacent said offset and extending in a plane perpendicular to said offset portion, the lower of said pair of sub-frames being provided with protruding lip means adapted to engage the upper sub-frame of an adjacent tray construction when in an unnested stacking position, said offset portions being adapted to engage the upper sub-frame of an adjacent tray construction in a nested stacking position.

2. The device of claim 1 wherein said pair of rectangular sub-frames are of the same length, the lower of said sub-frames being somewhat narrower than the upper subframe.

3. The device of claim 1 wherein said lower subframe and said protruding lip means are integral and are formed from a single piece of sheet material.

4. The device of claim 3 wherein said protruding lip means includes a lower U-shaped bend forming an end wall of the lower frame, a curved portion doubled back upon itself to form the protruding lip, and an upstanding portion also doubled back on itself to form a retaining flange, such construction imparting added strength to said lip means and end wall.

5. In a nesting rtay construction, an upper rectangular sub-frame, a lower rectangular sub-frame of substantially the same length as said upper sub-frame but of narrower width, posts joining corresponding corners of said subframes to form an open main frame, each of said posts including two substantially vertical segments and an intermediate offset portion joining said vertical segments, the lowermost of said vertical post portions being provided with an outwardly facing notch adjacent said offset and in a plane perpendicular thereto, said offset portions being in substantially the same plane and adapted to supportably receive the lower sub-frame of an upper nested tray, said lower sub-frame being provided with transverse protruding lip means adjacent its ends, said lip means adapting the tray to be supported on an upper sub-frame of a lower adjacent tray, whereby said trays may be stacked in a spaced position with one tray being supported on another by its lip means and may be subsequently nested with one tray being supported by another by the offset portions of its posts.

6. In a nesting tray construction, an upper rectangular sub-frame, a lower rectangular sub-frame, each of said sub-frames having side rails and end rails, the side rails of said lower sub-frame being spaced a lesser distance apart than the side rails of said upper sub-frame, posts joining corresponding corners of said subframes to form an open main frame having substantially rectangular sides, each of said posts having vertical side rail supporting segments and an inwardly directed offset portion, the offset portions of said posts being in substantially the same plane and parallel to the planes of said sub-frames, said lower sub-frame being provided with protruding lip means being adapted to engage the upper sub-frame of a lower adjacent tray construction in an unnested stacking position, each of said posts being provided with outwardly facing notch means permitting nesting of adjacent trays so that the offset portions of an upper tray construction are supported by the upper sub-frame of a lower tray construction in a nested stacking position.

7. In a nesting tray construction, a pair of rectangular sub-frames, means joining corresponding corners of said frames to form an open main frame having substantially rectangular sides, each of said means including an inwardly directed supporting surface and an outwardly directed indentation, said supporting surface and indentation being in planes that are perpendicular to one another, the lower of said pair of sub-frames being provided with support means adapted to engage the upper sub-frame of an adjacent tray construction when in an unnested, stacking position, said inwardly directed supporting surface being adapted to support on the sub-frame of an adjacent tray construction in a nested stacking position.

8. The device of claim 7 wherein said means joining corresponding corners of said sub-frames includes at least two vertical segments not in the same plane.

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