Feb. 23, 1965 F. M. NASCHER 3,170,594

STACKABLE AND NESTABLE CONTAINER

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FIG. 1.

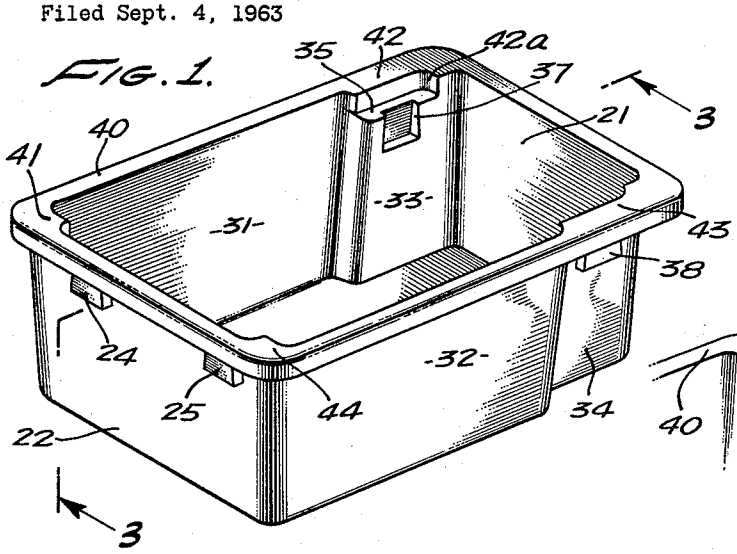


FIG. 2.

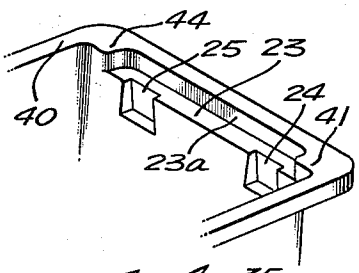
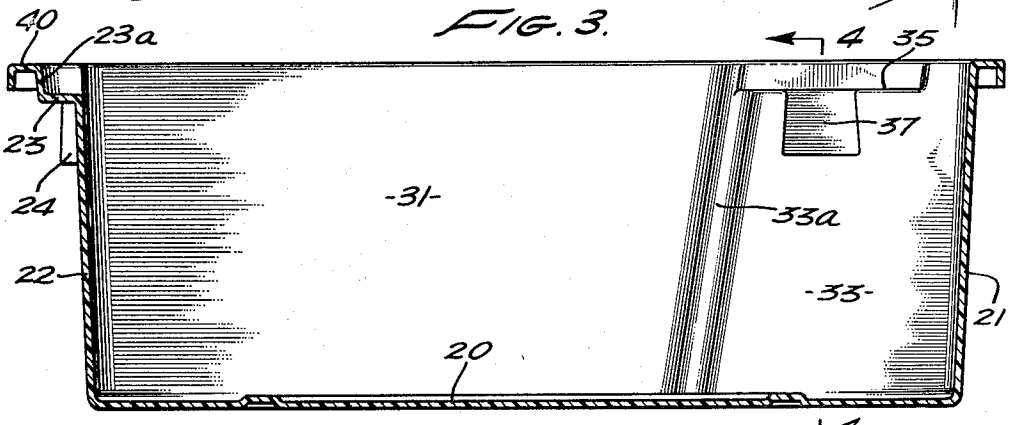


FIG. 3.



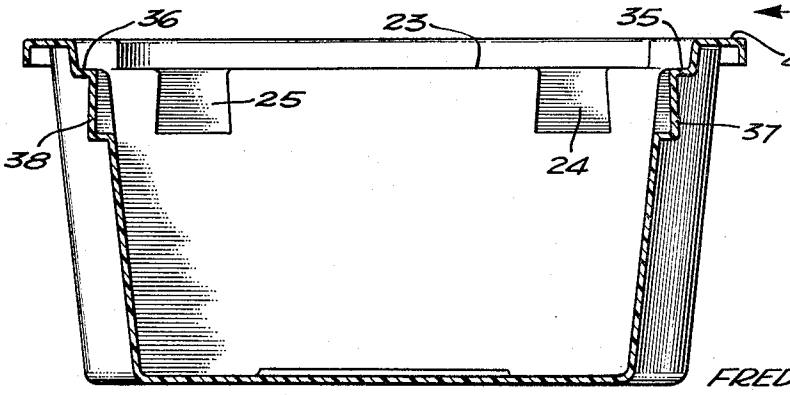


FIG. 4.

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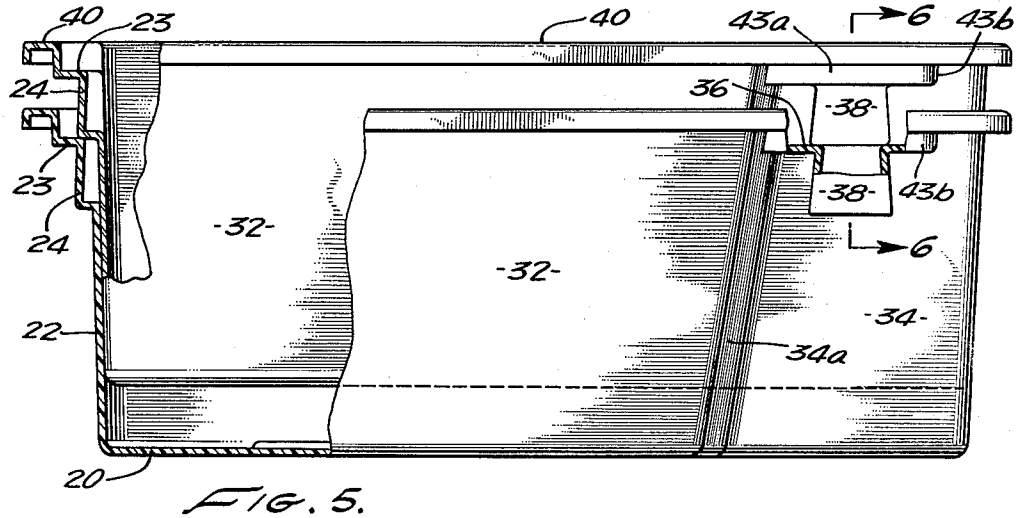


FIG. 5.

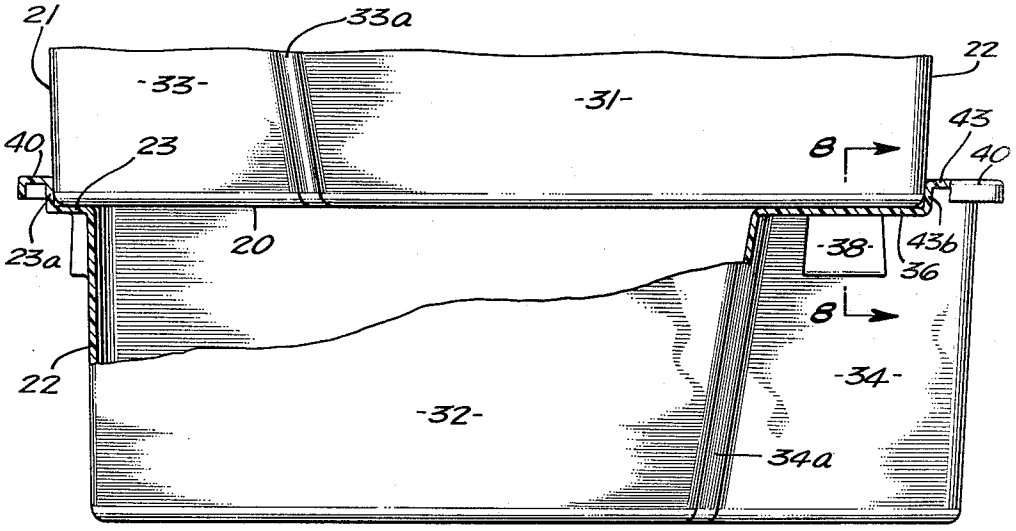
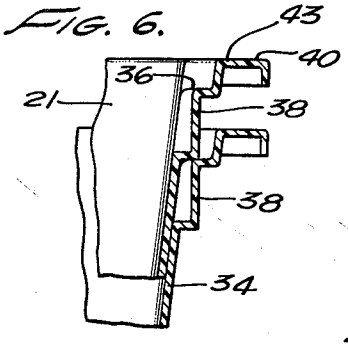


FIG. 7.

FIG. 6.



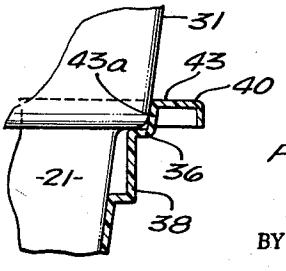


FIG. 8.

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FIG. 9.

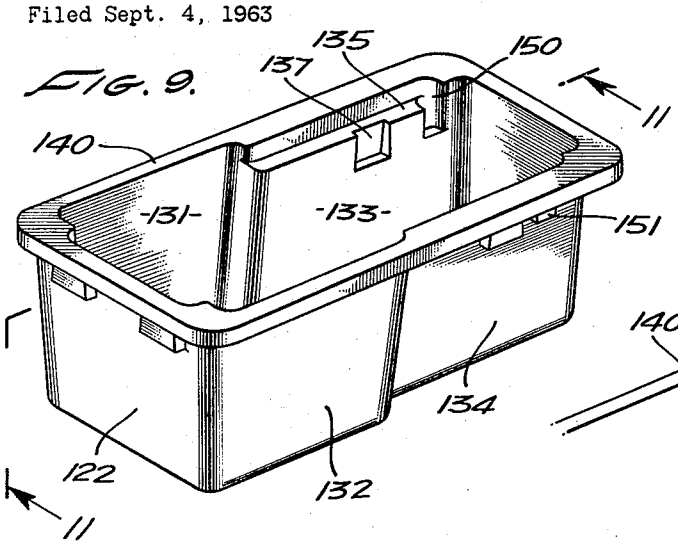


FIG. 10.

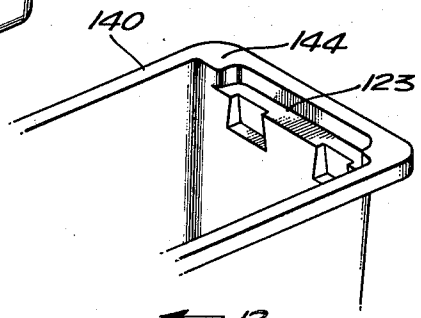
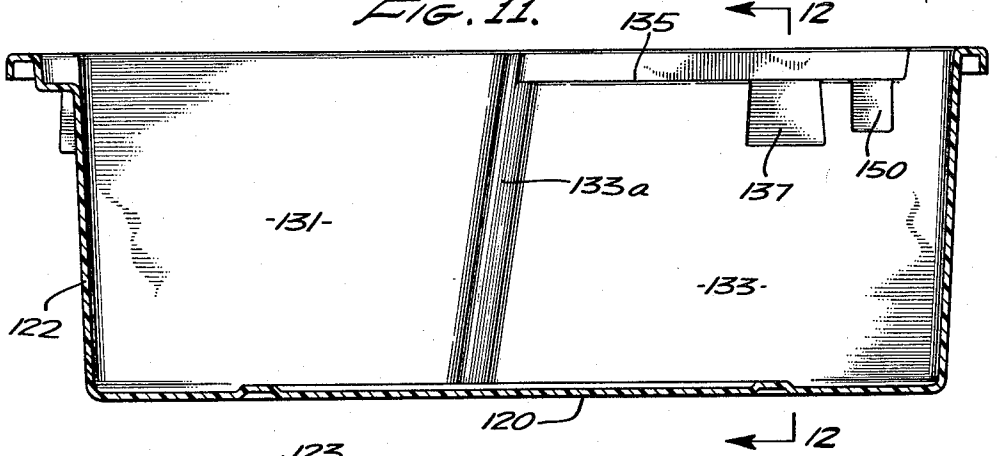


FIG. 11.



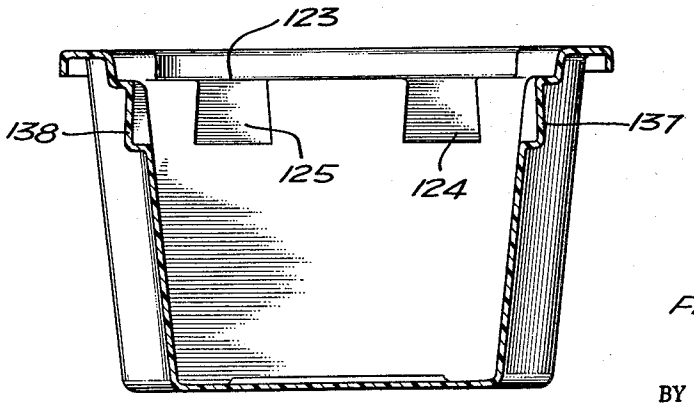


FIG. 12.

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STACKABLE AND NESTABLE CONTAINER

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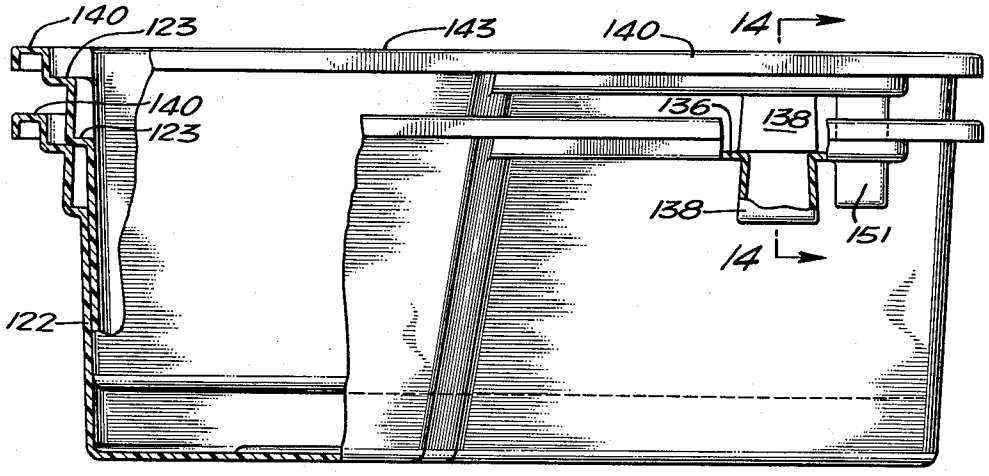


FIG. 13.

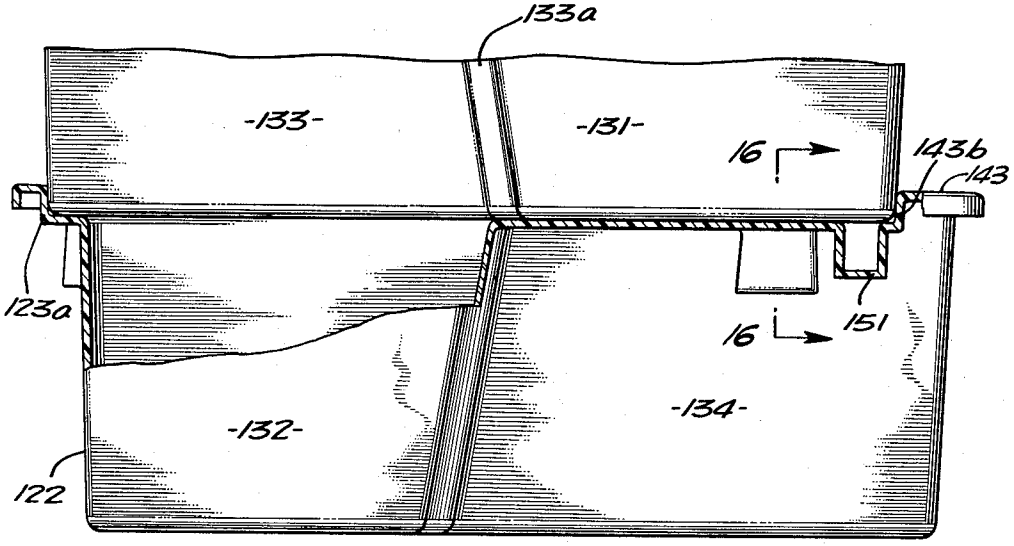
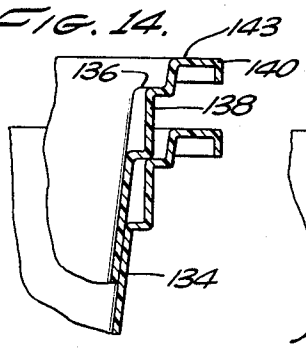


FIG. 15.

FIG. 14.



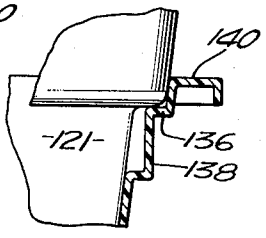


FIG. 16.

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United States Patent Office 3,170,594 Patented Feb. 23, 1965

3,170,594

STACKABLE AND NESTABLE CONTAINER

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Filed Sept. 4, 1963, Ser. No. 306,567
2 Claims. (Cl. 220—97)

The present invention relates to a stackable and nestable container, and more particularly to such a container having two flat end walls.

In the art of manufacturing integrally formed containers it is the general practice to design such containers so that both the side walls and the end walls thereof diverge upwardly and outwardly. One reason for this principle of construction is that it permits superimposed identical containers to be conveniently nested together. Another reason for this principle of construction is that the diverging wall configuration permits the fully formed container to be conveniently pulled from its mold during the forming operation. Numerous configurations of containers have been known and utilized which fall within the general category just referred to.

The advantage of having flat end walls for the container is pointed out, for example, in U.S. Patent No. 2,995,271, although the containers disclosed in that patent have only a single end wall which is flat. One of the objects of the present invention, therefore, is to provide a container of this general type having two flat end walls.

The significant basis of the present invention, however, is an economic problem that is not readily apparent. The number and configuration of the convolutions or stacking posts which are incorporated into a container of the general type under consideration, for the purpose of providing stacking support for a loaded superimposed container, has an important effect upon the manufacturing cost, and specifically, upon the cost of the tooling for forming the container. As a general proposition the simpler the configuration of the container the less expensive the tooling will be, and the faster the operation of forming containers from a given set of tooling.

But the effective support of a fully loaded superimposed container, or more importantly, of a high stack of such fully loaded superimposed containers, usually requires a considerable number of stacking convolutions or posts. At least, such has been the teaching of the prior art. And when the containers are made of a long and narrow configuration, and the walls thereof are made very thin so as to conserve the expensive material that is used, the mechanical problem of providing effective vertical stacking support becomes critical indeed.

Thus, the primary object and purpose of the present invention is to provide a stackable and nestable container of such configuration as to have more effective vertical stacking support, relative to the total cost of the container including the cost of the material, the tooling, and the manufacturing process, than has been achieved in prior containers of this general type.

The general concept of the invention is summarized as follows. Both end walls of the container are made flat, although the end walls of course diverge outwardly and upwardly in accordance with the basic principle of construction of this type of container. One of the end walls is, near its upper extremity, provided with an outwardly offset portion which provides a single end wall shelf. The two side walls also diverge outwardly and upwardly. The end portions of the side walls which are adjacent the other end wall (that is, on the opposite end of the container from where the end wall shelf is located), are offset inwardly relative to the remaining portions of the respective side walls, these inwardly offset side wall portions being in turn outwardly offset near their upper extremities so as to provide a pair of side wall shelves. The container also includes wall means rising up from each of the shelves to limit both the effective length and width thereof.

When a superimposed container is rotated end for end in order to assume its stacking position, one of the consequences of this relationship is that the upper container is shifted a small amount longitudinally relative to the lower container. This shift of longitudinal position of the upper container is measurable with reference to the end walls of both the upper and lower containers.

However, in the presently preferred form of the invention a conventional circumferential bead is utilized at the upper portion of the container, and this bead is in turn offset longitudinally relative to the longitudinal center of the container, as measured between the end walls thereof. More specifically the circumferential bead is provided with a first pair of widened portions which limit the length of the end wall shelf, and with a second pair of widened portions which limit both the width and the length of the side wall shelves.

Where containers of considerable length relative to their width are being utilized it is deemed preferable to incorporate side wall shelves which extend half the length of the container, or nearly so.

The objects and advantages of the invention will be more fully understood with reference to the following description considered in conjunction with the accompanying drawings, wherein:

FIGURE 1 is a perspective view of one presently preferred embodiment of the invention;

FIGURE 2 is a fragmentary perspective view showing a detail not visible in FIGURE 1;

FIGURE 3 is a longitudinal sectional view of the container of FIGURE 1 taken on the line 3—3 thereof;

FIGURE 4 is a transverse sectional view of the container taken on the line 4—4 of FIGURE 3;

FIGURE 5 is a longitudinal elevational view, partly in section, showing a pair of the containers of FIGURE 1 when superimposed in nested relationship;

FIGURE 6 is a fragmentary cross-sectional view taken on the line 6—6 of FIGURE 5;

FIGURE 7 is an elevational view, partially in section, showing a pair of the containers of FIGURE 1 in their stacking relationship;

FIGURE 8 is a fragmentary cross-sectional view taken on the line 8—8 of FIGURE 7; and

FIGURES 9 to 16, inclusive, are corresponding views of a second embodiment of the invention, which differs in some details from the first embodiment thereof.

Referring now to FIGURES 1 to 4, inclusive, the container there illustrated will be seen to include a bottom wall 20 from which end walls 21 and 22 extend upwardly and outwardly. The end wall 21 is of a flat configuration throughout, and at its upper extremity is joined to the circumferential bead or flange 40. End wall 22 near its upper extremity is outwardly offset so as to provide an end wall shelf 23 therein.

Side walls 31 and 32 likewise extend upwardly and outwardly from the bottom wall 20. At two of the corners of the container the side walls 31 and 32 are joined throughout their vertical height to the end wall 22. The portions of the side walls 31 and 32 which are adjacent the other end wall 21 are identified as 33 and 34, respectively; and it will be seen that these end portions of the side walls are inwardly offset relative to the remaining portions thereof. Thus at the other two corners of the container the side wall portions 33 and 34 are joined to the end wall 21 throughout their height. It will be observed that a result of this arrangement is that the length of end wall 21 is less than the length of end wall 22.

The inwardly offset side wall portions 33 and 34 are separated from the main wall portions by shoulders 33*a* and 34*a*, respectively; and it will be seen that these shoulders 33*a* and 34*a*, from bottom to top, incline toward the end wall 21. Alternatively stated, the inwardly offset side wall portions 33 and 34 have their greatest length, measured longitudinally of the container, at their lowermost extremities. This relationship is necessary in order to permit a superimposed identical container to nest within the lower container.

The inwardly offset side wall portions 33 and 34 are, near their upper extremities, outwardly offset so as to provide a pair of side wall shelves 35 and 36, respectively. These side wall shelves are formed at the same vertical elevation as the end wall shelf 23.

In conjunction with the end wall 22 the circumferential bead or flange 40 has a first pair of widened portions 41 and 44 which limit the length of the end wall shelf 23 so that it is substantially equal to the length of the lower extremity of the opposite end wall 21 at the point where it joins the bottom wall 20. In conjunction with the outwardly offset upper portions of inwardly offset side wall portions 33 and 34 the circumferential bead or flange 40 has a second pair of widened portions 42, 43, which limit both the width and the length of the side wall shelves 35, 36. The details of this relationship and the reasons for it will be more fully understood when the stacking relationship of the containers is discussed, subsequently.

As best seen in FIGURE 3 the circumferential bead or flange 40, which is of a rectangular configuration, is offset a short distance longitudinally relative to the longitudinal center of the container, as measured between its end walls 21 and 22. But if the length of the container is considered as including the end wall shelf 23, then in that event the longitudinal center thereof coincides with the longitudinal center of the circumferential bead or flange 40.

One of the features of the present container is the incorporation of anti-wedging posts 24, 25, 37, 38. The anti-wedging posts 24 and 25 are incorporated in the end wall shelf 23, while the anti-wedging posts 37 and 38 are incorporated in the side wall shelves 35 and 36, respectively. Each anti-wedging post is characterized by walls which generally diverge outwardly of the container as they extend downwardly. However, the location of such anti-wedging posts or lugs, as illustrated herein, is a significant aspect of the present invention.

Reference is now made to FIGURES 5 and 6 illustrating the nesting relationship of two of the containers of FIGURES 1 to 4; and it will be seen that the anti-wedging action of the posts or lugs 24, 25, 37, and 38 is clearly illustrated therein.

FIGURES 7 and 8 illustrate the stacking relationship of the containers of FIGURES 1 to 4. End wall shelf 23 receives the shortened opposite end wall 21, at the lower extremity thereof where it joins bottom wall 20. Side wall shelf 36 receives the lower extremity of side wall 31 where it joins end wall 22 and bottom wall 20; and in similar manner side wall shelf 35 (not specifically shown) receives the lower extremity of side wall 32 in the area where it joins end wall 22 and bottom wall 20. Thus, it will be seen that the horizontal spacing, measured transversely of the container, between the second pair of widened portions 42, 43 of the circumferential bead or flange 40, is such as to accommodate therebetween in a fairly precise fashion the lower extremity of end wall 22, along its juncture with bottom wall 20. The upwardly rising wall portions 42*a* and 43*a* (which could be considered as parts either of the side wall portions 33 and 34, respectively, or of the bead portions 42 and 43, respectively) are the particular structural segments of the container between which this transverse distance above referred to exists. In like manner the rounded end wall segments 42*b* and 43*b* define the longitudinal extent of the side wall shelves 35 and 36, in such manner as to rather precisely accommodate the full length of the bottom wall 20 of the superimposed container between such end wall segments and the end wall segment 23*a* which extends above the end wall shelf 23.

Referring now to FIGURES 9 through 16 of the drawings it will be seen that the container therein illustrated is essentially identical to the container of FIGURES 1 to 8, except for the following specific differences: the container is of lesser width, and therefore has a greater length to width ratio; the side wall shelves 135 and 136 are of much greater length, being approximately half the full length of the container; and notches 150, 151 separate the side wall shelves 135, 136, respectively, from their adjacent end wall 121. It will readily be appreciated that these elongated side wall shelves permit a very effective stacking support for fully loaded, superimposed containers, while posing no problems of additional tooling cost or processing time during the manufacture of the containers. In FIGURES 9 to 16, inclusive, like parts corresponding to those in the first embodiment of the invention are designated with the same part number, but increased by 100; thus the end wall 121 corresponds to the end wall 21, and so on. Further detailed description of this second embodiment of the invention is therefore unnecessary.

The invention has been described in considerable detail in order to comply with the patent laws by providing a full public disclosure of at least one of its forms. However, such detailed description is not intended in any way to limit the broad features or principles of the invention, or the scope of patent monopoly to be granted.

What I claim is:

1. An integrally formed stackable and nestable container of sheet material of uniform cross-section throughout comprising integral oppositely disposed side and end walls and a bottom wall interconnecting the side and end walls, said side and end walls diverging upwardly and outwardly from said bottom wall and terminating in a flange connecting the marginal edges of said side and end walls, one container end wall having an outwardly offset shelf forming recess therein, said recess including bottom, side and end walls, the bottom wall being disposed below the marginal flange and merging into the side wall thereof, said recess side wall being disposed outwardly of the container end wall and merging into said marginal flange, the end walls thereof terminating inwardly of the container side walls, said container side walls each including adjacent the other container end wall an inwardly offset portion extending the entire height of the side walls and defined by angularly disposed shoulders extending from adjacent the bottom wall to said marginal flange, said offset portion being of greatest length adjacent the juncture with the bottom wall and of less length at the juncture with the said flange to permit nesting of superimposed identical containers, each of said offset portions of the side walls including an outwardly extending shelf forming recess, each recess including bottom, side and end walls, said recess bottom wall being disposed below the marginal flange and merging into said side wall thereof, said recess side wall being disposed outwardly of the container side walls, one of the said recess end walls terminating short of the container end wall, the other of said recess end walls merging into the inclined shoulder, each of said side and end wall shelf forming recesses having a length several times their width and each recess including a downwardly extending anti-wedging post of less width than said shelf recess and of a height at least twice the distance from the bottom wall of the shelf forming recess to the said marginal flange, the exterior walls of the post diverging outwardly and downwardly in non-parallel relationship both with the container walls and a true vertical plane and terminating in a post bottom wall, said bottom wall being parallel with the recess bottom walls and the marginal flange of the container and

extending inwardly and merging with the container walls.

2. An integrally formed stackable and nestable container of sheet material of uniform cross-section throughout comprising integral oppositely disposed side and end walls and a bottom wall interconnecting the side and end walls, said side and end walls diverging upwardly and outwardly from said bottom wall and terminating in a flange connecting the marginal edges of said side and end walls, one container end wall having an outwardly offset shelf forming recess therein, said recess including bottom, side and end walls, the bottom wall being disposed below the marginal flange and merging into the side wall thereof, said recess side wall being disposed outwardly of the container end wall and merging into said marginal flange, the end walls thereof terminating inwardly of the container side walls, said container side wall each including adjacent the other container end wall an inwardly offset portion extending the entire height of the side walls and defined by angularly disposed shoulders extending from adjacent the bottom wall to said marginal flange, said offset portion being of greatest length adjacent the juncture with the bottom wall and of less length at the juncture with the said flange to permit nesting of superimposed identical containers, each of said offset portions

of the side walls including an outwardly extending shelf forming recess, each recess including bottom, side and end walls, said recess bottom wall being disposed below the marginal flange and merging into said side wall thereof, said recess side wall being disposed outwardly of the container side walls, one of the said recess end walls terminating short of the container end wall, the other of said recess end walls merging into the inclined shoulder, each of said side and end wall shelf forming recesses having a length several times their width, and said side wall shelf forming recesses having a length equal to substantially half the length of the container whereby a superimposed container is supported in the middle portion thereof as well as on both ends.

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2,995,271	8/61	Frater	220—97

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GEORGE O. RALSTON, *Examiner.*