United States Patent

Box

[15] **3,659,743**

[45] **May 2, 1972**

[54] PLASTIC NESTING AND STACKING CASE

[72] Inventor: **Theodor Box,** 1108 Ailene Road, Brielle, N.J. 08730

[22] Filed: **July 29, 1970**

[21] Appl. No.: **59,252**

[52] **U.S. Cl.** ..... **220/97 E**
[51] **Int. Cl.** **B65d 21/06**
[58] **Field of Search** ..... 220/23.6, 97 R, 97 C, 97 E, 220/97 F; D9/177; D87/1

[56] **References Cited**

UNITED STATES PATENTS

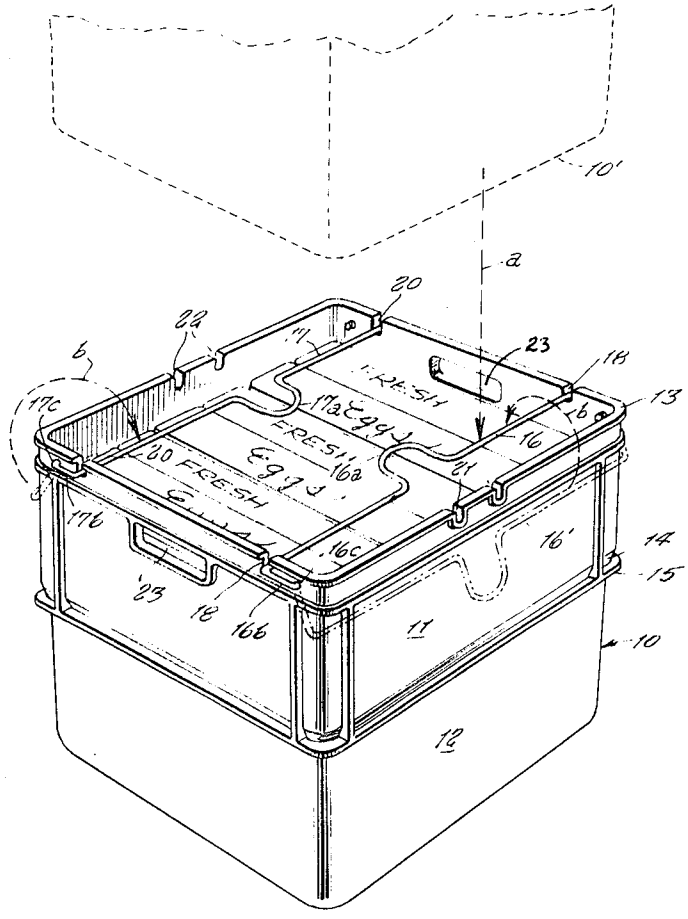
3,220,603	11/1965	Broomley	220/97 E X
3,214,057	10/1965	Box	220/97 R
2,087,944	7/1937	Brown	220/97 E
3,037,659	6/1962	Fredrick	220/23.4 X

Primary Examiner—George E. Lowrance
Attorney—Kenyon and Kenyon Reilly Carr & Chapin

[57] **ABSTRACT**

A plastic nesting and stacking case in the form of an open-topped integrally molded rectangular unit having a pair of first opposed side walls, a pair of second opposed side walls and a bottom wall, comprises an upper part with its walls normal to said bottom wall, an intermediate part slightly tapering inwardly and having a height equal to a substantial fraction of the height of said upper part, and a lower part having a height equal to said upper part and tapering slightly inwardly towards the bottom wall of the case. The upper edge of the lower part has an outwardly projecting flange, whereby to enable partial nesting of a first case in a second similar case by the flange of the former resting upon the top edge of the latter. A pair of retractible supporting frames rotatively mounted upon the top of the cases serve to enable stacking of a number of cases with the bottom wall of one case resting upon the supporting frames of the case below in the stack.

4 Claims, 7 Drawing Figures



Patented May 2, 1972

3,659,743

3 Sheets-Sheet 1

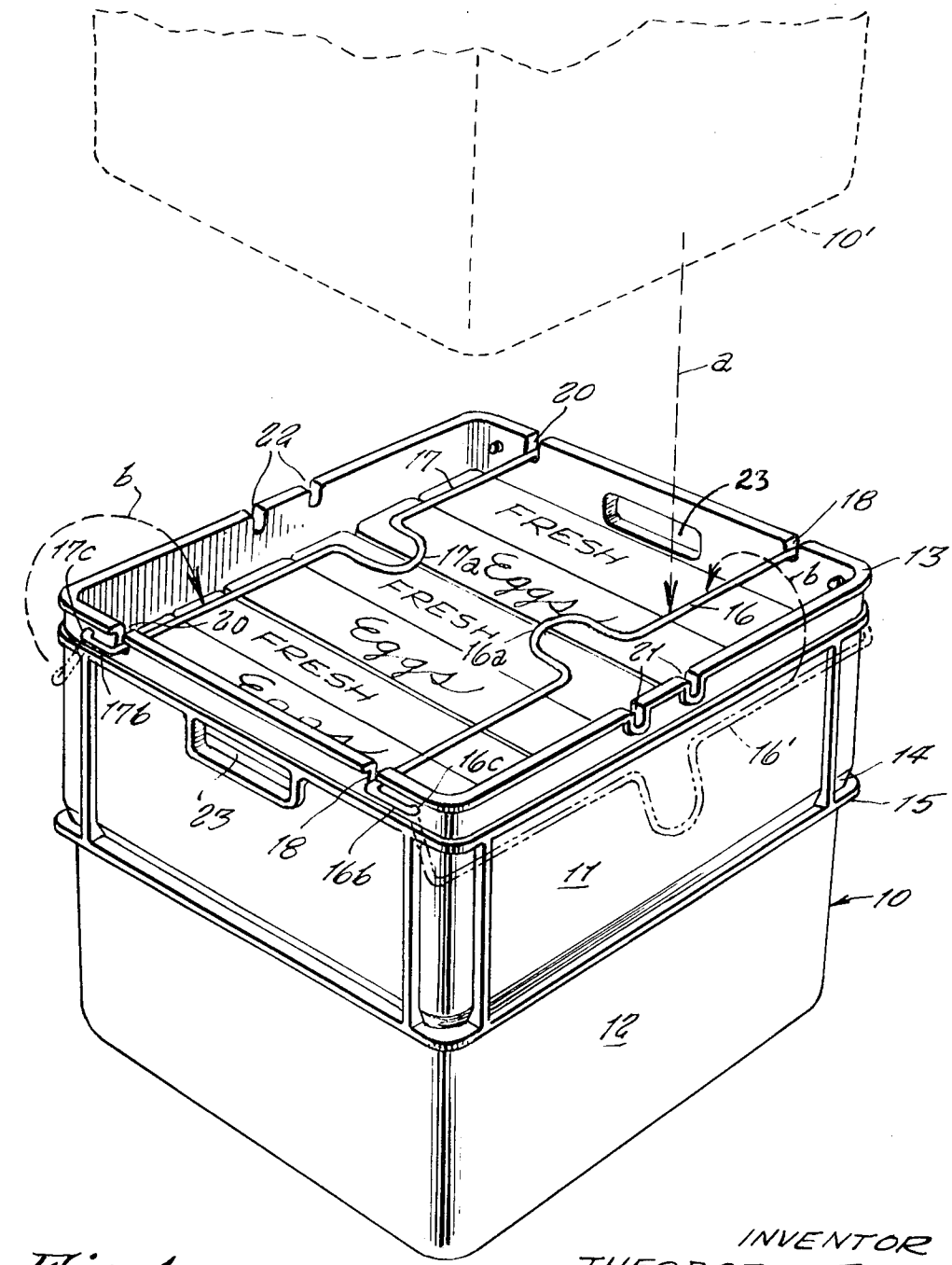


Fig. 1

INVENTOR
THEODOR BOX
BY
MARL RATH
ATTORNEY

Patented May 2, 1972

3,659,743

3 Sheets-Sheet 2

Fig. 2

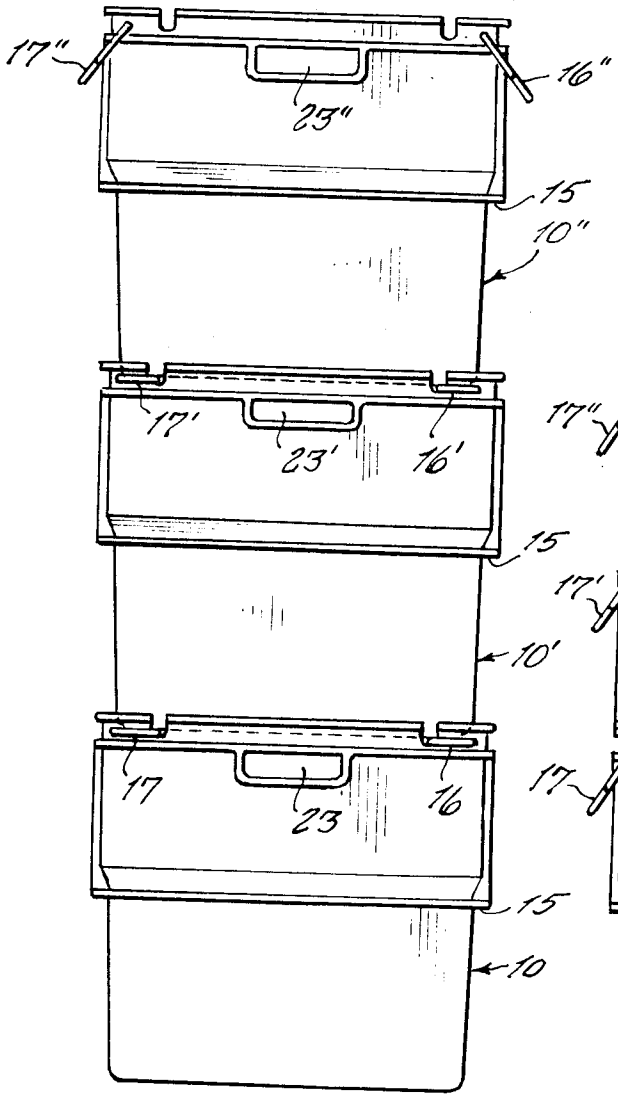
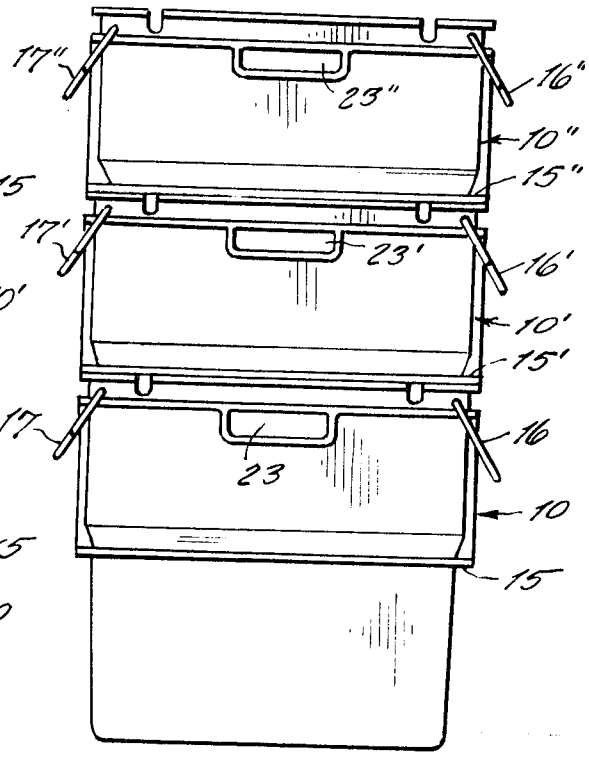


Fig. 3



INVENTOR
THEODOR BOX
BY
KARL RATH

ATTORNEY

Patented May 2, 1972

3,659,743

3 Sheets-Sheet 3

Fig. 6

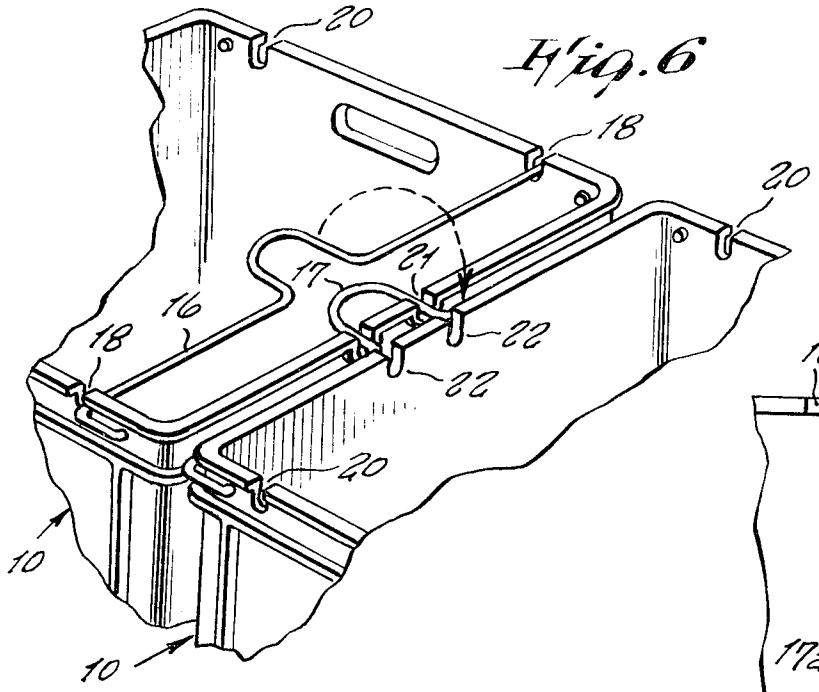


Fig. 7

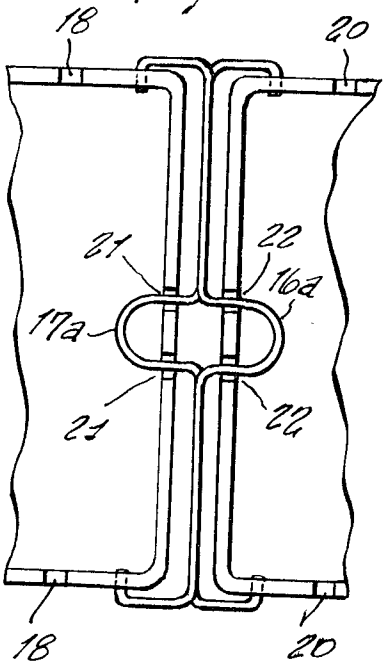


Fig. 4

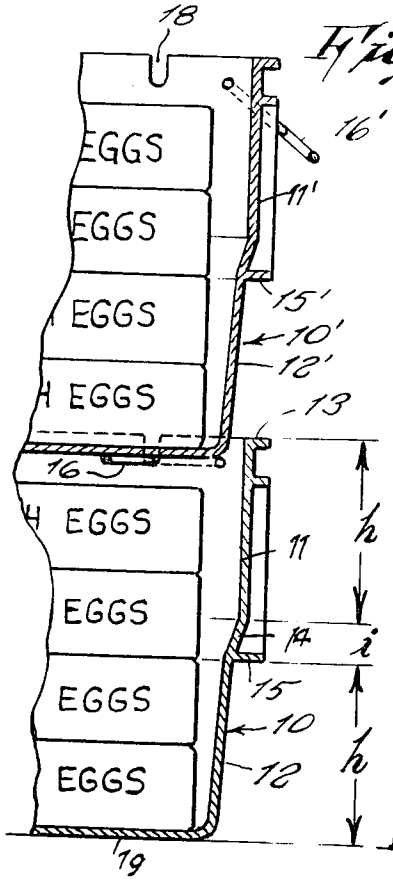
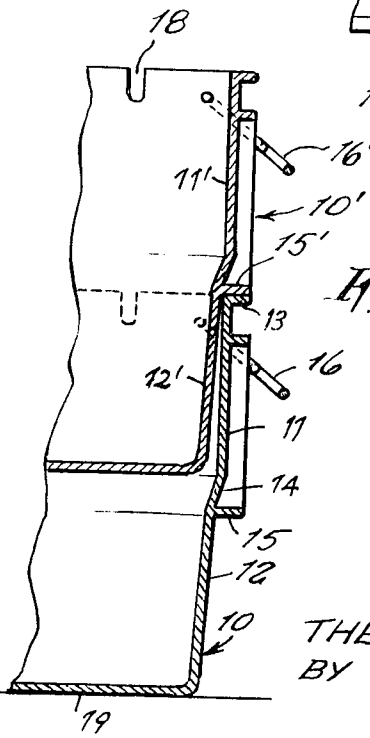


Fig. 5



INVENTOR
THEODOR BOX
BY
KARL RATH

ATTORNEY

PLASTIC NESTING AND STACKING CASE

The present invention relates to integrally molded plastic carrying cases or tote boxes as used for the storage and transport of bottles, cartons or the like containers of beverages and other packaged products or articles. The invention is more particularly concerned with carrying cases of this type capable of nesting within each other, to save storage and/or shipping space in the unloaded condition of the cases, as well as of being stacked in the loaded condition for the shipment and distribution of the products or articles stored in the cases.

It has already been proposed to construct plastic carrying cases of the referred to type, whereby nesting of a first case in a similar case is enabled by tapering or inclining the vertical or side walls of the cases inwardly from top to bottom sufficiently to enable telescoping a first or upper case into the open end of a second or lower case in a stack of empty or unloaded cases.

The known nesting cases have the disadvantage, among others, of being liable to jam or lock in the nested position, especially in the case of relatively large stacks containing greater numbers of cases, whereby to impede or prevent a ready and instant removal or separation of the cases of a stack, prior to the storing of the articles or products to be distributed. In extreme cases, the large-surface friction between the adjoining tapering walls in the stack of nested cases may result in "freezing" of adjacent units in a stack, multiplying thereby the difficulties mentioned. The latter can be reduced only to some extent by the fabrication of the cases to relatively close manufacturing tolerances, a requirement incompatible with costs and the purpose and nature of the devices, as well as of the plastic material, involved.

Accordingly, an important object of the present invention is the provision of an improved open-topped plastic carrying case of the referred to type which can be nested within a similar case, to produce a stack of substantially reduced bulk or mounting space, substantially without the previous and related difficulties encountered in connection with nesting cases constructed in accordance with the prior art.

Aside from the desirability of nesting a number of unloaded or empty cases, to reduce storage and/or shipping space, it is generally required to stack greater numbers of cases in the loaded condition in connection with transport and distribution operations of the goods, products or other articles to be distributed.

Another object of the invention is therefore the provision of a nesting plastic carrying case of the referred to type with retractable supporting means overlying or bridging the open top of the case in the operative or use position, to enable stacking of a number of cases in the loaded condition, substantially without interference with the nesting of the cases in the unloaded condition and the retracted position of said supporting means.

The invention, both as to the foregoing and ancillary objects as well as novel aspects thereof, will be better understood from the following detailed description of a preferred practical embodiment, taken in conjunction with the accompanying drawings forming part of this disclosure and in which:

FIG. 1 is a perspective view of a nesting and stacking case constructed in accordance with the principles of the invention;

FIG. 2 is an elevation showing a number of cases according to FIG. 1 in the loaded and stacked position;

FIG. 3 is an elevation similar to FIG. 2, showing the cases in the unloaded and nested position;

FIG. 4 is a fragmentary vertical section through a pair of adjoining cases of FIG. 2;

FIG. 5 is a fragmentary vertical section through a pair of adjoining cases of FIG. 3; and

FIGS. 6 and 7 are respectively fragmentary perspective and plan views illustrating and improved feature according to the invention.

Like reference numerals denote like parts throughout the different views of the drawings.

With the foregoing objects in view, the present invention involves generally the provision of an improved molded plastic carrying case of the referred to type which may be partially nested with and disassembled from a similar case in a stack, substantially, without the difficulties mentioned, while keeping with prevailing manufacturing tolerances in the fabrication of devices of this type. For this purpose, the side walls of an integrally molded open-topped rectangular unit comprise essentially an upper part having walls substantially normal to the bottom wall of the case, an intermediate part having a height equal to a substantial fraction of the height of said upper part and being inclined inwardly by a slight tapering angle, and a lower part having a height substantially equal to the height of said upper part and slightly tapering inwardly towards said bottom wall.

The foregoing construction makes it possible to readily nest and disengage greater numbers of cases without difficulty, while at the same time enabling the retention of customary manufacturing tolerances, in a manner as will become more apparent as the description proceeds. On the other hand, stacking of a number of loaded cases is enabled by the provision of pairs of retractible supporting rods or frames bridging the open tops of the cases in the operative or use position, to enable stacking with the bottom wall of one case resting upon the supporting rods or frames of the case below in the stack, said rods or frames being rotatable to a retracted position exterior of the space enclosed by the walls of the case, to allow of nesting of a number of empty or unloaded cases in the manner described. The supporting frames or rods are furthermore advantageously designed to act as coupling means in the retracted position, to form a continuous chain of cases for transport upon a wheel-type or the like conveyer, in a manner as will become more apparent as the description proceeds in reference to the drawings.

Referring more particularly to the latter, the same show a plastic carrying case **10**, FIG. **1**, essentially having the form of an integrally molded rectangular unit having pairs of opposite side walls composed of three parts, viz. an upper part **11** having side walls being normal to the bottom wall **19** of the case, FIGS. **4** and **5**, an intermediate part **14** having a height *i*, FIG. **4**, equal to a substantial fraction, practically from 10–15 percent, of the height *h* of the upper part **11** and being inclined inwardly with a slight tapering angle, practically of from 10°–15°, and a lower part **12** having a height *h* substantially equal to the height of the upper part **11** and being inclined inwardly with a tapering angle of from 10°–15° towards the bottom wall **19**. The top edge of the case is advantageously provided with an upper outwardly projecting reinforcing flange or rim **13**, while a similar intermediate flange **15** is provided projecting outwardly from the top edge of the lower part **12** of the case.

Carrying cases constructed in the foregoing manner may be readily stacked and nested with the intermediate flange **15'** of a first case **10'** resting upon the upper flange **13** of a lower case **10** of the stack, in the manner shown respectively in section and elevation by FIGS. **3** and **5**, wherein corresponding parts of the cases are denoted respectively by like single and double primed reference numerals. With specific reference to FIG.**5**, it can be seen that, provided a proper design of the height and tapering angle of the intermediate part **14**, as well as of the tapering angle of part **12**, adequate clearance is ensured between the cases to take care of prevailing manufacturing tolerances, whereby to enable ready and easy assembly and disassembly of a nested stack, on the one hand, and to prevent jamming or locking of the cases, due to the absence of large friction surfaces, on the other hand.

While the intermediate flange **15**, FIG.**1** is shown to extend along the entire periphery of the case, an interrupted flange restricted to a pair of opposite sides or to short sections adjoining the corners of the case may be provided, to reduce weight and costs.

In order to enable stacking of a number of loaded cases described hereinbefore and shown by FIGS. **2** and **4**, the upper edges of the first pair of side walls are provided, at points close to the second pair of side walls of the case, with pairs of opposed slots **18** and **20**, FIG.**1**, said slots being adapted to

receive respectively the intermediate portions of a pair of U-shaped supporting metal rods or frames **16** and **17** having leg portions **16***b* and **17***b* extending along the outer surfaces of said first side walls and terminating in inwardly bent ends **16***c* and **17***c* engaging bores in said walls, in such a manner that the rods **16** and **17** may be swung from the operative position, bridging the open space of the case, in the direction of the arrows *b* to retracted positions **16'** and **17'**, respectively, exterior of said space and adjoining the outer vertical surface of the second pair of side walls, as indicated in dot-dash lines in FIG.1. It is possible in this manner to stack greater numbers of loaded cases with the bottom wall **19'** of a first case **10'** resting upon the supporting rods **16** and **17** of a similar case **10** below in the stack, as indicated by the arrow a in FIG.1 and more clearly shown in FIGS.2 and 4 of the drawings.

According to an improved feature of the invention, the supporting rods **16** and **17** are provided with central bow-shaped portions **16***a* and **17***a* adapted to engage, in the retracted position of the rods, pairs of spaced slots **21** and **22** respectively in the upper edges of the second pair of side walls of a similar juxtaposed case, whereby to enable a series of cases to be coupled in the manner shown by FIG.6 (single coupling) and FIG.7 (double coupling) for the transport of a string of cases upon a wheel-type of the like conveyor band.

Case **10** in FIG.1 is shown provided with a pair of hand holes **23** disposed in opposite walls of part **11**, to facilitate handling.

In the foregoing, the invention has been described in reference to a specific exemplary device or embodiment. It will be evident however, that variations and modifications, as well as the substitution of equivalent parts to those shown herein for illustration, may be made without departing from the broader scope and spirit of the invention.

I claim:

1. A plastic nesting and stacking case comprising in combination:

1. an integrally molded open-topped unit having a pair of first opposed side walls, a pair of second opposed side walls and a bottom wall, said side and end walls composed of
   a. upper walls substantially normal to said bottom wall,
   b. a small intermediate portion joined at one end to said upper wall having a height equal to a substantial fraction of the height of said upper part and inclined inwardly from said upper wall at a slight tapering angle, and
   c. lower walls joined to the other end of said intermediate portion having a height substantially equal to the height of said upper walls and tapering slightly inwardly and joined to said bottom wall,
2. a first supporting flange mounted to and projecting outwardly from the upper end of said upper walls,
3. a second supporting flange mounted to and projecting outwardly from the lower end of said intermediate portion and the upper edge of said lower wall, and
4. retractable rotating supporting means mounted to said upper walls comprising
   a. a pair of supporting rods each having a central portion supported, in the operative position of the rods, by opposed slots in the top edges of said first pair of said side walls, with the leg portions of said rods hingedly mounted to the outer surfaces of said walls, to allow rotation of said rods from said supporting operative position bridging the open space of said unit to an inoperative position exterior of said space in juxtaposition to the outer surfaces of said second pair of side walls,
5. whereby a first case when stacked upon a second similar case having its supporting rods in the operative position has its bottom wall resting upon the supporting rods of said second case, and when said supporting rods of said second case are rotated to said retracted position, said first case is partially nested in said second case with its second flange resting upon and supported by the first flange of said second case.

2. A plastic case as claimed in claim **1**, wherein said U-shaped supporting rods engage the adjoining first side walls of said unit.

3. A plastic case as claimed in claim **1**, wherein said U-shaped supporting rods engage bores in the adjoining first side walls of said unit, and the central portions of said rods are formed with U-shaped extensions, the upper edges of said second side walls of said unit have pairs of additional slots in the upper surface of said case, adapted to permit said central portions of said rods to overlap similar rods and engage in similar slots of a second case when said cases are juxtaposed alongside each other to join said cases together.

4. A plastic case as claimed in claim **1**, wherein said intermediate part has a height of from 10–15 percent of the height of said upper part and said intermediate and lower part have tapering angles of from 10°–15°.

* * * * *