

Oct. 13, 1953

V. G. MOLDT
BOX CONSTRUCTION

2,655,283

Filed July 26, 1951

4 Sheets-Sheet 1

Fig. 1.

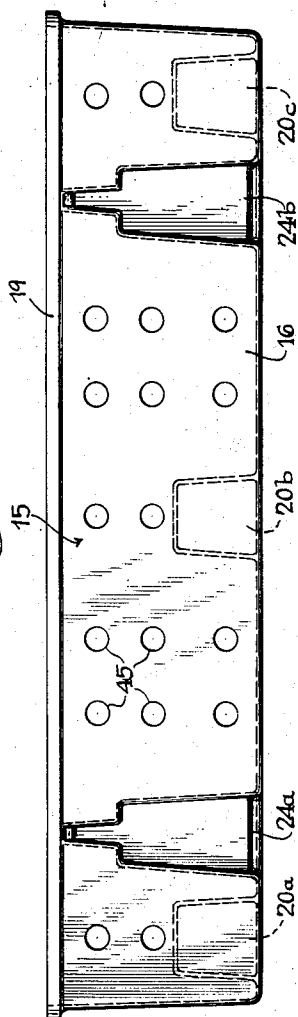


Fig. 3.

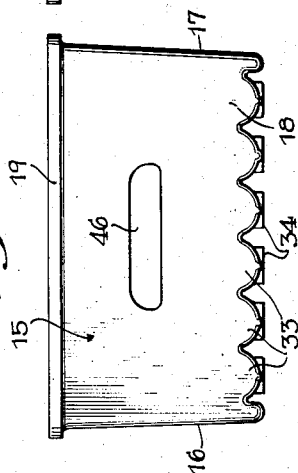
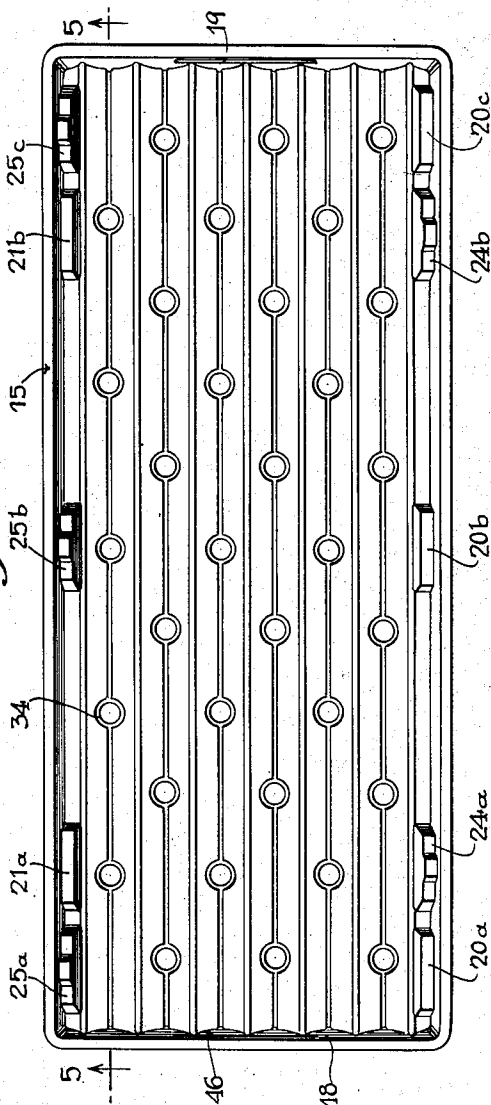


Fig. 2.



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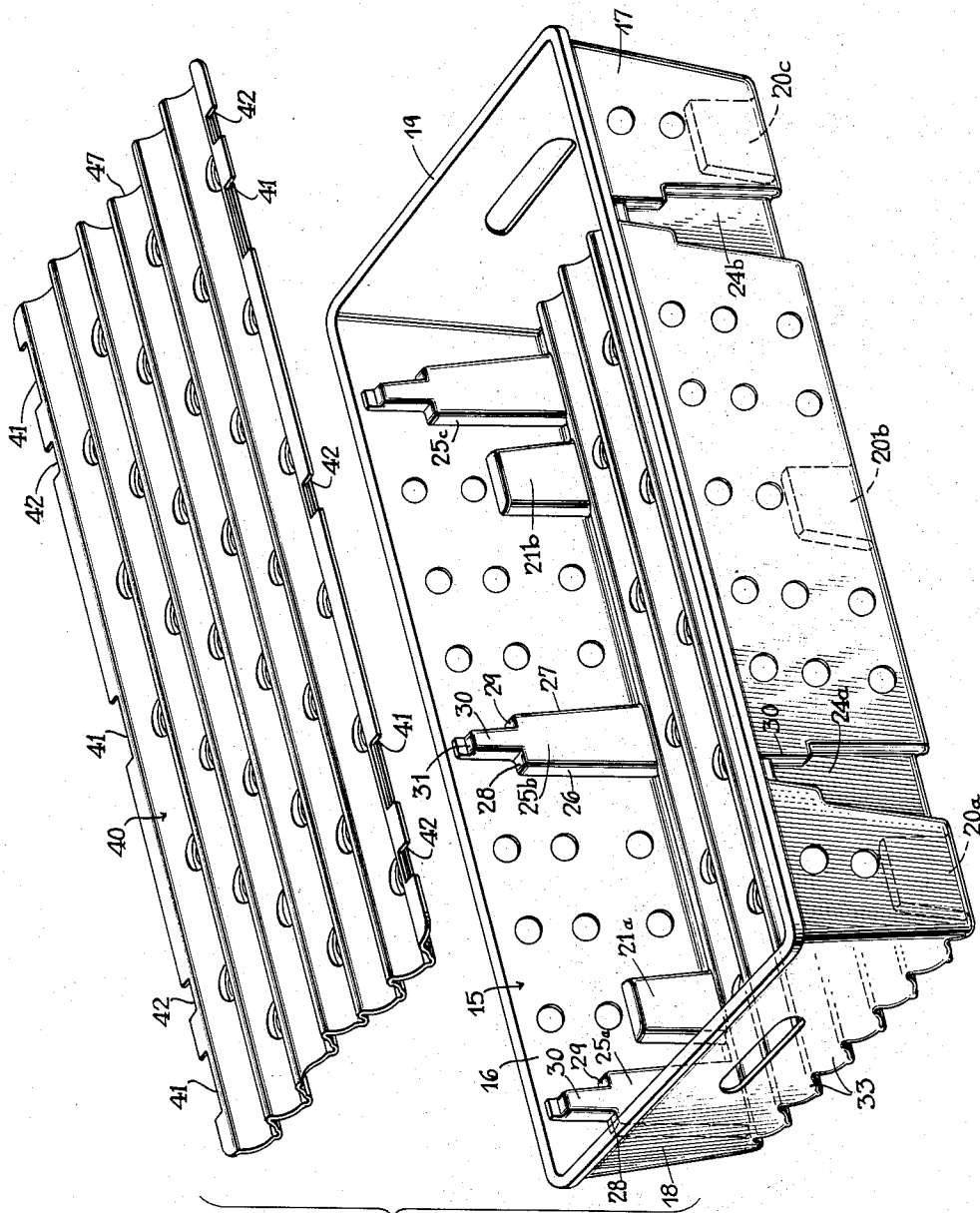


Fig. 4.

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Fig. 5.

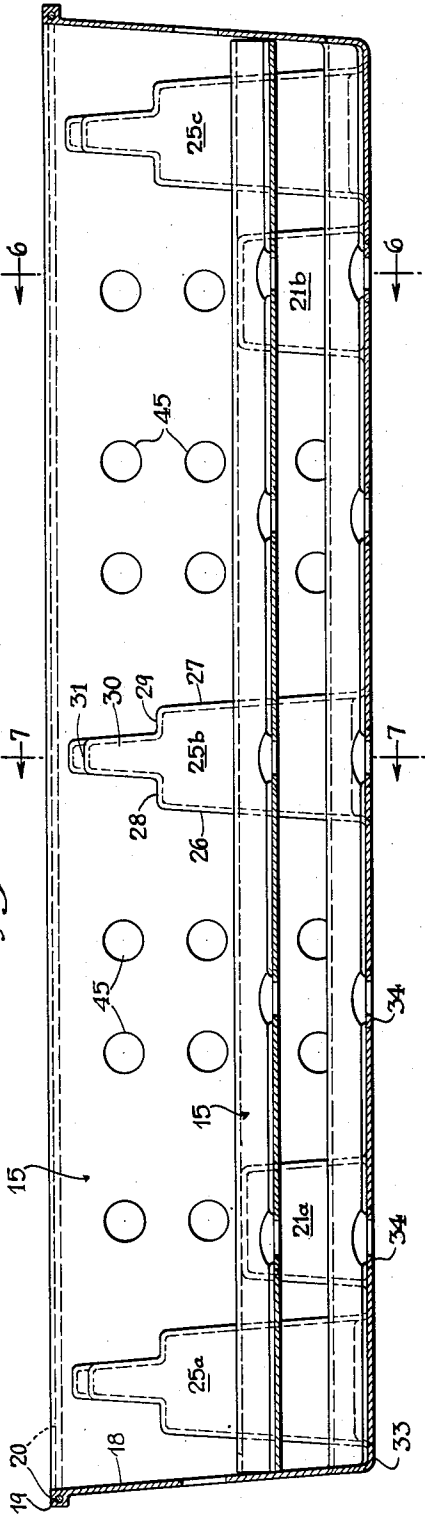


Fig. 7.

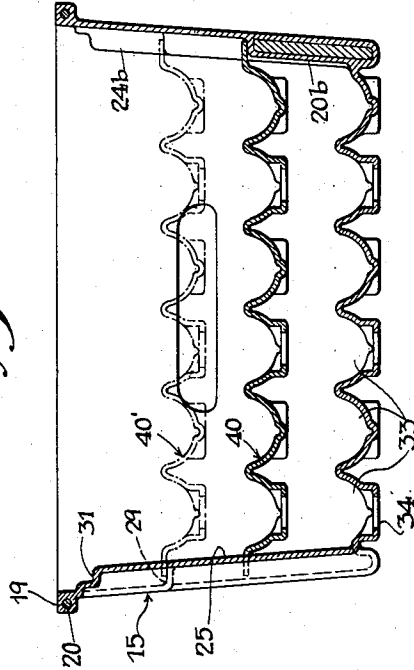
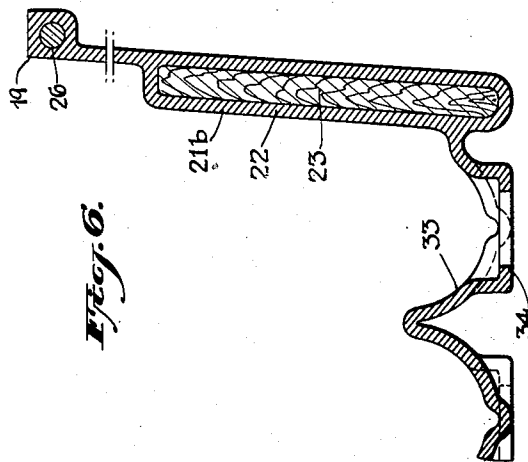


Fig. 6.



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Fig. 8.

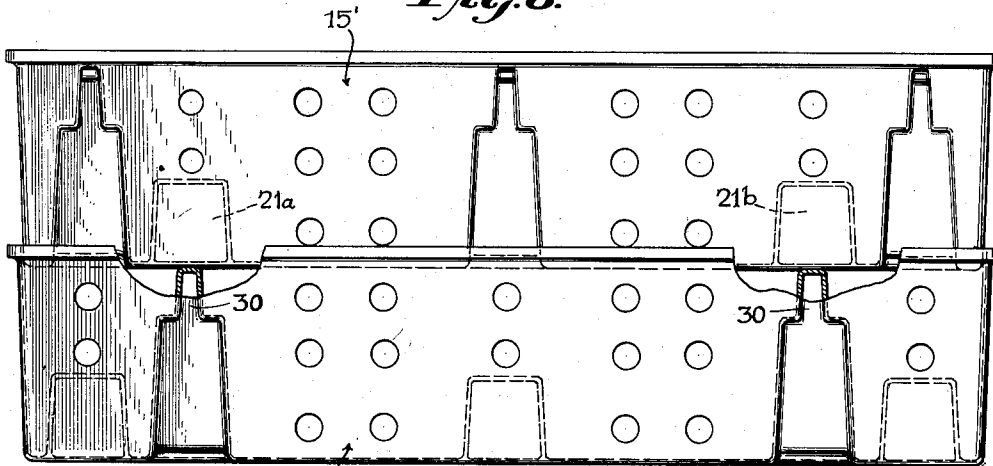


Fig. 9.

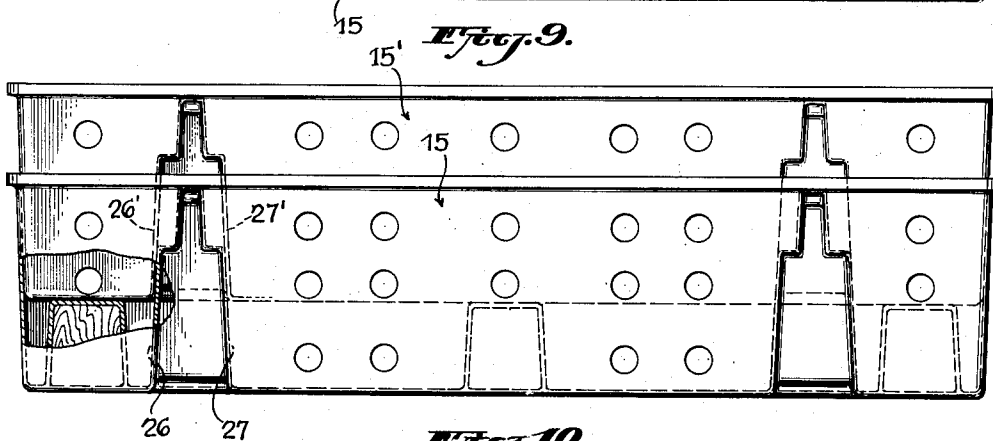


Fig. 10.

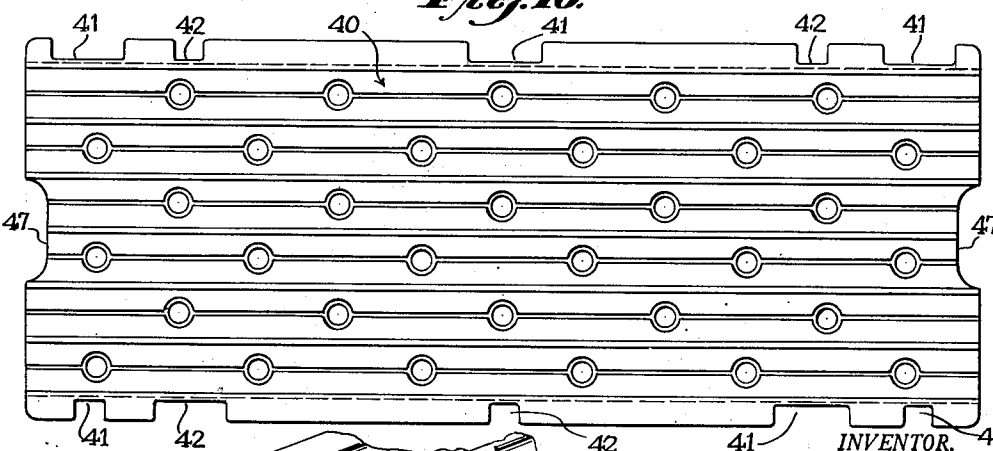
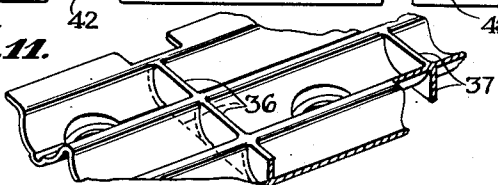


Fig. 11.



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UNITED STATES PATENT OFFICE

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BOX CONSTRUCTION

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Application July 26, 1951, Serial No. 238,608

4 Claims. (Cl. 220—22)

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This invention relates to tote boxes and the like, such, for example, as may be used for temporarily storing or carrying about various materials or products in a factory, or for general shipping purposes.

More specifically, according to the invention, a box or box-like construction is provided which conveniently may be nested with another like box therein at either of two alternative levels. Further, in its preferred form, the arrangement includes a tray or trays so formed, in cooperation with features of the box, that they may be deposited at either of two different levels in the box and as desired, either one or two trays may be placed at alternative levels, while another like box is supported and partially nested at a higher level in the box.

In carrying out the invention, two opposite side walls of the box on the inside thereof are formed with supporting protuberances terminating at a level intermediate the bottom and top of the box to there provide supports for another like box when in nested position. Also recessed areas are formed at other points on each of two opposite side walls on the outsides thereof, the wall material at said recessed areas protruding inwardly on the insides of the walls and including portions terminating near the top of the box to provide supports for the other like box to rest upon when in slightly nested position. Preferably each of said protuberances is positioned opposite one of said recessed areas on the opposite wall and, when another like box is desired to be deeply nested in position, this is made possible because corresponding recessed areas on the two boxes will normally also be in nesting relation, but when the upper box is to be supported at a higher level, it is turned horizontally through an angle of 180° and the supporting areas and recesses are such that the upper box may then be supported at the higher level on the top portions of the recessed areas of the lower box.

The trays are each made with notched formations along two opposite sides, such that, when a tray is in one position, it will be free to drop down into the box until it engages the supporting protuberances, but when such tray is turned end-for-end, the notches are such that it will engage and be supported at a higher level by reason of said recessed areas.

Stated and summarized in another way, substantially identically shaped boxes and pluralities of trays therefor all of the same shape are provided, and opposite side walls of each box and opposite edges of each tray are formed with two

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types of irregularities, one type being such that, when an upper box or a tray is in what may be referred to as the normal position, same will be free to drop down into the lower box to a lower supporting level, but when an upper box or tray is turned end-for-end with respect to the lower box, then the irregularities are such that the upper box or tray will be retained and supported in the lower box at a higher level.

Further and more specific objects and features of the invention will more clearly appear from the following description taken in connection with the accompanying drawings which form a part of this specification and illustrate by way of example the presently preferred forms of the invention.

In the drawings:

Figs. 1, 2 and 3, respectively, are side, plan, and end views of a preferred embodiment of the invention;

Fig. 4 is a perspective view of the same box and also of one of the trays which may be used therein;

Fig. 5 is a longitudinal vertical sectional view showing the box with one of the trays supported therein at an intermediate level;

Fig. 6 is a vertical sectional view partially broken away, taken substantially along line 6—6 of Fig. 5;

Fig. 7 is a transverse vertical sectional view, taken substantially along line 7—7 of Fig. 5;

Fig. 8 is a side view of two of the boxes superposed in slightly nested relation and partially shown in section;

Fig. 9 is a side view of the same two boxes, partially shown in section, but with the upper box nested at a deeper position in the lower box;

Fig. 10 is a plan view of one of the trays; and

Fig. 11 is a perspective view partially broken away, showing parts of an alternative tray construction.

Referring now to Figs. 1—3 in further detail, the particular box 15 here shown is of a shape having a rectangular cross-section, and having its four walls 16, 17, 18 and 19 all positioned to slant outwardly slightly toward the top to facilitate stacking or nesting with other like boxes without jamming. Preferably, the box walls and bottom are integrally formed of synthetic resin molded under heat and pressure, for example a thermosetting polyester resin reinforced with fibre glass mat may be used. A sheet of the fibre glass mat may be placed in a mold shaped to correspond to the shape of the desired box. The resin mixture is then poured in and the heated mold is closed.

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However, it will be understood that boxes according to the invention in various of its forms may be made of pressed sheet metal in lieu of plastic material.

Preferably, the rim portion 19, in case plastic material is used, is molded with a reinforcing wire 20 embodied therein (Fig. 6).

On the insides of two opposite side walls, preferably the longer side walls, a plurality of protuberances as at 20a, 20b, 20c, 21a and 21b are formed. As shown, these extend up from the bottom of the box and terminate at a level intermediate with bottom and top, to there provide rigid supports all of the same height for another like box when nested in position. In the form shown in Fig. 6, these protuberances constitute an inner wall formation as at 22 integral with the main or outer wall, the space between these wall portions containing filler 23 of wood or other material, as desired.

Preferably, the same two opposed walls which bear the protuberances are also formed with pluralities of recessed areas as at 24a, 24b, 25a, 25b and 25c. That is, each of these areas provides a recess on the outside wall surface of the box and each such area has a correspondingly shaped inwardly protruding area on the inside surface of the wall. As best shown in Fig. 9, the two opposite side edges 26 and 27 of each of these areas slant toward each other slightly so that the inwardly protruding portion of such an area in a lower box will nest readily but firmly within the corresponding recessed area of a higher box and between the similarly slanted side edges 26', 27' of the latter area.

As best shown in Fig. 4, each of the recessed area formations also has shoulders as at 28, 29 at an elevation intermediate the top of the box and the level of the protuberances. Such shoulders, if desired, may be used to support trays with side notches suitably cut to receive further upwardly extending portions 30 of the recessed areas. The latter portions preferably terminate as at 31 (Fig. 4) at a level just below the upper rim of the box to provide supports for another box as hereinafter more fully explained.

It will be noted that each of the protuberances 20a, 21a, etc., is located at a point opposite one of the recessed areas, such as at 24a, 25a, etc., on the opposite wall. Thus, when a like box as shown at 15' in Fig. 8 is placed upon box 15, the upper box will be rigidly supported by the portions 30, which engage the bottom of the upper box at points which are strongly reinforced by protuberances as at 20a, 21a, etc. However, when the upper box 15' is turned around through an angle of 180°, then it may be nested in the box 15 at an intermediate level with the bottom of the box 15' resting upon the protuberances in box 15, as shown in Fig. 9.

It will be understood that various numbers of the recessed areas and of the protuberances may be provided on either two or all of the four sides of the box as required, depending upon the supporting strength required when the boxes are nested at either of the two levels in use. In a typical case, at least two of the protuberances and two of the recessed areas will be desirable on each of the two opposite side walls.

The bottom of the particular form of box here shown has a generally corrugated formation providing a plurality of channels as at 33 (Figs. 4 and 7) adapted to receive for example strips, bands or tubes of extruding plastic material or the like to be supported, carried about, stored or

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aged. And to allow escape of moisture or other fluid, or to allow entrance of air, such channels may be formed at spaced points with apertured depressions as at 34 (Fig. 6) which also constitute supporting feet for the bottom.

As shown in Figs. 7 and 10, the removable trays similarly may be formed with channels having apertured depressions. It will, however, be readily understood that both the bottoms of the boxes and of the tray areas may be formed with other configurations adapted to comprise receptacles for receiving whatever objects or materials are to be carried thereby. As shown in Fig. 11, the channels may be interrupted at spaced points, either by apertured brace-like formations 36 for strengthening the tray (or a box bottom) or closed transverse areas as at 37 may be formed in the channels.

As shown in Fig. 10, the longitudinal side edges 20 of the trays as at 40 have a plurality of wide notches as at 41 and narrower notches as at 42. As will be apparent from this figure in connection with Figs. 4, 5 and 7, the wider notches 41 are so positioned and of sufficient width to receive the inwardly protruding areas of the recessed portions such as at 25a, etc., thereby permitting the tray when in the "normal" or appropriate position to drop down to the proper level to be supported on protuberances such as at 21a. That is, the narrower notches 42 are not of sufficient width to permit the tray to pass such protuberances. On the other hand, when such a tray is reversed end-for-end, then the narrower notches 42 will pass the upper recess portions 30, but then will come into contact with and be supported by the shoulders such as at 28, 29. A tray supported in this position is indicated at 40 in Fig. 7. As will be apparent from the above description, two of the trays of identical shape respectively may be supported at the two different elevations as shown in Fig. 7 if desired, and another box may be superposed on the box of Fig. 7 and partially nested within the top thereof as shown in Fig. 8. Thus a variety of nesting or tray arrangements are made possible permitting the equipment to be used with either a more or less compact relationship of the parts as may be desired under different conditions of use. Several of the boxes may, of course, be stacked in superposed position either slightly nested and with or without trays or deeply nested.

The side walls may be formed either with or without perforations at 45 to permit escape of moisture or gases or to permit entrance of air depending on the nature of the product for which the box is used. Hand holds as at 46 (Fig. 3) may be formed in each end wall of the box and the trays may have cutout areas 47 (Fig. 10) to provide clearance for the workmen's fingers at the region of the hand holds.

In order that workmen may quickly identify and distinguish the relative positions of the boxes and trays, the opposite ends of each box and of each tray may be painted with contrasting colors.

While the invention has been described in detail with respect to particular preferred examples, it will be understood by those skilled in the art that various changes and further modifications may be made within the spirit and scope of the invention as defined by the appended claims.

What is claimed as new and desired to be secured by Letters Patent is:

1. A tote box or the like formed with side walls which incline outwardly from the lower edges toward the top edges thereof thereby making

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the side walls flare outwardly to facilitate nesting of such boxes, at least two protuberances being formed at spaced points on each of two opposite side walls on the insides thereof, such protuberances terminating at a level intermediate the bottom and top of the box to provide supports for another like box in nested position, at least two recessed areas being formed also at spaced points on each of said two opposite side walls on the outside of each thereof, the wall material at said recessed areas protruding inwardly on the inside of each such wall and including portions terminating near the top on the inside of such walls to provide supports for another like box to rest upon, each one of said protuberances being opposite one of said recessed areas on the opposite wall, whereby another like box may be either supported in nested position as aforesaid with the corresponding recessed areas in nested relation, or when such other box is turned horizontally through an angle of 180° it may rest as aforesaid at a higher level.

2. A tote box or the like having side walls and an open top area bounded by the upper edges of such walls, at least two inwardly directed protuberances being formed at spaced locations on each of two substantially opposite side walls of the box, such protuberances each having a supporting surface intermediate the bottom and top of the box to provide supports for another box in nested position therein, at least two recessed regions being formed also at spaced locations on each of two substantially opposite side walls on the outside of each thereof, the wall material at each of said recessed regions protruding inwardly of the box, such inwardly protruding material of such regions each having a supporting surface at a higher level than that of said first-mentioned supporting surfaces, whereby another box may be supported in nested position as aforesaid with corresponding recessed regions in nested relation, or when such other box is turned horizontally through a preselected angle it may rest at such higher level, such other box having analogous protuberances and recessed regions positioned analogously therein, both boxes having upwardly flaring side walls.

3. A tote box or the like having side walls, at least two protuberances being formed at spaced locations on each of two opposite side walls on the inside of each thereof, such protuberances terminating at a level intermediate the bottom and top of the box to provide supports for a

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tray in nested position therein, at least two recessed portions being formed at different spaced locations on each of said two opposite side walls on the outside of each thereof, the wall material at said recessed portions protruding inwardly on the inside of each of such walls and including portions terminating at a higher level near the top on said inside walls to provide supports for such tray to rest upon, each one of said protuberances being directly opposite one of said recessed areas on the opposite wall, such tray having formed in its margin irregularities for accommodating said inwardly protruding recessed portions when same is resting upon said first-mentioned supports, said tray when turned end-for-end having its margin formed for engaging and resting upon said higher level supports.

4. A tote box or the like formed with flaring side walls, the mouth opening being larger in area than the base, at least two protuberances being formed at spaced points on each of two opposite side walls on the inside of each thereof, such protuberances terminating at a first level intermediate the bottom and top of the box to provide supports for another like box in nested position, at least two recessed areas being formed also at spaced points on each of said two opposite side walls on the outside of each thereof, the wall material at said recessed areas protruding inwardly on the inside of each of the walls and including portions terminating at a second level near the top of the box on said inside walls to provide supports for another like box to rest upon, each one of said protuberances being opposite one of said recessed areas on the opposite wall, whereby another like box may be supported at said first level either in nested position as aforesaid with the corresponding recessed areas in nested relation, or when such other box is turned horizontally through an angle of 180° it may rest as aforesaid at said second level.

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References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
2,064,518	Brogden -----	Dec. 15, 1936
2,252,964	Faulkner -----	Aug. 19, 1941
2,454,455	Irwin -----	Nov. 23, 1948
2,459,657	Klein -----	Jan. 18, 1949