Oct. 1, 1968 E. W. KREEGER 3,403,788

NEST AND STACK TRAYS

Filed Oct. 3, 1966 2 Sheets-Sheet 1

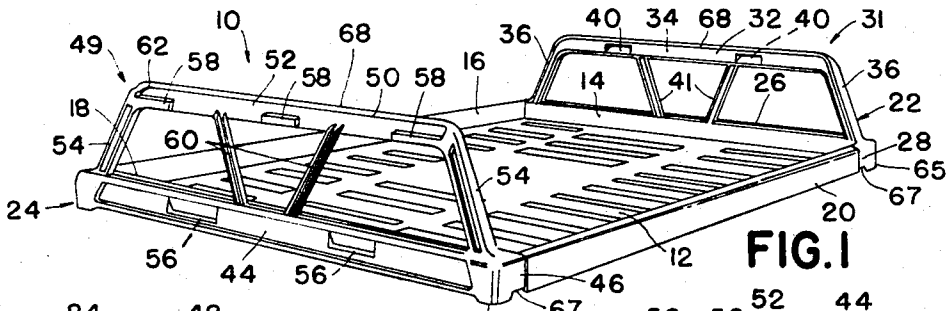


FIG.1

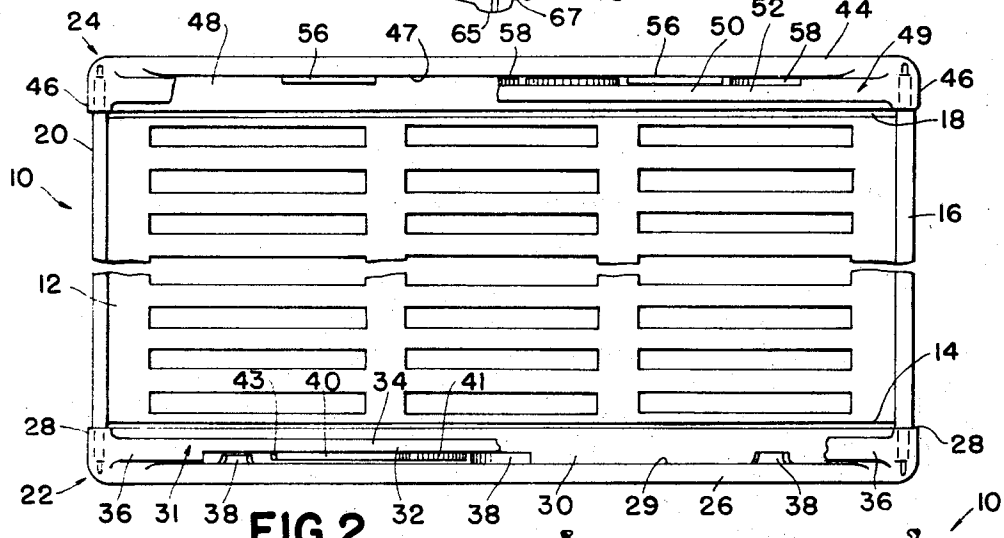


FIG.2

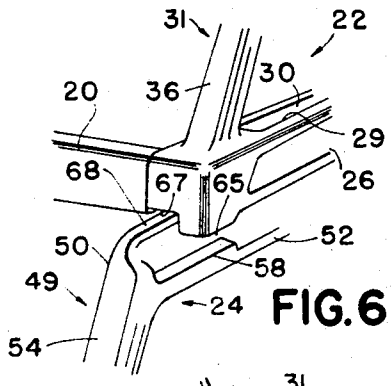


FIG.6

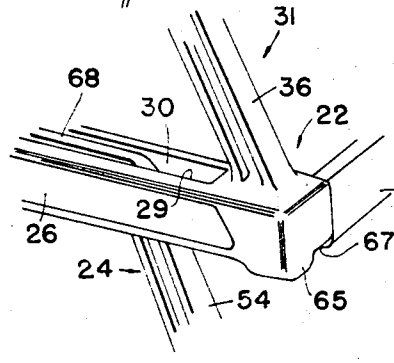


FIG.7

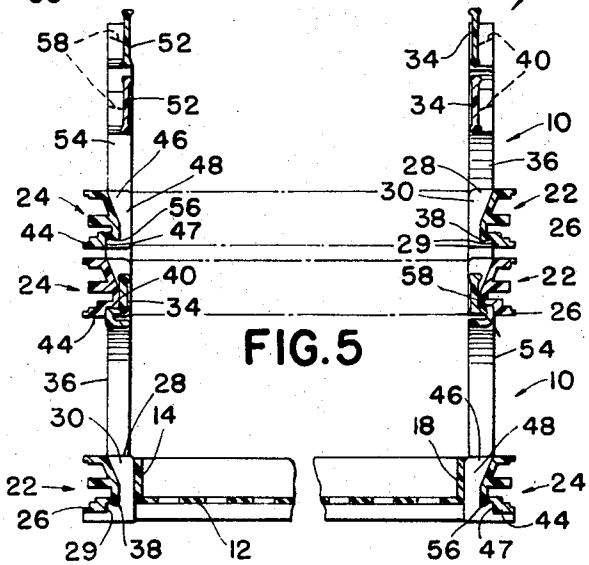


FIG.5

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Oct. 1, 1968 E. W. KREEGER 3,403,788

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Filed Oct. 3, 1966 2 Sheets-Sheet 2

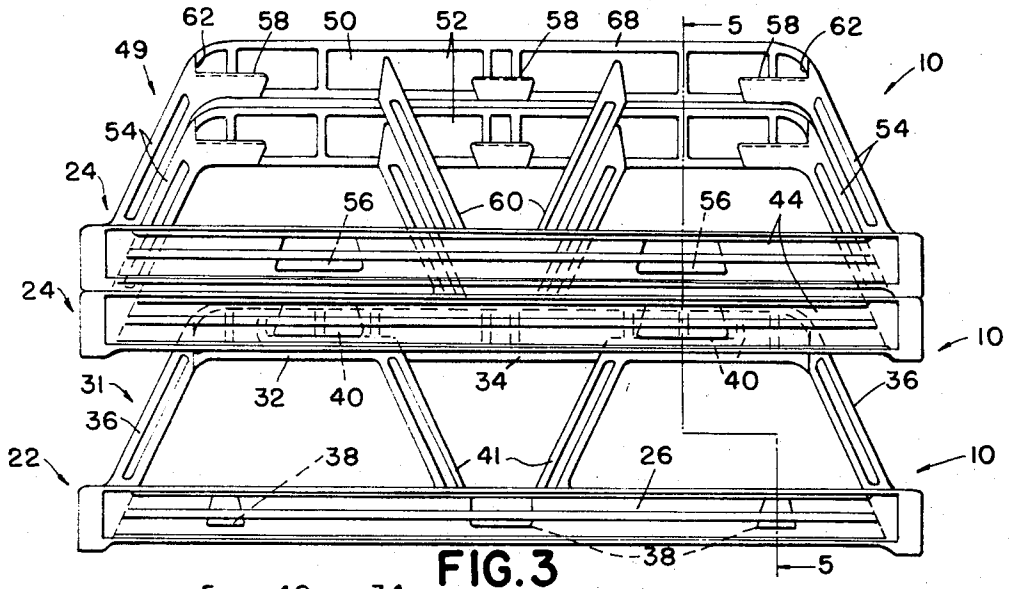


FIG. 3

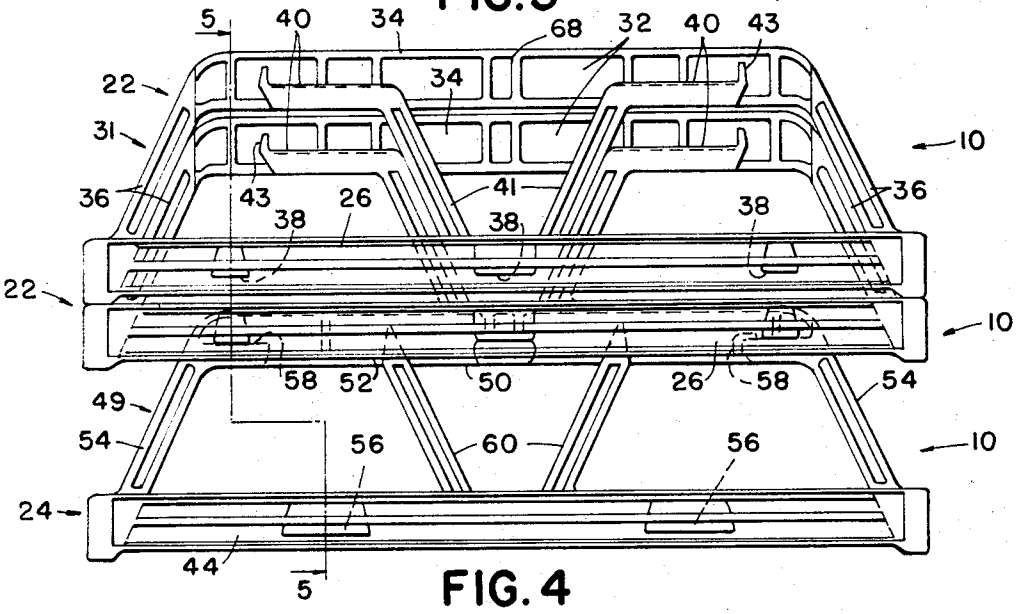


FIG. 4

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NEST AND STACK TRAYS

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ABSTRACT OF THE DISCLOSURE

The tray comprises a bottom wall and upright frames at opposite ends of the bottom wall. The bottom wall has slots beneath the frames so that the container will nest with a vertically aligned similarly oriented lower container of identical construction with the upright frames of the latter projecting upwardly through the slots. There are abutment means for supporting the container on a reversely oriented lower container of identical construction in stacked relation.

This invention relates generally to containers or trays and refers more particularly to relatively shallow containers or trays of the nesting and stacking type.

It is an essential object of this invention to provide a tray of the nesting and stacking type, that is, a tray which is capable of nesting when empty with other trays of the same construction in a compact group which takes up relatively little space, and is also capable of being stacked when filled with material upon trays of the same construction in a manner such that the material in the trays will not be crushed.

Another object of the invention is to provide an improved tray which is adapted to nest with a similarly oriented lower tray of identical construction or to stack thereon upon being reversed end-for-end.

Another object is to provide a nesting and stacking tray which is especially adapted to be stacked upon a reversely oriented lower tray of identical construction by being moved across the lower tray with a sliding motion into a superimposed position.

Another object is to provide a tray having a bottom, upright structures projecting upwardly from opposite edges of the bottom, and clearances in the bottom so located that when the tray is nested with a similarly oriented tray of identical construction the upright structures of the latter may project upwards through the clearances.

Another object is to provide a tray construction in which the clearances are in the form of elongated slots extending along the opposite edges of the tray.

Another object is to provide a tray wherein one or both sides thereof are open so that when a number of trays are stacked the contents are readily accessible.

Another object is to provide a tray wherein the upright structures each comprise an inverted generally U-shaped frame disposed in a plane normal to the bottom and having downwardly diverging legs, such upright structures being adapted to extend up into the slots in the bottom of an upper nested tray and to fit within the frames of the upper tray.

Another object is to provide a tray having abutment means adjacent opposite edges of the bottom and seating means on the frames, the abutment means adjacent each edge of the bottom being directly opposed to but in a lower plane than the seating means on the frame at the other edge of the bottom, whereby the seating means will engage and support the abutment means of a reversely oriented upper container of identical construction in stacked relation thereon.

Other objects and features of the invention will become apparent as the description proceeds, especially when

taken in conjunction with the accompanying drawings, illustrating a preferred embodiment of the invention, wherein:

FIGURE 1 is a perspective view of a tray constructed in accordance with my invention.

FIGURE 2 is a top plan view, with parts broken away, of the tray shown in FIGURE 1.

FIGURE 3 is an end view showing three trays, the top tray being nested with the middle tray and the middle tray being stacked upon the bottom tray.

FIGURE 4 is a view similar to FIGURE 3 as seen from the opposite end of the nested and stacked trays.

FIGURE 5 is a sectional view, the left end being taken on the line 5—5 in FIGURE 3 and the right end being taken on the line 5—5 in FIGURE 4.

FIGURE 6 is a fragmentary perspective view showing an upper tray in an intermediate position as it is being moved across the top of a lower tray to stacked position.

FIGURE 7 is a fragmentary perspective view of one corner of a tray shown stacked upon a lower tray.

Referring now more particularly to the drawings, the tray is of generally rectangular form and is designated by the numeral **10**. All of the trays shown in the various views are of identical construction. The tray **10** has a rectangular horizontal bottom wall **12**. Vertical retainer walls **14**, **16**, **18** and **20** extend upwardly from the four marginal edges of the bottom. These retainer walls are not high, extending only an inch or two above the bottom wall, but serve to retain material on the bottom wall. The retainer walls **14–20** are, of course, connected to one another at their ends. The tray also has the ends **22** and **24** at the opposite ends of the bottom which project upwardly above the plane of the bottom at right angles thereto. End **22** extends along the retainer wall **14** in parallel relation thereto, and end **24** extends along the retainer wall **18** in parallel relation thereto.

The bottom of the tray may be considered as including the bottom wall **12**, retainer walls **14–20** and the bases **26** and **44** of the ends **22** and **24**.

End **22** has an elongated base **26** which extends along the retainer wall **14** in spaced parallel relation thereto. At the ends, base **26** has connection portions **28** which extend at right angles thereto and are joined to the side retainer walls **16** and **20**. The inner surface **29** of base **26** together with its connection portions **28** and with the retainer wall **14** define an elongated narrow generally rectangular slot or clearance **30** which extends for substantially the full width of the tray.

The end **22** also has an upright structure **31** including an inverted generally U-shaped frame **32** which projects upwardly from the base **26** in a plane which is normal to the bottom wall **12**. The frame **32** has an elongated rail portion **34** which extends parallel to the base **26**. Frame **32** also has the downwardly diverging legs **36** connected at their lower ends to the base **26** beyond opposite ends of slot **30**. The frame **32** is disposed directly above slot **30**. In other words, a vertical projection of the frame **32** would pass through the slot **30**, excepting of course for those portions of the legs **36** which extend beyond the ends of the slot (see FIGURES 2 and 5). In accordance with this construction, it is possible to nest two trays of identical construction by passing the frame **32** of a lower tray upwardly through the slot **30** of an upper tray, as will become more apparent as the description proceeds.

The base **26** has three spaced feet **38** along its inner surface **29** projecting into the slot **30**. The rail **34** forming a part of the frame **32** has a pair of spaced seats **40** on its outer surface. The feet **38** and seats **40** are inclined upwardly and outwardly preferably at an angle of substantially 20° as shown in FIGURE 5.

The rail 34 in narrower than the slot 30, and as seen in FIGURE 2 its vertical projection is spaced from the inner surface 29 of base 26 a distance greater than the width of feet 38 or of seats 40. Moreover, feet 38 and seats 40 are laterally offset or staggered relative to one another. Obviously, therefore, the frame 32 of a lower tray could be passed upwards through the slot 30 of an upper nested tray without interference of the feet 38 and seats 40 with each other or with the slot. Additional legs 41 of frame 32 extend from the inner or adjacent ends of the seats downwardly in diverging relation and connect into the inner slot forming surface 29 of the base 26. These legs 41 are thin enough to pass through the slot 30 of an upper nested tray, as will be clear from FIGURE 2. The seats 40 have upwardly extending abutments 43 at their remote ends to restrict relative transverse movement of two stacked trays, as will be more apparent hereinafter.

End 24 has an elongated base 44 which extends along the retainer wall 18 in spaced parallel relation thereto. At the ends, base 44 has connection portions 46 which extend at right angles thereto and are joined to the side retainer walls 16 and 20. The inner surface 47 of base 44 together with its connection portions 46 and with the retainer wall 18 define an elongated narrow, generally rectangular slot or clearance 48 which extends for substantially the full width of the tray.

The end 24 also has an upright structure 49 including an inverted, generally U-shaped frame 50 which projects upwardly from the base 44 in a plane which is normal to the bottom wall 12. The frame 50 has an elongated rail portion 52 which extends parallel to the base 44. Frame 50 also has the downwardly diverging legs 54 connected at their lower ends to the base 44 beyond opposite ends of slot 48. The frame 50 is disposed directly above slot 48. In other words, a vertical projection of the frame 50 would pass through the slot 30, except for those portions of legs 54 which extend beyond the ends of the slot (see FIGS. 2 and 5). In accordance with this construction, it is possible to nest two trays of identical construction by passing the frame 50 of a lower tray upwardly through the slot 48 of an upper tray.

The base 44 has two spaced feet 56 along its inner surface 47 projecting into the slot 48. The rail 52 forming a part of frame 50 has three spaced seats 58 on its outer surface. The feet 56 and seats 58 are inclined upwardly and outwardly preferably at an angle of substantially 20° as shown in FIGURE 5.

The rails 52 is narrow that the slot 48, and as seen in FIGURE 2 its vertical projection is spaced from the inner surface 47 of base 44 a distance greater than the width of feet 56 or of seats 58. Moreover, feet 56 and seat 58 are laterally offset or staggered relative to one another. Obviously, therefore, the frame 50 of a lower tray could be passed upwards through the slot 48 of an upper nested tray without interference of the feet 56 and seats 58 with each other or with the slot. Additional legs 60 of frame 50 extend downwardly in diverging relation and connect into the inner slot forming surface 47 of the base 44. These legs 60 are thin enough to pass through the slot 48 of an upper nested tray, as will be clear from FIGURE 2. Two seats 58 have upwardly extending abutments 62 at their remote ends to restrict relative transverse movement of two stacked trays. The abutments actually are continuations of the legs 54.

In use, the trays may be nested one with another in the manner illustrated in FIGURES 3 and 4. For nesting, the trays are similarly oriented, and the upright structures 31 and 49 of the lower tray project upwards through the slots 30 and 48 of the upper tray (see upper two trays in FIGURES 3 and 4). The frames 32 and 50 of the lower tray are confined within the frames 32 and 50 of the upper tray. There is no interference between the legs 36, 41, 54 and 60, because of the diverging relation thereof. The seats along the upper rails 34 and 52 of each frame pass through the slots 30 and 48 without interference either with the slots or with the feet 38 and 56 along the bases 26 and 44.

When it is desired to stack the trays one upon another as shown in FIGURES 3 and 4, the upper tray is turned end-for-end relative to the lower tray so as to be reversely oriented with respect thereto, and then is lowered to permit the feet 38 on the upper tray to engage and rest upon the seats 58 on the lower tray, and the feet 56 on the upper tray to engage and rest upon the seats 40 on the lower tray. The seat abutments 43 and 62 are engageable with the feet to prevent any transverse movement, that is left and right in FIGURES 3 and 4, between stacked trays. The rails 34 and 52 of the lower tray are received in the slots of the upper tray to prevent any relative longitudinal movement between the two trays. The fact that the feet 38, 56 are slanted upwardly and outwardly preferably at substantially a 20° angle and the seats 40, 58 upon which they rest are slanted upwardly and outwardly at the same angle provides an interlocking relationship which also is effective in preventing relative longitudinal movement between the stacked trays.

It is sometimes necessary to stack trays by sliding the upper tray over the lower tray until the feet of the upper tray engage the seats of the lower tray. In other words, it may not be practical or convenient simply to lower the upper tray upon the lower tray where, for example, the trays have already been stacked to a considerable height. In such instances, it is desirable to be able to place an edge of one tray upon the rails of another and then to simply slide the upper tray transversely (right or left in FIGURES 3 and 4) until it has reached a position in which it is stacked. In this connection, it will be noted that at each corner of the tray, that is, at the two ends of each base 26, 44 there is a depending foot 65 which provides an upwardly extending and downwardly opening recess 67 between the foot and the adjacent end of one of the side retainer walls 16, 20. It will also be noted that throughout the full length of each rail, the upper edge thereof is narrow and straight except at the ends and defines an elongated track 68. The tracks 68 are horizontal and at the ends curve downwardly and merge into the legs 36 and 54. When it is found necessary or desirable to stack trays from the side, the leading side of the upper tray will be manipulated so that the recesses 67 engage the tracks 68 of the lower tray, and then the upper tray is slid transversely across the tracks. The upper tray is shown in FIGURE 6 in an intermediate position moving across the lower tray to a stacked position. When the upper tray has moved to a superimposed position directly above the lower tray, its slots 30 and 48 will receive the rails 34 and 52 of the lower tray and the upper tray will drop until its feet 38, 56 engage and rest upon the seats 40, 58 of the lower tray. When stacked, the upper tray is held from transverse movement relative to the lower tray by the abutments 43 and 62, and is held from longitudinal movement relative to the lower tray by the sides of slots 30 and 48. The slanted feet 38, 56 and seats 40, 58 also serve in preventing longitudinal movement.

It is also sometimes necessary to nest trays by sliding the upper tray over the lower tray in the same manner employed to stack trays. In other words, when nesting two trays the leading side of the upper tray is manipulated so that the recesses 67 of feet 65 engage tracks 68 of the lower tray, and then the upper tray is slid transversely across the tracks. When the upper tray has moved to a superimposed position directly over the lower tray, its slots 30 and 48 will receive the rails 34 and 52 of the lower similarly oriented tray and the upper tray will drop to a nested position.

It will be noted that in the stacked position of the

trays, they are open both at the front and at the rear, that is, along the edges defined by the retainer walls **16** and **20**. These retainer walls extend only about an inch or so above the bottom wall **12** of the tray to prevent the articles on the tray from slipping off, but provide little if any obstruction to the removal of the articles from the tray either from the front or rear. It will be understood, of course, that where desired the retainer walls **16** and **20** may be built to greater heights, even to the height of frames **32** and **50**.

What I claim as my invention is:

1. A nesting and stacking container comprising a bottom, upright structures projecting upwardly from points adjacent opposite edges of said bottom, said container having clearances directly vertically beneath said upright structures extending downward through the plane of said bottom so that said container nests with a vertically aligned similarly oriented lower container of identical construction by a direct vertical movement and when so nested the upright structures of the latter will project upwardly into said clearances, said container having stacking means for supporting the same in stacked position upon a vertically aligned reversely oriented lower container of identical construction, said stacking means comprising abutment means and seating means adjacent each of said opposite edges, said abutment means adjacent each one of said opposite edges being directly opposed to but in a lower plane than said seating means adjacent the other one of said opposite edges whereby said seating means will engage and support the abutment means of a reversely oriented upper container of identical construction in stacked relation thereon, said abutment means adjacent each one of said opposite edges being laterally offset from said seating means adjacent the same one of said opposite edges whereby said abutment means of said container will clear the seating means of a similarly oriented lower container of identical construction when lowered directly vertically into nested relation with the latter.

2. The container defined in claim **1**, wherein said container is open along the sides between said upright structures so that material in a stacked container is readily accessible.

3. The container defined in claim **1**, wherein said upright structures each include a generally horizontal track extending generally parallel to said opposite edges of said bottom in spaced relation above said bottom, said container having guiding means on the bottom engageable with said tracks of another container of identical construction so that an upper one of said containers can be slid across a lower one of said containers laterally to a stacked or nested position by slidably engaging the guiding means on the upper container with the tracks of the lower container.

4. The container defined in claim **1**, wherein said upright structures each comprise an inverted generally U-shaped frame disposed in a plane normal to said bottom and having downwardly diverging legs.

5. The container defined in claim **4**, wherein said clearances include slots in said bottom aligned with and directly vertically beneath said frames.

6. The container defined in claim **5**, wherein said abutment means adjacent one of said opposite edges comprises at least two laterally spaced feet and adjacent the other of said opposite edges at least one foot, and said seating means adjacent said one of said opposite edges comprises at least one seat and adjacent the other of said opposite edges at least two seats.

7. The container defined in claim **6**, wherein said seats are located on said frames and said feet are located on said bottom within said slots.

8. A nesting and stacking container comprising a bottom, upright structures projecting upwardly from opposite edges of said bottom, said bottom having clearances adjacent said opposite edges so located that when said container is nested with a similarly oriented container of identical construction the upright structures of the latter may project upward through said clearances, said container having stacking means for supporting the same in stacked relation upon a reversely oriented lower container of identical construction and for supporting upon the same in stacked relation a reversely oriented upper container of identical construction, said upright structures each comprising an inverted generally U-shaped frame disposed in a plane normal to said bottom and having downwardly diverging legs connected at their lower ends to said bottom and having a rail connecting the upper ends of said legs, said clearances being in the form of elongated slots parallel to and directly vertically beneath said frames, said stacking means comprising abutment means adjacent said opposite edges of said bottom and seating means on said frames, said abutment means adjacent one edge being directly opposed to but in a lower plane than said seating means on the frame at the other edge, whereby said seating means will engage and support the abutment means of a reversely oriented upper container of identical construction in stacked relation thereon, said abutment means adjacent each opposite edge of said bottom and said seating means on the frame at the same edge of said bottom being vertically aligned with the slot adjacent the same edge of said bottom but laterally offset with respect to one another so as to permit nesting with a similarly oriented container of identical construction, said abutment means at one edge of said bottom comprising at least two laterally spaced feet and at the opposite edge of said bottom at least one foot, said seating means on the frame at said one edge of said bottom comprising at least one seat and on the frame at said opposite edge of said bottom at least two seats, said rails of said frames constituting generally horizontal tracks, said tracks being parallel to one another, said container having guiding means on the bottom engageable with said tracks of another container of identical construction so that an upper one of said containers can be slid across a lower one of said containers laterally to a stacked or nested position by slidably engaging the guiding means of the upper container with the tracks of the lower container, said container being open along the sides between said frames so that material in a stacked container is readily accessible.

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