

July 5, 1966

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3,259,269

STACKABLE BIN CONTAINER

Filed May 10, 1965

2 Sheets-Sheet 1

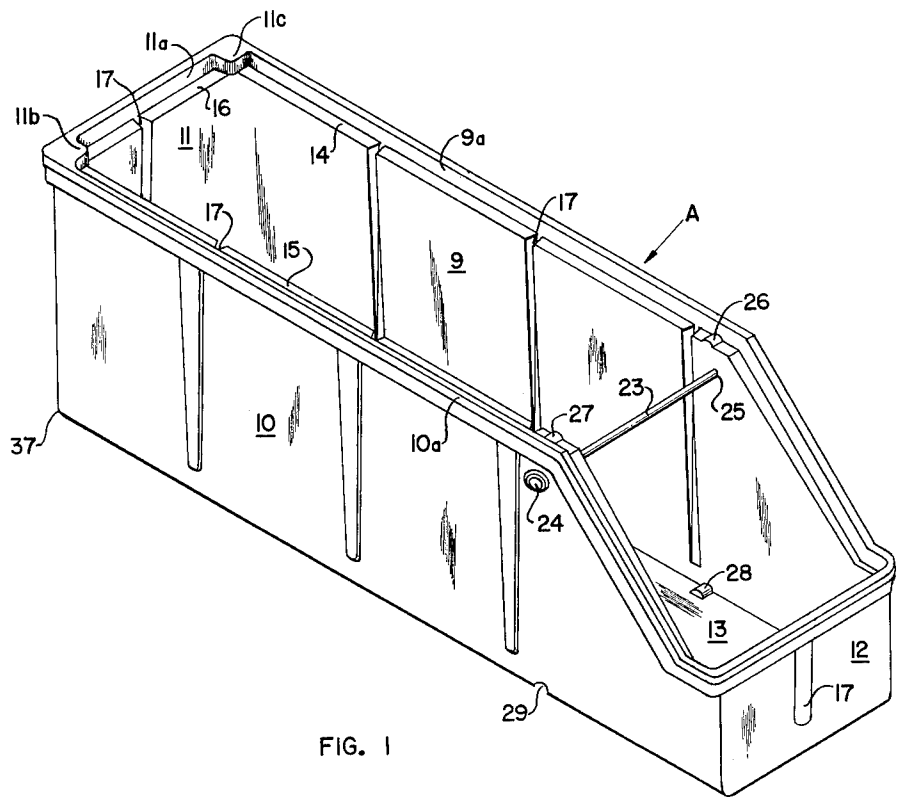


FIG. 1

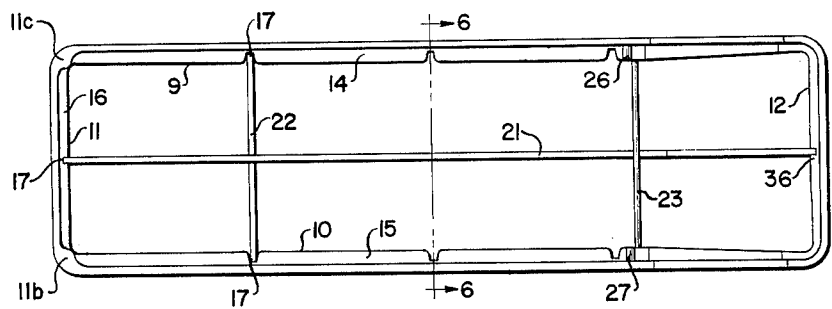


FIG. 2

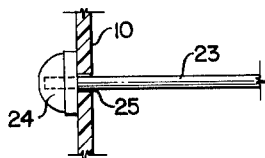


FIG. 3

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2 Sheets-Sheet 2

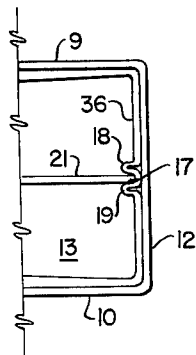


FIG. 4

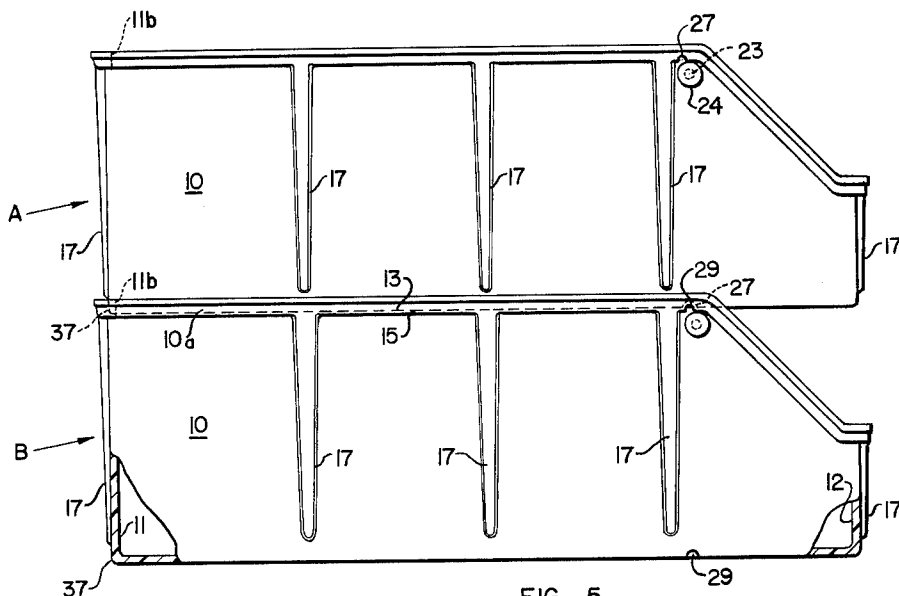


FIG. 5

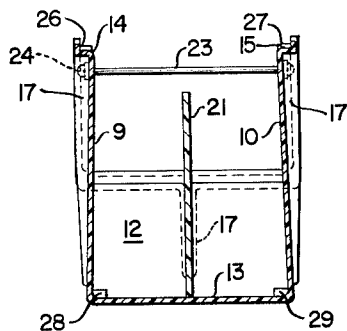


FIG. 6

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STACKABLE BIN CONTAINER

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4 Claims. (Cl. 220-97)

This invention relates to bin containers. More particularly, the invention relates to a stackable bin container having vertical grooves formed in its inner wall surfaces adapted to removably receive vertically disposed divider members for the purpose of dividing the container into compartments and having the front wall shorter than the side walls to thereby permit ready access to the contents of the container.

Specifically, the present invention is directed to a container of substantially uniform thickness throughout of the foregoing type which is integrally formed from a single piece of sheet material. While the present invention specifically contemplates the use of plastic material such as polyethylene, polypropylene, polystyrene, and acrylonitrile-butadiene-styrene copolymers, its application is nevertheless not to be thus limited.

Many industries today require storage for a multitude of small parts and accessories such as nuts, bolts, gears, and the like. Such storage must occupy a minimum of area and the materials so stored must be readily accessible. It is conventional at the present time to store small items in so-called bin boxes. The bin boxes generally employed, however, suffer from one or more serious shortcomings.

In most instances, the boxes must withstand rough usage occasioned by the constant impact of the contents with the walls when metal parts are placed in the boxes or removed therefrom. Such boxes have heretofore been made from materials having substantial impact and tear resistance such as wood or metal. Wood and metal construction materials not only add to the weight of such boxes but also increase the cost of such boxes such as painting and the like. The present box construction is particularly suitable for construction from light-weight, low-cost materials, i.e., heat formable plastics. The instant bin box has a unitary integral construction not possible with wood materials and very costly with metallic materials. Generally, such wood and metal storage boxes must be supported by a frame wherein the box is slid forward to gain access thereto and backward in storage position in much the same manner as a drawer. The present box does not require such a frame thereby not only reducing the storage costs but also increasing the storage capacity for a given area since each box stacks upon an identical box immediately below it. The instant box also offers a maximum of unencumbered storage space due to the elimination of the troughs and stacking posts found in many of the prior tool and storage boxes. It will be appreciated that there is no lateral or forward shifting of superimposed boxes of the present invention and such superimposed stacked boxes do not wedge together.

It is therefore a primary object of the present invention to provide a stackable bin container having a unitary construction and providing a maximum of unencumbered storage space. It is another object of the present invention to provide a stackable bin container which requires no frame supports, is non-wedging and non-shifting when superimposed or stacked upon boxes of identical configuration. It is still another object to provide a stackable bin container which is capable of facile manufacture and

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economical production by mass production methods from plastic materials.

These and other objects will become apparent to one skilled in the art from the following disclosure and attached drawings.

The invention is described in greater detail and the best mode presently contemplated of carrying out the present invention is illustrated in the attached drawings wherein:

FIGURE 1 is a perspective view of the container;

FIGURE 2 is a plan view of the compartmentalized container;

FIGURE 3 is an enlarged view of the spacer rod and keeper means;

FIGURE 4 shows a plan view of a modified front wall;

FIGURE 5 is a side view of two containers in normal stacked position;

FIGURE 6 is a cross-sectional view on line 6-6 of FIGURE 2.

Referring now to FIGURES 1 to 6 of the drawings, the stackable superimposed containers A and B of FIGURE 5 are identical. The description will therefore be directed only to container A.

Referring more particularly to FIGURES 1 and 2 of the drawings, an integrally formed open-top rectangular container A formed of plastic, metal, or the like preferably of substantially uniform thickness thin sheet material, comprises a pair of opposed side walls 9 and 10, a rear end wall 11 of the same height as the major portion of the side walls and a front end wall 12 of lesser height than said side and rear end walls. The side walls and end walls are connected together by a floor or bottom wall 13.

The side walls 9 and 10 slope inwardly and upwardly from the bottom wall 13. End walls 11 and 12 are substantially vertical and preferably slope outwardly and upwardly from bottom wall 13 for ease of removal from the forming molds. The upper extremity of side walls 9 and 10 near their forward ends incline downwardly to connect with the shortened front end wall 12 so as to provide easy access to the container. Preferably, the side walls 9 and 10 incline downwardly to a point slightly rearward of the front wall 12 and at the same height of the front wall 12 and then continue forward parallel to the bottom wall 13 to connect with front wall 12. A plurality of vertical grooves 17 are formed on the inner surface of each of these side and end walls by outwardly indenting said walls; and it will be seen that the spacing and alignment of the grooves is such that a pair of oppositely positioned grooves 17 in the end walls 11 and 12 are adapted to receive a vertical divider member 21 (FIGURES 4 and 6) which is disposed lengthwise of the containers while another pair of oppositely positioned grooves 17 in the side walls 9 and 10 are adapted to receive a vertical divider member 22 which is disposed transversely of the container. Preferably, the end walls contain a single groove. The longitudinal and transverse divider members interlock with each other in the customary manner, i.e., by interlocking slots positioned at the intersections of said longitudinal and transverse divider members.

It will be appreciated that the present invention also contemplates a bin container which does not contain such divider panels, i.e., is not compartmentalized, or said container may contain only longitudinal or only transverse divider panels. In those instances when the use of only transverse divider panels are desired, the grooves in the rear and front end walls may be eliminated.

At the upper extremity of the container each of the side walls is stepped horizontally outwardly approximately to

a point vertically above the outer bottom extremity of the side walls so as to provide shoulders, ledges, or inner shelves 14 and 15 on the side walls 9 and 10, respectively, to stackably support the superimposed container A as illustrated in FIGURE 5.

At the upper extremity of the container each of end walls 11 and 12 is stepped horizontally outward to provide shoulders, ledges, or inner shelves 16 and 36, respectively. While rear shelf 16 may be used for support of a superimposed identical container, shelves 36 are preferably used only for reinforcing the end walls, i.e., for rigidity. Since end walls 11 and 12 preferably slope outwardly from bottom wall 13, the horizontal step or shelf extends generally slightly beyond a point which is vertically above the outer bottom extremity of the end walls. When rear shelf 16 is not used for supporting a superimposed stacked container, projections 11b and 11c are provided in the corners formed at the intersection of side wall 10 and side wall 9 with end wall 11, respectively, on the top of the side and rear end wall shelves. Projections 11b and 11c are adapted to be adjacently positioned to the bottom outer corners 37 and 38 (not shown) of end wall 11 of a superimposed identical container. Thus when the longitudinal edges of bottom 13 of superimposed container A rests upon shelves 14 and 15 of container B, the forward faces of its projections 11b and 11c are in adjacent proximity to the rearward outer surface of corners 37 and 38 of container A. Above the shoulders 14, 15, 16 and 36, the side and end walls extend substantially vertically upward for a short distance, these vertical wall extensions being indicated by a reference numeral for the wall with letter "a" added thereto. For example, the portion of end wall 11 which extends vertically above the ledge or shoulder 16 is designated 11a.

It will be seen that a superimposed container A as illustrated in FIGURE 5 is supported by shoulders or ledges 14 and 15 at the uppermost extremity of the side walls 9 and 10.

In the shoulders or ledges 14 and 15 in the side walls 9 and 10 next adjacent the downwardly inclined portion are preferably projections 26 and 27, respectively. Vertically below projections 26 and 27 and aligned therewith are upwardly projecting depressions 28 and 29 in the underside of the floor or bottom wall 13 adapted to engage shelf projections 26 and 27 of another container when two identical containers are superimposed in stacked arrangement as shown in FIGURE 5.

Below projections 26 and 27 near the top of side walls 9 and 10 are located holes 25. A spacer rod 23 of essentially the diameter of holes 25 passes through said holes transversely of the container and terminating a short distance from the outer surface of side walls 9 and 10. A keeper means 24 which are preferably spring-loaded nuts, are affixed to the extreme ends of spacer rod 23. It will be appreciated that spacer rod 23 will be of such a length that when the keeper means are affixed to the extreme ends of the rod, the keeper means will be in contact with the outer surfaces of side walls 9 and 10 to prevent the distance between the walls from increasing due to outward spreading or flexing thereby preventing a superimposed stacked container from wedging downward into a lower container. The spacer rod and keeper means are illustrated in greater detail in FIGURE 3.

When two of the containers are stackably superimposed as illustrated in FIGURE 5, the bottom wall 13 of the upper container A rests upon side shelves 14 and 15 of the lower container B. It will be seen that in a preferred stacked arrangement shelf projections 26 and 27 of the lower container engage the depressions 28 and 29 in the floor 13 of the superimposed container thereby securing or interlocking the stacked containers so that a container will not slide forward when another container below is tilted slightly forward. It is also seen that in the preferred container configuration, the bottom lower corners 37 and 38 of rear end wall 11 of container A engages the

rear shelf projections 11b and 11c, respectively, of container B to facilitate correct alignment of stacked containers. The side wall extensions 9a and 10a engage with the side walls 9 and 10 of a superimposed container to provide a high degree of assurance of correct alignment and reliable support.

It will be appreciated that when the containers are compartmentalized by the utilization of vertical divider members 21 and/or 22, it may be necessary to allow a greater degree of accessibility than accorded by a simple stacked arrangement. Accordingly, a superimposed container may be slid forward in a drawer fashion. This is simply done by manually lifting the forward end as by grasping the front end wall 12 until the depressions 28 and 29 disengage projections 26 and 27. The container can then be pulled forward with the alignment of the container being maintained by the upper walls 9a and 10a as the side or outer bottom surface of the bottom wall 13 of the container is slidably pulled along the shelves 14 and 15 of the lower container. When access to the container is no longer desired, the container is then pushed rearward until the lower or bottom outer corners of rear end wall 11 engage corner projections 11b and 11c of the lower container and the depressions 28 and 29 again engage projections 26 and 27 of the lower container.

The upward and inward slope from the bottom wall 13 of the side walls 9 and 10 is more clearly shown in FIGURE 6.

It will be seen that since the walls 9 and 10 are sloping inwardly and upwardly and walls 11 and 12 are sloping outwardly and upwardly while the outside edge of the vertical grooves 17 are vertical with respect to the bottom wall 13, wedge-shaped outward projections from the side and end walls are thereby produced. These projections do not interfere with the close positioning of adjacent stacks of containers. Since it is necessary for many applications to affix a label or the like to the front wall of such a container, a relatively flat outer or front surface of the front wall is desirable. Accordingly, a preferred embodiment is illustrated in FIGURE 4 wherein the front wall 12 is substantially vertical with respect to the bottom wall 13 and has a flat outer or forward surface. Groove 17 is formed by a pair of inwardly directed projections 18 and 19. Projections 18 and 19 are each formed by inwardly indenting front end wall 12. Since the front or outer surface is flat, a label can be conveniently affixed thereto. It has also been found advantageous in certain instances, such as, for example, in small containers shown in FIGURES 1, 2 and 3, to modify the side wall grooves and rear end wall grooves in a manner illustrated in FIGURE 4. In other words, the side wall grooves may be formed by a pair of inwardly directed projections as shown in FIGURE 4.

I claim as my invention:

1. An integrally formed plastic open-top rectangular stackable container comprising a bottom wall, upwardly and inwardly sloping side walls and upwardly and outwardly sloping end walls connecting with said bottom wall, said side walls having their front portions downwardly inclining to connect with a shorter front end wall, said side walls having oppositely positioned vertical grooves formed by outward indentations in the faces of the walls and adapted for removably receiving a vertical divider panel placed in a preselected arrangement, said side and end walls at their upper extremity being stepped outwardly and then upwardly a short distance to provide shelves, said side wall shelves adapted to stackably support a superimposed identical container, the outward spreading of said side walls being prevented by a spacer rod and keeper means, said rod passing transversely through the side walls and a short distance beyond immediately beneath the shelf adjacent to the uppermost inclined portion of said side walls, said rod having said keeper means affixed to the extreme ends of said rod adjacent the outer surface of said side walls.

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2. An integrally formed plastic open-top rectangular stackable container comprising a bottom wall, upwardly and inwardly sloping side walls and upwardly and outwardly sloping end walls connecting with said bottom wall, said side walls having their front portions downwardly inclining to connect with a shorter front end wall, said side and end walls having at least one vertical groove in each wall, said grooves being formed by outward indentations in the faces of the walls and adapted for removably receiving vertical divider panels placed in a pre-selected arrangement, said side and end walls at their upper extremity being stepped outwardly and then upwardly a short distance to provide shelves, said side wall shelves adapted to stackably support a superimposed identical container, the outward spreading of said side walls being prevented by a spacer rod and keeper means, said rod passing transversely through the side walls and a short distance beyond immediately beneath the shelf adjacent the uppermost inclined portion of said walls, said rod having said keeper means affixed to the extreme ends of said rod adjacent the outer surfaces of said side walls.

3. A container as in claim 2 wherein projections are formed in the side wall shelves next adjacent the downwardly inclined portion and upwardly projecting depressions are formed in the floor wall vertically below said shelf projections and aligned therewith, each said shelf projection adapted to engage said depression of a super-

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imposed identical container thereby interlocking with said superimposed identical container.

4. A container as in claim 2 wherein the front wall is substantially vertical and the front outer wall surface is substantially flat, said front wall groove being formed by a pair of inwardly directed projections, said projections being each formed by inwardly indenting said front wall.

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