Sept. 21, 1971 J. E. JOYCE 3,606,949

TRANSPORTABLE STORAGE BIN ASSEMBLY

Filed Feb. 11, 1969 2 Sheets-Sheet 1

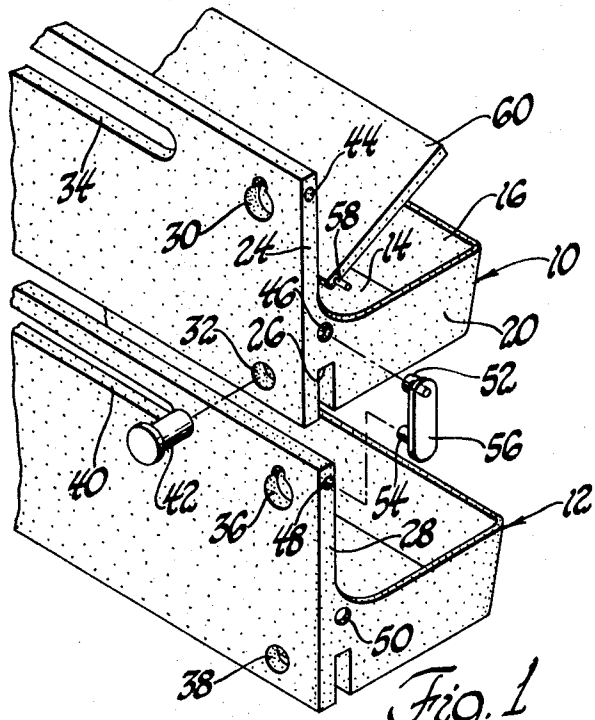
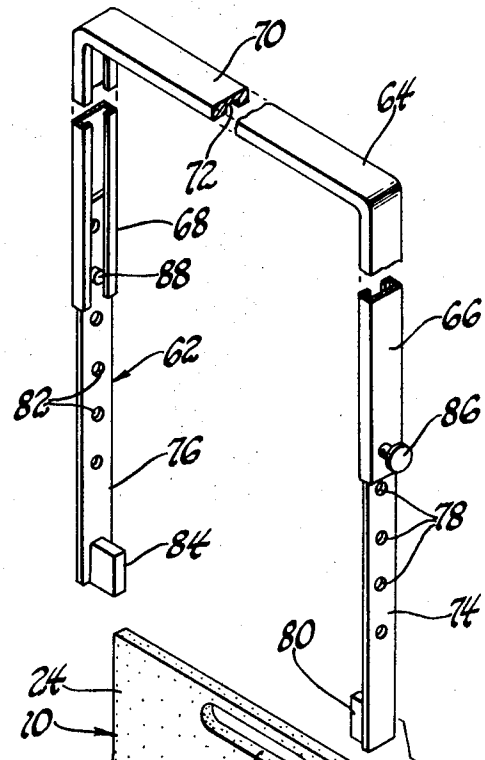


Fig. 1



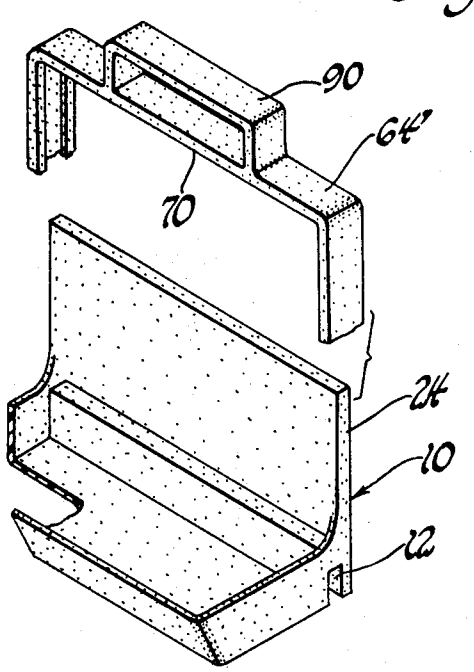


Fig. 3

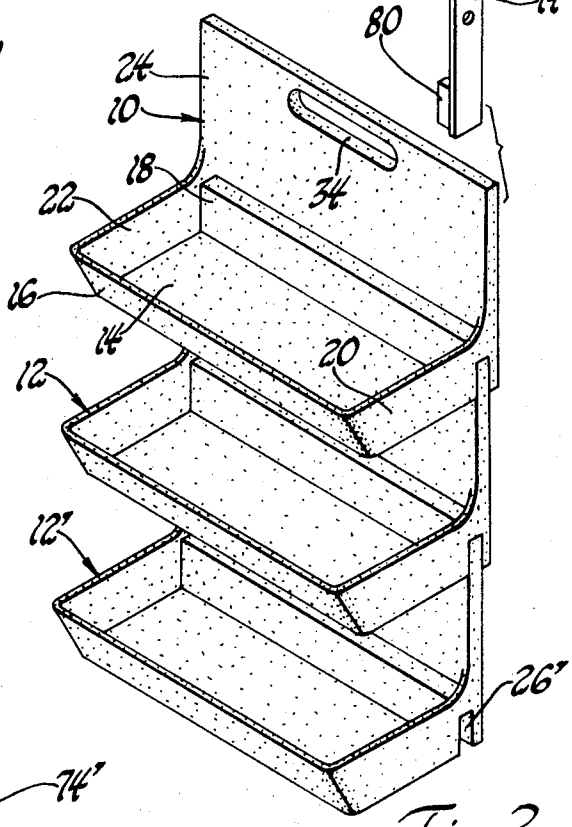


Fig. 2

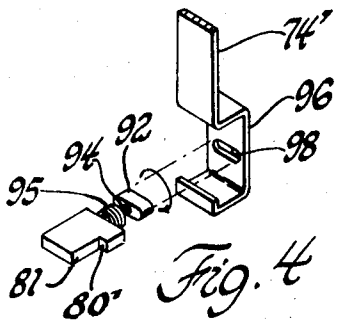


Fig. 4

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TRANSPORTABLE STORAGE BIN ASSEMBLY

Filed Feb. 11, 1969 2 Sheets-Sheet 2

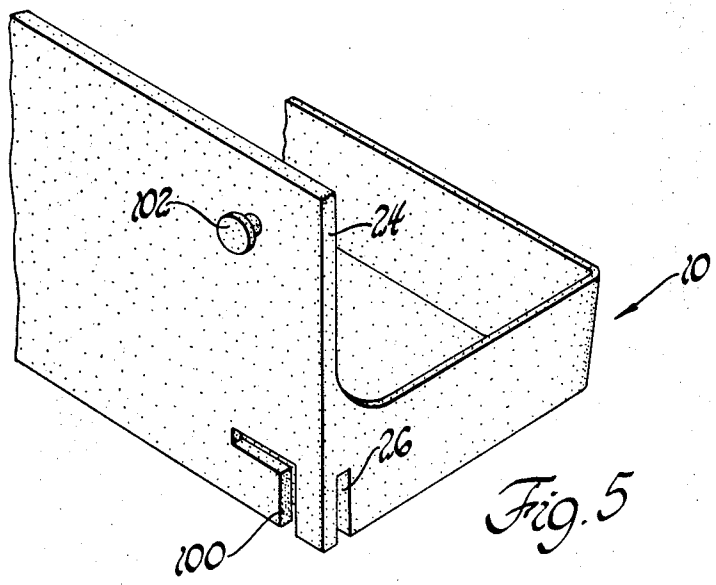


Fig. 5

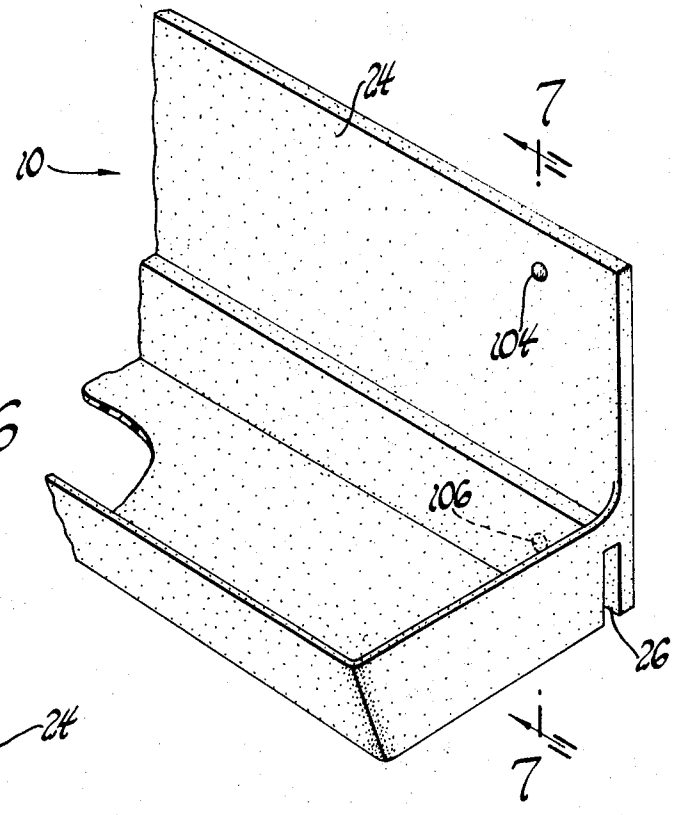


Fig. 6

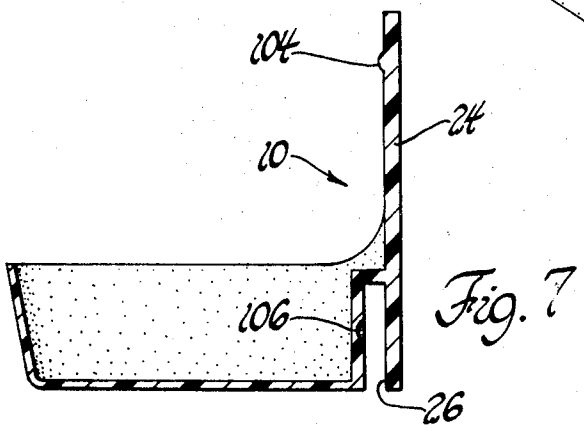


Fig. 7

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3,606,949

TRANSPORTABLE STORAGE BIN ASSEMBLY

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Int. Cl. A47f 3/14; B65d 21/02
U.S. Cl. 211—126 1 Claim

ABSTRACT OF THE DISCLOSURE

Storage bins or like articles, each having a storage compartment portion and an upstanding back member, are designed to be vertically stacked with the support member of one bin extending into a downwardly opening slot in another bin. To permit two or more such stacked bins to be carried as a unit means are provided for positively interconnecting the bins in the stacked array. Various embodiments are described in which the back member of one bin is positively connected to another bin in the stacked array.

This invention relates to stackable storage bins and the like and more particularly to means for positively interconnecting such bins in the stacked condition to permit the stacked bins to be carried as a unit.

U.S. Pat. No. 3,207,321 granted to James E. Joyce on Sept. 21, 1965, discloses a storage bin which may be stacked with other similar storage bins to form a vertical array which is self-supporting and which provides convenient access to the contents of each bin in the stacked array. In general, each bin includes a bottom, front and rear walls, and side walls to form a substantially enclosed storage compartment. The bin is further provided with an upstanding support member joined to and generally rearwardly spaced from the rear wall of the storage compartment to define a downwardly opening vertical slot. This slot is adapted to receive the upper portion of the support member of another similar bin into telescopic relation therewith to provide the self-supporting vertically stacked array.

In accordance with the present invention, two or more such bins when in the stacked condition may be conveniently transported as a unit in such a way as to prevent disengagement of the bins should the uppermost bin be grasped for transportation purposes.

In general, this is accomplished by providing locking means for positively interconnecting the bins whereby the stacked array may be transported as a unit simply by grasping the uppermost bin in the array.

In one embodiment of the invention each bin in a stacked array may be positively interconnected with another bin in the array by providing each bin with at least one set of vertically spaced holes such that when at least two bins are placed in the stacked condition, the lowermost hole of the upper bin is coaxially aligned with the uppermost hole in the lower bin to permit a pin bolt to be inserted through the coaligned holes thus locking the bins together.

In another embodiment, the holes in the bins may be placed such that in the stacked condition the holes are vertically spaced thereby to receive respective legs of a U-shaped bolt.

In a still further embodiment, the stacked bins may be interlocked by means of a strap member preferably having adjustable legs which extend along the side of the back support members of the stacked bins and a cross member, the legs being adapted to grasp the lowermost bin and the cross member being adapted to grasp the uppermost bin thereby interlocking the bins and permitting them to be carried as a unit.

In another embodiment the back member of each bin

is provided with vertically spaced keyways and pins, the keyway being adapted to receive in locking engagement therewith the pin on the back member of the next lower bin in a stacked array.

In another embodiment, the back member of each bin is provided with a nib and the interior of the stacking slot is provided with a vertically aligned cavity to receive the nib of the next lower bin therein.

Various features and advantages of the invention will become more apparent upon reading the following specification which is to be taken with the accompanying drawings of which:

FIG. 1 is a three-quarter view of two bins constructed in accordance with the invention and illustrating two alternate forms of the invention;

FIG. 2 is a perspective view of another alternate form of the invention for interlocking a vertically stacked array of bins;

FIG. 3 is a perspective view of an alternative form of the FIG. 2 embodiment;

FIG. 4 illustrates a modification of the structure shown in FIG. 2;

FIG. 5 is a perspective view of another embodiment of the invention;

FIG. 6 is a perspective view of another embodiment of the invention; and

FIG. 7 is a sectional view of the FIG. 6 embodiment taken along a line 7—7.

Referring now to FIG. 1, there is shown a pair of similar bins **10** and **12** of the type used to store relatively small articles in batch quantities. Bins **10** and **12** are constructed so as to be stackable in a self-supporting vertical array which permits convenient access to the contents of both bins in the array. It is to be understood that three or more bins similar to bins **10** and **12** may be stacked as suggested in FIG. 1.

Each bin, of which bin **10** is representative, includes a generally flat horizontal bottom **14**, an upstanding and preferably outwardly angled front wall **16**, a rear wall **18** as best shown in FIG. 2, and a pair of side walls **20** and **22**. In addition, bin **10** is provided with an upstanding rectangular back member **24** which is parallel to the rear wall **18** but extends vertically above the rear wall and is rearwardly spaced therefrom to define a downwardly opening vertical slot **26**. The slot **26** is defined by the spacing between the rear surface of wall **18** and the front surface of back member **24**. Slot **26** extends laterally across the entire width of the bin **10**.

Bin **12** is provided with a similar back support member **28** which is adapted to extend upwardly into the slot **26** of bin **10**. In the engaged condition the bins **10** and **12** are disposed in a vertically stacked manner, the back member **28** of bin **12** providing support for the bin **10** by way of slot **26**. In this condition the bottom **14** of bin **10** is vertically spaced above bin **12** to permit convenient access to the contents of both bins. Both bins **10** and **12** may be integrally molded from an organic polymeric material.

Bin **10** is further provided with a pair of holes **30** and **32** which are formed in the back member **24** adjacent a lateral edge and vertically spaced one above the other. A second set of holes (not shown) may be formed adjacent the laterally opposite edge of back member **24**. In addition, back member **24** has formed therein a gripping aperture **34** which may be laterally elongated to facilitate grasping of the back member **34** by the fingers. Bin **12** is similarly provided with vertically spaced holes **36** and **38** in a gripping aperture **40**.

In the stacked condition, the hole **32** of bin **10** is axially aligned with hole **36** of bin **12**. Accordingly, the holes **32** and **36** receive a pin-type bolt **42** in engagement therewith. Bolt **42** may be formed of a resilient material so

as to snugly engage the walls of at least hole **36** thereby to be maintained in position. When locked together by the insertion of pin bolt **42** into aligned holes **32** and **36**, the bins **10** and **12** may be carried about as a unit by insertion of the fingers into the gripping aperture **34**. Locking the bins **10** and **12** together precludes the possibility of the bins separating while being transported even though the lowermost bin **12** may be filled with relatively heavy articles which would otherwise tend to withdraw the back portion **28** from slot **26**.

FIG. 1 also illustrates an alternate means for interlocking the bins **10** and **12**. In this embodiment, back member **24** has formed therein a pair of vertically spaced holes **44** and **46**, the axes of which are transverse of the bin **10**. Hole **46** is preferably directly above slot **26** in the portion of back member **24** which is contiguous with side wall **20**. Bin **12** is similarly provided with a pair of corresponding holes **48** and **50**. In the vertically stacked condition, holes **46** and **48** may thus receive legs **52** and **54** respectively of a U-shaped pin bolt **56** into engagement therewith. Although FIG. 1 shows only one side of the bins **10** and **12** and accordingly only one U-shaped pin bolt **56** it is to be understood that a similar arrangement is provided at the other side of each of the bins **10** and **12**. With the pin bolt **56** inserted, the bins **10** and **12** are locked together thereby permiting the vertically stacked arrangement to be carried as a unit simply by grasping the aperture **34**.

As shown in FIG. 1, hole **46** may extend into or immediately above the interior of bin **10**. U-shaped pin bolt **56** has the upper leg **52** thereof hollowed out to act as a bearing for a laterally outwardly extending pivot pin **58** of a rectangular lid **60**. In the combined state the pin **58** extends into the hollow leg **52** of U-shaped pin bolt **56** on either side of the bin **10** thus to permit the lid **60** to pivot about pins **58** between open and closed positions relative to the storage compartment of bin **10**. It is to be understood that bin **12** may also be provided with such a lid and pin bolt bearing arrangement.

Referring now to FIG. 2 there is shown a stacked array of three bins **10**, **12**, and **12'** together with means generally designated at **62** for interlocking the bins to permit transportation thereof as a unit. Several features of the bins shown in FIG. 1 such as the holes **30**, **32**, **44**, and **46** are eliminated from FIG. 2 for the sake of simplicity.

The interlocking means **62** includes a U-shaped strap **64** having a pair of channeled legs **66** and **68** joined by a cross member **70** having formed therein a shallow downwardly opening slot **72**. Channeled legs **66** and **68** are adapted to receive, in slidably adjustable relationship therewith, a pair of extensions **74** and **76**, respectively. Extension **74** is provided with a plurality of vertically spaced holes **78** and a rigid rectangular tab **80** affixed to the inner surface thereof adjacent the terminal end of the leg **74**. Leg **76** is similarly provided with a plurality of holes **82** and an inwardly extending tab **84**.

The extensions **74** and **76**, which are slidably adjustable within the channeled legs **66** and **68**, may be fixed in vertical position relative to the legs **66** and **68** by means of pins **86** and **88** which removably extend laterally through the legs **66** and **68** and through a selected one of the holes **78** and **82**, respectively.

In use, the apparatus of FIG. 2 is assembled such that the tabs **80** and **84** extend laterally into the slot **26'** of the lowermost bin **12'** in the stacked array, the width of cross member **70** being such that the extensions **74** and **76** snugly embrace the sides of the bins in the array. The extensions **74** and **76** and the legs **66** and **68** may be flexed outwardly for the insertion of tabs **80** and **84**. In addition, the back member **24** of the uppermost bin **10** extends upwardly into the shallow slot **72** of cross member **70**, this being accomplished by suitable adjustment of the extensions **74** and **76** within the legs **66** and **68** of the U-shaped strap **64**. When so assembled the entire arrangement of apparatus including the stacked bins **10**, **12**, and **12'** may be carried as a unit by grasping aperture **34**. The upward force applied by one's fingers through aperture **34** is transmitted to the lowermost bin **12'** by way of the legs **66** and **68**, the extensions **74** and **76**, and the tabs **80** and **84** which are disposed within the slot **26'** on the lowermost bin **12'**.

Referring to FIG. 3 an alternate construction of the apparatus **62** is shown. In FIG. 3 the U-shaped strap **64** has secured to the cross portion **70** thereof an upstanding handle portion **90** which eliminates the necessity for an aperture **34** in the back member **24** of bin **10**. The apparatus of FIG. 3 may be otherwise similar to the apparatus of FIG. 2 and adapted to cooperate in a similar fashion.

FIG. 4 shows an alternate construction of the extensions **74** and **76** of FIG. 2. In FIG. 4 the tab **80'** is separate from the extension **74'** so as to be removable therefrom. Tab **80'** is notched out along one side as shown at **81** to coact with the upturned end of extension **74'**. To assemble the tab **80'** to the extension **74'**, tab **80'** is provided with a flat, elongated key **92** connected to the tab **80'** by means of a short shaft **94** carrying a spring **95**. The extension **74'** is provided with an offset portion **96** having an elongated aperture **98** adapted to receive the key portion **92** of tab **80'**. Spring **95** biases the tab **80'** outwardly so that when it is turned through 90° after insertion, the notched out portion **81** is biased against the upturned end of extension **74'**.

FIG. 5 illustrates another embodiment of the invention in which a bin **10** has an upstanding back member **24** with an L-shaped keyway **100** formed therein. Keyway **100** has a vertical portion opening at the bottom edge of the back member **24** and a horizontal portion which joins the vertical portion at a right angle. Aligned vertically above the horizontal portion on back member **24** is a rearwardly projecting pin **102** having an enlarged head portion. A second keyway and pin may also be located adjacent the other side of bin **10**, but is omitted from the drawing.

In assembling a vertically stacked array of the bins illustrated in FIG. 5, the back member **24** of one such bin is inserted into the slot **26** in another such bin, the pins **102** entering the vertical portions of keyways **100** and traveling up to the horizontal portion of keyways **100**. The bins are then urged laterally of one another to displace pins **102** into the horizontal portions of keyways **100** as far as possible to lock the bins together against relative vertical separation.

FIGS. 6 and 7 illustrate another embodiment wherein the back member **24** of each bin **10** is provided with a forwardly extending nib **104** adjacent the top edge thereof. A vertically aligned cavity **106** is provided in the forward surface of slot **26**. In assembling a vertically stacked array of the bins illustrated in FIG. 6, the back member **24** of one such bin is inserted into the slot **26** of another such bin and the nib **104** is forced into the cavity **106** locking the bins together against relative vertical separation. Two or more sets of vertically aligned nibs and cavities may be provided.

It is to be understood that the foregoing description is illustrative in nature and is not to be construed in a limiting sense.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. In combination: an open top storage bin having a horizontally disposed bottom, a rear wall, sides, and a back member extending substantially parallel to and vertically above the rear wall and being rearwardly spaced from the rear wall to define a vertical slot extending laterally across the bin whereby two or more of the bins may be disposed in a free-standing, vertically stacked array wherein the back member of a lower bin extends upwardly into the vertical slot of the next upper bin and the back members maintain the bins in such a vertical rela-

tionship as to permit access to the open top of each bin even when in the stacked array, means for positively interconnecting the back members of the bins only when disposed in the stacked condition to permit the stacked array to be carried as a unit and including a pair of substantially vertically spaced holes having parallel axes and formed in each side of the bin the lowermost hole in each side being disposed adjacent and above the slot, and the uppermost hole in each side being disposed in an upper portion of the back member, a pair of substantially U-shaped bolts each having legs to be disposed within the uppermost hole of the lower bin, and the lowermost hole in the upper bin in a stacked array, the leg of each of the U-shaped bolts extending through the lowermost hole being hollow, and a substantially flat lid for closing the bin, the lid having at each lateral end thereof a pivot member adapted to extend into the hollow leg of the U-shaped bolt to pivot therein.

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RAMON S. BRITTS, Primary Examiner

U.S. Cl. X.R.

108—91; 220—94, 97; 224—48