

Jan. 5, 1965

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3,164,259

PARTS CONTAINER AND MOUNTING MEANS THEREFOR

Filed June 18, 1962

2 Sheets-Sheet 1

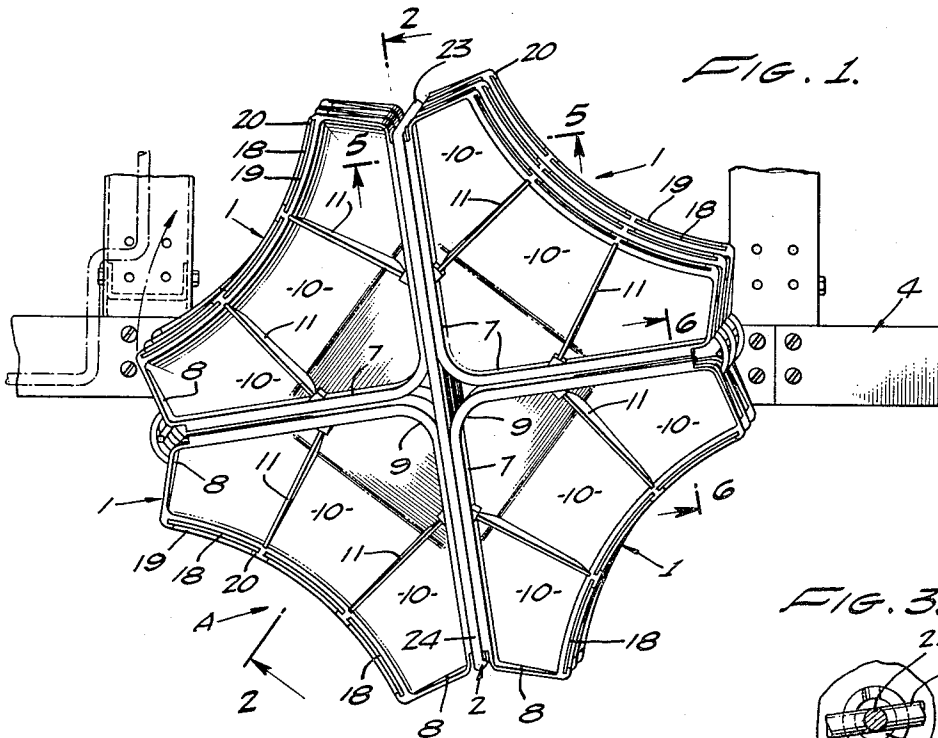


FIG. 3.

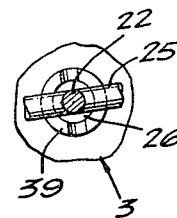
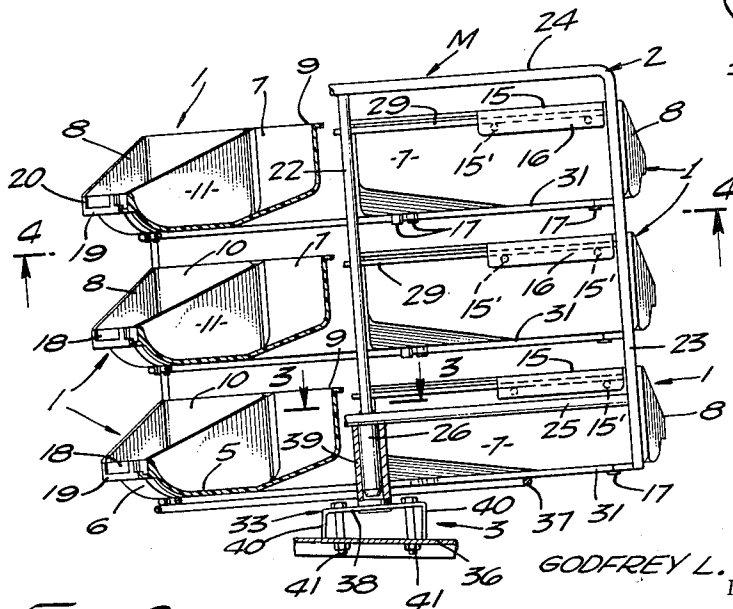


FIG. 2.

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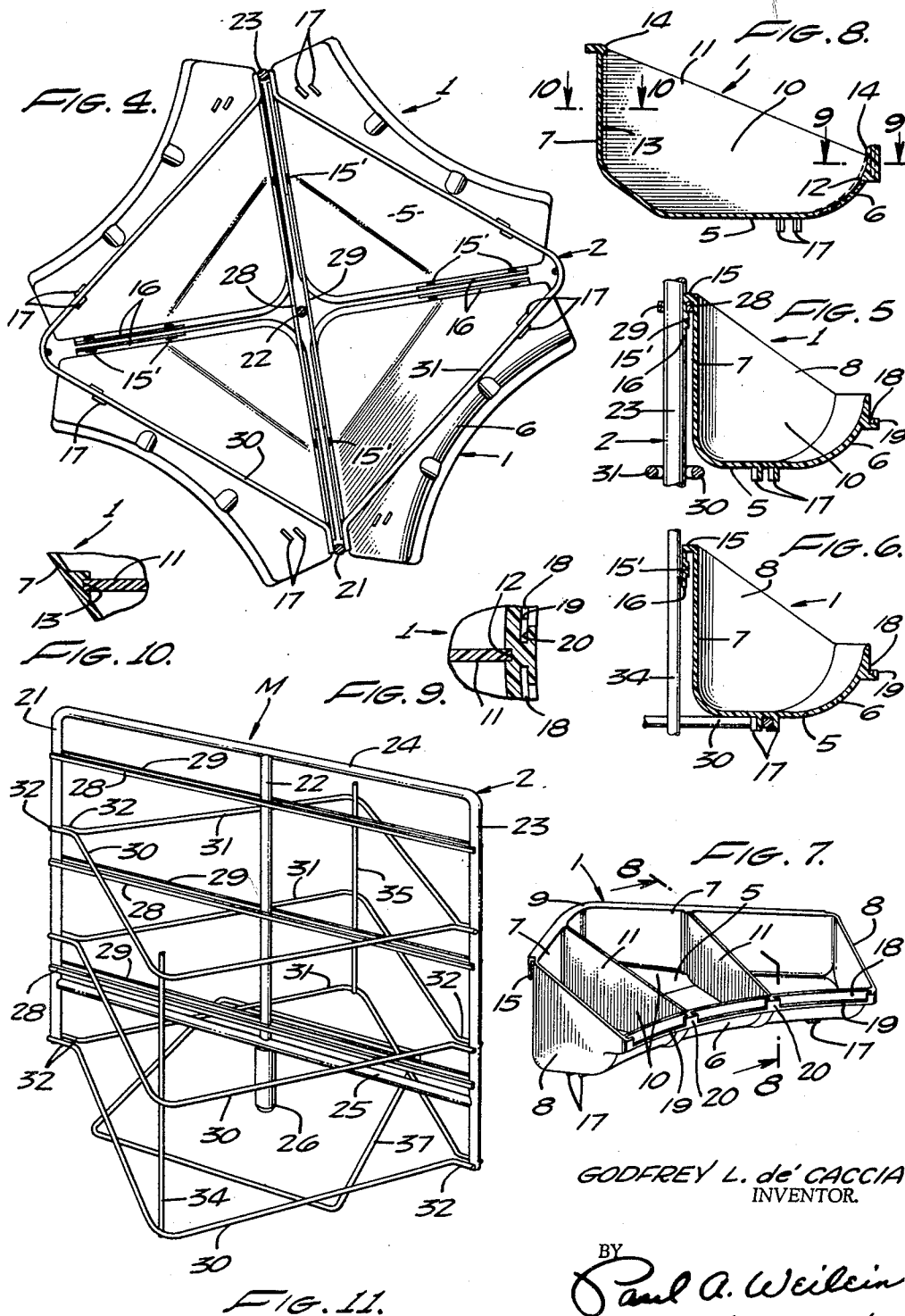
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PARTS CONTAINER AND MOUNTING MEANS THEREFOR

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2 Sheets-Sheet 2



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PARTS CONTAINER AND MOUNTING MEANS THEREFOR

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Filed June 18, 1962, Ser. No. 203,347
14 Claims. (Cl. 211-131)

This invention relates to a container unit for parts to be used in the assembly or other treatment of mechanical, electromechanical, electronic and similar devices and units, especially at production stations, repair stations and in assembly lines.

It is in object of this invention to provide a parts container and related mounting means therefor which comprises a compact unit constructed and arranged so that it may be readily set up in a manner whereby one or more operators at adjacent stations may have ready access to the parts with a minimum of effort and movement to thereby facilitate production and assembly operations.

It is another object hereof to provide for the purpose above noted a novel unitary structure including a plurality of parts-containing trays and a mounting frame constructed and arranged to provide tiers of the trays, and operable so that each tray in each tier may be positioned to afford ready access to the interior thereof and the parts therein.

It is a further object of this invention to provide a parts-container unit such as above described which is arranged so that the unit may be moved angularly about an axis inclined somewhat from the vertical in such a manner that upon turning of the unit, an operator stationed adjacent thereto and toward which the unit is inclined, may have ready access to the interior of each tray in each of the several tiers with a minimum of effort and arm movement and without moving from a predetermined seated or standing position adjacent the unit.

It is a further object hereof to provide a parts-container unit such as hereinbefore described in which the trays arranged in tiers in the unit are provided with means for removably interlocking them to supporting elements of a frame whereby the trays will be securely held in place, yet subject to removal and replacement when desired, each tray being adapted to be placed upon a table or workbench apart from the supporting frame should this be desired. With this arrangement the trays may be filled with parts at the stock room and thereafter placed on the frame.

It is another object of this invention to provide a container-frame unit for the purpose described which readily lends itself to efficient use in connection with a frame structure of the type shown in my application for patent entitled Production Station Unit, Serial No. 203,346, filed June 18, 1962.

Other objects and advantages of the invention will be hereinafter described or will become apparent to those skilled in the art, and the novel features of the invention will be defined in the appended claims.

Referring to the drawings:

FIG. 1 is a top plan view of a parts container unit embodying the present invention as it would appear when mounted upon a structure comprising a part of a production station;

FIG. 2 is a sectional view taken on the line 2-2 of FIG. 1;

FIG. 3 is a sectional view taken on the line 3-3 of FIG. 2 on a slightly enlarged scale;

FIG. 4 is a sectional view taken on the line 4-4 of FIG. 2;

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FIG. 5 is a sectional view taken on the line 5-5 of FIG. 1;

FIG. 6 is a sectional view taken on the line 6-6 of FIG. 1;

FIG. 7 is a perspective view of one of the trays;

FIG. 8 is a sectional view on an enlarged scale taken on the line 8-8 of FIG. 7;

FIG. 9 is an enlarged sectional view taken on the line 9-9 of FIG. 8;

FIG. 10 is an enlarged sectional view taken on the line 10-10 of FIG. 8; and

FIG. 11 is a perspective view of the tray-supporting frame of the mounting means embodying this invention with the trays removed.

An embodiment of this invention, as shown in the accompanying drawings, generally comprises a plurality of parts-containing trays 1, a supporting frame 2 for the trays, and mounting means 3 (see FIG. 2) for rotatably supporting the frame and trays at the desired location on a frame structure 4 constituting a part of a production station or assembly line, as shown in FIG. 1, whereby at a station indicated at A, the parts in the trays are readily available to an operator for use in production and assembly operations.

Each tray 1 is specially constructed to afford ready access to the interior thereof, especially when the trays are arranged one above the other in closely associated relation. Preferably, each tray is made of a suitable light plastic material and is elongate, being formed as shown in FIGS. 5, 6, 7 and 8, with a somewhat cupped bottom wall 5, an arcuate front wall 6, a V-shaped rear wall 7, and like end walls 8.

The arcuate front wall 6 curves upwardly and outwardly from the cupped bottom wall 5 so that the front wall is arcuate in cross section as well as in the direction of its length, thereby providing a concave front side of the tray. The V-shaped rear wall 7 has a radius at the apex 9 thereof and is of greater height than the front wall 6. The end walls 8 increase in height from the front wall toward the ends of the rear wall. With this arrangement of walls, the trays have considerable capacity, and an operator adjacent one side or in front of the unit readily and easily may reach into any interior portion of the adjacent trays over the comparatively low concave front wall 6 and the low forward portions of the end walls 8.

Each tray 1 is provided with a plurality of compartments 10 formed by somewhat flexible plastic partitions 11 removably fitted in grooves 12 and 13 suitably provided in the front and rear walls, respectively. At their upper ends these grooves are provided with protuberant detent portions 14 which hold the partitions in place, the flexibility of the walls of the tray and the partitions permitting the partitions to be moved past the detent portions so that the latter will snap over the upper ends of the partitions.

As a means for detachably mounting the trays 1 on the frame 2, the V-shaped rear wall 7 of each tray is provided with flanges 15 which extend outwardly and then downwardly to form frame-engaging hook portions 16. These flanges may be provided with protuberant detents 15' on the inner sides thereof to prevent accidental dislodgement of the tray. The underside of the bottom wall 5 of each tray is also provided adjacent each end thereof with a pair of spaced frame engaging lugs 17, the purpose of which will be apparent hereinafter.

Labels, not shown, for identifying parts in the compartments 10 of each tray, may be set into upwardly-opening pockets 18 formed on the outer face of the front wall of each tray by means of outwardly-extending grooved members 19 and 20, as shown in FIGS. 5-9.

The frame 2 for supporting the tray 6 is of skeleton

form and, as here shown, made of suitable wire or rod stock. Accordingly, the frame 2 includes a rectangular main section M made up of a plurality of rods constituting upright frame members 21, 22 and 23 equidistantly spaced one from the other in a row and which, in the complete frame 2, is centrally thereof. The upright frame members 21, 22 and 23 are joined at their upper and lower ends by cross-frame members 24 and 25. The members 21, 23 and 24 may, as here shown, be formed of a single length of rod or bar stock bent to inverted U-form. The center upright frame member 22 may be spot welded or otherwise secured to the cross members 24 and 25, while the lower cross member 25 may be welded at its ends or otherwise secured to the upright frame members 21 and 23 adjacent the lower ends of the latter.

As a means for rotatably supporting the frame 2, a cylindrical bearing member 26 is fixed as by welding to the lower cross member 25 in line with the center member 22. This bearing member becomes a part of the mounting means 3 for rotatably supporting the frame 2, as shown in FIG. 2.

As a means for supporting the trays one above the other in separate tiers on the frame 2, the main section M is provided with a plurality of tray-engaging rods or members 28, here shown as of non-circular cross section, extending transversely of the upright frame members 21, 22 and 23 on one side of each of the latter and secured thereto in predetermined vertically spaced relation to one another. Tray-engaging members 29 identical with the members 28 are extended transversely of the upright frame members 21, 22 and 23 on the other side of each of the latter and secured thereto as by welding in the same spaced relation one to the other as the members 28 and so as to be coplanar with the members 28.

The arrangement of the members 28 on one side of the frame section M is such that a pair of trays 1 will be engaged by each member 28 when the trays are disposed side by side in contact therewith in a manner which will be hereinafter described. Likewise, the members 29 on the other side of the frame section M provide for mounting the trays in pairs in a manner which will be hereinafter pointed out.

Means are provided in the frame 2 for cooperation with the transverse members 28 and 29 to support the trays 1. For this purpose a plurality of V-shaped tray-supporting members 30 are arranged one above the other in a substantially horizontal position with their apices outermost and their ends fixed as by welding to the upright members 21 and 23 on one side of the latter. Another set of substantially horizontal V-shaped tray-supporting members 31 are mounted one above the other on the other side of the upright members 21 and 23 with their ends welded thereto so that each member 31 is disposed in the same plane as the member 30 opposite thereto. The ends of the V-shaped members 30 and 31, as here shown, may be bent to extend outwardly in parallel relation to one another as at 32 so as to lie against opposite sides of the upright frame members 21 and 23 in the same manner as do the ends of the members 28 and 29. This arrangement facilitates the welding of the V-shaped members to the upright frame members, also has a reinforcing effect increasing the rigidity of the frame.

The V-shaped members 30 and 31 are secured to the upright members 21 and 23 so that each pair of related members 30 and 31 is disposed below a related pair of transverse tray engaging members 28 and 29 since the latter are adapted to be engaged with the upper portions of the rear wall 7 of the trays 1, whereas the members 30 and 31 are disposed to extend beneath the trays in contact with the undersides of the bottom thereof.

The upright rods 34 and 35 are welded to the inner sides of the apices of the V-shaped members 30 and 31 to rigidly support them in predetermined spaced relation and to lend rigidity to the frame 2 as a whole.

A substantially square base frame member 37 may be

welded to the underside of the lowermost members 30 and 31 so as to provide a footing enabling the frame 2 as a whole to stand upright on any suitable supporting surface.

While the frame, as here shown, is constructed to support four tiers of trays 1 with each tier containing three trays, it is obvious that it may be constructed to support a greater number of trays in each tier and that it may be used to support one or more tiers on either or both sides of the main frame section M.

In mounting the trays on the frame 2, for example, on the upper part of the frame on one side of the centre frame section M, a pair of trays are placed side-by-side on the uppermost V-shaped member 30 with one-half of the V-shaped rear wall 7 of each tray parallel with the uppermost transverse members 28, while the other halves of the V-shaped walls are parallel to one another and side by side. When in this position, the trays are pushed downwardly, as shown in FIG. 5, so that hook portion 16 will hook over the member 28 and snap past the detents 15', thereby releasably holding the trays on the frame. With reference to FIG. 7, when the trays are hooked in place in this manner, the lugs 17 on the ends of the trays adjacent the apex of the member 30 will straddle the member 30 on each side of the apex. Thus, each tray-engaging member 28 and each tray-supporting member 30 will accommodate a pair of trays 1. This is also the case with each transverse member 29 and each tray-supporting member 31 on the other side of the main section M of the frame 2.

It should be noted that the mounting means 3, shown in FIG. 2, includes an inverted U-shaped bracket 33 having legs 40 of uneven length whereby upon fastening the bracket to a support 36 as by means of fastenings 41, the body 38 of the bracket will be inclined. A socket 39 is supported on the body 38 and is also inclined so that when the bearing member 26 on the frame 2 is mounted in the socket, the frame 2 will be rotatably supported in a tilted position. It is desired to have the frame 2 tilt toward the operator at a production station to facilitate access to the frame and trays thereon. It is obvious that this mounting means may be mounted so as to tilt in different directions according to where it is desired to have the operator positioned at a production station.

It should be noted that the parts container unit of this invention comprises a very compact and useful adjunct for use at production stations and in assembly lines, in that in a comparatively small space it will support a number of large capacity trays containing parts and other components used in assembly work with each tray readily available to the operator with a minimum of movement and exertion on the part of the operator. The trays and frame are constructed so that the trays may be readily removed and replaced with respect to the frame or permitted to stand on any suitable supporting surface. The spacing of the trays in the tiers is such that in consideration of the shapes thereof and the relative heights of the walls, an operator at a production station readily may reach into any one of the trays inasmuch as the frame may be rotated to present each tier of trays in readily accessible position.

While specific structural details have been shown and described, it should be understood that changes and alterations may be resorted to without departing from the spirit of the invention as defined in the appended claims.

I claim:

1. A frame for supporting trays one above the other in tiers, comprising: upright main frame members disposed in opposed spaced relation to one another; a plurality of tray-engaging members extending transversely between and joined to said main frame members at predetermined vertically spaced intervals with each tray-engaging member disposed to engage the upper portions of a pair of said trays when the latter are positioned side-by-side thereagainst; and a plurality of tray-supporting members projecting laterally outwardly from said main frame members with their ends joined to said main frame

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members; said tray-supporting members being disposed in spaced relation to said tray-engaging members with portions thereof disposed to engage the undersides of trays engaged by said tray engaging members and cooperate therewith to retain the trays against lateral movements.

2. A frame for supporting trays one above the other in tiers, comprising: upright main frame members disposed in opposed spaced relation to one another; a plurality of tray-engaging members extending transversely between and joined to said main frame members at predetermined vertically spaced intervals; each tray-engaging member being disposed to engage the upper portions of a pair of said trays when the latter are positioned side-by-side thereagainst; and a plurality of tray-supporting members joined to said main frame members; each tray-supporting member having portions extending convergently outwardly from said main frame members and joined at their outer ends; an upright member secured to and supporting said outer ends of said portions; said tray-supporting members being disposed in spaced relation to said tray-engaging members with said portions thereof disposed to engage the undersides of trays engaged by said tray-engaging members.

3. A frame unit for supporting trays one above the other in tiers, comprising: a plurality of upright main frame members arranged in a row in spaced relation to one another; upper and lower cross frame members joined to upper and lower end portions of said upright main frame members; a plurality of tray-engaging members extending transversely of opposite sides of and joined to said upright main frame members at vertically spaced intervals for engaging upper portions of the trays positioned thereagainst; and tray-supporting members secured to the main frame members; said tray-supporting members having portions extended convergently outwardly from opposite sides of said row of upright main frame members for contact with the undersides of trays engaged by said transverse tray-engaging members, whereby trays are supported on opposite sides of said upright main frame.

4. A frame unit for supporting trays one above the other in tiers, comprising: a plurality of upright main frame members arranged in a row in spaced relation to one another; upper and lower cross frame members joined to upper and lower end portions of said upright main frame members; a plurality of tray-engaging members extending transversely of and joined to said upright main frame members at vertically spaced intervals along the latter for engaging upper portions of the trays; and a plurality of V-shaped tray-supporting members having their ends secured to upright frame members of said plurality thereof so that said V-shaped tray-supporting members extend laterally outwardly from opposite sides of said row of upright main frame members for contact with the undersides of trays engaged by said transverse tray-engaging members; said transverse tray-engaging members being arranged in pairs with one such member of each pair being on one side of said row of upright frame members and the other member of said pair disposed opposite said one member and on the other side of said row.

5. A frame unit for supporting trays one above the other in tiers, comprising: a plurality of upright main frame members arranged in a row in spaced relation to one another; upper and lower cross frame members joined to upper and lower end portions of said upright main frame members; a plurality of tray-engaging members extending transversely of and joined to said upright main frame members at vertically spaced intervals for engaging upper portions of the trays; a plurality of V-shaped tray-supporting members having their ends secured to the upright frame members at the ends of said row so that said V-shaped members extend laterally outwardly from opposite sides of said row of upright main frame

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members for contact with the undersides of trays engaged by said transverse tray-engaging members; one of said upright main frame members of said plurality being disposed substantially centrally of the frame unit; and a bearing member on said lower cross frame member in line with said centrally disposed upright frame member and adapted to be mounted for rotation in a support whereby the frame unit will be rotatably supported.

6. A unit for containing parts to be used at production and assembly stations, comprising: a plurality of trays for containing such parts; a frame supporting said trays; said trays each having a bottom wall and upright walls; said frame having a row of upright members; tray-engaging members joined to and extending transversely between said upright members so as to engage trays placed one above the other thereagainst; hook portions on said trays adapted to be removably hooked over said transversely extending tray-engaging members; and tray-supporting members carried by and extending laterally from said upright member for engaging the undersides of the bottom walls of trays hooked to said transverse tray-engaging members.

7. A unit for containing parts to be used at production and assembly stations, comprising: a plurality of trays for containing such parts; a frame supporting said trays; said trays each having a bottom wall and upright walls; said frame having a row of upright members; tray-engaging members joined to and extending transversely between said upright members so as to engage trays placed one above the other thereagainst; hook portions on said trays adapted to be removably hooked over said transversely extending tray-engaging members; tray-supporting members carried by and having portions extending laterally from said upright member for engaging the undersides of the bottom walls of trays hooked to said transverse tray-engaging members; and a pair of downwardly projecting lugs on the bottom wall of each tray arranged to straddle said portions of said tray-supporting members.

8. A unit for containing parts to be used at production and assembly stations, comprising: a plurality of trays for containing such parts; a frame supporting said trays; said trays each having a bottom wall and upright walls; said frame having a row of upright members; tray-engaging members joined to and extending transversely between said upright members so as to engage trays placed one above the other thereagainst; said tray-engaging members being arranged in pairs with the members of each pair disposed on opposite sides of said row of said upright members; each member of each pair of said tray-engaging members being capable of engaging a pair of trays placed side-by-side thereagainst; means on said trays removably engaged with said tray-engaging members; and tray-supporting members joined to and extending outwardly from said upright members with portions thereof disposed to be engaged with the undersides of the bottom walls of the trays.

9. A unit for containing parts to be used at production and assembly stations, comprising: a plurality of trays for containing such parts; a frame supporting said trays; said trays each having a bottom wall and upright walls; said frame having a row of upright members; tray-engaging members joined to and extending transversely between said upright members so as to engage trays placed one above the other thereagainst; hook portions on said trays adapted to be removably hooked over said transversely extending tray-engaging members; tray-supporting members carried by and extending laterally from said upright member for engaging the undersides of the bottom walls of trays hooked to said transverse tray-engaging members; and means supporting said frame for angular movement about an upright axis.

10. A unit for containing parts to be used at production and assembly stations, comprising: a plurality of trays for containing such parts; a frame supporting said trays; said trays each having a bottom wall and upright walls;

said frame having a row of upright members; tray-engaging members joined to and extending transversely between said upright members so as to engage trays placed one above the other thereagainst; portions on said trays adapted to be removably engaged with said transversely extending tray-engaging members; tray-supporting members carried by and extending laterally from said upright members for engaging the undersides of the bottom walls of trays engaged by said transverse tray-engaging members; and means for supporting said frame in a position tilted from the vertical so that it will lean toward an operator at a production station and the trays may be selectively moved by the operator to an inclined position directly in front of his position.

11. A unit for containing parts to be used at production and assembly stations, comprising: a plurality of trays for containing such parts; a frame supporting said trays; said trays each having a bottom wall and upright walls; said frame having a row of upright members; tray-engaging members joined to and extending transversely between said upright members so as to engage trays placed one above the other thereagainst; portions on said trays adapted to be removably engaged with said transversely extending tray-engaging members; tray-supporting members carried by and extending laterally from said upright member for engaging the undersides of the bottom walls of trays engaged with said tray-engaging members; and means supporting said frame for rotation about an axis inclined from the vertical so that said frame will be inclined to an operator at a production station.

12. A frame for supporting trays one above the other in tiers, comprising: upright main frame members disposed in opposed spaced relation to one another; a plurality of tray-engaging members extending transversely between and joined to said main frame members at predetermined vertically spaced intervals with each tray-engaging member disposed to engage the upper portions of a pair of said trays when the latter are positioned side-by-side thereagainst; a plurality of tray-supporting rod members projecting laterally outwardly from said main frame members with their ends joined to said main frame members; said tray-supporting members being disposed in spaced relation to said tray-engaging members with portions thereof disposed to engage the undersides of trays engaged by said tray-engaging members; and means supporting said frame so that it is inclined from the vertical in a particular direction.

13. A frame for supporting trays one above the other in tiers, comprising: upright main frame members disposed in opposed spaced relation to one another; a plurality of tray-engaging members extending transversely

between and joined to said main frame members at predetermined vertically spaced intervals with each tray-engaging member disposed to engage the upper portions of a pair of said trays when the latter are positioned side-by-side thereagainst; a plurality of tray-supporting rod members projecting laterally outwardly from said main frame members with their ends joined to said main frame members; said tray-supporting members being disposed in spaced relation to said tray-engaging members with portions thereof disposed to engage the undersides of trays engaged by said tray-engaging members; and means supporting said frame so that it is inclined from the vertical in a particular direction and rotatable about a correspondingly inclined axis.

14. A unit for containing parts to be used at production and assembly stations, comprising: a plurality of trays for containing such parts; a frame supporting said trays; said trays each being of generally triangular form with a bottom wall and upright side walls in right angled relation connected at their ends to a front wall extending at an angle therebetween; said frame having a row of upright members; tray-engaging members joined to and extending transversely between said upright members so as to engage trays placed one above the other thereagainst; said tray-engaging member being arranged in pairs with the members of each pair disposed on opposite sides of said row of said upright members; each member of each pair of said tray-engaging members being capable of engaging a pair of trays placed side-by-side thereagainst and so that their front walls are arranged substantially in quadrature; means on said trays removably engaged with said tray-engaging members; tray supporting members joined to and extending outwardly from said upright members with portions thereof disposed to be engaged with the undersides of the bottom walls of the trays; and means for rotatably supporting said frame for rotational movement about an axis common to said trays, said axis being tilted from the vertical so that the front walls of the trays may be selectively brought to a tilted position in front of an operator at the assembly station.

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