Nov. 20, 1951 H. L. KAUTZMANN ET AL 2,575,919

BUILT-UP LETTER TRAY

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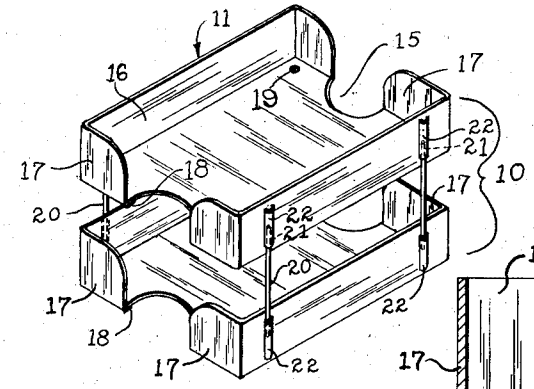


Fig. 1.

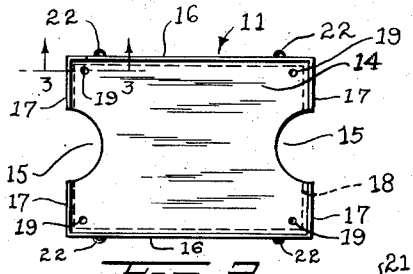


Fig. 2.

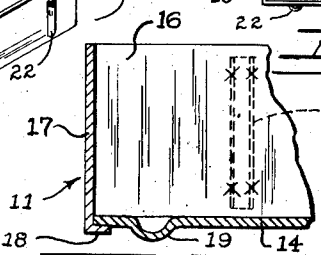


Fig. 3.

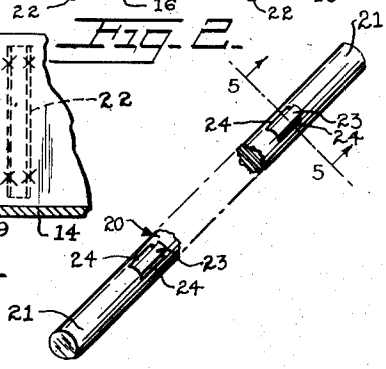


Fig. 4.

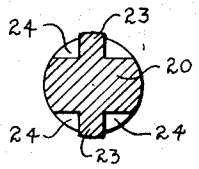


Fig. 5.

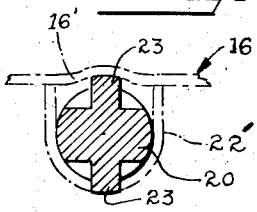


Fig. 6.

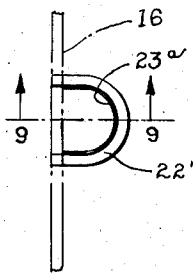


Fig. 8.

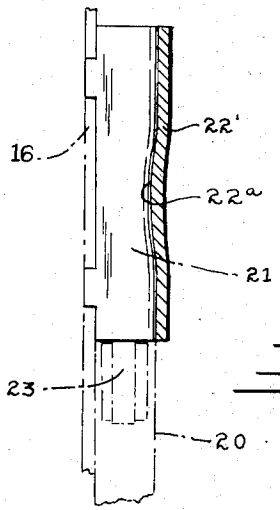


Fig. 9.

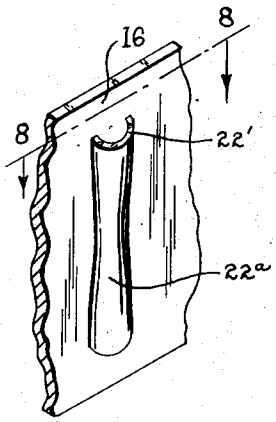


Fig. 7.

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BUILT-UP LETTER TRAY

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2 Claims. (Cl. 211—126)

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This invention relates to new and useful improvements in build-up letter trays.

A tray for use on desks and the like in business offices is a familiar convenience for temporarily holding letters, memoranda and other papers, and a plurality of such trays is almost always an advantage for permitting segregation or sorting of papers of different kinds, as for later filing, mailing, immediate attention, deferred attention, etc.

According to the invention an arrangement is provided whereby a plurality of trays may be arranged as a single article of office furniture, to be rested on a desk or the like, yet able to be readily transported to some other point; and an arrangement also wherein the number of trays in said article, these securely yet detachably connected, may be varied as conditions require, wherein an upper tray will be predeterminedly spaced above one therebelow, and wherein improved means for thus connecting the trays are provided.

A particular object of the invention is to provide a plurality of separate trays, in combination with tray interconnecting means whereby a dependable impositive interlock is provided between a tray and the tray therebelow or thereabove; with such interlock so arranged that the trays may be readily coupled and when desired readily uncoupled, yet with the interlock of such nature that when an interlock has been made it may be depended on to prevent accidental tray separation even with a fairly heavily loaded tray suspended by way of the tray interconecting means from a tray thereabove, and with the stack of trays handled only at the tray marking the top of the stack of trays.

A further feature of the invention is an improved tray construction, for giving a sturdy and yet a light-weight tray, and one which may be inexpensively made of metal, and, at the same time, a tray which incorporates means for facilitating the quick and easy removal of a stack of papers in a particular tray.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawing, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawing forming a material part of this disclosure:

Fig. 1 is a perspective view, showing an embodiment of the invention incorporating a stack of two like trays.

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Fig. 2 is a top plan view of one of said trays.

Fig. 3 is, on an enlarged scale, a fragmentary detail vertical sectional view, taken on the line 3—3 of Fig. 2.

Fig. 4 is a perspective view, on a further enlarged scale, showing one of the several cylindrical tray-connecting posts, each of said posts having end portions for coacting with receptors projected from the sides of a pair of stacked trays.

Fig. 5 is a transverse section, on still a further enlarged scale, taken on the line 5—5 of Fig. 4.

Fig. 6 is a view similar to Fig. 5, for illustrating a modified use of the tray connecting means, and showing a receptor and the adjacent portion of the tray in dot and dash lines.

Fig. 7 is, on a scale somewhat enlarged over that of Fig. 3, a fragmentary perspective view of a side wall of a tray, showing a modified form of receptor.

Fig. 8 is, on a somewhat further enlarged scale, a horizontal section taken on the line 8—8 of Fig. 7, but with the side wall of the tray indicated in dot and dash lines.

Fig. 9 is a view similar to and showing the modification of Fig. 8, this view, however, being a vertical section taken on the line 9—9 of Fig. 8.

Referring to the drawing more in detail, and first to Figs. 1 to 5, the illustrated stack of trays 10 is shown as including merely two trays 11 and 12, both alike.

Each tray is preferably made of thin sheet metal, and incorporates a floor wall 14 having half-round cut-outs 15, and a pair of side pieces each providing a side wall 16 and a pair of end-wall sections 17, 17. Said side pieces thus are U-shaped in plan. They are also L-shaped in vertical section, due to the inclusion of a bottom horizontal flange 18 for underlying the marginal portions of the floor wall 14 all around the latter except at the locations of the cut-outs 15. At suitable points along the flanges 18 they are spot welded to the floor wall 14, or can be made in one piece and spot welded only at the end wall sections 17, 17.

The floor wall is stamped to include a plurality of downwardly dished portions to provide depending teats 19, each extended sufficiently to lie below the bottom surfaces of the flanges 18 when the tray is completed.

By the tray construction just described, the invention provides, in one aspect thereof, a novel and valuable tray, in that the same, even when made of small-gauge sheet metal, is strong and rugged; is easily assembled and at really trifling

cost; is made of one piece of only three stamped sheet metal blanks, so shaped as to involve substantially no waste of sheet material.

The tray is provided with end arrangements, these constituted by the cutouts 15 and the openings thereabove at the ends of the tray, for facilitating quick and easy removal of a stack of papers in the tray; and has feet, in the form of the teats 19, by way of which a tray, either by itself or as the lower or lowermost tray of a stack thereof, may rest on or slide over the top of a desk or the like without danger of marring the finish of the latter.

The connecting means for stacking a plurality of trays, either merely the two thereof shown in Fig. 1 or three or more thereof, to provide therefrom a single portable article of furniture as above, comprises parts carried by the tray, and a plurality of posts 20 like the one shown in Figs. 4 and 5.

Said parts carried by a tray are here shown as four in number, these being made from elongate rectangular pieces of sheet metal, and so without any waste of the sheet material; each such piece being laterally uniformly curved from end to end, whereby, when two thereof are suitably fixed in place on each of the side walls 16 of a tray for outward projection therefrom, there are provided four receptors 22 each of a cross-section such that a cylindrical end portion 21 of a post 20 may be endwisely inserted therein for snug frictional grip thereby.

Each receptor 22 may be thus fixed on a tray by wedging into holes as indicated at *x, x, x, x* in Fig. 3. The four receptors for each tray are positioned thereon as shown in Fig. 2, and are so placed on the side walls 16, as shown in Fig. 1, that the top of a receptor is somewhat below the top of said side wall and the bottom of a receptor is somewhat above the bottom of said side wall.

The length of each receptor 22 from top to bottom thereof is a trifle greater than twice the length of an end portion 21 of a post 20.

The inner end of such an end portion 21 of a post 20 is marked by the outer ends of a pair of diametrically opposite, elongate ribs 23 on said post. Said ribs 23, elongated in the direction of length of the post, are made by the use of swedging dies, for cold-working the metal of the post at opposite sides thereof and along opposite sides of the ribs; the extra metal needed for establishing the crest portions of the ribs being shifted from the metal of the post which previously presented the locations of the troughs 24.

To assemble a stack of trays as in Fig. 1, the then lower end portions 21 of four posts 20 are inserted downward into the upper halves of the interiors of the four receptors 22 of the lower tray 12, until the lower ends of the lower pair of ribs 23 on these posts abut the tops of said receptors; then the upper tray 11 is brought to a position above the tray 12 and is lowered until the bottoms of the receptors 22 of the tray 11 engage the upper tips of the posts, and then the tray 11 is further lowered, until the lower halves of the interiors of receptors 22 of the tray 11 have fully predeterminedly received the upper end portions 21 of the posts, as checked by abutment of the upper ends of the upper ribs 23 on the posts with the bottoms of the last-named receptors.

By the like use of another set of four posts 20, another tray may be added above the tray 11; and by the use of still another set of four

posts 20, still another tray may be added; and so on.

With the receptors 22 suitably laterally arched, relative to the rotundity of the end portions 21 of the posts 20, a sufficiently tight frictional fit is had between the receptors and said post portions, so that a stack of trays carrying a comparatively heavy paper load may be lifted, even by grasp of the upper or uppermost tray, without drop therefrom of the lower tray, or any lower tray when there are more than one of the latter. Yet the posts are readily deliberately manually coupled to or uncoupled from the receptors of the trays.

The relatively thin side walls 16 of a tray, made desirably of a sheet metal of at least some resiliency, act as quasi-leaf-spring agents for cooperating with the receptors 22 in effectuating a good frictional hold on the end portions 21 of the posts 20. Therefore, in one way of using the invention, a plane common to the two ribs of a pair of contiguous ribs 23 may be arranged substantially parallel to the plane of extension of the adjacent side wall 16; that is, the rib ends may be employed merely as stop elements as above.

However, referring to Fig. 6, the posts 20 may be coupled with their receptors 22 as here shown, that is, with one of the ribs of a pair of contiguous ribs 23 projected at right angles toward the adjacent side wall 16 of a tray, thereby to force said side wall to a resiliently opposed temporary deformation such as indicated at 16', giving what may be termed a quasi-leaf-spring impositive detent.

In Figs. 6–9, a modified structure is illustrated in which the receptors, here marked 22', are shaped in such manner that each receptor, at a zone thereof located half-way between its upper and lower ends is constricted, as at 22^a, and at the same time upwardly and downwardly slightly tapered; each such taper for tight impositive grip on the end portion 21 of an inserted post 20. When such an end portion 21 is fully inserted into its appointed end portion of a receptor 22', to the extent indicated in dot and dash lines in Fig. 9, the part of the side wall opposite the receptor 22' resiliently yields inward to the slight amount necessary to permit full insertion of said end portion 21, thereby giving, here again, what may be termed a quasi-leaf-spring impositive detent.

While we have illustrated and described the preferred embodiments of our invention, it is to be understood that we do not limit ourselves to the precise constructions herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as defined in the appended claims.

Having thus described our invention, what we claim as new, and desire to secure by United States Letters Patent is:

1. A build-up tray assemblage, comprising a plurality of trays one to be spaced above another, said trays having substantially vertically rising walls, means for connecting said trays one spaced above another, said means partially carried by each tray and partially constituted by a plurality of posts each substantially vertically arranged, the parts of said means carried by the trays being a plurality of vertically extending elongate receptors for end portions of the posts, said receptors open from end to end and exteriorly secured to the trays at their said walls, each of said posts having end portions each end-

wisely insertable into one of said receptors, said posts having lateral projections for acting as stops against the ends of receptors for insuring that the maximum insertion of an end portion of a post into a receptor will be to the extent only of substantially half the length of a receptor, said posts being cylindrical, said receptors being laterally arched for snug fit against the rotundity of an end portion of the post, said projections on a post being constituted, adjacent the inner end of each of a post's said end portions, as a pair of ribs elongated in the direction of length of the post, each of said receptors in part incorporating a laterally arched elongate rectangular piece of sheet material secured adjacent its sides to one of said walls and in part incorporating an adjacent portion of such wall, whereby the receptor is substantially C-shaped in cross section, the top of each receptor being spaced below the top of its carrying tray walls and the bottom of each receptor being spaced above the bottom of said wall, said walls being of resilient material, whereby with an end portion of a post inserted into a receptor, and with the post angularly positioned to have one of its ribs bear at its crest against said wall, said wall will be resiliently deformed to act as a quasi-leaf-spring impositive detent for gripping said end portion of the post.

2. A build-up tray assemblage, comprising a plurality of trays one to be spaced above another, said trays having substantially vertically rising walls, means for connecting said trays one spaced above another, said means partially carried by each tray and partially constituted by a plurality of posts each substantially vertically arranged, the parts of said means carried by the trays being a plurality of vertically extending elongate receptors for end portions of the posts, said receptors open from end to end and exteriorly secured to the trays at their said walls, each of said posts having end portions each endwisely insertable into one of said receptors, said posts having lateral projections for acting as

stops against the ends of receptors for insuring that the maximum insertion of an end portion of a post into a receptor will be to the extent only of substantially half the length of a receptor, said posts being cylindrical, said receptors being laterally arched for snug fit against the rotundity of an end portion of the post, said projections on a post being constructed, adjacent the inner end of each of a post's said end portions, as a pair of ribs elongated in the direction of the length of the post, each of said receptors in part incorporating a laterally arched elongate rectangular piece of sheet material secured adjacent its sides to one of said walls and in part incorporating an adjacent portion of such wall, whereby the receptor is substantially C-shaped in cross section, said tray walls being of resilient material, and each receptor at a zone intermediate its ends being restricted in cross sectional area, such constriction from substantially the central part thereby being upwardly and downwardly tapered, whereby an end portion of a post may be inserted into a receptor to an extent to force said post end portion to an overlapping position relative to such a taper, thereby to resiliently deform the adjacent tray wall to cause said wall to act as a quasi-leaf-spring impositive detent for gripping said end portion of said post.

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