Sept. 7, 1948. J. W. MEINHARDT 2,448,679

KNOCKDOWN TRAY STACK

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Fig. 1.

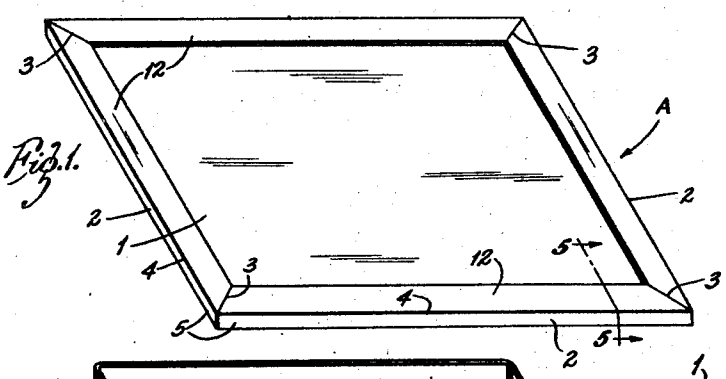

Fig. 2.

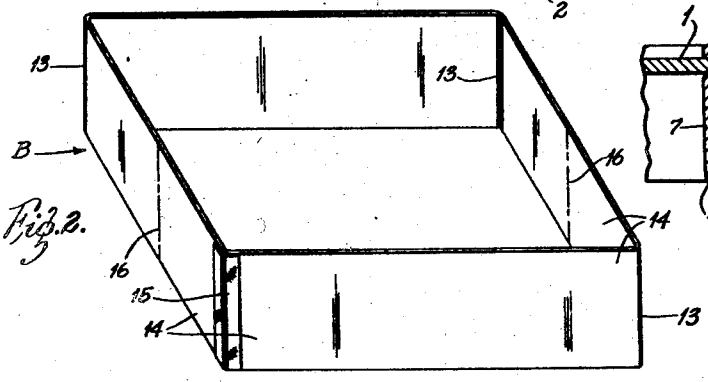

Fig. 5.

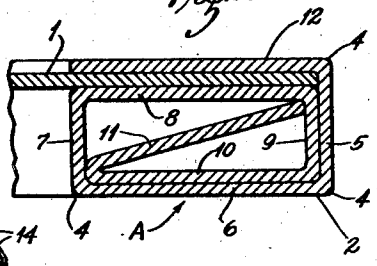

Fig. 3.

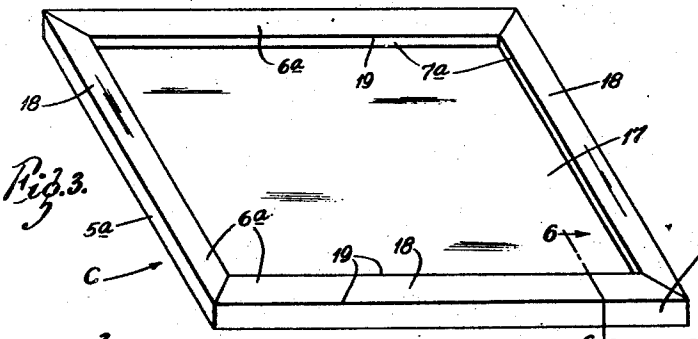

Fig. 4.

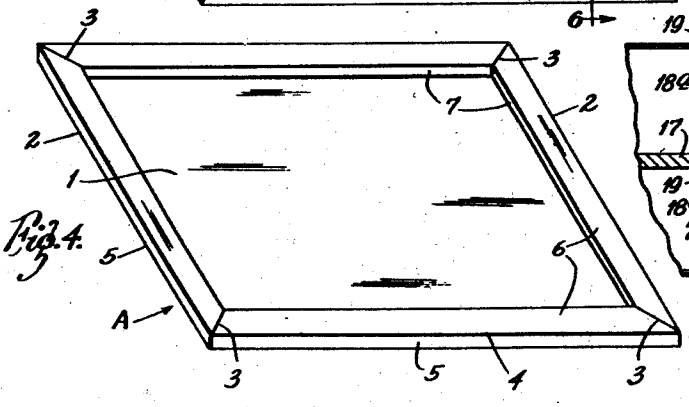

Fig. 6.

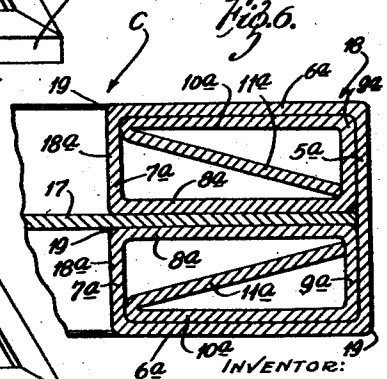

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Fig. 7.

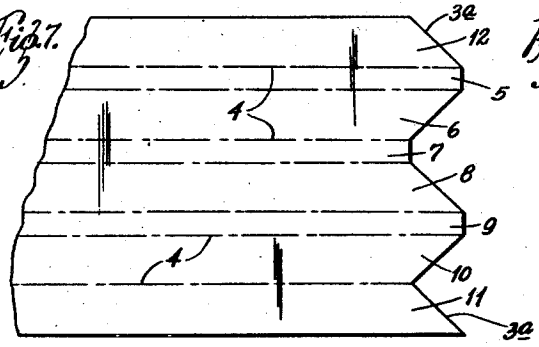


Fig. 8.

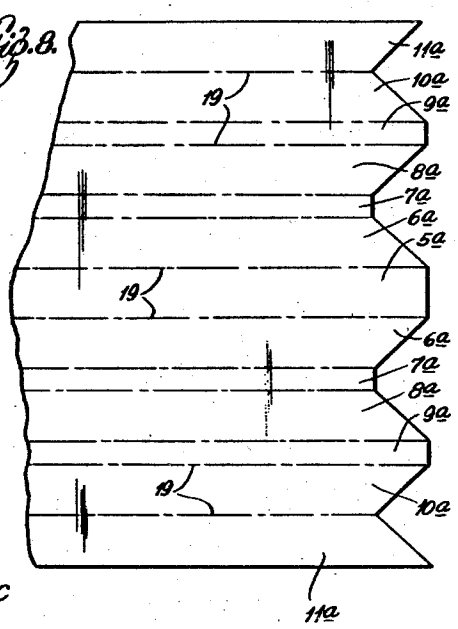


Fig. 9.

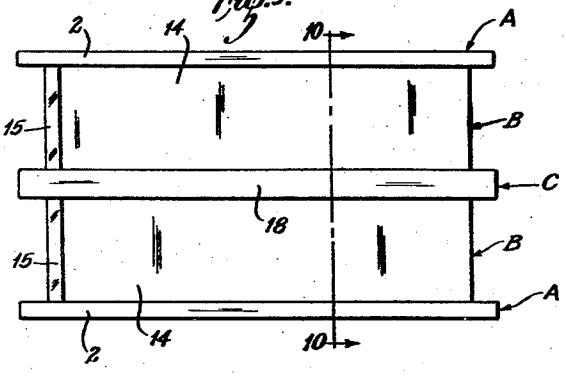


Fig. 10.

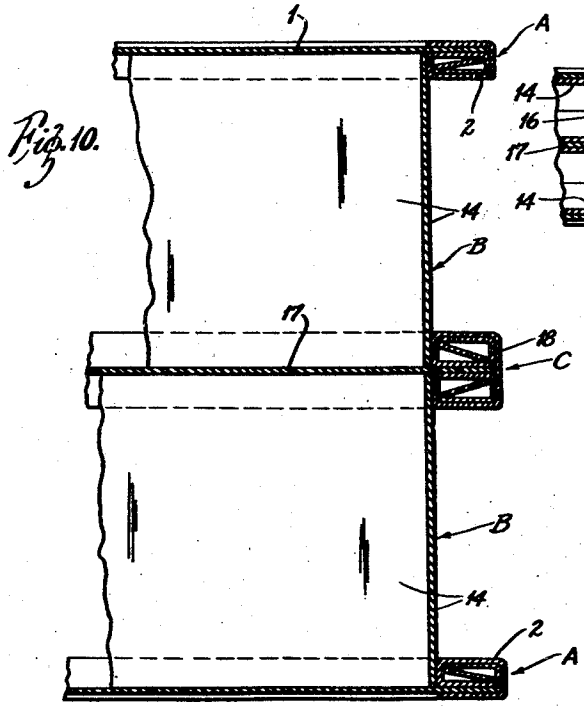
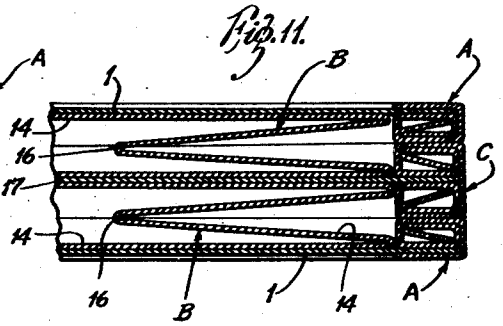


Fig. 11.



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Patented Sept. 7, 1948

2,448,679

UNITED STATES PATENT OFFICE

2,448,679

KNOCKDOWN TRAY STACK

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Application July 14, 1944, Serial No. 545,019

2 Claims. (Cl. 229—41)

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This invention relates to knockdown tray stacks of the kind used for supporting articles for convenient distribution along factory assembly lines, while being moved about on lift trucks and while being stored or shipped. The invention has for its principal object to devise a simple and inexpensive, strong and durable, light-weight tray stack which is made entirely of corrugated board or the like and which can be quickly and easily erected and knocked down in compact form to be later assembled again. The invention consists in the knockdown tray stack and in the parts and combinations and arrangements of parts hereinafter described and claimed.

In the accompanying drawings, which form part of this specification and wherein like symbols refer to like parts wherever they occur,

Fig. 1 is a perspective view of one of the closure sections of a knockdown tray stack embodying my invention, said section being shown in position to form the top cover member of the tray stack,

Fig. 2 is a perspective view of a side wall section of the tray stack,

Fig. 3 is a perspective view of a partition section of the tray stack,

Fig. 4 is a perspective view of the other closure section of the tray stack, said section being shown in position to form the bottom or base member of the stack,

Fig. 5 is an enlarged fragmentary cross-sectional view on the line 5—5 in Fig. 1,

Fig. 6 is a similar view on the line 6—6 in Fig. 3,

Fig. 7 is a partial plan view of the blank for each tubular frame member of the closure sections shown in Figs. 1 and 4,

Fig. 8 is a similar view of the blank for each tubular frame member of the partition section shown in Fig. 3,

Fig. 9 is a side elevational view of the erected tray stack,

Fig. 10 is a vertical partial sectional view on the line 10—10 in Fig. 9; and

Fig. 11 is a similar view showing the sections knocked down and stacked for storage or shipment.

My knockdown tray pack or stack comprises duplicate top and bottom closure sections A, two or more side wall sections B and one or more intermediate closure or partition sections C, all made entirely of corrugated board, fiberboard or like bendable material. Each of the closure sections or members comprises a flat closure sheet or panel 1 supported and enclosed in a rectangular frame composed of tubular frame members 2

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of rectangular section with beveled ends that form miter joints 3 at the corners of said frame. As shown in Fig. 7, each tubular frame member 2 is made from a corrugated board blank which is scored along longitudinal lines 4 to provide panels 11 and 12 along opposite longitudinal side margins of said blank and longitudinal panels 5, 6, 7, 8, 9 and 10 intermediate between said longitudinal side marginal panels. The corrugated board blank is folded upon itself in the same direction along the longitudinal score lines 4 to form the hollow box section frame member 2. When thus folded, the panels 5 and 9 are adhesively secured together flatwise to form the vertical outer side wall of said frame member, the panel 7 forms the vertical inner side wall of said frame member, the panels 6 and 10 are adhesively secured together to form one horizontal wall of said frame member, the panels 8 and 12 are disposed one on each side of the closure panel 1 and adhesively secured thereto and cooperate therewith to form the other horizontal wall of said frame member and the panel 11 extends between the two diagonally opposite corners formed by the panels 6 and 7 and 8 and 9, respectively, so as to form an inclined strut or brace inside said frame member. As shown in Fig. 7, each end of the blank is notched, as at 3a, to give the frame member the beveled end required to form the miter joints 3 at the corners of the edge frame of each closure section A.

Each of the side wall sections or members B comprises a strip of corrugated board that is bent along transverse score lines 13 to form four side walls 14. The ends of the strip are permanently secured together, preferably at one corner of the folded strip, by means of a strip 15 of adhesive tape. Two opposite side walls of the side wall section B are scored vertically, as at 16, so that said section may be collaped to occupy a small space.

The partition section C of the tray stack comprises a flat closure sheet or panel 17 supported and enclosed in a rectangular frame composed of frame members 18 having duplicate tubular portions 18a of rectangular cross-section between which are received the marginal portions of said panel. As shown in Fig. 8, each of the double tube frame members 18 is made from a corrugated board blank that is divided by longitudinal score lines 19 into a middle panel 5a, side marginal panels 11a and intermediate panels 6a, 7a, 8a, 9a and 10a between said middle panel and each of said side marginal panels. The blank is folded upon itself along the longitudinal

score lines 19 to form the two tubular portions 18a of the frame member 18. When thus folded, the middle panel 5a connects the two tubular portions 18a of the frame member 18 and is adhesively secured to each of the panels 9a to form the vertical outer side walls of said tubular portions, the panels 6a are adhesively secured to the panel 10a to form the horizontal outer walls of said tubular portions, the panels 7a form the vertical inner side wall of said tubular portions, the panels 8a are adhesively secured flatwise to opposite faces of the closure panel 17 of the partition section, and the panels 11a extend between diagonally opposite corners of said tubular portion to form inclined strut members therein.

The tray stack is built up from the sections A, B and C by positioning one of the closure sections A with its hollow frame disposed uppermost to form the bottom member of the first or lowermost tray and then setting an opened side wall section B edgewise on the closure panel 1 of said closure section inside the frame thereof to form the four side walls of said tray. The material or articles to be packed are then placed in the tray, after which the top of the tray is closed by the partition section C, whose closure panel 17 rests on the upper edges of the four walls of the side wall section B and whose tubular frame members 18 snugly embrace the upper portions of said side walls. Another side wall section B is then unfolded and seated within the upper tubular frame member 18 of the partition section C to form the four side walls of the second tray; and this second tray, after being packed, is closed by a second closure section A whose panel 1 seats on the upper edges of the side walls of said second tray and whose frame is disposed lowermost and snugly embraces the upper portions of said side walls. As stated above, the upper and lower sections are of the same construction, while the number of partition sections used in the tray stack depends on the number of trays therein. If a single tray unit is assembled, the partition member may be dispensed with.

The superposed tray stack sections may be fastened together in assembled relation for shipment by means of fastening bands or other securing means (not shown). All of the sections of the tray stack are made entirely of corrugated board or other inexpensive light-weight bendable material and permit the tray stack to be quickly and easily erected and knocked down. The main panels of the closure and partition sections are rigidly supported and enclosed within strong and rigid frames that protect and stiffen and strengthen said panels and prevent horizontal shifting or spreading of the side wall sections. Each of the hollow frame members of the closure and partition sections is made from a one-piece corrugated board blank and has two ply outer vertical and horizontal walls and is

strengthened by a diagonal strut or brace member. As shown in Fig. 11, the tray stack may be stored or shipped in knockdown condition by stacking the closure and partition sections one on another with the collapsed side wall units housed in the closed spaces formed by the closure panels and frames of adjacent closure and partition sections.

What I claim is:

1. A knockdown tray stack made entirely of corrugated board or the like comprising duplicate upper and lower side wall sections permanently closed on all sides and open at their tops and bottoms, duplicate closure sections, one for the top of the upper side wall section and the other for the bottom of the lower side wall section, and a partition section between said upper and lower side wall sections, each of said closure sections comprising a closure panel disposed in abutting relation to the adjacent end of a side wall section and a relatively wide flat tubular edge frame permanently secured to said closure panel and fitting around said end of said side wall section in outstanding relation thereto, said partition section comprising a closure panel disposed between and in abutting relation to the adjacent ends of said upper and lowe. side wall sections and a relatively wide flat edge frame permanently secured to said last mentioned closure panel and having tubular portions disposed above and below the latter and fitting around said adjacent ends of said upper and lower side wall sections in outstanding relation thereto.

2. The combination set forth in claim 1 wherein said side wall sections are collapsible into flat form and said closure and partition members, when detached and stacked with their tubular edge frames seated flatwise one on another with the tubular edge frame of said partition section between the tubular edge frames of said closure sections, form separate storage chambers between the stacked closure and partition sections for the two collapsed side wall sections.

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