Feb. 7, 1950 D. R. SWINGLE 2,496,965

CRATE FOR PAPER MILK CONTAINERS

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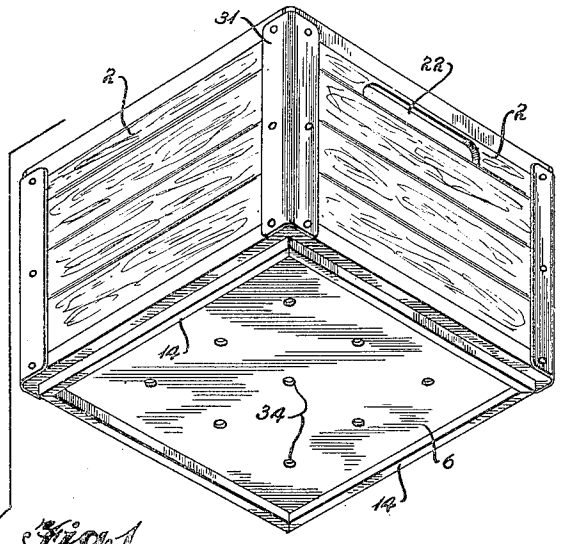
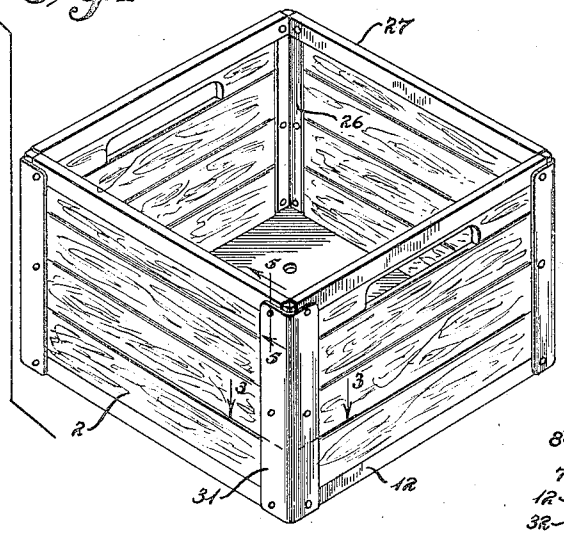


Fig. 1



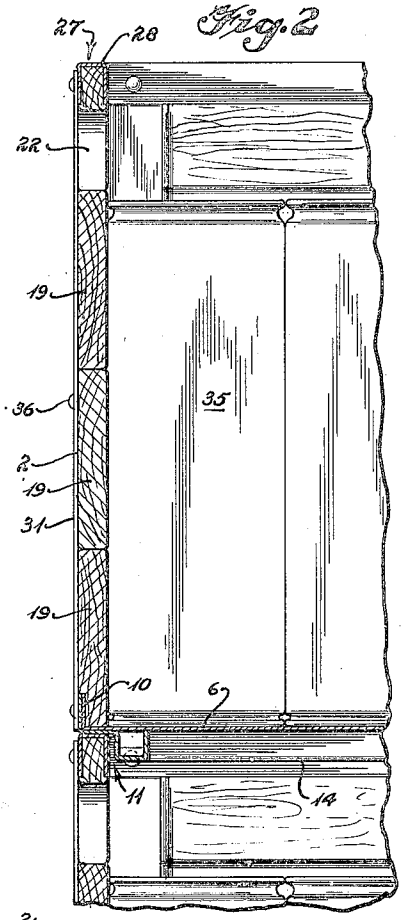


Fig. 2

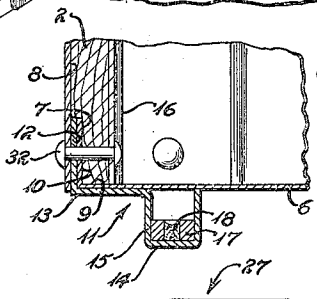


Fig. 4

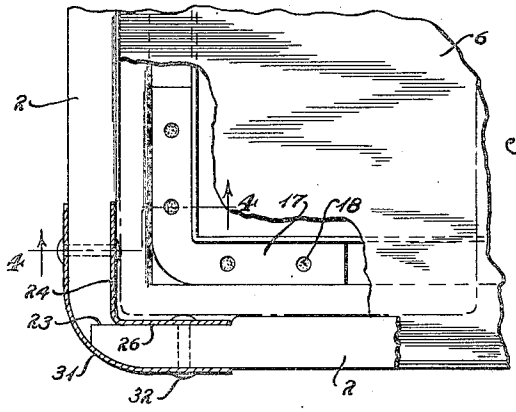


Fig. 3

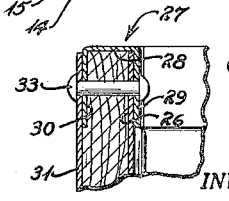


Fig. 5

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CRATE FOR PAPER MILK CONTAINERS

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This invention relates to crates, and more particularly to improvements in a crate for handling milk cartons composed of paper or other relatively soft material.

In the past, milk crates have been designed primarily for use in handling glass bottles. These crates included spacers for the bottles and stacking irons at the corners of the crate. This type of construction has proved to be disadvantageous in handling paper cartons since the latter were frequently scratched or otherwise damaged upon contacting the usual stacking irons upon withdrawal from the crate. Furthermore, with this conventional construction, the interiors of the crates contained other obstructions such as reinforcing braces which also resulted in damage to the paper cartons.

An object of this invention is to provide a crate having smooth unobstructed interior surfaces so as to prevent damage to paper containers to be carried therein.

A further object of this invention is to provide a crate having a smooth unobstructed interior, but which, nevertheless, is strongly and rigidly braced by reinforcing elements.

Another object of this invention is to provide crate stacking means so positioned that they will not subject paper cartons to possible scratching or damage upon withdrawal from the crate.

A further object of this invention is to provide crate stacking means which will also serve to increase the strength and rigidity of the crate structure.

Another object of this invention is to provide crate stacking means which will prevent relative lateral displacement of the stacked crates.

Another object of this invention is to provide a crate for paper cartons wherein the carton walls may contact only smooth crate walls composed of wood or other relatively soft material, but which crate nevertheless is strongly reinforced by non-obstructing metal braces.

Further objects and advantages of the present invention will appear as the description proceeds.

In the accompanying drawing forming part of this specification:

Figure 1 is an exploded perspective view of two crates in aligned relation before stacking the upper crate on the lower one,

Figure 2 is a fragmentary vertical sectional view showing an upper crate and the upper portion of a lower crate in stacked relation and containing paper cartons,

Figure 3 is a fragmentary sectional view taken approximately in the plane indicated by the line

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3—3 of Figure 1, a portion of the bottom of the crate being broken away,

Figure 4 is a fragmentary vertical sectional view taken on line 4—4 of Figure 3, and

Figure 5 is a fragmentary vertical sectional view taken on line 5—5 of Figure 1.

Referring to the drawing, the crate comprises four vertical or side walls 2 and a bottom 6. Preferably, although not necessarily, the walls 2 are of wood and the bottom 6 of sheet metal.

As shown in Figure 4, the exterior surfaces 8 of the walls 2 are provided with an inwardly offset recess or shoulder portion 7 extending horizontally and lengthwise of their lower edges 9. The bottom 6 has upturned flanges 10 extending around its perimeter and lying flat against the offset shoulder portion 7.

Extending along each of the four edges formed by the junctions of the side walls 2 with bottom 6 is a bracing element 11 having an upstanding flange 12 integral therewith and lying flat against the outside surface of the upstanding flange 10 of bottom 6. It will be seen that the combined thickness of flanges 10 and 12 is equal to the offset distance of the shoulder portion 7 so that the exterior surface of the upturned bracing element flange 12 will lie substantially flush with the exterior surface 8 of the corresponding side wall 2. Integral with the bracing element flange 12 and extending inwardly therefrom is a horizontal bearing portion 13. At its inner edge, bearing portion 13 includes a depending stacking portion 14. Although the preferred cross-sectional shape of the stacking portion 14 is that of a U-shaped channel as shown, it is obvious that other similar shapes may be employed. The outer legs 15 of the U-shaped stacking portions 14 are disposed inwardly of the interior surfaces 16 of the respective side walls 2 for a purpose to be described below.

As is shown in Fig. 1, the stacking portions 14 abut in end-to-end relation so as to form a continuous stacking rib or ridge extending adjacent and inwardly of the perimeter of bottom 6. As is best shown in Figures 3 and 4, the U-shaped stacking portions 14 have angle securing members 17 positioned within their abutting ends, one leg of each angle member lying within each channel. The angle or securing members 17 are spot-welded to the stacking portions 14 as at 18, or are otherwise rigidly secured thereto.

The side walls 2 of the crate are preferably formed of a plurality of slats such as 19. The upper slats of two opposite walls 2 may be cut

away as at 22 to provide a hand-grip opening for carrying the crate.

As shown in Fig. 3, one of the ends of each of the walls 2 is recessed as at 23 and the abutting edge of the adjoining wall 2 is shaped to snugly fit within this recess. The interior surfaces of the side walls 2 have vertical recesses 24 formed in their inner surfaces adjacent their ends. Interior vertical bracing angle members 26 are disposed within the recesses 24. The thickness of each interior vertical angle member 26 is less than the depth of the vertical recesses so that the angle members are embedded within the walls 2 and do not project from or obstruct the smooth interior surface of the crate.

Disposed along the upper edge of each of the side walls 2 is a rim bearing member 27 of U-shaped cross-section and having a base portion 28 and two depending legs 29 and 30. The base portion 28 lies flat upon the upper edge of the corresponding side wall 2 and the legs 29 and 30 are respectively disposed within recesses extending horizontally along the exterior and interior upper edges of the wall 2. The inner leg 29 of member 27 is embedded within wall 2 to a sufficient depth to avoid projecting from the interior surface of wall 2. The exterior surface of the outer leg 30 lies substantially flush with the exterior surface of the wall 2. As shown in Figures 1 and 5, the vertical recesses 24 are of a greater depth than the interior horizontal recess within which the inner leg 29 is embedded, so as to allow the inner leg 29 of the horizontal rim member 27 to overlap the vertical angle member 26.

Disposed along each of the edges formed by the junctions of the walls is an exterior vertical bracing member 31 having two legs each lying flat against the exterior surfaces of abutting walls 2. The exterior members 31 will also lie flat against the upturned bracing element flanges 12 and the exterior legs 30 of the rim members 28.

As shown in Figures 3 and 4, rivets 32 extend through and rigidly join the exterior angle members 31, the upstanding bracing element flanges 12, the upstanding bottom flanges 10, the crate walls 2, and the interior angle members 26. As shown in Figure 5, rivets 33 extend through and rigidly join the exterior angle members 31, the bearing rim members 27, the crate walls 2, and the interior angle members 26. Rivets 36 secure the exterior angle members 31 to the crate walls 2, preferably to the middle slats as seen in Figure 2.

The bottom 6 has a plurality of discharge holes 34 therethrough to eliminate any waste liquid that may be in the crate. The stacking portions 14 serve to keep the bottom 6 spaced above a floor on which the crate may rest and thus prevent material on the floor from entering the crate through holes 34.

In Figure 2 are shown two crates in stacked relation. It will be seen that the outer legs 15 of the stacking portions 14 of the upper crate are disposed inwardly of the interior surfaces of the walls 2 and the interior surfaces of the inner legs 29 of the rim members 27 of the lower crate. The horizontal bearing portions 13 of the bracing elements 11 of the upper crate rest upon the base portions 28 of the rim members 27 of the lower crate. Substantial lateral displacement of the upper crate is prevented by the abutment of the outer legs 15 of the stacking portions against the inner legs 29 of the rim members 27.

The bracing elements 11, in addition to providing a stacking function, also serve to brace or reinforce the crate so as to increase its strength and rigidity. To increase the strengthening and rigidifying effect of the bracing elements 11, the stacking portions 14 are formed integral therewith and the U-shaped cross-section of the stacking portions serves to increase the torsional and bending moments of inertia of the bracing elements.

The continuous stacking rib adjacent the periphery of the bottom prevents lateral displacement of the stacked crates in any horizontal direction. The rigid joinder of the abutting ends of the several stacking portions 14 by the securing members 17 serves to further increase the rigidifying and strengthening effect of the bracing elements 11.

It will be seen that the interior surfaces of the crate are smooth and devoid of projections so as to prevent scratching or otherwise damaging the paper cartons to be placed therein, as shown by carton 35 in Figure 2.

The embodiment shown in this specification and the drawings is for the purpose of illustration and not of limitation, the scope of the invention being indicated in the appended claims.

I claim:

1. A crate comprising side walls each having a horizontal recess in its exterior surface and extending longitudinally along the lower edge, a bottom having upstanding flanges integral therewith and disposed in said recesses, a plurality of bracing elements each extending along one of the edges formed by the junctions of the walls with the bottom, each bracing element comprising an upstanding flange disposed within one of said recesses and lying flat upon one of said bottom flanges and having an exterior surface lying flush with the exterior surface of the adjacent wall, a horizontal bearing portion extending inwardly from said bracing element flange and lying flat against the lower surface of the bottom, and a stacking portion projecting downwardly from the bearing portion and being of U-shaped cross-section and having an exterior vertical leg integral with said bearing portion, said leg being spaced inwardly of the interior surface of the respective wall, and means securing said flanges to said walls.

2. The combination set forth in claim 1 wherein the stacking portions abut in end-to-end relation so as to form a continuous stacking rib disposed adjacent the periphery of the bottom.

3. The combination set forth in claim 1 having a plurality of vertical angle members each disposed along one of the exterior edges formed by the junctions of the walls and lying flat against the exterior surfaces of the respective two abutting walls and lying flat against the exterior surfaces of the respective two abutting bracing element flanges.

4. The combination set forth in claim 3 wherein the interior surfaces of the walls have vertical recesses disposed along the interior edges formed by the junctions of the walls and having vertical interior angle members disposed within said recesses, said securing means extending through and securing said angle members, said flanges, and said walls in rigid fixed relationship.

5. The combination set forth in claim 1 wherein the interior surfaces of the walls have vertical recesses disposed along the interior edges formed by the junctions of the walls and having vertical interior angle members disposed within said recesses, said securing means extending through

and securing said angle members, said flanges and said walls in rigid fixed relationship.

6. The combination set forth in claim 1 wherein each of the interior wall surfaces is in the form of a flat vertically-extending plane throughout its entire area, said walls having flat horizontally-extending upper edges, a U-shaped bearing rim member disposed along each of said upper edges and having a flat horizontal portion lying flat on the respective upper edge, said walls each having a horizontally-extending recess in the interior surface adjacent the upper edge, said U-shaped bearing rim members each having an inner vertical flange embedded within the corresponding horizontal interior recess so as to lie flush with the interior surface of the wall.

7. The combination set forth in claim 6 wherein the interior surfaces of the walls have vertical recesses disposed along the interior edges formed by the junctions of the walls and having angle members disposed within said vertical recesses and each rigidly secured at the upper end to two of said rim members and along its length to two of said walls and rigidly secured at its lower

end to two of said bracing elements, whereby a rigid framework is provided for the walls and the interior of the crate is smooth and devoid of projections which might injure paper cartons to be placed therein.

8. The combination set forth in claim 7 wherein the stacking portions abut in end-to-end relation so as to form a continuous stacking rib disposed adjacent the periphery of the bottom.

DONALD R. SWINGLE.

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