United States Patent [19]

Schoeller

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[54] **PLASTIC BOTTLE CRATES**

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[52] **U.S. Cl.** **206/511,** 220/23.6

[51] **Int. Cl.** **B65d 21/02**

[58] **Field of Search** ..... 220/21, 97 R, 97 D, 23.6, 220/DIG. 15

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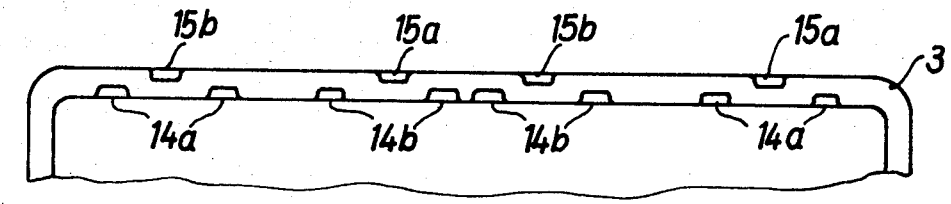
[57] **ABSTRACT**

A plastic bottle crate having interengaging tops and bottoms which are so constructed to permit the crates to be transported on roller-type conveyors without rattling or bouncing. The particular construction permits the crates to be stacked in vertical alignment as well as in displaced fashion.

1 Claim, 7 Drawing Figures



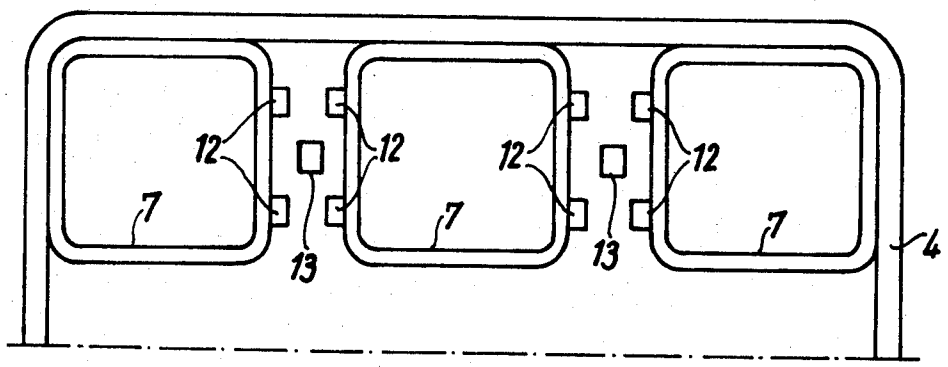


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Fig. 1

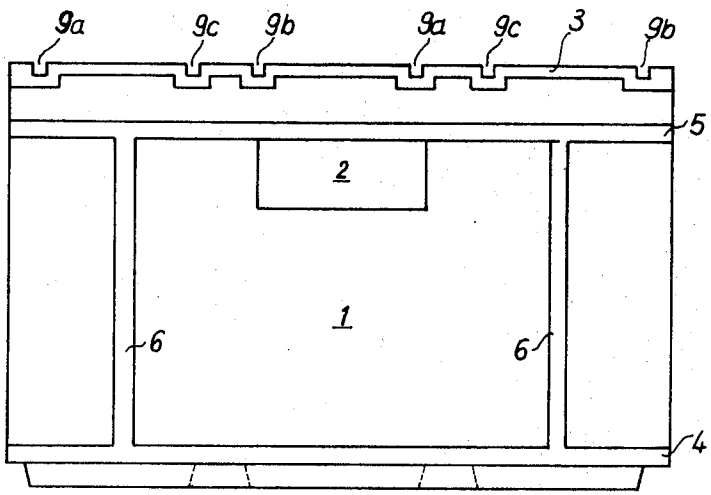

Fig. 2

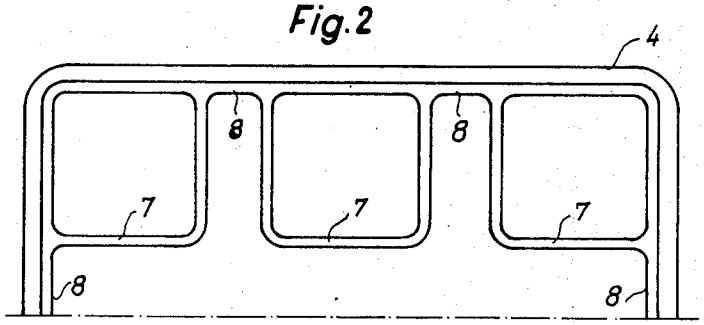

Fig. 7

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Fig. 3

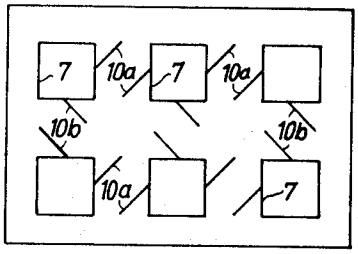


Fig. 4

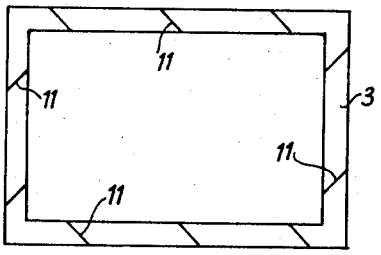


Fig. 5

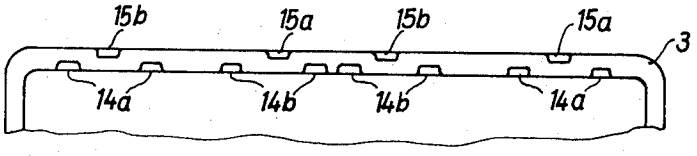
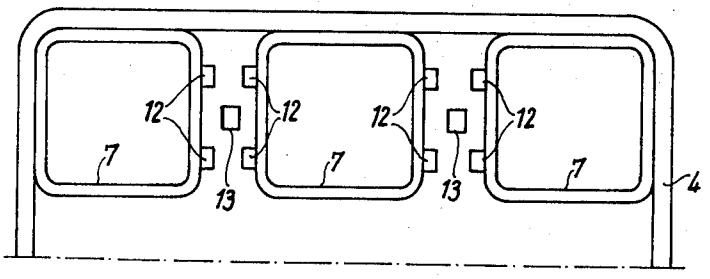


Fig. 6



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PLASTIC BOTTLE CRATES

This invention relates to plastic bottle crates having tops and undersides that interengage when stacked and ribs forming open or closed configurations that project downwardly from the underside of the crate.

Conventional bottle crates of this kind can be stacked not only in vertical alignment but also when they are relatively horizontally displaced or when they are superimposed on the cross. For this purpose the rib configurations on the underside of the crate are so designed and located that they engage the top of a crate underneath and thus provide location by virtue of the upper edge of the crate underneath, or the adjoining upper edges of two side-by-side crates underneath, engaging between said rib configurations. In this way large numbers of crates can be stacked in locating interengagement.

However, the spaces needed between the rib configurations for the reception of the continuous edges at the top of the crates cause one serious difficulty in the ordinary handling of crates of this type. In breweries and bottling establishments as well as in sales organizations bottle crates are frequently handled by being conveyed on roller beds in which the rollers extend transversely of the longitudinal direction of the bed and have a length corresponding to the width of the bed. When crates of the above described kind are conveyed on such a bed the roller can slip into the spaces between the rib configurations causing the crates to rattle and bounce. The contents of the crates as well as the crates themselves may be badly damaged and difficulties may be arise in transportation resulting in individual crates even riding off the roller bed.

It is therefore an object of the present invention to provide bottle crates of the above specified kind that will run smoothly on roller beds while retaining the advantages of plastic bottle crates, including the advantage of staggered stacking.

According to the invention there is provided a plastic bottle crate of a kind wherein the tops and undersides interengage when such crates are stacked having downwardly projecting ribs forming open or closed configurations projecting downwardly from the underside of the crate. The spaces between the rib configurations are bridged by projections of the same height as the ribs in such a manner that the rollers of roller beds cannot slip into these spaces. The edge at the top of the crate is provided with corresponding recesses for the reception of the downward projections when the crates in a stack are relatively displaced.

The crates are then able to run on roller beds without rattling and at the same time it is even possible to stack the crates in relatively staggered positions. The additional expenditure in material is negligible.

Several embodiments of the invention are disclosed. In one embodiment of the invention the projections may complete the rib portions of the rib configurations at the external crate edge to form an unbroken peripheral stacking edge. A conventional peripheral stacking edge, as in normal bottle crates that stack in vertical alignment and locate themselves in a vertical stack, is thus created. On the other hand, in a stack in which the crates are relatively displaced, those parts of the stacking edge which bridge the spaces between the rib configurations are received into the recesses in the edge at the top of the crate underneath so that the crate above can still engage the top of the crate underneath for stable location.

In another embodiment, parallel projections, in the form of webs, may extend from the rib configurations to the center of the intervening spaces in pairs. These projections likewise present an unbroken surface to the relatively long rollers or a roller bed so that the rollers cannot drop into the remaining gaps. Preferably, the webs are arranged to extend at an angle of 45° to the sides of the crate.

In yet another embodiment the projections may consist of groups of bosses so disposed that the corresponding recesses in the edge at the top of the crate enable an unbroken face of the edge to remain. This continuous face enables stacked crates to be easily withdrawn from the stack without any risk of the edge at the top being broken or damage being done to the recesses themselves. With advantage, the groups of bosses may comprise opposed bosses adjoining the ribs of two neighboring rib configurations and associated with at least one isolated boss, the edge at the top of the crate being provided with corresponding slots in its sides. When crates in relative lateral displacement are stacked, the edge at the top of the crate underneath will then, as it were, snake in between the bosses adjoining the rib configurations and the isolated boss.

In order to facilitate the reception of the projections, webs or bosses into the cooperating recesses in the top edge of the crate underneath, even when the crates are not very carefully placed, the recesses of all embodiments are preferably provided with tapering entry faces which slope downwardly toward the base of the recess.

The invention will be hereinafter more particularly described with reference to embodiments shown in the drawings in which:

FIG. **1** is a side elevation of a first embodiment of a bottle crate according to the invention;

FIG. **2** is a view of the underside of the crate of FIG. **1**;

FIGS. **3** and **4** are schematic views respectively of the underside and top of a second embodiment;

FIG. **5** is a fragmentary view of the edge at the top of a third embodiment;

FIG. **6** is a view of the underside of the bottle crate of FIG. **5**; and

FIG. **7** shows cross sectional shapes for recesses in the edge at the top of a crate.

Turning to the drawings, apart from features of a particular kind which will be described, the bottle crate shown in FIGS. **1** and **2** is of conventional construction having closed sides **1**, a handhold **2** as well as a reinforcing rib **3**, **4** respectively at the top and the bottom edges of the crate. An additional reinforcing rib **5** above the handhold **2** as well as vertical reinforcing ribs **6** further increase the stability of the crate.

According to FIG. **2**, three closed rib configurations **7** are provided on the underside of the crate in each half thereof. These project from the underside downwardly. Lengths of rib **8** between rib configurations **7** complete the rib portion which at the crate edge forms a stacking edge engaging the edge **3** at the top of a crate underneath when the crates are stacked in alignment. The position and size of the rib configurations **7** are so chosen that when a crate is stacked that has been turned through an angle of 90°, i.e., when a transversely placed crate is stacked on a longitudinally placed crate,

the corner configurations **7** on one side of the crate and the two center configurations **7** engage the edge at the top of the crate underneath and thus ensure location. One pair of the rib members **8** facing each other on the longitudinal sides of the crate engage the pairs of slots **9***a* respectively **9***b* in the peripheral rib **3** at the top. Together with corresponding slots at the ends of the crate the slots **9***c* permit relatively staggered stacking, for instance only one corner of the upper crate engaging the crate underneath or the upper crate being only horizontally displaced without being turned.

Since the rib sections **8** are of the same height as the rib configurations **7,** such a crate will readily ride smoothly on roller beds because the rollers cannot engage the spaces between the rib configurations.

FIGS. **3** and **4** schematically illustrate another embodiment of the invention. The rib configurations **7** are not here joined together to complete a stacking edge around the underside of the crate, as in FIGS. **1** and **2.** Instead, pairs of parallel webs **10***a* and **10***b* extend to roughly the center of the intervening spaces. These webs run at an angle of 45° to the sides of the crate and their height corresponds to the height of the rib configurations **7.** When the crates are superimposed in a displaced stack, the webs **10***a* respectively **10***b* engage slots **11** of matching disposition and shape in the peripheral reinforcing rib **3** at the top of the crate underneath.

When such a crate is conveyed on a roller bed, the pairs of webs **10***a* prevent the rollers from slipping into the spaces between the rib configurations **7** when the crate runs longitudinally, whereas the pairs of webs **10***b* prevent the rollers from entering the gaps when the crate runs in the sideways direction, so that in either case the crate rides smoothly.

In a further embodiment shown in FIGS. **5** and **6,** bosses **12, 13** are provided between each two rib configurations **7** in the longitudinal direction of the crate, two bosses **12** adjoining the neighboring rib configurations **7** and one boss **13** being located centrally between the bosses **12.** When crates are stacked in crosswise positions, the bosses **12** of one rib configuration engage corresponding inside slots **14***a* respectively **14***b* in the edge **3** at the top of the crate underneath and the outer slots **15***a* respectively **15***b* are engaged by the associated isolated bosses **13.** The crate edge **3** which has a quasi wave-shaped configuration is thus able to fit itself between the bosses **12** and **13** without its upper face having to be interrupted.

Since the bosses **12, 13** close the spaces between the rib configurations **7** to the rollers of a roller bed, the crate will run lengthwise on a roller bed smoothly. If the crate is also required to run crosswise, corresponding groups of bosses can also be provided in the transverse direction in the spaces between the rib configurations. In the same way, the webs **8** at the end face (FIG. **2**) or the webs **10***b* (FIG. **3**) in the embodiments of FIGS. **1** and **2** can be omitted if these crates are required to ride on a roller bed exclusively in the lengthwise position.

FIG. **7** shows possible cross sectional shapes for the recesses or slots. The cross sections in the middle and on the right have the advantage that even when the crates are inaccurately located, corresponding projections or ribs on the underside of the crate can readily drop into the slots.

I claim:

1. In a plastic bottle crate of the type adapted to be stacked with matching crates in aligned as well as in displaced fashion, the combination comprising

a plurality of rib configurations distributed over the bottom of the crate projecting downwardly therefrom,

a plurality of rib projections projecting downwardly from the bottom of the crate and located in the spaces between the rib configurations,

the lower edge surfaces of said rib configurations and said rib projections being substantially coplanar for supporting the crate,

said crate having a continuous upper edge,

the bottom of said crate having a periphery such that one crate may be stacked on another in aligned fashion with the upper edge of one crate surrounding the bottom of the crate above it,

said upper edge having a plurality of recesses complementary to portions of said rib projections,

the relative positions of said recesses being such that the downward rib projections of a matching crate may be received therein to permit the matching crate to be stacked thereon in aligned as well as displaced fashion,

said rib projections comprising groups of bosses,

said groups of bosses comprising opposed bosses adjoining opposed portions of adjacent rib configurations and at least one isolated boss intermediate the opposed bosses in the space therebetween,

said recesses comprising corresponding slots in the upper peripheral edge of the crate.

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