Aug. 8, 1967 W. B. CRANE 3,334,738

SPACING STRIP FOR PRODUCE TRAY

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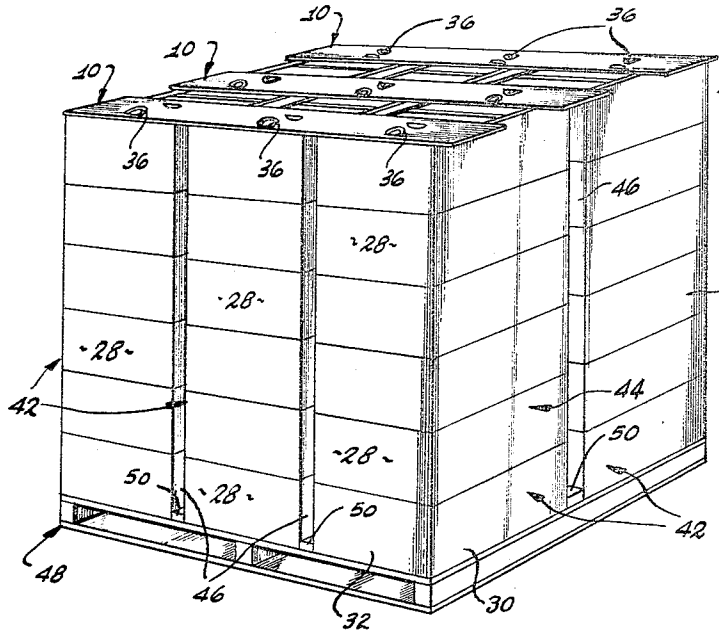


Fig. 1

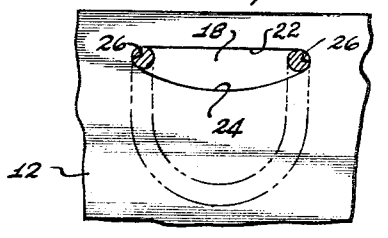


Fig. 4

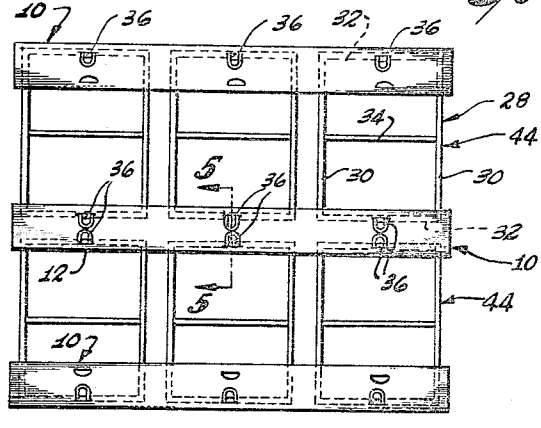


Fig. 2

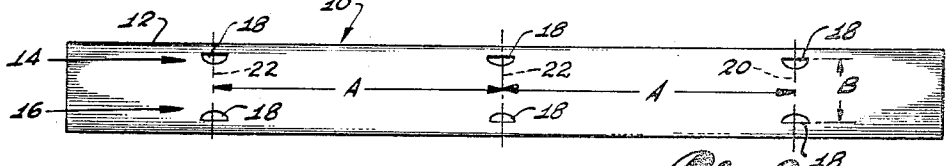


Fig. 3

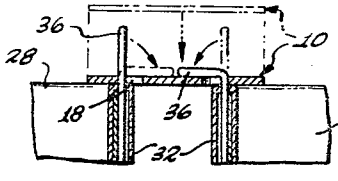


Fig. 5

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SPACING STRIP FOR PRODUCE TRAY

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This invention relates generally to the art of stacking produce containers, or trays, of the type having upstanding wire couplers for interlocking stacked trays against relative shifting. The invention relates more particularly to a spacer for interconnecting and spacing adjacent columns of stacked trays of the character described.

Agricultural products, such as berries, fruit, vegetables, and the like, are commonly stored and shipped in large open-topped produce trays, or lugs as they are sometimes called. These trays are constructed so they may be stacked one on top of the other for storage and shipment. One type of produce tray for this purpose is equipped with upstanding wire couplers which project above the end walls of the tray. When several of these trays are stacked one on top of the other, the couplers in each tray engage in slots in the end walls of the adjacent upper trays, thereby to interlock the stacked trays against shifting relative to one another. For convenience, the trays are generally handled in stacked pairs, each composed of two trays stacked one on top of the other with the wire couplers on the lower tray engaging in the end wall slots of the upper tray.

During storage and shipment, produce trays of this type are stacked in vertical columns arranged side by side in a number of parallel rows. The adjacent columns of stacked trays in each row and the adjacent columns of stacked trays in adjacent rows are generally spaced to provide air passages through the tray stack in order to assure proper ventilation of the produce in the trays. In a tray stack of this type, particularly one in which the columns of trays are spaced, it is desirable during storage of the stacked trays, and essential during transportation of the stacked trays from one point to another, to interconnect adjacent columns of trays against shifting relative to one another.

A general object of this invention is to provide a spacer for interconnecting adjacent columns of stacked produce trays of the character described in order to prevent relative shifting of the columns during storage and shipment.

Another object of the invention is to provide a spacer of the character described which retains adjacent columns of stacked trays in spaced relation, thereby to maintain ventilation passages between the columns.

A further object of the invention is to provide a spacer of the character described which is simple in construction, economical to manufacture, and otherwise ideally suited to its intended purposes.

Other objects, advantages, and features of the invention will becomme readily evident as the description proceeds.

A presently preferred embodiment of the invention will now be described by reference to the attached drawing, wherein:

FIG. 1 is a perspective view of a stack of produce trays wherein the columns of stacked trays are interconnected by spacers constructed in accordance with the present invention;

FIG. 2 is a plan view of the tray stack in FIG. 1 on slightly reduced scale;

FIG. 3 is an enlarged plan view of a spacer according to the invention;

FIG. 4 is an enlargement of a portion of the spacer in

FIG. 3 and showing particularly one of the coupler-re ceiving slots in the spacer; and

FIG. 5 is an enlarged section taken on line 5—5 in FIG. 2.

Referring now to this drawing, the spacer **10** of this invention comprises a relatively long, narrow strip **12** of a material having sufficient strength to enable the spacer to function in the manner hereinafter described. The spacer may be made from various materials, such as plastic, corrugated paperboard, or metal, for example, aluminum. In the strip **12** are two rows **14** and **16** of slot-like openings **18**. While the illustrated strip has three slots in each slot row **14** and **16**, it will become evident from the ensuing description that spacers according to the invention may have a lesser or greater number of slots in each slot row. The adjacent slots in the two slot rows are aligned crosswise of the strip **12** and have common transverse center lines **20** which extend normal to the length of the strip. The spacing between adjacent center lines **20** is approximately double the spacing between each outer center line **20** and the adjacent end of the strip **12**. In the case of the illustrated interconnecting spacer **10**, wherein each slot row **14** and **16** has three slots **18**, the center line **20** of the centrally located pair of slots is coincident with the transverse center line of the strip **12**.

The shape of the slots **18** constitutes a primary and highly important feature of the invention. As shown best in FIG. 4, each slot **18** has a straight outer edge **22**, parallel to the longitudinal center line of the strip **12**, and a curved inner edge **24**. The straight edges **22** of the several slots **18** in each slot row **14** and **16** are aligned lengthwise of the strip. The ends of the straight edge **22** and curved edge **24** of each slot **18** converge to define therebetween relatively narrow slot ends **26**. According to the preferred practice of the invention, the end walls of each slot **18** are curved to a small radius, as shown. The reason for this will appear presently.

The interconnecting spacer **10** of the invention is designed for use with produce trays **28** of the type shown in FIGS. 1 and 2. Each produce tray is rectangular in outline and has parallel side walls **30** and parallel end walls **32**. Midway between and parallel to the end walls **32** is a center connecting wall **34** which joins the centers of the side walls **30**. Each end wall **32** of the produce tray has a wire coupler **36** which is located approximately midway between the side walls **30** and projects above the upper edge of the respective end wall. This wire coupler is formed from a wire which is bent to provide the coupler with an inverted U-shape. In the bottom of each tray end wall **32**, in line with the adjacent wire coupler **36**, is a slot (not shown). When stacking produce trays of the type shown, one tray is placed on top of another, with the wire couplers **36** in the lower tray engaging in the bottom slots in the adjacent upper tray.

The spacer **10** of this invention is intended for use during stacking of a number of produce trays **28** to form a tray stack, such as that illustrated at **40** in FIG. 1. The trays **28** in this stack are placed one on top of the other in a number of vertical columns **42** with the wire couplers **36** on each tray engaging in the bottom slots in the adjacent upper tray. These wire couplers, then, serve to interlock the several produce trays **28** in each column **42** against shifting relative to one another.

The tray columns **42** are arranged in two parallel rows **44**. In order to minimize spoiling of the produce in the trays **28**, the adjacent columns **42** of trays in each of the rows **44**, as well as the adjacent rows, are generally spaced, as shown, to provide ventilation air passages **46** between the columns. For convenience of handling, the tray stack **40** may be supported on a pallet **48** which may be transported from one place to another by a forklift truck.

The columns **42** of produce trays **28** in the tray stack **40** are interconnected against shifting relative to one another, and are maintained in spaced relation, by three spacers **10** located on the top of the stack. The center spacer **10** overlies adjacent end walls of the adjacent trays in the two rows **44**. The wire couplers **36** on these adjacent end walls project through the slots **18** in the center spacer **10** and are folded inwardly of the spacer, in the manner shown in FIG. 2, thereby to lock the spacer in position on the stack. The two outer spacers **10** overlie the outer end walls of the trays in the two rows **44**. The wire couplers **36** on these latter end walls project through the outermost slots in the adjacent spacer and are bent inwardly over the spacer, as shown, thereby to retain the outer spacers in position on the stack.

The distance A between the center lines **20** of the pairs of slots **18** in each spacer **10** is greater than double the width of each produce tray **28**. Accordingly, the spacers **10** space the adjacent columns **42** of stacked trays **28** in each column row **44**. The spacing B between each pair of transversely aligned slots **18** is greater than the end wall thickness of the produce trays. Accordingly, the center spacer **10** spaces the two column rows **44**.

It is apparent, therefore, that the spacers **10** interconnect the tray columns **42**, at their upper ends, to prevent the columns from shifting realtive to one another, and, in addition, space the columns to provide the ventilation air passages **46** therebetween. Generally, the pallet **48** is equipped with spacers **50** for spacing the columns **42** at their lower ends. Additional spacers **10** may be placed at one or more levels in the tray stack **40**, particularly if the spacers **50** are omitted from the pallet **48**.

As mentioned earlier, the shape of the slots **18** in the spacers **10** constitutes a primary and highly important feature of the invention. Referring to FIG. 4, it will be noted that the radius of curvature of the curved ends **26** of each slot **18** is approximately the same as the radius of curvature of the wire making up the wire couplers **36** of each produce tray. The length of each slot is approximately the same as the width of each wire coupler. It is apparent, therefore, that the slots **18** are shaped to facilitate initial insertion of the wire couplers through the slots and to thereafter locate the wire couplers in fixed positions in the slots. In other words, the relatively wide central portion of each slot **18** enables a coupler **36** to be easily initially engaged in the slot. As the spacer is forced downwardly over the coupler, the curved edge **24** of the slot guides the coupler into the narrow ends **26** of the slot. In the final assembled position of the spacer on the coupler, shown in FIG. 4, the coupler is restrained against movement in all directions parallel to the plane of the spacer.

Clearly, therefore, the invention herein described is fully capable of attaining the several objects and advantages preliminarily set forth.

While a presently preferred embodiment of the invention has been disclosed for illustrative purposes, various modifications of the invention are possible within the spirit and scope of the following claims.

What is claimed is:

1. In combination:

two parallel rows of rectangular produce trays, each including to opposite end walls and two opposite side walls, a wire coupler carried on each end wall, each coupler being located midway between the container side walls and having an upper end normally projecting above the upper edge of the respective end wall, said trays being arranged with said end walls parallel to the rows of trays and with the trays in one row aligned with and located closely adjacent to the trays in the other row, and

a spacer comprising a relatively longitudinally rigid strip extending lengthwise of said rows across the upper edges of the opposing end walls of the trays in the two rows, said spacer having two rows of slots extending lengthwise of the spacer and receiving said projecting couplers, respectively, and each slot having a curved longitudinal edge and a second longitudinal edge which meet at the ends of the slot to define therebetween relatively narrow slot ends having a width approximately equal to the wire diameter of each coupler.

2. The subject matter of claim **1**, wherein said curved longitudinal edge curves progressively away from said second longitudinal edge commencing at said slot ends and proceeding toward the center of each said slot, whereby each said slot has a relatively wide central portion.

3. The subject matter of claim **1**, wherein said slot ends are curved to a small radius substantially less than the radius of curvature of the curved longitudinal edge of each said slot.

4. The subject matter of claim **1** wherein said upper end of each said wire coupler has an inverted U-shaped configuration, with the width of said upper end being less than the width of its respective slot, and the width spaced downwardly from said upper end being substantially equal to said slot width so as to be snugly received by said slot ends when said spacer is so positioned on said upper edges of said end walls.

5. In combination: a pair of adjacent columns of stacked trays, each including two opposite end walls and two opposite side walls, coupler means carried on said end walls and having upper ends projecting above the respective end walls, said coupler means on a given tray being receivable by the end walls of the tray stacked thereon so as to interlock the trays in each said column to one another, said columns of interlocked trays being arranged with the trays in one aligned side-by-side with and closely adjacent to the trays in the other, and

a pair of spacers comprising relatively longitudinally rigid strips disposed on the top trays of said columns and extending horizontally therebetween at opposite ends of said adjacent columns, each of said spacers having slots for receiving the coupler means projecting up from the respective end walls of the top trays in said columns so as to interconnect said columns and prevent them from shifting relative to one another, and each slot having relatively narrow ends for snugly receiving the side edges of the respective coupler means and a relatively wide central portion.

6. The subject matter of claim **5**, wherein the said coupler means has a progressively decreasing width from a point spaced downwardly from said upper end proceeding toward said end, whereby to cooperate with its respective slot to facilitate reception thereby.

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