

Dec. 16, 1952

A. J. STEFANICH
VENTILATED CONTAINER

2,621,847

Filed April 26, 1948

3 Sheets-Sheet 1

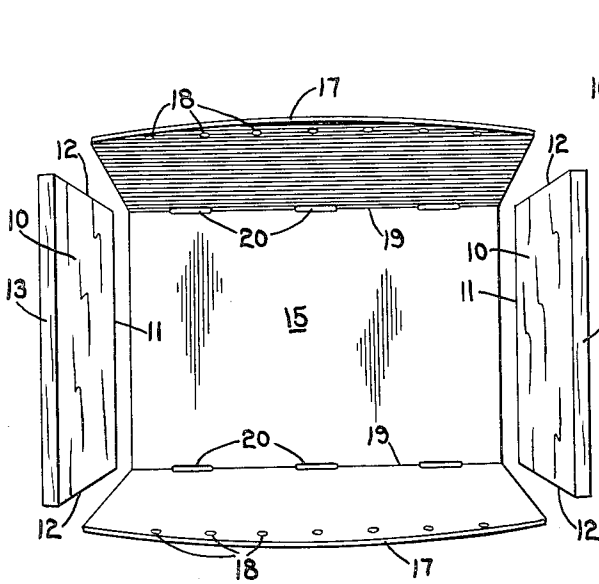


FIG. 1.

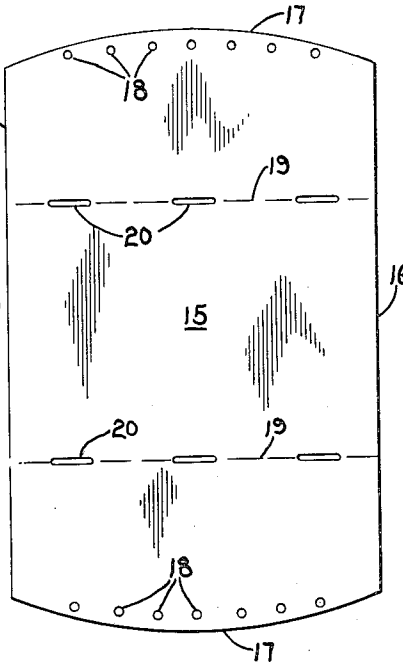


FIG. 2.

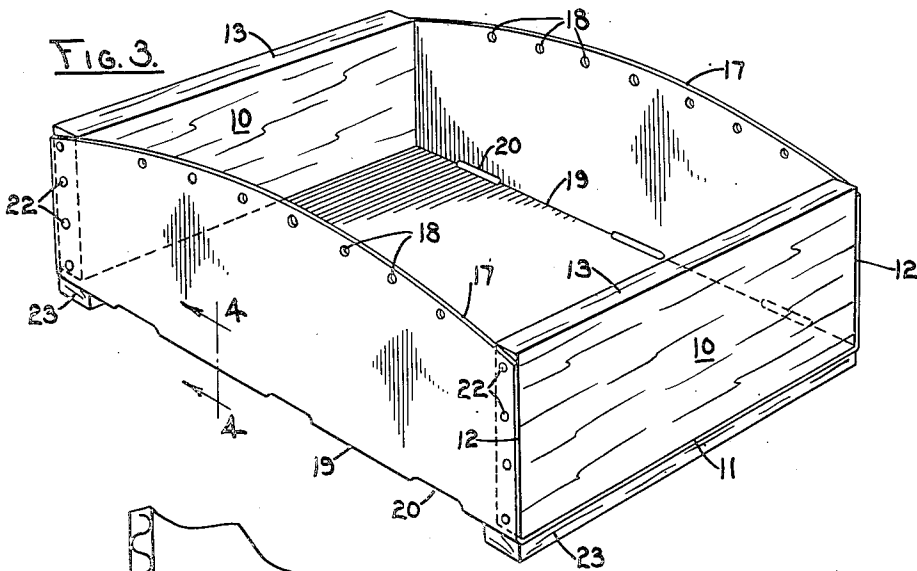


FIG. 3.

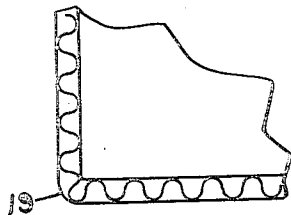


FIG. 4.

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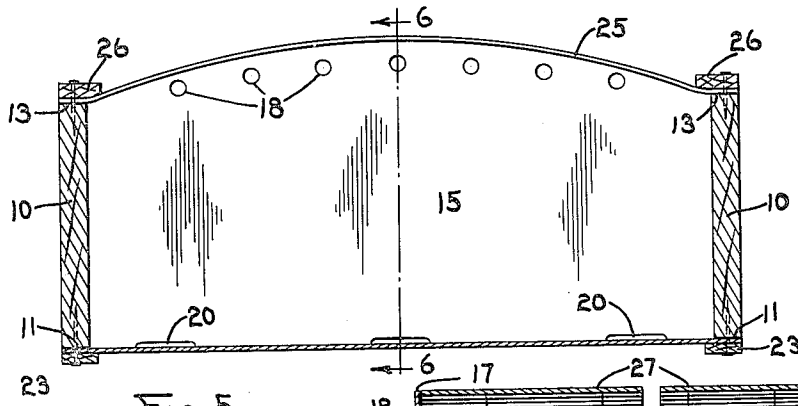


FIG. 5.

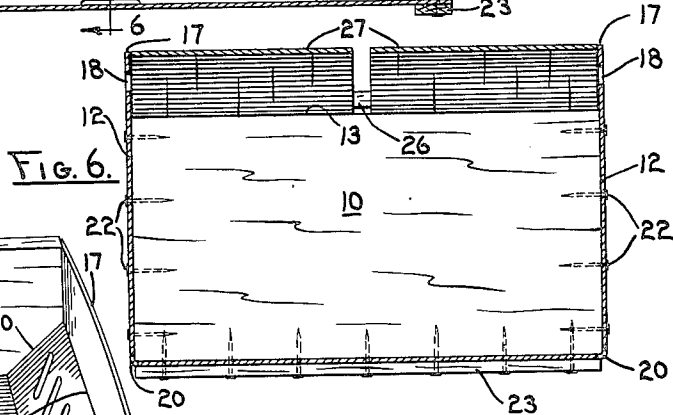


FIG. 6.

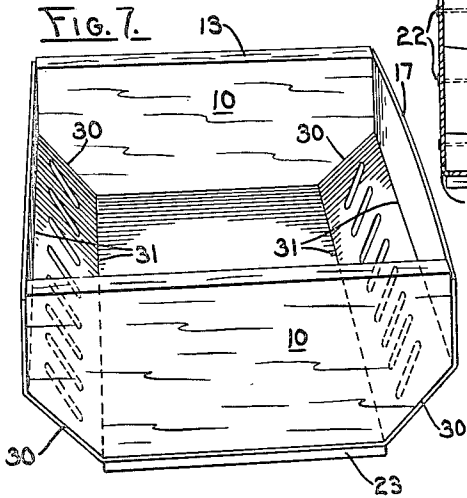


FIG. 7.

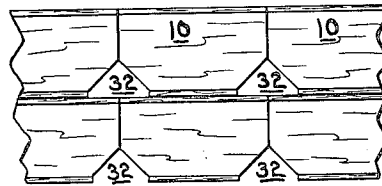


FIG. 8.

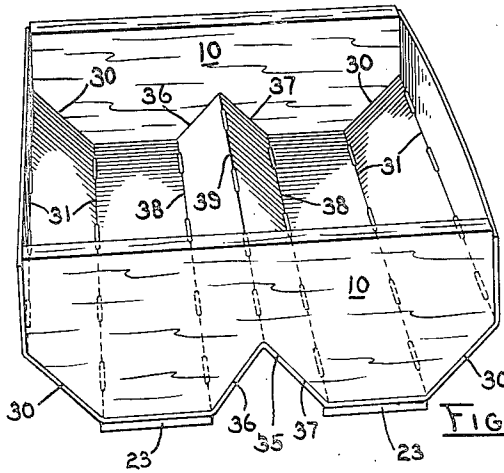


FIG. 9.

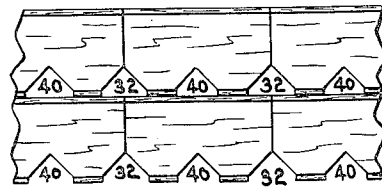


FIG. 10.

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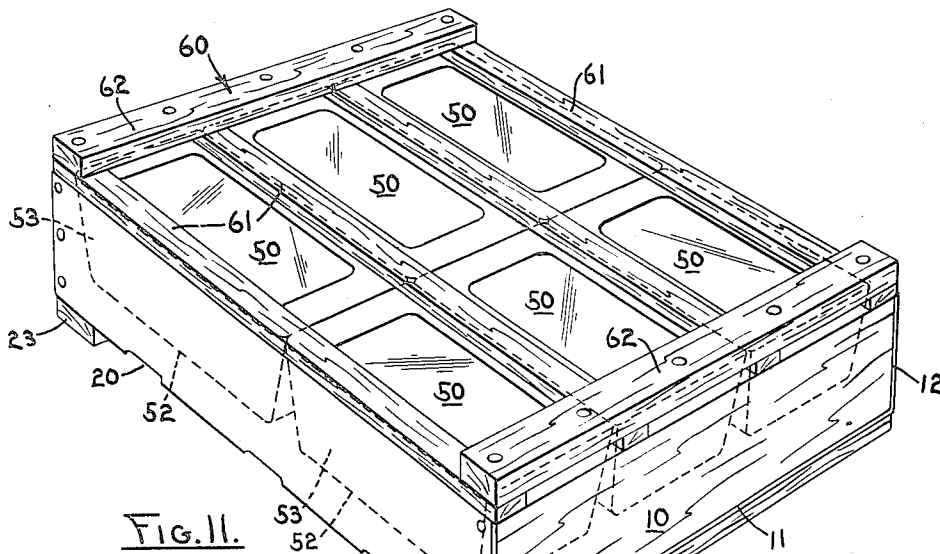


FIG. 11.

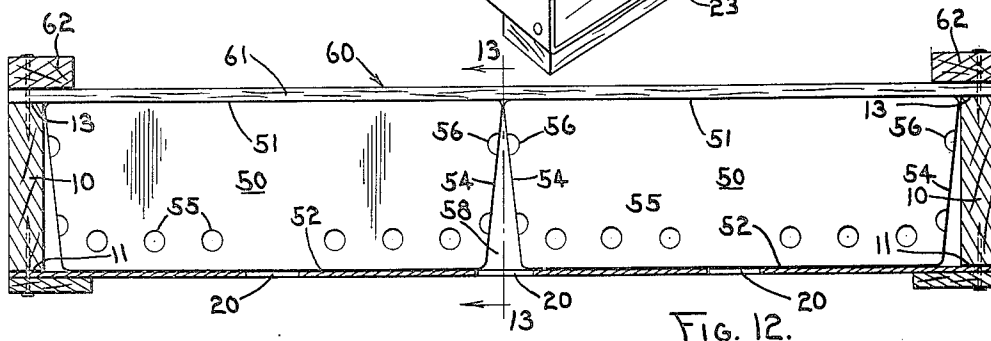


FIG. 12.

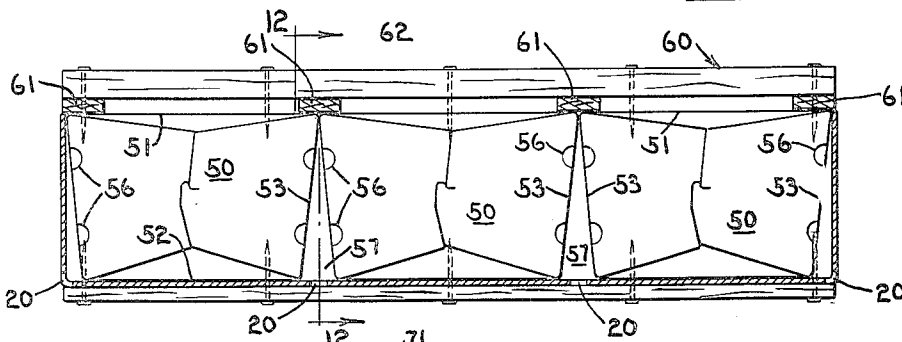


FIG. 13.

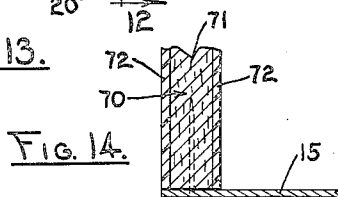


FIG. 14.

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2,621,847

VENTILATED CONTAINER

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Application April 26, 1948, Serial No. 23,369

5 Claims. (Cl. 229-6)

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The present invention relates to containers and more particularly to a combined wood and fibreboard container adapted for the shipment of fresh fruits, vegetables, and other perishable agricultural products.

Many fruits and vegetables are commonly moved to market in wood containers commonly referred to as lug boxes. Such boxes are conventionally rectangular in shape having wooden ends, sides, and bottoms formed of wood shook nailed to the ends, and wood lids employed to confine produce to the box. Such boxes are subject to certain difficulties which the present invention seeks to overcome. The cost of the boxes frequently exceeds the total profit of the shipper for packing and transporting to market the produce contained therein. The boxes are unnecessarily heavy resulting in unnecessarily large transportation expenses. The thin shook comprising the bottoms, sides, and lids are easily split and broken subjecting the contained produce to damage. The wood tends to absorb moisture and in many instances is responsible for mold and decay of the produce. During transportation of the fruit, vibration is unavoidably transmitted to the boxes and delicate produce contained therein is chafed by frictional engagement with the inner surfaces of the box. To avoid these difficulties it has become a conventional practice to provide paper padding and liners for such boxes. In order to heap produce in the boxes and to retain the same therein above the sides, cardboard side guards are inserted between the sides of the box and the produce and upwardly arched in fruit confining position. Further, padding is overlaid the produce for shipment and in cooperation with the side guards maintains the produce in packed position. The liners, side guards, cushions and other aids required in conventional lug boxes constitute needless expenses which further add to the shipper's costs. Still further it is essential that fresh fruits and vegetables continue breathing for several days after being harvested. Such breathing is necessary to the preservation of the produce in salable condition and is ineffectively permitted in conventional lug boxes of the type described employing the liner, cushions, side guards and the like. Conventional lug boxes provide cracks between the shook in the sides, bottoms, and lids and ventilation openings through the side guards, but such openings are limited to the interstices between the shook. The cutting of ventilation openings through the shook is expensive and weakens the shook to such extent as to preclude such supplementary venting.

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These and other difficulties have long been recognized in fruit and vegetable marketing as evidenced by the many efforts to solve the problems. The substitution of other materials for the wood in conventional lug boxes has quite generally been productive of difficulties of aggravated nature. For example, the expense frequently has been increased, strength has been sacrificed, and in instances in which efforts have been made to employ cardboard or fibreboard materials in the crate, the resulting crates have been unsuited to stacked arrangement, tending to crush, and have been unsuited to clamp truck operations.

An object of the present invention therefore is to reduce the costs incident to crating and shipping fresh fruits, vegetables, and the like.

Another object is to provide an improved container of the lug box type that is light weight, strong, and adapted for stacking and clamp truck operations.

Another object is to provide a container for the purposes set forth that is easily constructed and economically produced.

Another object is to provide a combined wood and fibreboard container having improved strength and ventilation characteristics.

Another object is to provide an improved lug box minimizing abrasion of produce contained therein during shipping and handling operations.

Another object is to provide a shipping container having resilient sides and bottom making provision for cushioned support of produce packed therein.

A further object is to provide a shipping container in which the sides and bottom thereof, as well as the side guards upwardly extended from the sides, are of a continuous sheet of material.

A still further object is to provide a combined shipping container and pre-packaging cartons housed thereby conducive to more effective ventilation of pre-packaged produce than heretofore known.

Other objects and advantages will become apparent in the subsequent description in the specification.

In the drawings:

Fig. 1 is an exploded plan view of a container embodying the principles of the present invention.

Fig. 2 is a blank of fibreboard material illustrative of the formation of the bottom, sides, and side guards of the container in continuous relation.

Fig. 3 is a perspective view of the container shown in Fig. 1.

Fig. 4 is a section taken on line 4—4 of Fig. 3. Fig. 5 is a side elevation of the container shown in Fig. 3 illustrating the provision of a lid therefor as for transporting purposes.

Fig. 6 is a section taken on line 6—6 of Fig. 5. Fig. 7 is a perspective view of a modified form of the present invention.

Fig. 8 is an end elevation of a plurality of containers of the type shown in Fig. 7 in stacked relation illustrative of ventilation passages formed through the stack.

Fig. 9 is a third form of the present invention having additional ventilative features.

Fig. 10 is an elevation of a group of the cartons of the type shown in Fig. 9 in stacked relation.

Fig. 11 demonstrates the combined container and prepackaging cartons of the present invention.

Fig. 12 is a vertical longitudinal section taken through the combined container and prepackaging cartons shown in Fig. 11.

Fig. 13 is a section taken on line 13—13 of Fig. 12.

Fig. 14 is a fragmentary illustration showing a box end of material other than wood.

Referring in greater detail to the drawings.

In Figs. 1, 3, 5, and 6, substantially rectangular, wooden ends for a container of the present invention are indicated at 10. As subsequently will become apparent the present invention is not limited to the employment of ends having the common rectangular shape but is well adapted to formation from ends of other geometrical configuration providing angularly related edges. The ends are preferably of a thickness and type of wood suited to the reception of nails in the securing of the sides, bottom, and lid, subsequently described. Pinewood ends approximately $\frac{3}{4}$ of an inch thick are suitable. The ends conveniently provide a bottom edge 11, oppositely disposed side edges 12 and a top edge 13, in right angular relation.

The bottom and sides of the container are formed from a blank 15 of fibreboard material configured as shown in Fig. 2. For purposes of descriptive convenience, the term fibreboard is used to designate pasted chip board, corrugated fibreboard, laminated fibreboard, solid fibreboard and other fibre products such as cardboard, paper board, and the like. The blank is delineated by a pair of substantially parallel end edges 16. For containers of the size of a conventional lug box the blank is approximately $17\frac{1}{2}$ inches long. Arcuate convex side edges 17 interconnect the end edges 16 preferably in attitudes so that chords drawn between each chord's arcuate side's opposite ends are normal to the end edges. For containers of lug box size the overall width of the blank is approximately 28 inches. The area between such chords and said chords' respective side edges 17 comprise side guards in continuous relation with the side of the container. These side guards are provided with ventilation openings 18. A pair of parallel scores 19 interconnect the end edges 16 and are spaced a distance equal to the width of the bottom edges of the ends. This distance, for usual lug box size, is $13\frac{1}{2}$ inches. Said scores are spaced inwardly from the ends of the side edges 17 of the blank a distance substantially equal to the height of the ends 10, normally $5\frac{3}{4}$ inches, leaving side guards $1\frac{1}{2}$ inches high at their vertex. The measurements given are illustrative only and in no way limit the invention to

embodiment in the size or relative shape described.

Ventilation openings 20 are formed in the blank in quantity and arrangement desired for the particular produce for which the container is provided. Much of the strength of the container results from the ability of sheets of fibreboard material to withstand even excessive strains imposed edgewardly thereon. The employment of ends of geometrical configuration providing angularly related edges assures the container of a resulting plurality of continuous fibreboard panels resistive to edgewardly imposed forces when a sheet of fibreboard is made to conform to said edges. The scores 19 are for the purpose of facilitating bending of the sheet in the conforming operation. Once formed, the scores delineate crease lines longitudinally of the container that are of major effect in imparting rigidity to the container. Normally, the ventilation openings may be positioned anywhere in the fibreboard sheet, even on a crease line, without weakening the container excessively. When maximum strength is desired, however, the openings are arranged to avoid the crease lines, as shown in Fig. 7.

As shown in Fig. 3 the fibreboard blank 15 interconnects the ends 10 in fixed spaced relation by being nailed as at 22 to the side edges 12 and bottom edges 11 of the ends 10. For the purpose of more effectively supporting the fibreboard material at the bottom edges of the ends, a cleat 23 is positioned in underlying relation to the fibreboard material and nailed to the ends there-through. In addition to the strength imparted to the container by bending of the blank 15, as previously discussed, the blank is preferably formed of laminated corrugated fibreboard, of the type shown in Fig. 4, in which the corrugations are endwardly disposed the container.

As shown in Figs. 3, 5, and 6 the arcuate edges 17 are upwardly extended above the ends to constitute side guards adapted to confine heaped produce in the container. The lid is conveniently formed of a plurality of wooden shakes 27 arched between the ends in superposed relation to the edges 17. The inner surface of the fibreboard blank is preferably coated with a thin film of waterproof and friction reducing wax material such as paraffin, carnauba wax, or other unguent material having said characteristics. So formed the container provides cushioned support for produce contained therein through the resilience of the corrugated fibreboard, is lighter in weight than lug boxes heretofore found suitable for fruit shipping purposes, possesses strength characteristics surpassing those of conventional wooden lugs in the avoiding of tendencies to split and crack, incorporates ventilation openings at positions advantageously suited to produce requirements, and minimizes chafing and spoiling of the fruit contained therein by the friction reducing and waterproofing characteristics of the unguent material applied to the interior of the box.

Second form

As previously suggested the ventilation of fresh produce is of great importance to shipping and storing thereof. In Figs. 7 and 8, a form of the present invention having improved ventilation characteristics is shown. In this second form, the ends 10 are provided with biased edges 30 interconnecting the bottom edges 11 and side edges 12 eliminating lower corners of the ends. In this

form the fibreboard blank 15 has the scores 19 positioned to coincide with the outer ends of the bottom edges, and additional scores 31 provided in substantially parallel relation to the first scores coincident with the intersection of the biased edges and the side edges. The ventilation openings 20 are provided in the fibreboard material in the panels thereof interconnecting the respective biased edges. In stacked relation portions of the fibreboard material define ventilation openings 32 between the sides of the container near the bottoms thereof. These passages facilitate ventilating of the produce in the containers and the cooling and fumigation thereof rendering material savings in refrigeration time and costs in precooling refrigeration cars and in the time required and costs for fumigating the produce prior to shipment.

Third form

A third form of the present invention is directed to further effective ventilation, refrigeration, and fumigation of packed produce. The third form provides ends 10 having biased edges 30 as described for the second form and in addition, inverted V-shaped notches 35 formed upwardly from the bottom edges 11 of the ends. The notches are delineated by intersecting angularly related edges 36 and 37. In the formation of the third form of the present invention the fibreboard blanks 15 is provided with additional parallel score lines 38 and 39 spaced to coincide with the intersections of the edges 36 and 37 with the bottom edge 11 and of said edges 36 and 37 with each other. The fibreboard material is nailed to the side edges 12 and biased edges 30 as previously described, and to the bottom edges 11 by means of cleats 23, also as previously described. The fibreboard sheet is bent along crease lines endwardly of the container enabling the humping of the fibreboard sheet upwardly into inverted V-shaped notches 35 and the maintenance of said material in intimate engagement with the edges 36 and 37 by the firm securing of the blank to the bottom edges 11, obviating any need to secure said sheet to the edges 36 and 37 thus avoiding the inconvenience and expense of securing the same. Ventilation openings are provided in the panels of fibreboard interconnecting the biased edges and in the panels thereof interconnecting the edges 36 and 37 of the notch 35. In stacked arrangement not only do the panels interconnecting the biased edges form ventilation passages 32 between the sides of the containers near the bottom portions thereof but in addition the panels interconnecting the edges 36 and 37 form ventilation passages 40 longitudinally of each container, said passages being in communication with the interiors of the containers by way of the openings 20.

Combination of container with prepackaging cartons

In Fig. 11, the combination of the first form of the carton of the present invention with prepackaging cartons 50 of substantially uniform size is illustrated. The cartons shown are of a popular form having substantially parallel top panels 51, bottom panels 52, and downwardly convergent side panels 53 and end panels 54. The cartons employ ventilation openings 55 through the lower portions of the side panels and end panels and further ventilation openings 56 at the intersections of said side and end panels. When the pre-packaging cartons are grouped

for shipping purposes they define ventilation passages 57 along the sides thereof and ventilation passages 58 along the ends. In constructing the first form of the containers of the present invention to house the grouped pre-packaging cartons 50, as shown in Fig. 11, the ends 10 are spaced a distance a multiple of the over all length of a carton, provided of a width a multiple of the over all width of said carton, and of a height equal to the over all height, or a multiple thereof, of said carton. The fibreboard blank 15 is secured in interconnecting relation between the ends as previously described forming, in continuous relation, a bottom panel interconnecting the bottom edges 11 of the ends and side panels interconnecting the side edges 12 of said ends. The ventilation openings 20 are formed to register with the ventilation passages 57 and 58, a positioning not practical in wooden lugs. This gives a free flow of air through the container between the cartons. A lid 60 somewhat different in form from the lid 25, previously described, is employed to maintain the cartons in the container. The lid 60 includes slats 61 positioned endwardly of the container and in overlying relation to the side edges of the cartons in substantially vertical alignment with the openings 20. The slats are conveniently secured by lid cleats 62 nailed to the top edges of the ends.

Although the ends 10 for the containers of the present invention have been described as made of wood, it will readily be apparent that the present invention is not limited to such material. The ends 10 obviously should be thick enough to provide adequate bearing surfaces on the mounting edges for the fibreboard bottom and sides, light enough to be practical for handling, cheap enough to be economical, and soft enough to accept the claws of clamp trucks. Said ends are preferably of a material that will receive nails in securing the fibreboard material thereto but not necessarily so, said fibreboard material being adapted for securing to the ends by gluing the same thereto. In Fig. 14 an end 70 configured as previously described for the ends 10 is illustrated to show a material, other than wood, suited to the purpose. The end 70 is formed from a relatively thick block of solid fibreboard 71, and has surface impregnations 72 of synthetic resin or the like to stiffen the fibreboard block. The impregnations need not be deep as their chief purpose is to give additional rigidity to the block and a strong enough surface for the claws of a hand truck. The solid fibreboard provides sufficient bulk to which to nail the fibreboard bottom and sides.

Operation

The operation of the embodiments of the present invention are clearly apparent and briefly reviewed at this point. Fruits, vegetables and the like are packed in the containers in any suitable manner, the containers being adapted for bulk pack as well as the pre-packaging of the produce in cartons. In each pack, the containers of the present invention provide ventilation characteristics superior to that known in convention lug boxes or other shipping containers for produce. After the produce is packed it is maintained in the containers by the employment of a lid 25, or a lid 60, appropriate to the type of pack involved. During shipping, the produce is preserved in a fresh condition by the thorough ventilation thereof and by the waterproof coating inwardly disposed of the container which pre-

cludes the absorption and maintenance of moisture in contact with the produce. The wax coating further serves to reduce chafing incident to jostling and shaking of the containers during handling and shipping. The containers are lighter in weight than those heretofore known and thus shipping costs are reduced. The sides and bottom of the container can not crack or split and thus a common cause of a waste of produce incident to lug box failure is obviated. The wooden ends of the containers permit ready stacking thereof to heights commonly employed in refrigeration cars and trucks and higher without collapsing or crushing the containers. The wooden ends adapt the container of the present invention to hand truck operation. The bending of the fibreboard blanks along crease lines endwardly of the container imparts strength characteristic to the improved container not known in conventional lug boxes. As previously noted the produce is cushioned during handling and transporting by the fibreboard sides and bottom. In addition to the numerous operational advantages of the containers of the present invention, perhaps most significant is the reduction of expense over conventional lug boxes resulting in savings for any given quantity of produce packed and shipped equaling what is normally considered a fair profit for the shipper in packing and shipping such a quantity.

What I conceive to be the true scope of my invention is the combination, in a container, of wooden ends or other suitable material having angularly related edges, adapting the container to hand truck operation and imparting vertical rigidity to the container conducive to the dependable stacking thereof, and of a sheet of fibreboard material intimately conformed to the angularly related edges of the ends and interconnecting the ends in fixed spaced relation thereby imparting longitudinal rigidity to the container by bending of the sheet along crease lines longitudinally of said container coincident with the intersections of angularly related edges of the ends.

Although I have herein shown and described my invention in what I have conceived to be the most practical and preferred embodiments, it is recognized that departures may be made therefrom within the scope of my invention, which is not to be limited to the details disclosed herein, but is to be accorded the full scope of the claims so as to embrace any and all equivalent devices and structures.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A ventilated container comprising substantially rectangular wooden end members each having a bottom edge, opposite erect side edges, and a top edge; a single sheet of fibreboard material interconnecting the end members and secured to the bottom edges and side edges thereof, said sheet having ventilation openings formed therethrough; lower spacing cleats positioned below the sheet of fibreboard material and nailed to the bottom edges of the end members therethrough; spaced slats interconnecting the top edges of the end members; and upper spacing cleats nailed to the end members through the slats whereby when said container is in stacked relation with similar containers horizontal air passages are defined transversely across the top and across the bottom thereof between the spaced upper cleats and the spaced lower cleats which air passages communicate with the ventilation

openings in the fibreboard material and with the spaces between the slats.

2. A ventilated container comprising a pair of substantially rectangular ends of similar size each having plain parallel surfaces and a bottom edge, a top edge, and side edges all angularly disposed to the plane surfaces of their respective ends, a sheet of corrugated fibreboard material affixed to said bottom and side edges of the ends and interconnecting the same in fixed spaced relation with the corrugations of said sheet endwardly disposed in the container, the ends being of sufficient thickness firmly to support the sheet of corrugated fibreboard material and being of a material soft enough to receive standard nails in securing said fibreboard sheet to the edges of the ends and of a stiffness at least equal to the stiffness of a softwood of the same dimensions, said fibreboard sheet being bent along crease-lines endwardly of the container coincident with the intersections of the bottom and side edges of the container and having ventilation openings formed therethrough along said crease-lines; cleats underlying the sheet and secured to the lower edges of the ends; slats interconnecting the upper edges of the ends and positioned above the ventilation openings formed through the fibreboard sheet; and cleats overlaying the slats and secured to the upper edges of the ends therethrough.

3. A ventilated display package for fresh fruits and the like comprising in combination a ventilated container and a plurality of substantially uniform prepackaging cartons of fibreboard material nested therein in alignment longitudinally of the container; the container having a pair of spaced substantially rectangular wooden end members each having a bottom edge, opposite erect side edges, and a top edge; a single sheet of fibreboard material interconnecting the end members and secured to the bottom edges and side edges thereof; the cartons having downwardly convergent side and end walls provided with ventilation openings therethrough and defining ventilation passages between the lower portions of the cartons and between the lower portions of said cartons and the container, bottoms continuous with said side and end walls, and lids in covering relation to said cartons, the lids having transparent inspection windows provided therein of an area less than the area of their respective lids; slats interconnecting the upper edges of the end members of the container and arranged to overlay the portions of the lids bounding the inspection windows to retain the cartons in the container, the sheet of fibreboard material being formed with ventilation openings therethrough in registry with the ventilation passages formed between the cartons and between the cartons and the container.

4. A ventilated inspection package for fresh fruits and the like comprising a pair of substantially rectangular spaced wooded end members each having a bottom edge, opposite side edges, and a top edge; a sheet of fibreboard material affixed to the bottom and side edges of the end members and interconnecting the same in fixed spaced relation, said fibreboard sheet being bent along crease-lines endwardly of the container coincident with the intersections of the bottom and side edges of the end members; a plurality of substantially rectangular prepackaging cartons fitted in abutting end-to-end and side-to-side relation between the end members and the portions

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of the fibreboard sheet interconnecting the side edges of the end members respectively, said cartons having lids providing inspection windows therein, downwardly convergent end walls and side walls defining ventilation passages between the cartons, between the cartons and the end members and between the cartons and the portions of the fibreboard sheet interconnecting the side edges of the end members; slats interconnecting the upper edges of the end members and overlaying adjacent edges of the cartons and the edges of the cartons adjacent to the portions of the fibreboard interconnecting the side edges of the end members, respectively, said slats being spaced for visual reference to the carton inspection windows therebetween; cleats overlaying the slats and secured to the upper edges of the end members therethrough; and cleats underlaying the fibreboard sheet and secured to the lower edges of the end members therethrough, the fibreboard sheet having ventilation openings formed therethrough in registry with the ventilation passages defined by the end walls and the side walls of the cartons and in registry with transverse passages formed between the passages by the cleats when said packages are in stacked relation.

5. A ventilated container comprising a pair of wooden members of similar shape each having a bottom edge, opposite side edges and a top edge; a single sheet of fibreboard material interconnecting the end members and secured to the bottom edges and side edges thereof, said sheet having ventilation openings formed therethrough;

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lower spacing cleats positioned below the sheet of fibreboard material and nailed to the bottom edges of the end members therethrough; an air pervious lid interconnecting the top edges of the end members; and upper spaced cleats nailed to the end members through the lid whereby when said container is in stacked relation with similar containers horizontal air passages are defined transversely across the lid and across the bottom thereof between the spaced upper cleats and the spaced lower cleats which air passages communicate with the ventilation openings in the fibreboard material and with the air pervious lid.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
410,429	Mott -----	Sept. 3, 1889
464,565	Hawley -----	Dec. 8, 1891
1,346,661	Lemon -----	July 13, 1920
1,412,361	Lippmann -----	Apr. 11, 1922
1,947,446	Boren -----	Feb. 20, 1934
1,959,998	Bronson -----	May 22, 1934
2,248,682	Hulett -----	July 8, 1941
2,328,689	Shofer -----	Sept. 7, 1943

FOREIGN PATENTS

Number	Country	Date
266,861	Great Britain -----	Mar. 10, 1927