Dec. 13, 1932. E. P. SHERMAN 1,890,951

SHIPPING CARTON

Filed Feb. 16, 1932 3 Sheets-Sheet 1

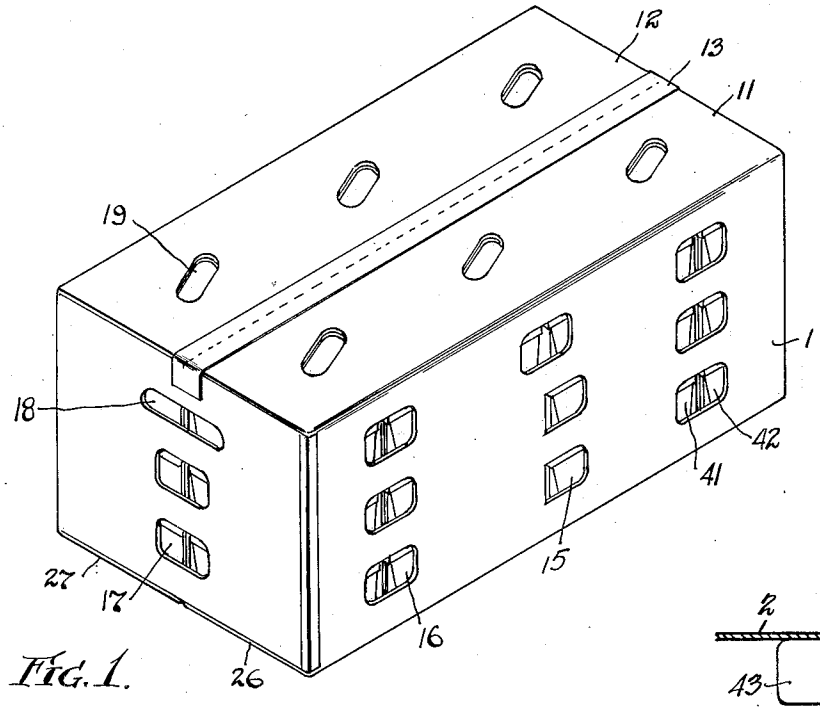


FIG. 1.

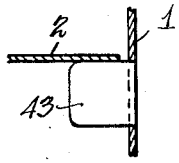


FIG. 2A.

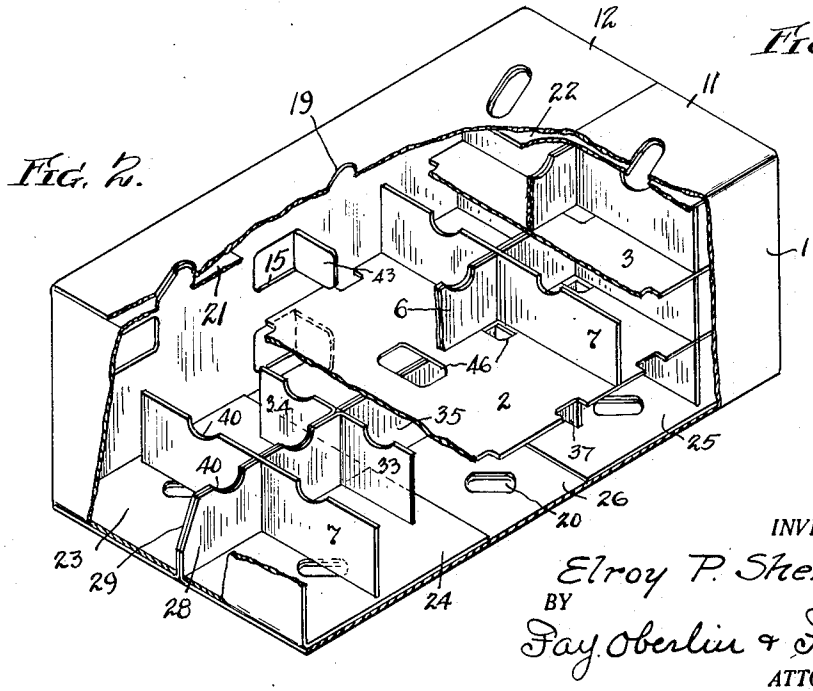


FIG. 2.

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SHIPPING CARTON

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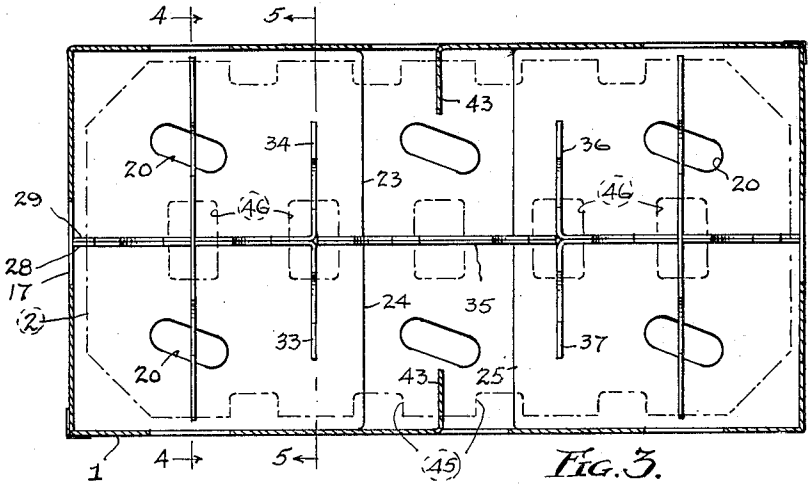


FIG. 3.

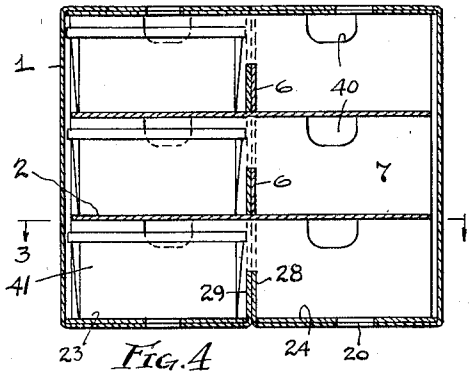


FIG. 4

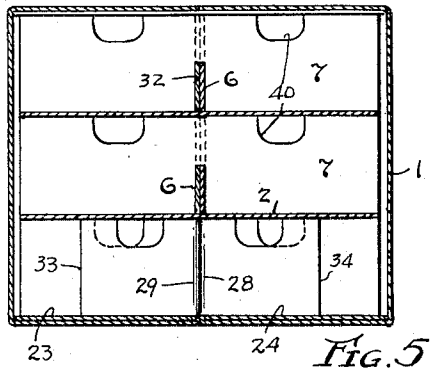


FIG. 5

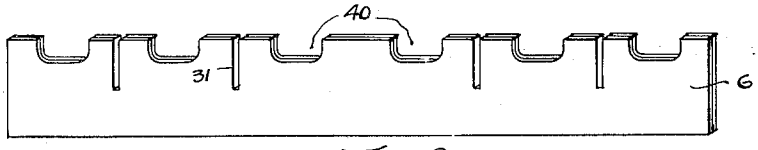


FIG. 6.

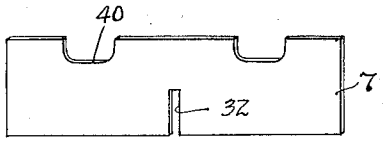


FIG. 7

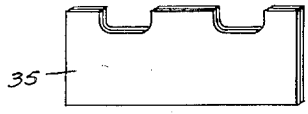


FIG. 8

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SHIPPING CARTON

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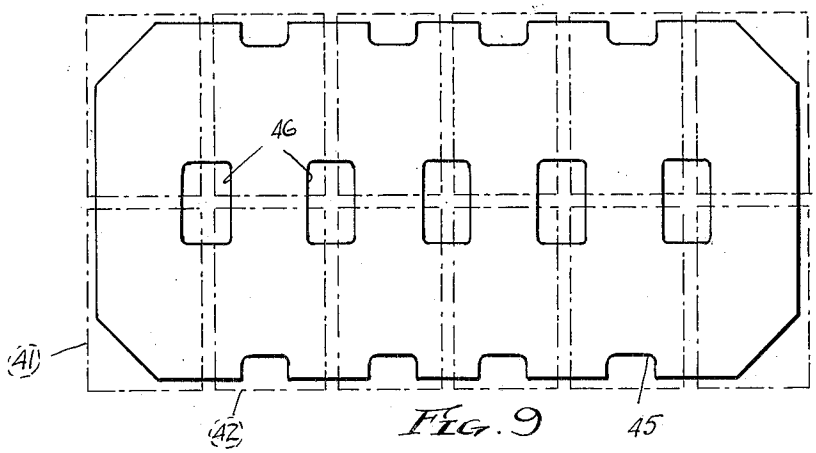


FIG. 9

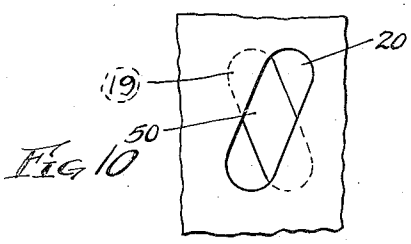


FIG 10

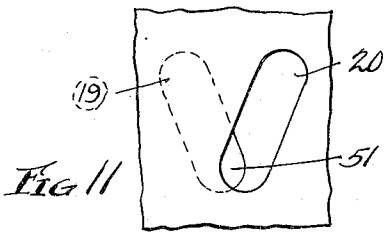


FIG 11

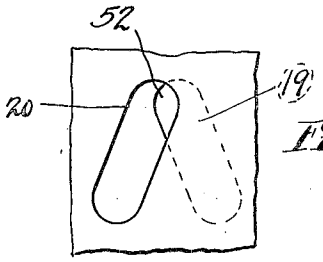


FIG. 12

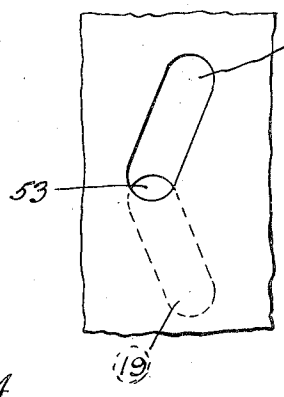


FIG. 13.

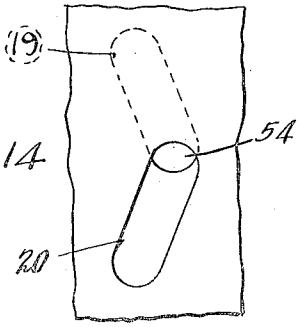


FIG. 14

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UNITED STATES PATENT OFFICE

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SHIPPING CARTON

Application filed February 16, 1932. Serial No. 593,291.

This invention relates to shipping cartons and aims to provide a carton which is particularly adapted for construction out of corrugated board, which carton will provide adequate ventilation for the contents under all conditions ordinarily met with in shipping, which will support several layers of fruit with the weight of each borne entirely by the structure of the carton, and which will rely almost altogether on folding and bending operations both for its construction and closing, thereby reducing the amount of pasting and/or strip sealing to a minimum.

Other purposes and advantages of the invention will appear from the following description and claims. To the accomplishment of the foregoing and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims.

The annexed drawings and the following description set forth in detail certain structure embodying the invention, such disclosed means constituting, however, but one of various structural forms in which the principle of the invention may be used.

In the drawings, Fig. 1 is a perspective view of the carton closed for shipping, Fig. 2 is a corresponding view broken away to show the interior construction, Fig. 2A is a detail in vertical section showing a support for a horizontal element, Fig. 3 is a horizontal section on the line 3—3 of Fig. 4, Figs. 4 and 5 are vertical sections on the lines 4—4 and 5—5 respectively of Fig. 3, Figs. 6, 7 and 8 are details of interior partitions, Fig. 9 is a plan view of a horizontal partition element or "pad", Figs. 10 to 14 inclusive are fragmentary plan views illustrating the ventilating arrangement of piled cartons.

Referring now particularly to Fig. 2, it will be seen that the carton comprises an outside casing 1 of about the same size and shape as an ordinary fruit or berry crate, this being divided by a suitable number of horizontal and vertical partitions. It will be understood in the following specification and claims, without further explanation, that the exact numbers of elements and similar details may be varied, but for convenience the showing of the drawings will be closely adhered to in the description.

There are two interior horizontal partitions or "pads" 2 and 3 which are slightly shorter and narrower than the inside of the carton, as best seen in Fig. 3. These pads rest on longitudinal and transverse supports generally indicated at 6 and 7 and are cut through at intervals along the middle and along the edges in such a way that the openings coördinate with the supporting partitions 6 and 7 allowing complete circulation of air. The ribs or partitions are higher than the baskets, so that the pads and the fruit on each do not rest on the berries but the weight is carried entirely by the partitions and by the lugs 43. This feature is illustrated in Fig. 4.

The interior arrangement is such that the carton, when assembled, is locked shut at the bottom without the use of any adhesive or tape or any other means except the interengagement of various of the carton elements. At the top the carton is longitudinally divided into two top flaps 11 and 12 which can be closed over and sealed with a gummed strip 13 in the usual manner. External air circulation is permitted by means of side openings such as 15 and 16, end openings such as 17 and 18, certain of which also serve as hand holds, and top and bottom openings 19 and 20 respectively. These openings are of various different formations for definite purposes, as will be described in more detail below.

The casing 1 resembles in its general formation a carton of the usual type having inner flaps such as 21 and 22 integral with and bent into a hinge to the end edge of the respective ends of the carton, turned in a part of the distance from each end under the covering flaps 11 and 12. At the bottom the corresponding inwardly directed flaps are split longitudinally, as best seen in Fig. 2, in which figure the two which together correspond to the flap 21 are designated as 23 and 24 respectively, and the only one visible at the far end in this figure is designated as 25. The bottom is formed of two inturned flaps 26 and 27 each half the carton width and each hav-

ing an edge turned up as at 28 and 29 to project up into the carton forming a longitudinal central rib. The flanges 28 and 29 are cut off at their upper corners to allow further air circulation and also to guide them into the carton more easily during assembly. At intervals this rib is notched down from the top to receive a reversely notched transverse piece such as 7. The notching arrangement is best understood by a comparison of Figs. 6 and 7 by which it will be apparent that the upper part of the transverse piece 7 fits into the notch 31 of the longitudinal rib and the notch 32 in the piece 7 fits over the lower part of the longitudinal rib. Fig. 6 does not, however, represent the rib formed by the flanges 28 and 29 but one at a higher level. The notches 31 are so spaced that a cross member such as 7 or 33, 34 is provided at intervals which at the end is equal to the width of one berry box and in the middle is equal to the width of two berry boxes, there being different spacing members opposite this middle portion. In the case of cartons designed for carrying fruit not in boxes the spacing can be appropriately varied. The slots 31 in the longitudinal partitions 6 are upward so that when one of these partitions is lifted out it carries its cross pieces with it.

The bottom locking arrangement is made by cutting the flanges 28 and 29 vertically at their mid-length and also severing them at the bottom horizontal bend and folding each back to a transverse position as shown at 33 and 34. Thus by overlapping the flaps 23 and 24 the ends 33 and 34 prevent the flaps from being raised and at the same time the flaps and ends, by their interlocking, prevent the flanges 28 and 29 from being pulled out. Thus the bottom is completely locked and can only be opened from the inside after the carton has been emptied.

In order to give a uniform center support for the pad 2, a short rib 35 of double thickness and of height such that its top edge is level with the top each of 28, 29, is inserted in the space left vacant by the bending out of the ends 33, 34 and the two opposite corresponding ends 36 and 37, seen in Fig. 3. Since these ends are folded back a little outward of the inner edge of the flaps 23, 24, 25 and 26 respectively, the piece 35 fits in the space left between the flaps and is maintained in place that way, as seen in dotted lines in Fig. 2. The longitudinal and transverse ribs hereinbefore described are deeply notched on the top as indicated at 40 to allow circulation of air. The ends 33 and 34 do not extend out to the sides of the carton, thus air can circulate past the extremities of these as well as through their notches 40.

The ventilating system is so arranged that, although ample numbers of ventilating openings are cut through the exterior, the number of such openings necessary to secure adequate ventilation is kept at a minimum by reason of the fact that each opening serves to admit air directly to at least two berry boxes. Thus opposite each of the openings 16, Fig. 1, corners of two boxes 41 and 42 can be seen and the same is true as to the openings 17 and 18 in the ends and the openings 19 and 20 in the top and bottom. The side openings 15 directly expose only one box each, but these openings are made with hinged flaps 43 which extend inward only a little beyond the edge of the pad 2 or 3, and being a little above the bottom of the pad or the bottom of the carton as the case may be, do not prevent circulation of air around the lower edge of the flap to the adjacent berry box.

The pads, besides being slightly shorter and narrower than the inside of the carton, as shown in Fig. 3, are notched along the edge as at 45 and down the middle as at 46 and also cut off at the corners. The principal advantage of the edge notching is that in case the pad gets slipped over against the side of the carton, vertical air circulation will not be stopped on that side.

The holes 46 are spaced so that each is over the adjacent corners of four berry boxes, as best seen in Fig. 9. This is accomplished by having the openings 46 at the same spacing as the notches 31 and large enough so that any possible endwise or sidewise movement of the pad do not close off any of the boxes. This is shown in Fig. 3 in which the pad, being above the general plane of the figure, is illustrated in dotted lines. Vertical ventilation through the individual boxes is provided by the top and bottom openings 19 and 20, earlier mentioned, each of which overlaps two boxes, as shown in Fig. 1. In order that this will not be shut off when cartons are stacked, the holes are diagonally disposed, as shown, those in the top being in the opposite direction to the corresponding ones in the bottom but at the same spacing on top and bottom. The result of this is that when cartons are placed in the usual vertical stack the holes overlap as shown in Fig. 10, in which the solid line represents the opening 20 in the top of the bottom carton of the stack and the dotted line represents the opening 19 in the bottom of the carton thereon. Thus, in what may be termed a normal stack, the diamond shaped air passage 50 is left. In case the top carton is moved somewhat to the right the relative position of the openings will be as shown in Fig. 11, leaving a smaller air passage 51. Movement of the top carton to the left similarly leaves an air passage 52. The passages left by backward or forward movement of the top carton are respectively shown at 53 and 54, Figs. 13 and 14.

From the foregoing it will be seen that I have invented a carton in which the ventilation is very fully provided for in all direc-

tions without weakening the carton and that the piling of the cartons will not interfere with the ventilation on account of the fact that the outside holes in all outside walls of the carton are in registry and are of sufficient size and so arranged that some movement of the cartons with respect to one another in the pile, either superposed or alongside, will not block off the air passages from one carton to the next.

Although the holes are adequate for ventilation, they are so arranged as to prevent pilfering. In the top and bottom holes this is accomplished by the relatively long narrow shape of the hole and in the holes in the sides and ends the available access through each one of the interior compartments of the carton is only half of the area of the opening.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the structure herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:

1. In a fruit shipping carton having interior ventilating passages from top to bottom, top and bottom openings vertically aligned, each of said openings being relatively long to give ventilating area and narrow to prevent pilfering, said openings in the top being uniformly inclined in one direction and those in the bottom being uniformly inclined in the opposite direction, thereby causing the bottom openings in an upper carton to overlap the top openings in the next lower carton, when piled, even when said cartons are out of vertical alignment.

2. In a shipping carton for fruit in boxes, a plurality of series of transversely disposed vertical partitions, horizontal partitions each supported by a lower one and supporting an upper one of said series, openings of substantial size but less than basket size in said horizontal partitions approximately centered over an intersection of said partitions.

3. In a shipping carton for fruit in boxes, a plurality of series of transversely disposed vertical partitions, horizontal partitions each supported by a lower one and supporting an upper one of said series, openings of substantial size but less than basket size in said horizontal partitions approximately centered over an intersection of said partitions, said vertical and horizontal partitions defining compartments for holding fruit baskets, whereby vertical ventilation is permitted through one opening to four baskets.

4. In a carton for shipping fruit in boxes, horizontal interior dividing partitions each adapted to support a layer of the boxes, holes in said partitions in registry with one another with intervals between the boxes from top to bottom and external openings in the tops and bottoms of said carton.

5. In a shipping carton of corrugated board or the like, a self locking bottom comprising two longitudinal folds each forming one-half the bottom surface, two inner end flaps at each end, each the width of one of said longitudinal folds, each of said folds including a flange bent from its inner edge, said flanges being adapted to project inside the carton side by side, a part of the length of each of said flanges being formed into a hinged tongue movable towards the side of the carton and with its bottom edge bearing against the inner surface of said end flap.

6. In a shipping carton of corrugated board or the like, a self locking bottom comprising overlapping inner and outer bottom flaps having fold lines at right angles to one another, and a member attached to the inside of an outer flap and movable into a position to engage the inside of an inner flap, thereby locking both flaps together and against motion.

7. In a lock bottom shipping carton of corrugated board or the like, a plurality of superposed vertically aligned longitudinal vertical partitions each supporting a horizontal pad, the bottom partition being formed by two adjoining inturned flanges of the carton bottom and each of the upper partitions being of corresponding double thickness, transverse partitions attached to said longitudinal partitions, said vertical partitions, by reason of their equal thickness, forming compartments of equal size on all layers of the carton.

8. In a shipping carton of corrugated board or the like, having a bottom formed with inner and outer flaps, said outer flaps each having a flange upturned at a right angle, said flaps being adapted to abut along their respective angle edges with the flanges vertical and adjoining, said flanges having means thereon for locking said inner and outer flaps, a horizontal partition, and means for supporting the same at center and sides of the carton, said supporting means comprising board elements vertically disposed and with their upper edges at a common level, the side supporting means consisting of lugs inturned along one vertical edge and connected only by such edge to the side of the box, and the central supporting means consisting of said adjoining inturned flanges of the carton bottom.

9. In a shipping carton of corrugated board or the like, a self locking bottom comprising overlapping inner and outer bottom flaps having fold lines at right angles to one another, and a member attached to the inside of an outer flap and movable into a position to engage the inside of an inner flap, thereby locking both flaps together and against mo-

tion, a horizontal partition resting on the upper edge of said member, and side supports for said partition, said side supports consisting of inturned vertical lugs, connected only along one edge to the side of the box.

Signed by me this 10th day of February, 1932.

ELROY P. SHERMAN.