Nov. 28, 1950 N. CARTER 2,532,085

VENTILATED CARDBOARD CARTON

Filed June 13, 1946 2 Sheets-Sheet 1

FIG. 1.

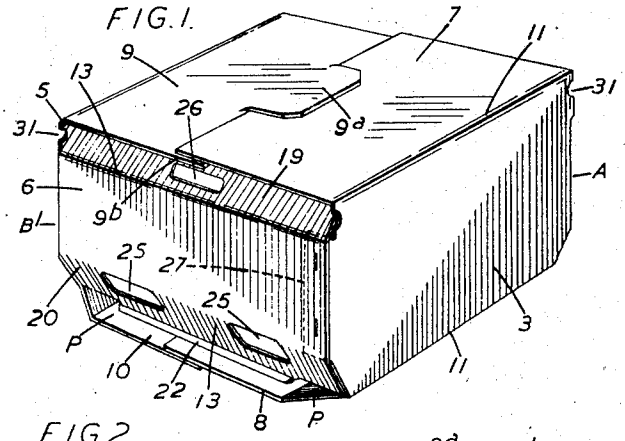


FIG. 2.

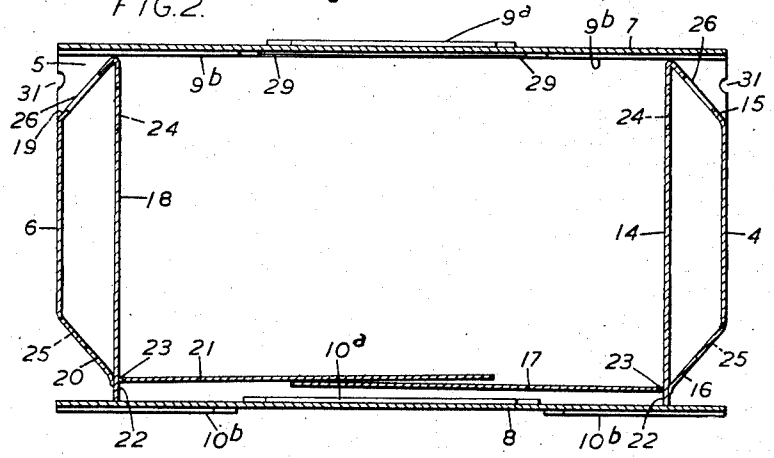
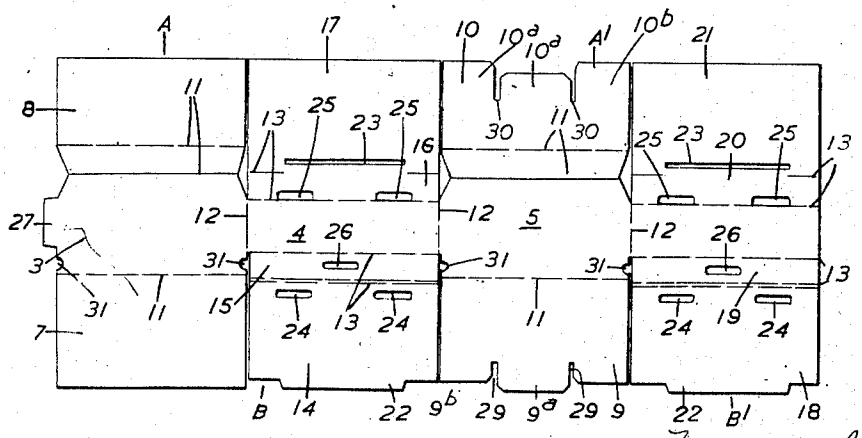


FIG. 3.



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Filed June 13, 1946 2 Sheets-Sheet 2

FIG. 4.

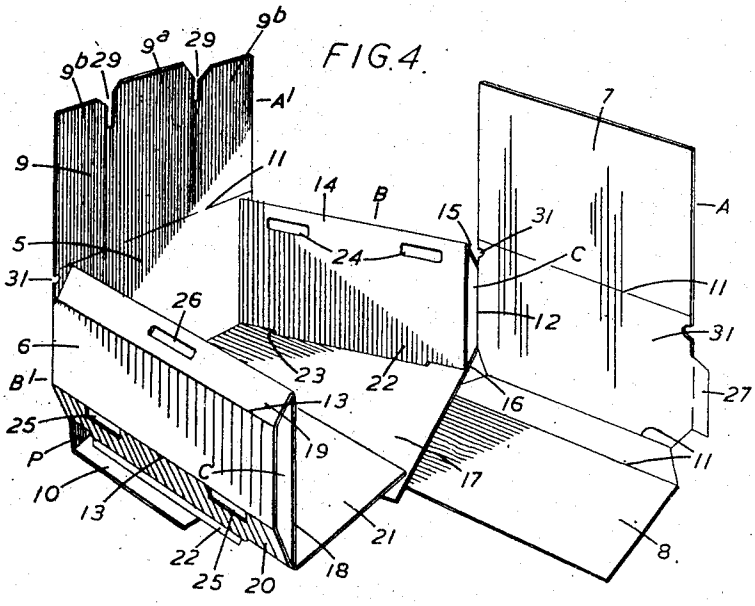


FIG. 5.

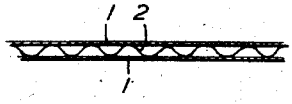
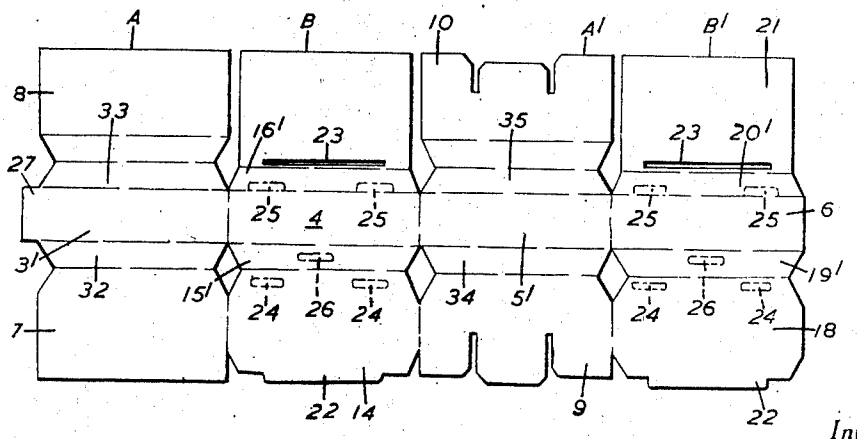


FIG. 6.



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UNITED STATES PATENT OFFICE

2,532,085

VENTILATED CARDBOARD CARTON

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4 Claims. (Cl. 229—16)

1

This invention has reference to improvements relating to boxes or cartons made of cardboard or similar materials.

One object of the invention is to provide a box or carton of this character which is so constructed as to provide for protection of the contents against crushing or squashing.

Another object is to provide a box or carton of the character aforesaid which is strong and admits of the ventilation of the interior even if a number of boxes or cartons are stacked in abutment with one another, and thus renders this form of the improved box or carton particularly suitable for the packing and transport of small live stock such as chickens and ducklings.

In order that the invention may be more clearly understood and readily carried into practical effect, some specific constructional examples thereof will now be described with reference to the accompanying drawings, wherein,

Figure 1 is a general perspective view of a collapsible box or carton which is especially suited for the packing and transport of small live stock such as chickens and ducklings,

Figure 2 is a cross-sectional view of the same, drawn to a larger scale and with the lid closed,

Figure 3 illustrates the single piece foldable blank (shown in its initially flat condition) from which the said box is made,

Figure 4 shows the box in the course of erection, but for illustration purposes with one of the four sections of the blank unconnected with the next adjacent section thereof,

Figure 5 is an enlarged detail sectional view of the three-ply material from which the blank is made, and

Figure 6 is a view similar to Figure 3 depicting a modified form of the blank.

Like parts are designated by similar reference characters throughout the drawings.

Referring to the example illustrated in Figures 1 to 4, the box or carton is made, from a blank such as that shown in Figure 3 of three-ply material of which the outer layers 1 are composed of stout paper and the inner layer 2 of a corrugated cardboard (see Figure 5), said blank being composed of four sections A, A^1, B and B^1 which are interconnected by foldable portions 3, 4, 5 and 6 located at the central parts of said sections. Two of the sections, A and A^1 which are generally similar, serve to constitute the lid, an outer bottom and front and back of the box or carton and will be referred to henceforth as the "lid and outer bottom sections," whilst the other two sections, B and B^1 which are

2

identical, serve to constitute the ends of the box or carton and an inner bottom, and will be termed hereinafter the "end sections."

The lid and outer bottom section A is composed of three panels 3, 7 and 8 and the section A^1 of the three panels 5, 9 and 10—all of substantially equal dimensions with lines 11 of folding which are at right angles to the lines 12 of folding between adjacent sections. These lid and outer bottom sections A and A^1 fold to form the lid, outer bottom and front and back of the box or carton in the usual manner of a collapsible box or carton of the well known four flap type.

The end sections B and B^1 which in the blank alternate with the lid and outer bottom sections A and A^1 are each composed of five panels which are defined by lines 13 of folding which also are at right angles to the lines 12 of folding between adjacent sections. Thus, the section B is composed of the panels 4, 14, 15, 16 and 17, whilst the section B^1 is composed of the panels 6, 18, 19, 20 and 21. The middle panels 4 and 6 are of a depth less than the depth of the erected box (see Figure 2) and have on opposite sides thereof the narrow panels 15 and 19 and 16 and 20 which will be called henceforth the top and bottom slope panels respectively. The upper panels 14 and 18 of the end sections B and B^1 are provided with tongues 22 which are adapted to be passed through slits 23 formed adjacent to the lines 13 of folding of the inner bottom panels 17 and 21 of the said end sections when the box or carton is erected. The upper panels 14 and 18 of the end sections B and B^1, moreover, are of the same depth as the middle panels 3 and 5 of the lid and bottom sections A and A^1 and are each provided adjacent to the appropriate lines 13 of folding with two ventilation slots 24 which are similarly arranged to two ventilation slots 25 formed in the respective bottom slope panels 16 and 20, whilst each upper slope panel 15 and 19 is provided with a single centrally disposed ventilation slot 26.

The middle panel 3 of the lid and outer bottom section A is provided with a short flap 27 which is adapted to be brought into abutment with the inner face of the outer portion of the middle panel 6 of the outermost end section B^1 and to be secured thereto, e. g. by staples 28 (see Figure 1). It must be understood that in practice the flap 27 is permanently attached to the panel 6. It is merely for the sake of clarity that the blank has been shown fully laid out in Figure 3. Similarly, in Figure 4 the sections A and B^1 are shown unconnected for illustration

purposes only, the section A being turned outwardly to show more clearly the general construction of the erected box or carton, and in particular to disclose the internal cavities C. Alternatively, the stitching flap 27 may be omitted, in which instance the central panels of the sections A and B^1 may be "taped" together.

The free marginal portion of the upper panel 9 of the lid and outer bottom section A^1 is provided with slits 29 which are adapted to have an interlocking engagement with the marginal portion of the upper panel 7 of the other lid and outer bottom section A, the central portion 9*a* between the slits 29 being centrally disposed and elongated so as to constitute a lifting flap for opening the lid, and the two outer portions 9*b* being located beneath the panel 7.

In a somewhat similar way the free marginal portion of the lower panel 10 of the section A^1 may, as shown, be provided with slits such as 30 to form central and outer divided portions 10*a* and 10*b* respectively adapted to have an interlocking engagement with the marginal portion of the panel 8 of the section A, as shown in Figure 2. As an alternative, the outer bottom panels 8 and 10 may form a butt joint and be secured together by adhesive strip material or tape applied to the joint to seal the box or carton, or the latter may be otherwise fastened when closed, as by means of string or the like.

For erection purposes, the sections (with the section A secured to the section B^1 as aforesaid) are first opened out into a rectangular shape whereupon the bottom panels 17 and 21 of the end sections B and B^1 are turned inwardly to form the inner bottom of the box or carton, and the upper panels 14 and 18 are turned inwardly and downwardly and the tongues 22 pushed through the slits 23. These folding operations involve also an inward inclination of the top and bottom slope panels 15 and 19 and 16 and 20 of the said end sections so that when the tongues 22 have been passed through the slits 23, the upper panels 14 and 18 constitute the inner end walls of the box or carton with the respective middle panels 4 and 6 externally disposed and with a cavity C between the presented inner faces of the respective upper and middle panels, all as shown in Figures 2 and 4. After erection, the middle panels 4 and 6 of the end sections are bounded by the inwardly and upwardly sloping panels 15 and 19 and the inwardly and downwardly sloping panels 16 and 20 and each cavity C is then in communication with the interior of the box or carton by way of the ventilation slots 24 adjacent to the appropriate folding line 13 of the upper panels 14 and 18, that is at the top of the inner wall, and with the atmosphere by way of the ventilation slots 25 in the bottom slope panels and the slots 26 in the top slope panels.

The lower panels 8 and 10 of the lid and outer bottom sections A and A^1 are then folded inwardly and interengaged in the manner depicted in Figure 2 to provide a closed outer bottom. The upper panels 7 and 9 of the sections A and A^1 are then turned inwardly to constitute the lid and may be interlocked by engaging the marginal portion of the panel 7 with the slits 29 in the marginal portion of the other panel with the lifting flap 9*a* on top.

It is considered that when a box or carton, with a body of the construction as just described is in use, fresh air enters the body by way of the lower openings 25, the cavities C and the lower edges of the upper openings 24, and the vitiated air leaves the interior of the body by way of the upper edges of the said upper openings 24, the cavities and the upper edges of the openings 26 in the top slope panels.

It will be perceived that the double walled ends in conjunction with the ventilation slots provide for an efficient but draughtproof ventilation of the interior of the box or carton, the sloping panels ensuring that ventilation passages are provided even if a number of boxes or cartons be stacked in abutment. In this latter connection, the free flow of air along the said ventilation passages is made certain by forming semi-circular or similar recesses such as those indicated at 31 in the vertical portions of the panels 3 and 5 adjoining the ends of the top slope panels 15 and 19.

The body of the box or carton has in effect a double or cavity bottom, the outer bottom panels 8 and 10 in conjunction with the tongues 22 forming ventilation passages P under the inner bottom panels 17 and 21 to dissipate heat when the box or carton contains livestock. The inner bottom panels 17 and 21 are preferably made so as to overlap, as shown clearly in Figure 2, and thus avoid the possibility of the claws of chicks being caught between the panels.

The modified blank shown in Figure 6 is in all essential respects similar to that previously described with reference to Figure 3, the principal differences residing in the shaping of the ends of the slope panels 15^1, 16^1, 19^1 and 20^1, and the provision of additional slope panels 32 and 33 and 34 and 35 at opposite sides of the middle panels 3^1 and 5^1 respectively, whereby when the blank is erected there will be provided a box or carton having top and bottom slope panels all round, that is to say not only at the ends but also at the front and at the back thereof.

What I claim then is:

1. A cardboard or like box which is formed from a blank composed of four lineally connected sections, with the ends of the blank joined to form a continuous loop, each section including a foldable flap extension at each unattached side thereof, interconnected by foldable portions, two of the said sections constituting the lid, an outer bottom and the front and back of the box, whilst the other two sections constitute an inner bottom, and double walled ends the inner and outer walls of which are formed respectively with internal and external ventilation openings whereby the internal cavities within the ends are placed in communication with the interior of the box and with the external atmosphere, the portions of the outer walls containing the external ventilation openings being sloped so that ventilation is assured in the event of boxes being stacked in abutment with one another.

2. A cardboard or like box which is formed from a blank composed of four connected sections, viz. two lid and outer bottom sections each comprising three panels with lines of folding disposed at right angles to the lines of folding between adjacent sections, said lid and outer bottom sections constituting the lid, an outer bottom and the front and back of the box, and two end sections alternating with the said lid and outer bottom sections, said end sections constituting an inner bottom, and double walled ends and each being composed of five panels defined by lines of folding which are also at right angles to the lines of folding between adjacent sections the middle panels of the said end sections being of a depth less than the depth of the erected box and having on each side thereof a slope panel, these slope

panels and the inner walls of the double walled ends having therein ventilation openings, for the purpose described.

3. A cardboard or like box as claimed in claim 2, wherein the lower edges of the panels constituting the inner walls of the double walled ends are formed with tongues adapted to be passed through slits formed in the inner bottom panels.

4. A cardboard or like box which is formed from a blank composed of four lineally connected sections, with the ends of the blank joined to form a continuous loop, each section including a foldable flap extension at each unattached side thereof, interconnected by foldable portions, two of said sections presenting lid panels formed to interlock outer bottom panels similarly formed to have interlocking engagement, outer bottom panels, and panels constituting the front and back of the box, whilst the other two sections present inner bottom panels formed with slits and inner and outer walls providing double walled ends, the inner and outer walls of which are formed respectively with internal and external ventilation openings whereby the internal cavities within the ends are placed in communication with the interior of the box and with the external atmosphere, the portions of the outer walls containing the external ventilation openings being sloped so that ventilation is assured in the event of boxes being stacked in abutment with one another, said inner walls being formed with tongues adapted to be passed through the aforesaid slits, and the outer bottom panels, in conjunction with the tongues, forming ventilating passages under the inner bottom panels.

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