Jan. 23, 1951 K. T. BUTTERY 2,538,860

AUTOMATIC SETUP BOX

Filed Sept. 23, 1948 3 Sheets-Sheet 1

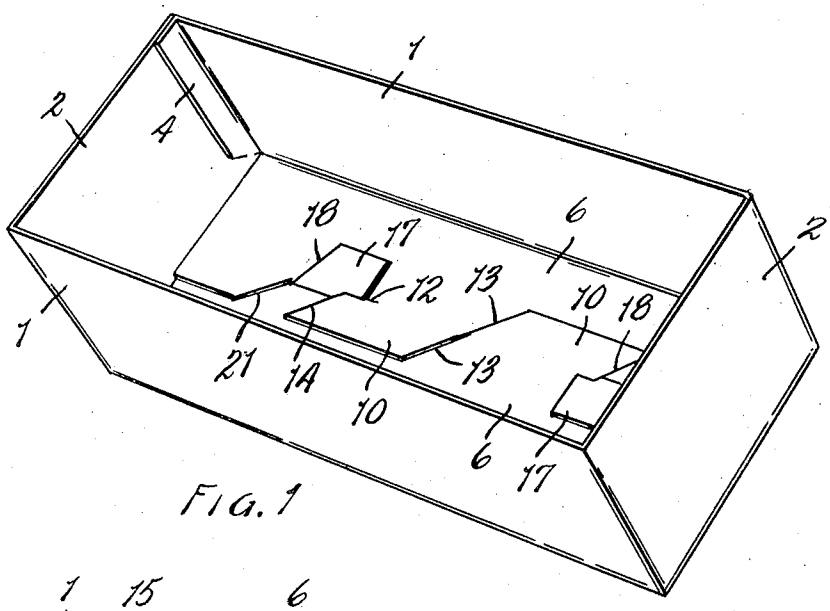


FIG. 1

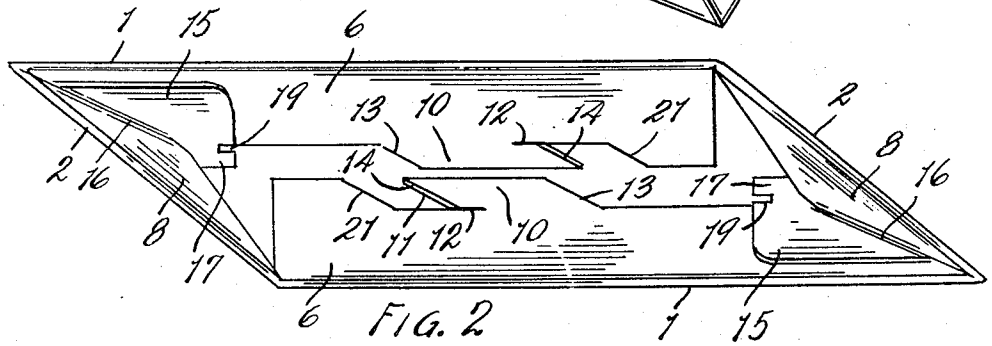


FIG. 2

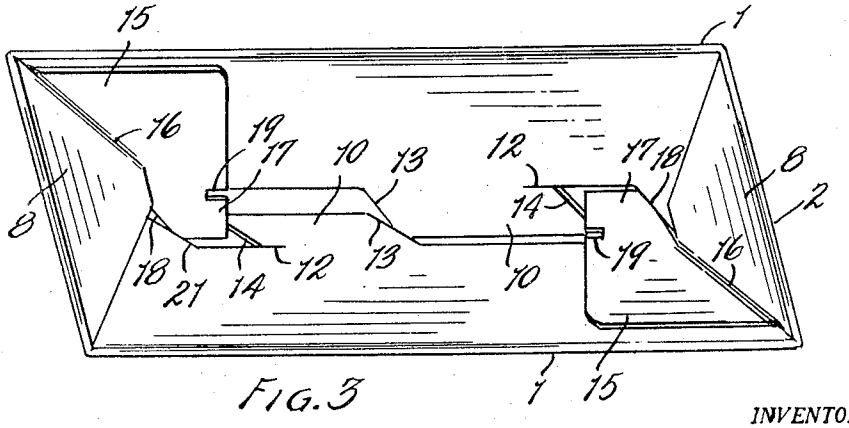


FIG. 3

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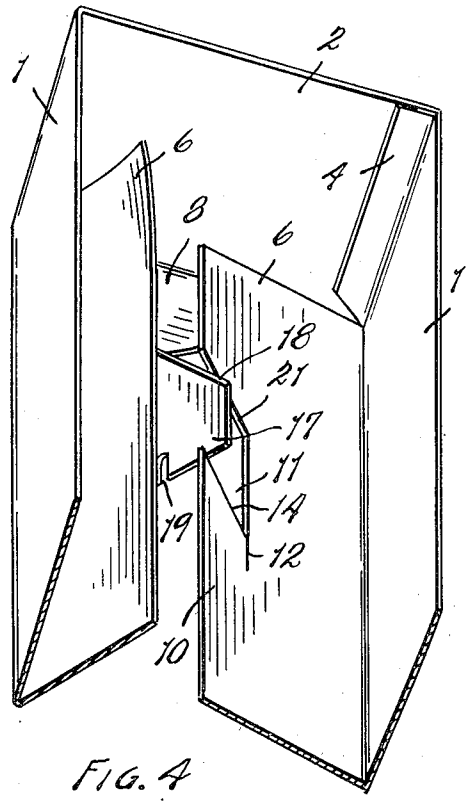


FIG. 4

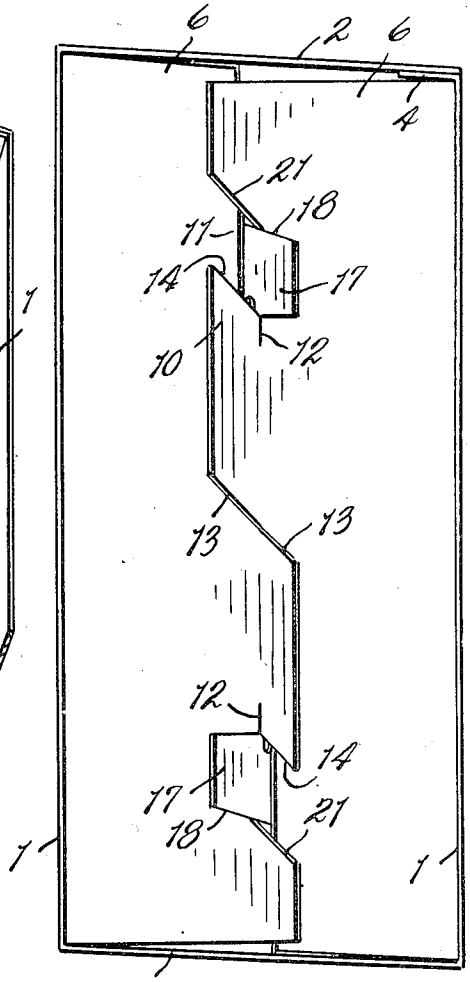


FIG. 5

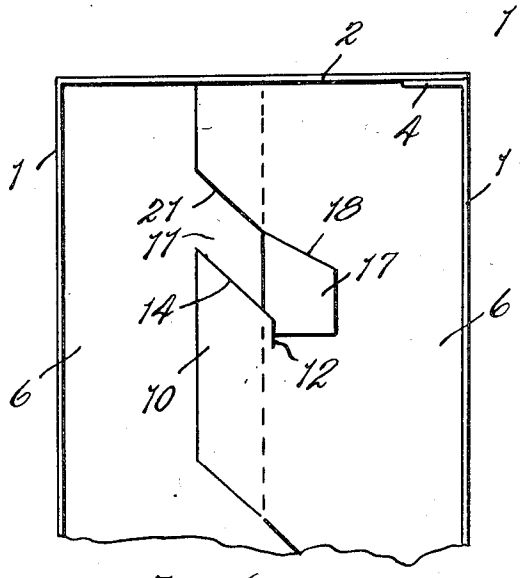


FIG. 6

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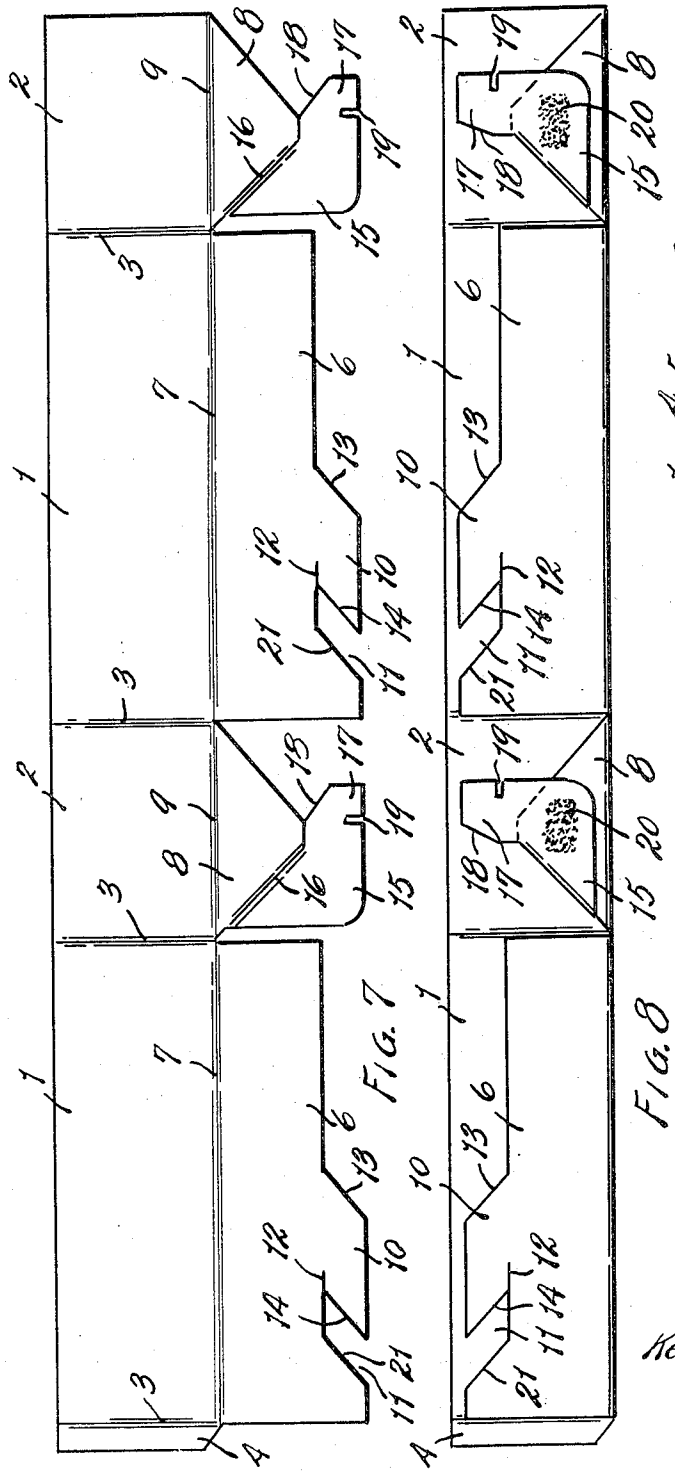

FIG. 7



FIG. 8

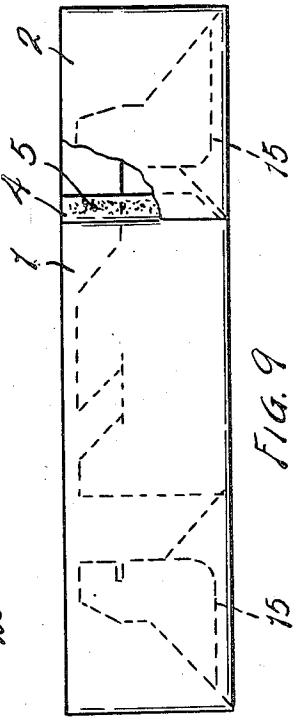

FIG. 9

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Patented Jan. 23, 1951 2,538,860

# UNITED STATES PATENT OFFICE

2,538,860

## AUTOMATIC SETUP BOX

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Application September 23, 1948, Serial No. 50,710

7 Claims. (Cl. 229—41)

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This invention relates to improvements in collapsible cartons which may be automatically erected by pressure on the ends of the collapsed structure.

The main objects of this invention are:

First, to provide a collapsible carton of the automatic erecting type in which the bottom parts are interlocked and capable of supporting a substantial load when in erected position.

Second, to provide a carton which may be automatically erected by pressure on opposite ends of a collapsed carton and the parts positively moved to erected position and which when erected coact to provide a stable bottom and to support the walls against racking stresses.

Third, to provide a structure having these advantages which may be economically produced from an integral blank, the parts secured together and folded or collapsed into compact form.

Objects relating to details and economies of the invention will appear from the description to follow. The invention is defined and pointed out in the claims.

A preferred embodiment of the invention is illustrated in the accompanying drawing, in which:

Fig. 1 is a perspective view of a box or carton embodying my invention.

Fig. 2 is a top plan view illustrating one of the stages in the erection of the carton.

Fig. 3 is a top plan view illustrating a succeeding stage in the erection.

Fig. 4 is an enlarged fragmentary perspective view partially in section further illustrating the interlocking engagement and the coacting relation of the parts while the carton is being erected.

Fig. 5 is a plan view of the carton with the parts in nearly the final stage of erection.

Fig. 6 is a fragmentary top plan view with the parts in erected position.

Fig. 7 is a plan view of the blank in the flat or extended position.

Fig. 8 is a plan view with the bottom members folded upwardly on the walls, adhesive being indicated on the coupling flaps prior to the sealing or securing of the parts together.

Fig. 9 is a side plan view of the collapsed blank.

In the specification and claims, I use the terms "side" walls and "end" walls for convenience in description. While the carton illustrated is elongated, it will be understood that it might be square, and that the dimensions and shape in these particulars are unimportant with the exception that the carton is rectangular when erected.

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The embodiment of my invention comprises side walls 1—1, end walls 2—2, hingedly joined end to end as by the scores conventionally illustrated at 3. The sealing flap 4, which is aligned with the walls, is hingedly joined to the adjacent wall as by scoring 3 so that when it is sealed, as indicated at 5, to the opposite ends of the blank, a tubular structure results.

The side bottom members 6—6 are hingedly connected to the bottom edges of the side walls as by means of scores 7. These side bottom members are of substantially the same length as the side walls. The end bottom members 8 are triangular and are hingedly secured to the ends 2 as by the scores 9—9. The side bottom members 6 have diagonally opposed tabs 10 preferably extending about one-half the length of the side bottom members. These tabs have diagonal slots 11 of substantial width and are provided with slits 12 extending from the bottom edges of the slots in parallel relation to the outer edges of the bottom side members.

The inner edges 13 of the tabs are inclined and are at an angle substantially parallel to the inner edges 14 of the slots 11. The end bottom members 8 have coupling flaps 15 hingedly connected to diagonally opposite edges thereof as by the scores 16. These flaps 15 extend beyond the inner ends of the end bottom members and are provided with tongues 17 having inclined inner edges 18 and notches 19 in their outer edges.

In the manufacture of the carton the blank is dyed and cut as shown in Fig. 7. The bottom members may then be folded upon their respective walls as shown in Fig. 8 the joining flaps 15 folded upon the end bottom members and adhesive applied as indicated at 20. The adhesive is also applied to the sealing flap 15. The blank thus folded is then folded upon itself and the sealing flap 4 secured to the opposite end of the blank. A tubular collapsed structure results with the bottom members folded upwardly.

To erect the box, end thrust is applied to the ends of this folded structure which swings the walls to an angular erected position or relationship to each other and swings the bottom members downwardly to erected position. The various stages of this erecting movement are illustrated in the drawings, Figs. 2, 3, 4 and 5 showing successive steps or positions. By reference to Fig. 3, it will be noted that the inner inclined edges 18 of the tongues coact with the outer in-

clined edges 21 of the slots 11 with a camming action and also that the inner inclined edges of the tabs 10 coact with each other with a camming action.

At the same time the side bottom members are pulled downwardly by the connection of the coupling flaps 15 thereto. This camming and interlocking action continues until the walls are in a right angular relationship or the box is fully erected, in which condition the notches 19 of the locking tongues engage the inner edges 22 of the slots 11, the slits 12 permitting some deflection of the tabs so that the bottom lies in a substantially flat condition.

The bottom tabs 10 of one side bottom member 6 overlap the other bottom member and this together with the tongues forms an effective support for the bottom members so that they are capable of carrying a substantial load. It is not ordinarily contemplated that the carton will be recollapsed after it has once been erected and used but it may be recollapsed with some care in the disengagement of the bottom members and the reversal of the erecting movement.

The structure is simple and economical to produce and may be quickly set up for use, the bottom being automatically erected when pressure is applied to the ends of the collapsed blank.

I have illustrated and described my invention in a highly practical embodiment thereof. I have not attempted to illustrate or describe certain modifications and adaptations which I contemplate as it is believed that this disclosure will enable those skilled in the art to embody or adapt my invention as may be desired.

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

1. A collapsible carton formed of an integral blank and comprising side and end walls hingedly connected end to end, opposed side bottom members hingedly connected to the bottom edges of the side walls and of a length substantially corresponding to that of the side walls, the said side bottom members having diagonally opposed tabs on their outer edges provided with diagonal slots, the inner end edges of the tabs being inclined inwardly in substantially parallel relation to the adjacent edges of the slots, there being slits at the bottoms of the slots extending toward the inner end edges of the tabs, opposed triangular end bottom members hingedly connected to the bottom edges of the end walls and having coupling flaps hingedly connected to their diagonally opposed edges and secured to the outer sides of the adjacent side bottom members, said coupling flaps having transversely projecting tongues at their outer ends disposed beyond the outer ends of the end bottom members and having notches on their outer edges, the inner edges of the tongues being inclined to coact with the outer inclined edges of the slots in the side bottom member flaps when the bottom parts are moved to erected position, the notches of said coupling flaps engaging the inner edges of the slots and the slits at the base of said slots receiving said tongues when fully erected, the inclined inner edges of said bottom member flaps being in coacting camming engagement as the bottom parts are swung to erected position, the ends of the wall portions blank being secured together and the side and end bottom members being folded upwardly at the inner sides of their respective walls when the carton is collapsed so that pressure on the ends of the collapsed carton acts to swing the walls to erected angular relation and erects the bottom members with the tongues of the coupling flaps in interlocking engagement with the slots of the side bottom member tabs and with the tabs in overlapping relation to the opposed side members, the said interengaging parts acting to hold the bottom in erected load supporting position and to brace the walls against racking distortion.

2. A collapsible carton formed of an integral blank and comprising side and end walls hingedly connected end to end, opposed side bottom members hingedly connected to the bottom edges of the side walls and of a length substantially corresponding to that of the side walls, the said side bottom members having diagonally opposed tabs on their outer edges provided with diagonal slots, the inner end edges of the tabs being inclined inwardly in substantially parallel relation to the adjacent edges of the slots, there being slits at the bottoms of the slots extending toward the inner end edges of the tabs, opposed triangular end bottom members hingedly connected to the bottom edges of the end walls and having coupling flaps hingedly connected to their diagonally opposed edges and secured to the outer sides of the adjacent side bottom members, said coupling flaps having transversely projecting tongues at their outer ends disposed beyond the outer ends of the end bottom members and having notches at their outer edges, the inner edges of the tongues being inclined to coact with the outer inclined edges of the slots in the side bottom member flaps when the bottom parts are moved to erected position, the notches of said coupling flaps engaging the inner edges of the slots and the slits at the base of said slots receiving said tongues when fully erected, the inclined inner edges of the side bottom member flaps being in coacting camming engagement as the bottom parts are swung to erected position.

3. A collapsible carton formed of an integral blank and comprising side and end walls hingedly connected end to end, opposed side bottom members hingedly connected to the bottom edges of the side walls and of a length substantially corresponding to that of the side walls, the said side bottom members having diagonally opposed tabs on their outer edges provided with diagonal slots, the inner end edges of the tabs being inclined inwardly in substantially parallel relation to the adjacent edges of the slots, opposed triangular end bottom members hingedly connected to the bottom edges of the end walls and having coupling flaps hingedly connected to their diagonally opposed edges and secured to the outer sides of the adjacent side bottom members, said coupling flaps having transversely projecting tongues at their outer ends disposed beyond the outer ends of the end bottom members, the inner edges of the tongues being inclined to coact with the outer inclined edges of the slots in the side bottom member flaps when the bottom parts are moved to erected position, the inclined inner edges of said bottom member flaps being in coacting camming engagement as the bottom parts are swung to erected position, the ends of the wall portions blank being secured together and the side and end bottom members being folded upwardly at the inner sides of their respective walls when the carton is collapsed so that pressure on the ends of the collapsed carton acts to swing the walls to erected angular relation and erects the bottom members with the tongues of the coupling flaps in interlocking engagement

with the slots of the side bottom member tabs and with the tabs in overlapping relation to the opposed side members, the said interengaging parts acting to hold the bottom in erected load supporting position and to brace the walls against racking distortion.

4. A collapsible carton formed of an integral blank and comprising side and end walls hingedly connected end to end, opposed side bottom members hingedly connected to the bottom edges of the side walls and of a length substantially corresponding to that of the side walls, the said side bottom members having diagonally opposed tabs on their outer edges provided with diagonal slots, the inner end edges of the tabs being inclined inwardly in substantially parallel relation to the adjacent edges of the slots, opposed triangular end bottom members hingedly connected to the bottom edges of the end walls and having coupling flaps hingedly connected to their diagonally opposed edges and secured to the outer sides of the adjacent side bottom members, said coupling flaps having transversely projecting tongues at their outer ends disposed beyond the outer ends of the end bottom members, the inner edges of the tongues being inclined to coact with the outer inclined edges of the slots in the side bottom member flaps when the bottom parts are moved to erected position, the inclined inner edges of the side bottom member flaps being in coacting camming engagement as the bottom parts are swung to erected position.

5. A collapsible carton formed of an integral blank and comprising side and end walls hingedly connected end to end, opposed side bottom members hingedly connected to the bottom edges of the side walls and of a length substantially corresponding to that of the side walls, the said side bottom members having diagonally opposed tabs on their outer edges provided with slots, there being slits at the bottoms of the slots extending toward the inner end edges of the tabs, opposed end bottom members hingedly connected to the bottom edges of the end walls and having coupling flaps hingedly connected to their diagonally opposed edges and secured to the outer sides of the adjacent side bottom members, said coupling flaps having transversely projecting tongues at their outer ends disposed beyond the outer ends of the end bottom members and having notches on their outer edges, the inner edges of the tongues being inclined to coact with the edges of the slots in the side bottom member flaps when the bottom parts are moved to erected position, the notches of said coupling flaps engaging the inner edges of the slots and the slits at the base of said slots receiving said tongues when fully erected, the ends of the blank being secured together and the side and end bottom members being folded upwardly at the inner sides of their respective walls when the carton is collapsed so that pressure on the ends of the collapsed carton acts to swing the walls to erected angular relation and erects the bottom members with the tongues of the coupling flaps in interlocking engagement with the slots of the side bottom member tabs and with the tabs in overlapping relation to the opposed side members.

6. A collapsible carton formed of an integral blank and comprising side and end walls hingedly connected end to end, opposed side bottom members hingedly connected to the bottom edges of the side walls and of a length substantially corresponding to that of the side walls, the said side bottom members having diagonally opposed tabs on their outer edges provided with slots, opposed end bottom members hingedly connected to the bottom edges of the end walls and having coupling flaps hingedly connected to their diagonally opposed edges and secured to the outer sides of the adjacent side bottom members, said coupling flaps having transversely projecting tongues at their outer ends disposed beyond the outer ends of the end bottom members, said tongues being disposed to project through the slots of said tabs and in overlapping relation to the inner sides of the opposed side bottom members when the carton is erected, the inner edges of the tongues being inclined to coact with the edges of the slots in the side bottom member flaps when the bottom parts are moved to erected position, the ends of the blank being secured together and the side and end bottom members being folded upwardly at the inner sides of their respective walls when the carton is collapsed so that pressure on the ends of the collapsed carton acts to swing the walls to erected angular relation and erects the bottom members with the tongues of the coupling flaps in interlocking engagement with the slots of the side bottom member tabs and with the tabs in overlapping relation to the opposed side bottom members.



7. In a collapsible carton formed of an integral blank, side and end walls hingedly connected end to end opposed side bottom members hingedly connected to the bottom edges of the side walls, opposed end bottom members hingedly connected to the bottom edges of the end walls, a first coupling flap having a hinge connection to one opposed end bottom member and secured to one opposed side bottom member and having a tongue projecting therefrom over the inner side of the other opposed side bottom member, a second coupling flap having a hinge connection with the other opposed end bottom member and secured to the side bottom member opposite from that to which the first coupling flap is secured and having a tongue projecting therefrom over the inner side of the side bottom member opposite from that over which the first tongue projects, the hinge connections of the first and second coupling flaps extending from diagonally opposed bottom corners of the carton, the side and end bottom members being folded upwardly at the inner sides of their respective walls when the carton is collapsed, so that pressure on the ends of the collapsed carton acts to swing the walls to erected angular relation and erects the bottom members with the tongues of the coupling flaps projecting over the inner sides of the opposed side bottom members.

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