Jan. 5, 1937. A. J. WEISS 2,066,753

KNOCK-DOWN CONTAINER

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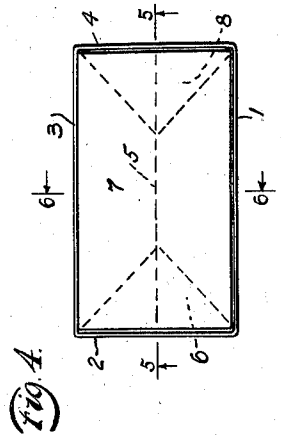


Fig. 4.

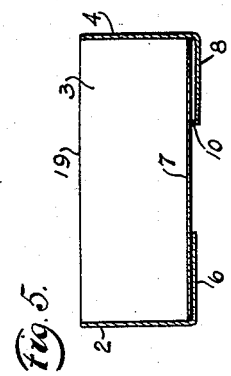


Fig. 5.

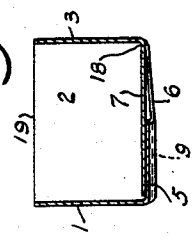


Fig. 6.

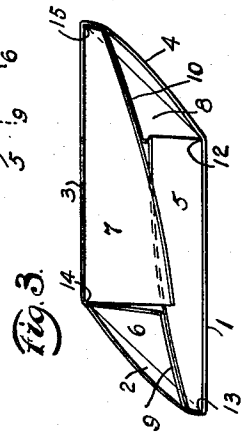


Fig. 3.

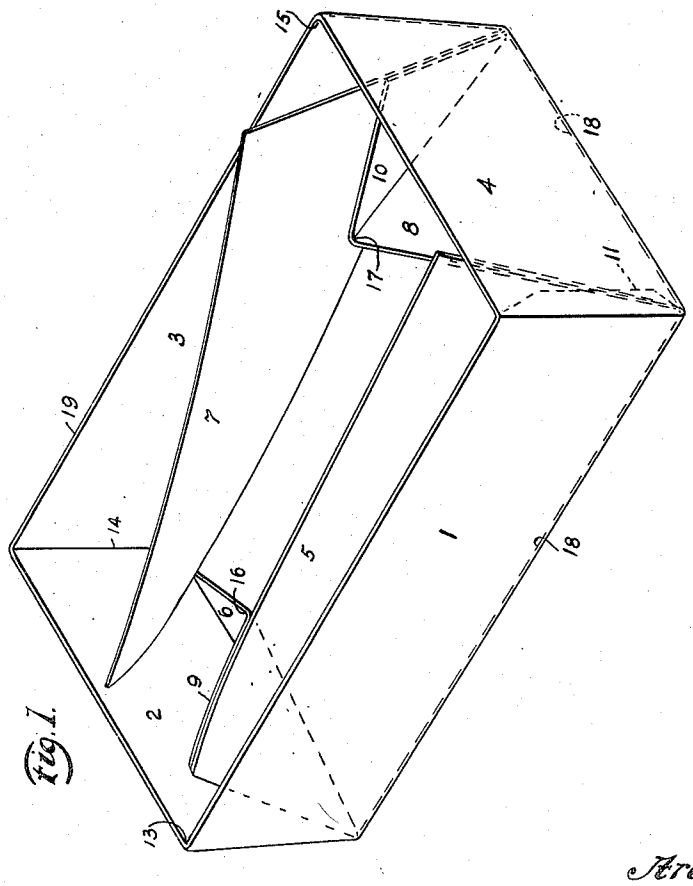


Fig. 1.

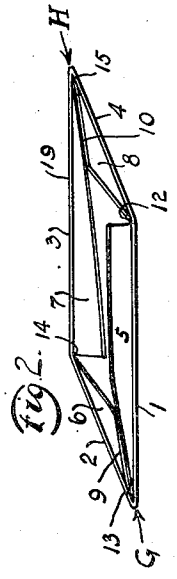


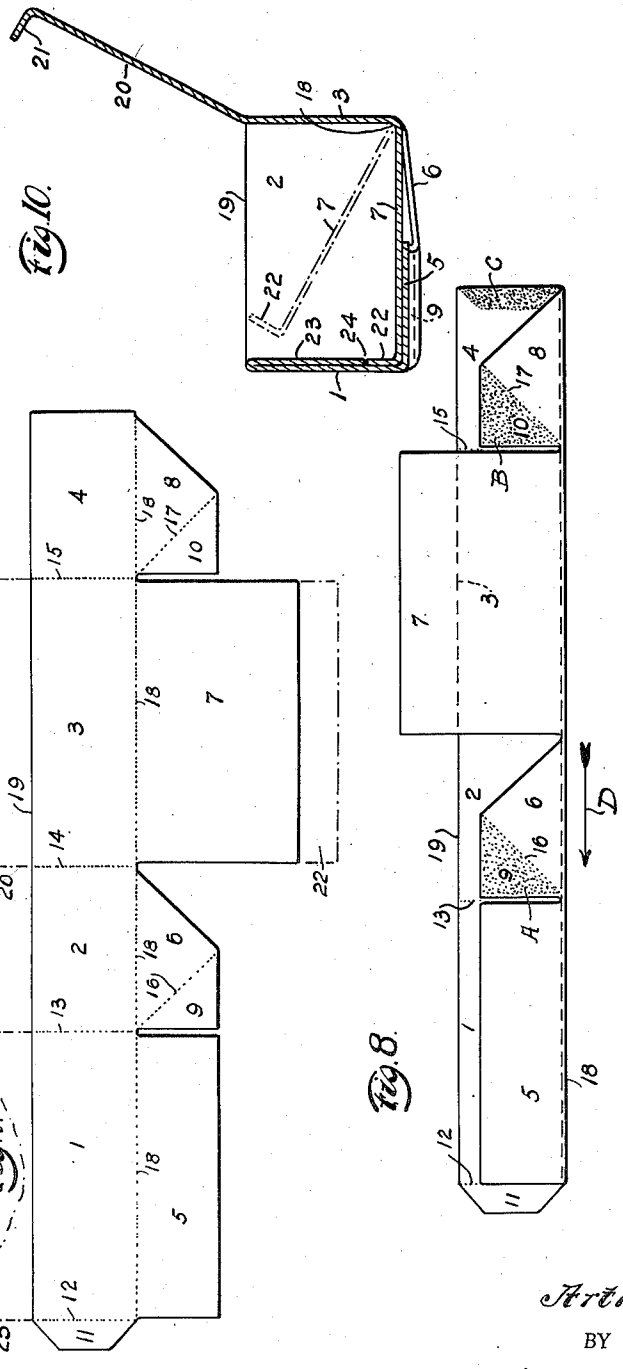
Fig. 2.

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KNOCK-DOWN CONTAINER

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UNITED STATES PATENT OFFICE

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KNOCK-DOWN CONTAINER

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Application January 26, 1935, Serial No. 3,575

9 Claims. (Cl. 229—41)

The present invention relates to knock-down cartons made of a one piece blank of paper board and has for its principal advantage that it can be made by automatic machines, in its entirety, and it comes from the carton making machine ready for erection into a carton.

Covers for the carton may be made in the same manner, the differences being only in dimension.

One of the important features of the present construction is in the provision, in the blank, of means thereon whereby to automatically form an interlocking closure for forming a top, or a bottom closure for the cover, or carton, respectively, these being automatically drawn into interlocking operative top or bottom forming position, upon erection of the side walls of the carton from the flat, knock-down position, to the erect, carton or cover forming condition.

The carton herein may have other features, common to such cartons such as double side walls, hinged display covers and the like, such as are auxiliary to the various forms of package cartons in use, without interfering with or changing the simpler embodiment herein disclosed.

These and other features will be apprehended as the herein description proceeds, and it is obvious that modifications may be made in the structure herein, without departing from the spirit hereof or the scope of the appended claims.

In the drawings;

Fig. 1 is a perspective view of the carton, partially erected;

Fig. 2 is a plan view thereof showing the carton in the act of being opened up into erected form from the flat;

Fig. 3 shows a view similar to Fig. 2, with the carton opened still further;

Fig. 4 shows the carton, plan view, fully opened into rectangular form;

Fig. 5 is a sectional view taken on the line 5—5, Fig. 4, looking in the direction of the arrows;

Fig. 6 is a sectional view taken on line 6—6, Fig. 4, looking in the direction of the arrows;

Fig. 7 is a plan view of the blank of the carton;

Fig. 8 is a flat view of the first step of overfolding the bottom forming portions of the carton over and on to the side wall forming panels;

Fig. 9 shows the finished carton, in the flat, ready for erection into a rectangular body; and

Fig. 10 is a transverse sectional view, similar to Fig. 6, showing the present self-forming bottom carton with modified details of cover tuck flap and bottom latch.

The carton blank generally denoted by 19, as in Fig. 7, is made up of one piece, and comprises two side forming panels 1 and 3, and two end forming panels 2 and 4, with a glue lap 11 scored from panel 1 by score line 12. Panels 1, 2, 3 and 4 are defined from each other by transverse score lines 13, 14 and 15, respectively.

The bottom forming panels comprise two rectangular, main, bottom forming panels 5 and 7, and two triangular bottom locks 6 and 8.

The panels 5 and 7 and the locks 6 and 8 are defined from all of the side forming panels by a common, medial and longitudinal score line 18, which traverses the entire length of the blank 19.

Bottom locks 6 and 8 have each a triangular glue lap 9 and 10 scored therefrom respectively, by diagonal score lines 16 and 17. Thus, in effect, lock 6 and its glue lap 9, and lock 8 and its glue lap 10 are unitary, and, as will be later described, become bottom and end panel connecting means, whereby erection of the sides of the carton, from the flat, cause automatic infolding of the bottom or closure forming elements into orderly carton forming assembly.

After the blank has been made, as in Fig. 7, it is placed in an automatic machine, and as it passes therethrough, in the direction of the arrow D, Fig. 8, bottom forming panel 5, which is half the width of bottom forming panel 7, is infolded over onto side forming panel 1, and in sequence, or simultaneously, the locks 6 and 8 with their glue laps 9 and 10 and the bottom panel 7, are infolded down over side forming panels 2, 3 and 4, all being folded on common score line 18.

Thereafter the blank, as folded in Fig. 8, is spotted with glue at three places, at A, B and C, thus covering the area of the glue laps 9 and 10 to their score lines 16 and 17, respectively, and covering a limited end portion of the side panel 4 as at C, Fig. 8.

After the gluing step, the blank moves along further in the machine and panels 1 and 5 are infolded onto the blank on score line 13, thus causing the glued area A to attach itself to the face of panel 5; then, the next step is to infold panel 4 and its glued superposed connecting panel 8 over onto the blank, as in Fig. 9, thus causing the glued lap 10 and its glued area to affix itself to the surface of bottom panel 3, and to attach glue portion C of panel 4 to glue lap 11.

As thus described, the carton blank has been turned into a flat, knocked down carton member by three successive steps of infolding, and is thus

ready, after the glue laps have set to be shipped in bundles to the user.

The user, to open the knocked down structure into a carton structure, pushes simultaneously on the ends G—H, in the direction of the arrows adjacent, thus causing the structure to open as in Fig. 2.

Continued pushing on the ends of the structure gradually brings the carton into the form shown in Fig. 3, and finally, as the side forming panels reach full rectangular position as in Fig. 4, the major bottom forming panel 7 may be pushed down into its bottom forming position on top of panel 5 and connectors 6 and 8, as in Fig. 4.

The act of pushing on corners G and H as described causes the end panels 2 and 4 to straighten from the flat knock-down position to the full rectangular open carton position, and as illustrated in Fig. 3, and, due to the fact that the lock panels 6 and 8 are scoredly attached to end panels 2 and 4 and said lock panels being also attached by their triangular glue laps 9 and 10 to bottom forming panels 5 and 7, respectively, the opening action causes the lock panels to follow the outwardly moving side panels 2 and 4, and this action draws the bottom panels from their normal knock-down position downwardly into the bottom of the carton, the glue laps 9 and 10, being gradually bent on their score lines 16 and 17 until they finally reach their final overlapped, bottom forming positions, in which the panel 5 and the triangular lock panels 6 and 8 form the exterior bottom while the panel 7 forms the interior carton bottom.

During the erecting operation the carton forming elements, as illustrated in Fig. 3, in an exaggerated manner, flex a little as the bottom forming members pass from their flat knock-down position into carton forming position. The paper board being flexible, easily accommodates this flexure without harm.

The operation of opening this carton from the flat to the full open position is practically and substantially instantaneous.

After the carton has been opened full and the bottom 7 set into final operative position, the exterior lock panels 6 and 8 prevent the bottom 7 from being pushed out of the carton and lock it against collapse of contained load. This is due to the attachment of said panels 6 and 8 to end panels 2 and 3 and to their being glued to panels 5 and 7 at their adjacent triangular faces 9 and 10.

The mode of assembly of the herein noted carton also prevents its collapse as a carton, and once erected it is rigid and proof against accidental collapse.

In the modification shown in Fig. 10 like parts of this modified form are identified by like indices as shown on all previous views. The differences of this modification over the other figures lie in the addition to the blank of a cover 20, scored from the top edge of side panel 3, said cover having a tuck flap 21 whereby the hinged cover may be folded down and held closed by the tuck flaps 21 being pushed or tucked on the inside face of panel 1.

In addition the front wall panel 1 is provided with a doubled in flap 23, which is glued to the inner face of said wall panel 1, to reinforce the same, and its lower edge, as at 24, terminates short of the bottom of the carton, leaving a latch space in which to receive the lock tab 22 scored off the front edge of bottom 7, thereby to lock the bottom 7 in operative position. These modifications are indicated by broken away dot and dash lines on the blank 19, in Fig. 7.

It will be seen that, as the blank is disclosed in Fig. 7, that the side forming walls 1 and 3 are alternated to the end forming members 2 and 4, and that the side forming members have scored therefrom the minor, half size rectangular bottom forming member 5 which is connected to side member 1, and the other, inside, full size bottom forming member 7 is attached to side forming member 3, and that the bottom forming members 5 and 7 are alternated by the lock flaps 6 and 8.

Having thus described the invention what is claimed is:

1. A blank of paperboard which is provided with fold lines and turned into a flat folded, extensibly erectable carton comprising two staggered side walls, two end walls connecting said side walls; a bottom disposed between said walls and including two rectangular members which are continuous with the side walls; and two triangular members continuous with said end walls, each of the triangular members having an oblique edge portion attached to one of the respective rectangular members, so that when said walls are extended to the erect or vertical position, said members may be drawn thereby into horizontal position to form the extended bottom.

2. A knockdown box constructed of stiff sheet material having therein fold lines and including opposed side walls which are movable inwardly in parallel relation, opposed end walls connecting said side walls and being movable therewith into folded position; a closure including inwardly swingable rectangular folds which are carried by said side walls, and inwardly swingable triangular panels carried by said end walls and disposed outside of said folds; said panels having their apices on the central line of the box and there being one of the oblique edge portions of each of said panels hingedly attached to one of the respective folds, whereby the closure may also be urged into folded position.

3. A carton comprising a sheet of paperboard having therein fold lines to provide two opposed ends and a front side which have extending therefrom coacting bottom supports, a reinforcing flap turned inwardly from the top of said side and extending nearly to the supports so as to leave an elongate recess thereat, a rear side disposed between said ends and having extending therefrom a rectangular bottom closure which at its front and opposite end margins finds a seat on said supports, said rear side having extending from the top thereof a cover, and a latch strip extending from said front margin to lockingly engage in said recess.

4. A carton made from a blank of paperboard comprising two side wall members having rectangular bottom flaps thereon, two connecting end wall members having thereon triangular locking flaps which cooperate with the first flaps, said second flaps being secured at one of their respective side edges to the first flaps by attaching members.

5. A knockdown box of rectangular formation constructed of stiff sheet material having fold lines therein and providing a side wall and an end wall which are foldable inwardly in an oblique direction, an opposite side wall and end wall which are foldable inwardly in the opposite oblique direction, whereby to close the box, and four members which are hingedly continuous with the respective walls, the two members of the side

walls being rectangular, the two members of the end walls being triangular, one of said triangular members having one of its side edges hingedly attached on an oblique line at one end of a rectangular member, the other triangular member having its opposite side edge hingedly attached on an oblique line at the opposite end of the other rectangular member, said members being in flat extended closed position when the side walls are in the open position, whereby as said walls are closed inwardly said members may be drawn inwardly therebetween into substantial flat folded position.

6. A collapsible carton comprising four hingedly connected side walls and a bottom having four flaps hingedly connected with the walls, there being one flap on each wall; said flaps including a rectangular member having an area equal to half of the area of the closed bottom, an uppermost rectangular member having an area greater than that of the first member whereby to at least partly overlap said first member in the closed position; the other two members of the flaps being lowermost and each having an obliquely disposed edge portion hingedly connected with one of the respective rectangular members, so that when pressure is applied to obliquely opposite corners of the carton said walls may be closed inwardly, whereby to also draw said members inwardly and upwardly, into substantial flat closed position.

7. A foldably erectable and knockdown carton comprising four hingedly connected walls and a bottom having four flaps disposed in flat collapsed state between said walls; said flaps including a rectangular member having its free end edge extensible to the central line of the erect carton, an uppermost or covering rectangular member having an area substantially twice as great as that of the first member, two lowermost or outer members each of which has an obliquely disposed edge portion permanently and hingedly attached to one of the respective rectangular members, so that when pressure is applied to the opposite ends of the collapsed walls the latter may be moved outwardly whereby to draw said members downwardly into flat horizontal bottom closing position, the three free edge portions of said uppermost member being adapted to substantially engage against three of said associated walls.

8. A foldably erectable carton comprising four hingedly connected walls and a bottom having four flaps disposed in flat collapsed state between said walls, one of said walls being a front wall and having on its inner face a reinforcing fold which extends nearly to the bottom of the wall so as to provide a recess thereat; said flaps including a rectangular member which has its free end edge extensible to the central line of the erect carton, an uppermost or covering rectangular member including a main portion having an area practically twice as great as that of the first member, two lowermost members each of which has an obliquely disposed edge portion permanently and hingedly attached to one of the respective rectangular members, and a latch strip extending from the front margin of said covering member, so that when pressure is applied to the opposite ends of the collapsed walls the latter may be moved outwardly into the erect position, whereby to also draw said members into horizontal bottom forming position, said strip being engageable in said recess.

9. A foldably erectable carton comprising four hingedly connected wall panels and a bottom having four flaps disposed in flat collapsed state between the panels, said panels including a front wall and a rear wall which have extending from their top portions separate folds, the front fold being disposed in reinforcing relation on the inner face of its associated wall and being extended nearly to the bottom of said wall so as to provide a recess thereat; said flaps including a rectangular member which is extensible half way across the carton in the erect postion, an uppermost or covering rectangular member including a main portion having an area substantially equal to that of the complete bottom in said position, two lowermost members each of which has an obliquely disposed edge portion permanently and hingedly attached to one of the respective rectangular members, and a latch strip extending from the front margin of said covering member, so that when pressure is applied to the opposite ends of the collapsed walls the latter may be moved outwardly into erect position, whereby to also draw said members into horizontal bottom closing position, said strip being engageable in said recess.

ARTHUR J. WEISS.