April 11, 1939. M. E. SEIFER 2,154,218

ONE-PIECE FOLDING CARDBOARD BOX

Filed April 26, 1937 2 Sheets-Sheet 1

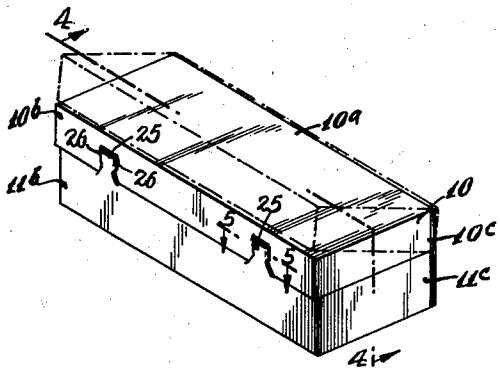


Fig. 1.

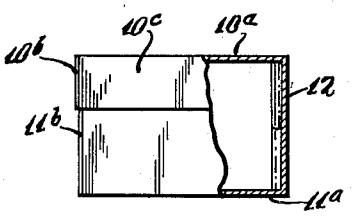


Fig. 3.

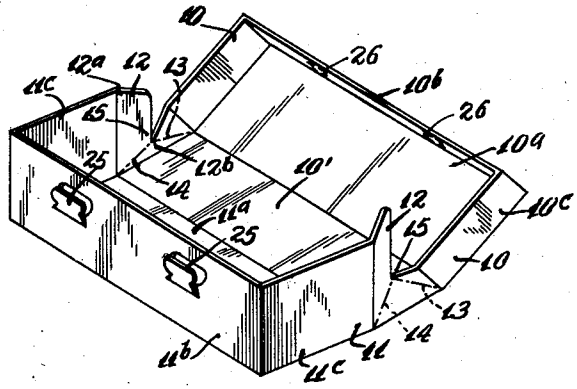


Fig. 2.

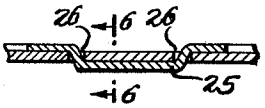


Fig. 5.

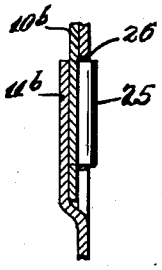


Fig. 6.

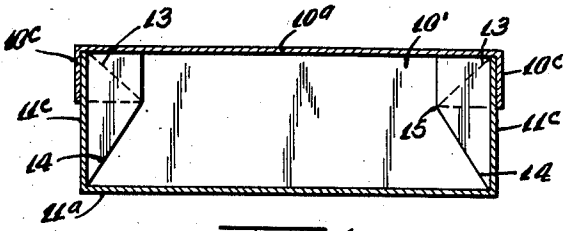


Fig. 4.

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ONE-PIECE FOLDING CARDBOARD BOX

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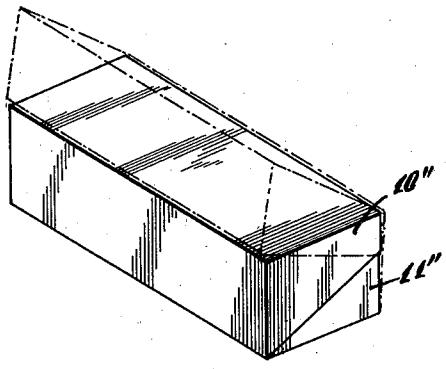


Fig. 10.

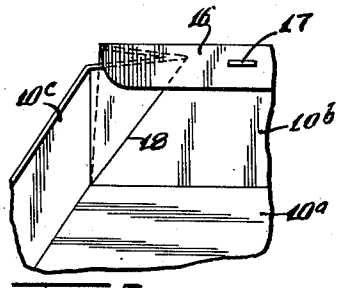


Fig. 8.

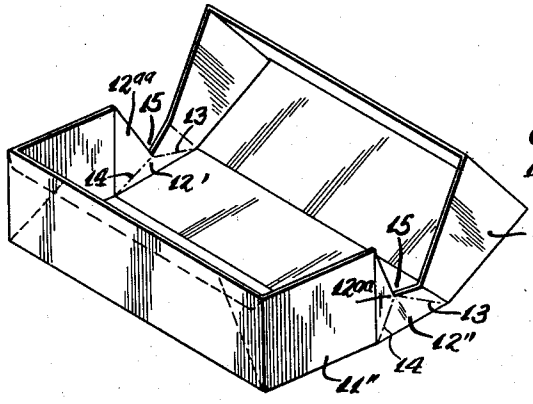


Fig. 11.

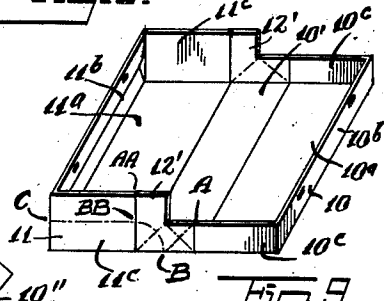


Fig. 9.

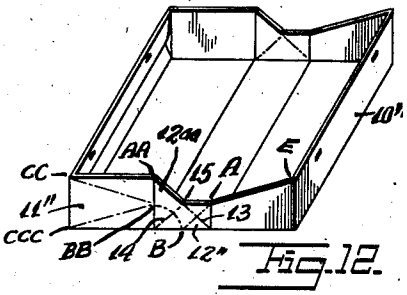


Fig. 12.

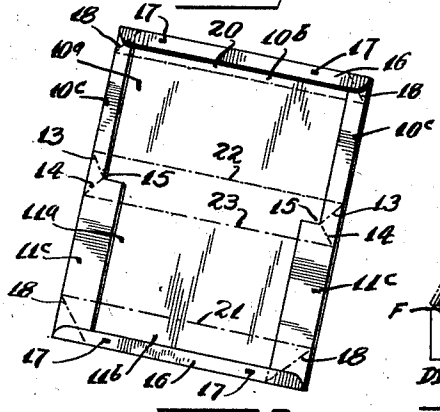


Fig. 7.

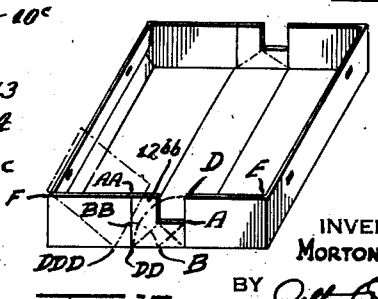


Fig. 13.

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Patented Apr. 11, 1939 2,154,218

UNITED STATES PATENT OFFICE

2,154,218

ONE-PIECE FOLDING CARDBOARD BOX

Morton E. Seifer, New York, N. Y.

Application April 26, 1937, Serial No. 138,961

5 Claims. (Cl. 229—31)

This invention relates to new and useful improvements in a one piece folding cardboard box. In part, the subject matter of this application is similar to that disclosed in my previous application, Serial No. 753,847, filed on November 20, 1934.

The dominant object of this invention is to so construct the one piece folding box that it is capable of being closed and opened without distorting parts thereof. Heretofore boxes very similar to those covered by this invention have been made. This invention distinguished from these prior constructions primarily in the location of the pivot point, or point of turning and sliding of the cover of the box. In accordance with this invention the pivot point or point of turning and sliding of the cover is so arranged that it is not necessary to bend and distort portions of the box to open and close the same.

The invention has for a further object the construction of a box as mentioned which is characterized by a lid section and a body section, and arranged in such a manner so as to be foldable from a flat, inoperative position into an open, operative position.

Still further the invention particularly proposes an arrangement wherein each section of the box, that is, the lid and body sections, have main walls, outer side walls, end walls, and are arranged with a side wall common to the lid and body sections, and certain foldable substantially L-shaped webs connecting like end walls and arranged with folds in a certain manner so that the box may operate as previously mentioned.

Still further the invention contemplates a provision wherein the box may be made to function with the lid thereof hinging upon one creased edge of the material of the box, or opening up by the motion of one of the side walls thereof.

Another object of the invention is the construction of article as mentioned which is simple and durable and which can be manufactured and sold at a reasonable cost.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

Fig. 1 is a perspective view of a box constructed according to this invention, and illustrated in the closed position.

Fig. 2 is a perspective view of the box shown in Fig. 1, in an open position.

Fig. 3 is an end view looking from the right hand end of Fig. 1, but illustrated with a portion thereof broken away to illustrate interior parts.

Fig. 4 is a sectional view taken on the line 4—4 of Fig. 1.

Fig. 5 is a fragmentary horizontal sectional view taken on the line 5—5 of Fig. 1.

Fig. 6 is a fragmentary sectional view taken on the line 6—6 of Fig. 5.

Fig. 7 is a view of the box opened up into the flat position.

Fig. 8 is a fragmentary perspective view of one of the corners of the box illustrated in a partially closed position.

Fig. 9 is a perspective view of the box shown in an open condition.

Fig. 10 is a perspective view of a box constructed according to a modification of this invention, and illustrated in the completely closed position.

Fig. 11 is a perspective view of the box illustrated in Fig. 10 in an open condition.

Fig. 12 is a perspective view of the box illustrated in Figs. 10 and 11 but showing the box in an open position.

Fig. 13 is a perspective view of a box of modified form.

The one piece folding cardboard box, according to this invention, comprises a lid 10 of shallow height and a body section 11 of relatively deep height. These sections have main walls 10^a and 11^a respectively, outer side walls 10^b and 11^b respectively, end walls 10^c and 11^c respectively, and a common inner side wall 10'. This side wall 10' forms a portion of the body section of the box and also forms one of the sides of the lid of the box. All of said walls are connected and foldable with reference to each other.

Foldable L-shaped webs 12 are connected like end walls 10^c and 11^c of the sections and are arranged with the vertical arms 12^a foldably joining with the end walls 11^c of the body section and with the horizontal arms 12^b foldably joining with the end walls 11^c of the lid section. These L-shaped webs are also formed with converging lines of folds 13 and 14 from the bottom corners thereof to the inner corners 15 of the junctions of the arms 12^a and 12^b. The folds 13 and 14 are inward, while the folds between the edges of the L-shaped webs at the end walls are outward so that the box may be folded from the open position illustrated in Fig. 2, to the closed position illustrated in Fig. 4.

Figs. 7 and 8 illustrate the construction of the cardboard box in further detail, so that a construction wherein the box may be completely collapsed into a flat condition may be understood. More particularly, the ends 16 of the material forming the box are bent inwards and held down with staples 17. These staples are spaced from the sides of the material so that the ends of the end walls may be engaged thereunder as clearly illustrated in Fig. 7. The ends of the walls are formed with diagonal folds 18 from the inner corners and arranged so that each end wall may be moved to its operative position as illustrated in Fig. 8. The full line 20 is for the purpose of forming the side wall 10b of the lid. The score line 21 is for the purpose of forming the side 11b of the body section. The score lines 22 and 23 locate the common inner side wall 10. It is believed that the other parts of the box may be readily recognized by the reference numerals as applied previously.

A means is provided for locking the box in the closed position and this means comprises several lugs 25 stamped from the material of one of the side walls, preferably, the side wall 11b of the body section, and engageable into receiving slots 26 formed in the side wall 10b. These lugs 25 are so constructed that their ends may be bent inwards, as clearly illustrated in Fig. 1, and engaged through the openings 26 and then allowed to bend laterally, as shown in Fig. 5, so as to hold the closed position. Since the lugs 25 are relatively stiff, they will naturally assume the position illustrated in Fig. 5 when the ends thereof are engaged through the openings.

In Fig. 9 the box is shown in the open position. It should be noted that when the box is closed the point A will theoretically first move over to the position B along the dot and dash line between these points. Then, as the cover of the box is closed the point B will swing upward in an arc to the position BB. During this period the cover of the box will engage across the body of the box and will assume the position indicated by the line BB and C. A feature of the invention is that the width of the box (between the points D and E) is substantially equal to or slightly larger than the distance between BB and C. Therefore, the cover of the box will easily close upon the body of the box. Practically the point A will move in some path to the point AA and then slide down to the point BB.

In Figs. 10 to 12 a modification of the invention has been disclosed which distinguishes from the prior form in the construction of the lid and the junction of the sides of the lid with the side walls of the body section. The one piece folding box comprises a lid 10'' which at its free end is of the same height as the body section 11''. The side walls of the lid are cut at an angle so that the inner ends thereof are substantially ½ the height of the outer ends. These inner ends connect with the bottom arms of foldable substantially L-shaped webs 12''. Each of these webs has a vertical arm 12aa which has its inner side cut at an inclination and extending from the top outer corner downwards to the junction of the vertical and horizontal arms.

Each L-shaped web 12'' is formed with converging lines of folds 13 and 14 from the bottom corners thereof to the inner corners 15 of the junction of the said vertical and horizontal arms. The folds 13 and 14 are inwards, while the folds between the edges of each L-shaped web at the end walls are outwards so that the box may fold from an open position as shown in Fig. 11 to the closed position shown in Fig. 10. In other respects this form of the invention is identical to the previous form an dsimilar parts may be identified by the corresponding reference numerals.

In Fig. 12 an open view of the box is illustrated. The box closes theoretically in the following manner: The point A first moves over to the position B and then as the box is closed B moves on the arc over to the position BB. The cover of the box then is engaged over the body of the box and when the bottom inclined edge of the cover first engages the body it will be at the position CC, and in the same closed position of the box it will be at the position CCC. A feature of the invention resides in the fact that the cover of the box pivots about the point BB to close the cover on the body of the box. Furthermore, the length of the edge of the cover of the box between the points D and E is equal to the length between the points BB and CC, and the points BB and CCC. For this reason the box is capable of being closed without the necessity of crushing the side walls. Practically, the point A will move in the same path to the point AA and then slide down to the point BB when the box is closed.

In Fig. 13 another form of the invention has been disclosed. In this form there is an L-shaped web portion 12bb between the side walls of the body and the side walls of the cover. The side walls of the cover are of the same depth as the side walls of the body portion. When this box is closed the point A will theoretically first travel along the dot and dash lines to the position B, and then along the arcuate line to the position BB. From this position the cover portion will pivot. When the cover is initially moved to close the box the point D will travel along the dot and dash line to the position DD and then to the position DDD.

In practice, when the box is closed, the cover is not moved so far that the point A really reaches the theoretical point B, since at the same time that the cover is being pivoted it is being lifted to engage it over the body portion. It may be lifted to a position in which the point A reaches the point AA on the body portion. From this point AA the point A will slide downwards to the position BB. It will not be necessary to distort the side walls of the box because the distance on the cover from the point A to the point E is equal in length or slightly greater than the distance from the point BB to the point F.

The portion of the side wall of the cover between the line AE and the point D is merely excess material which is in a position so as not to interfere with using the points A to pivot the box cover closed.

The dot and dash lines in Fig. 10 indicate the box in Fig. 12 in a position before it is completely closed. These dot and dash lines clearly show the cover pivoting about the mid-point of the height of the box.

While I have illustrated and described the preferred embodiments of my invention, it is to be understood that I do not limit myself to the precise constructions herein disclosed and the right is reserved to all changes and modifications coming within the scope of the invention as defined in the appended claims.

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

1. A one piece folding box comprising a lid

section and a body section, each of said sections having a main wall, outer side walls, end walls, and an inner side wall common to both sections, all of said walls being connected and foldable with reference to each other, and substantially L-shaped webs having legs of substantially equal length connecting like end walls of the sections and arranged with the vertical arms foldably joining with the end walls of the body section and with the horizontal arms foldably joining with the end walls of the lid section, and converging lines of folds from the bottom corners of the webs to the inner corners of the junctions of the arms thereof.

2. A one piece folding box comprising a lid section and a body section, each of said sections having a main wall, outer side walls, end walls, and an inner side wall common to both sections, all of said walls being connected and foldable with reference to each other, and substantially L-shaped webs having legs of substantially equal length connecting like end walls of the sections and arranged with the vertical arms foldably joining with the end walls of the body section and with the horizontal arms foldably joining with the end walls of the lid section, and converging lines of folds from the bottom corners of the webs to the inner corners of the junctions of the arms thereof, the vertical arms of said L-shaped webs being cut off at a slant.

3. A one piece folding box comprising a lid section and a body section, each of said sections having a main wall, outer side walls, end walls, and an inner side wall common to both sections, all of said walls being connected and foldable with reference to each other, and substantially L-shaped webs having legs of substantially equal length connecting like end walls of the sections and arranged with the vertical arms foldably joining with the end walls of the body section and with the horizontal arms foldably joining with the end walls of the lid section, and converging lines of folds from the bottom corners of the webs to the inner corners of the junctions of the arms thereof, and the end walls of said lid section being cut at an inclination so that the outer wall of the lid section is as deep as the body section, while the inner ends of the end walls connect with the arms of said L-shaped webs.

4. A one piece folding cardboard box, comprising a lid of shallow height, and a body section of deep height, each section having a main wall, outer side walls, end walls, with an inner side wall common to both sections, all of said walls being connected and foldable with reference to each other, foldable L-shaped webs having legs of substantially equal length connecting like end walls of the sections and arranged with the vertical arms foldably joining with the end walls of the body section, and with the horizontal arms foldably joining with the end walls of the lid section, and converging lines of folds from the bottom corners of the webs to the inner corners of the junctions of the arms thereof, said lid pivoting about a point midway between the height of said body section.

5. A one piece folding box comprising a lid section and a body section, each of said sections having a main wall, outer side walls, end walls, and an inner side wall common to both sections, all of said walls being connected and foldable with reference to each other, and substantially L-shaped webs having legs of substantially equal length connecting like end walls of the sections and arranged with the vertical arms foldably joining with the end walls of the body section and with the horizontal arms foldably joining with the end walls of the lid section, and converging lines of folds from the bottom corners of the webs to the inner corners of the junctions of the arms thereof, and the end walls of said lid section being cut at an inclination so that the outer wall of the lid section is as deep as the body section, while the inner ends of the end walls connect with the arms of said L-shaped webs, said lid pivoting and sliding about a point midway between the height of said body section.

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