May 11, 1943. M. ULLMAN 2,319,018

SELF-LOCKING BOX

Filed July 12, 1940

FIG. 1

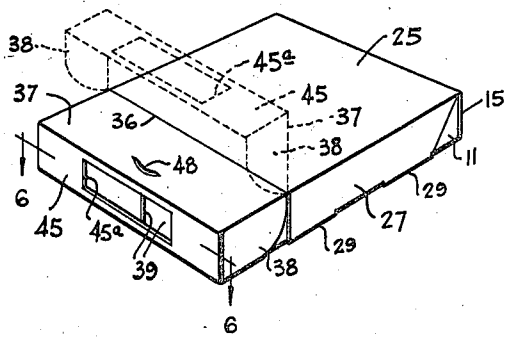


FIG. 4

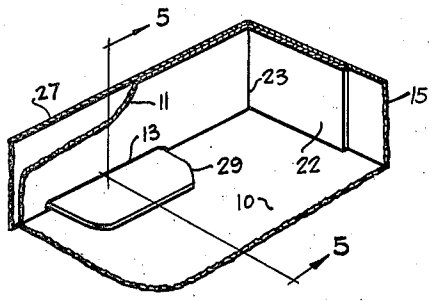


FIG. 2

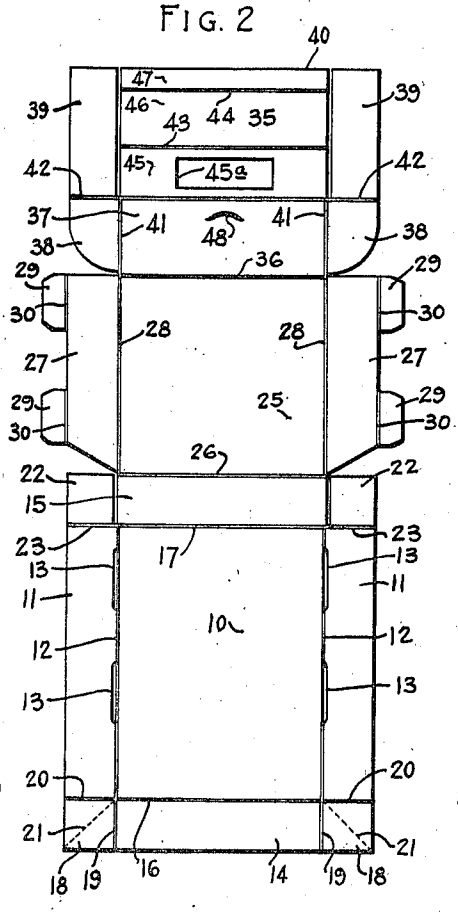


FIG. 3

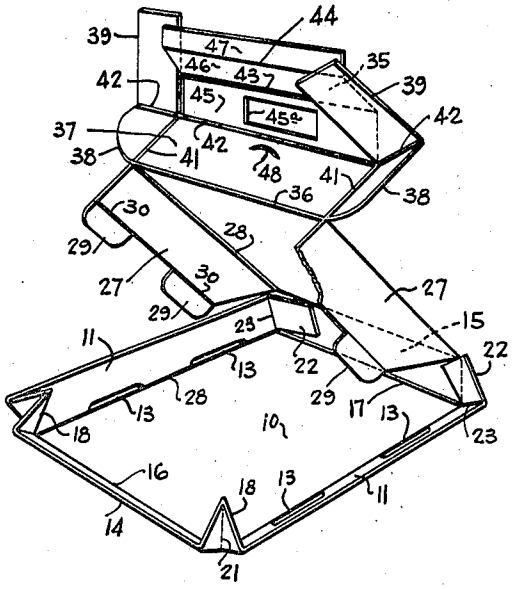


FIG. 6

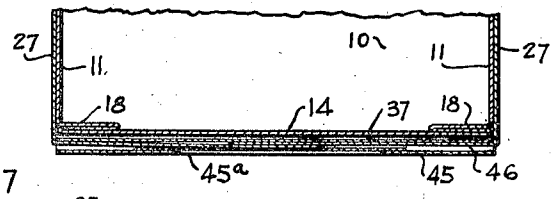


FIG. 5

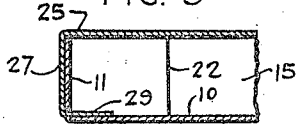
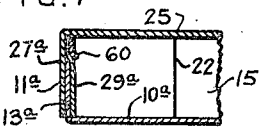


FIG. 7



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SELF-LOCKING BOX

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Application July 12, 1940, Serial No. 345,201

4 Claims. (Cl. 229—33)

This invention relates to folding box structures of a type which may be constructed from paper board or fiber board.

An object of the invention is to provide a self-locking folding box structure constructed of paper board or like material.

Another object of the invention is to provide a folding box which can be assembled from a single box-blank form, and which may be locked in the assembled condition by suitable locking tabs.

A still further object of the invention is to provide a folding paper board box, of one piece construction, wherein a permanent cover section is provided for a portion of the box and a movable cover section is provided for the remaining portion of the box.

Another object of the invention is to provide a paper board box structure wherein the front wall of the retaining member of the box is hinged in such a manner as to permit the front wall to assume a planar relation with the bottom of the box when a hinged lid portion is raised.

A still further object of the invention is to provide a one piece paper board box structure having a permanent cover section locked in position, and having a movable cover section hinged to the permanent cover section which is constructed in such a manner that the vertical front wall of the movable cover section provides means whereby a placard or identification card may be positioned behind a window in the wall.

Further objects and advantages of the present invention will be apparent from the drawing and a reading of the description which follows.

In the drawing:

Figure 1 is a perspective view of the assembled box of this invention;

Figure 2 is a plan view of the box in an enfolded condition, that is, the box-blank;

Figure 3 is a perspective view of the box in a partially folded condition;

Figure 4 is a partial perspective view partly in cross-section showing the manner of locking the box assembly;

Figure 5 is a cross-sectional view taken along line 5—5 of Figure 4;

Figure 6 is a horizontal cross-sectional view taken along line 6—6 of Figure 1;

Figure 7 is a cross-sectional view similar to that of Figure 5 but shows a modified arrangement of locking the box assembly.

In this invention, a fiber board sheet is precut and scored along certain lines so that the various elements of the box will assume their proper relationship with respect to each other when the elements are folded along the various scored lines. By following a set procedure of folding, the box can be assembled and the various parts locked into position. The box generally consists of a bottom section having a side, front and rear walls attached thereto which provide the retaining portion of the box. A permanent cover section is hinged to the rear wall and is provided with suitable flaps and locking tabs for securing the cover section in its proper relation with the walls of the box. A movable cover section is hinged to the permanent cover section and is provided with suitable flaps and tabs which, when folded, will provide a hinged cover for the box. The front wall of the box is hinged to the bottom wall and the side walls in such a manner that it may open outwardly into planar relation with the bottom, but is normally retained in its upward closed position by the movable cover section.

In this invention the box consists of a bottom section 10 to which the side walls 11 are hingedly mounted upon the scored lines 12. The slots 13 are provided in the scored lines 12 in such a manner that when the side walls 11 are arranged at right angles to the bottom section 10, the slots 13 will be adjacent the inner face of the bottom 10. A front wall 14 and a rear wall 15 are hingedly mounted to the bottom wall 10 by means of the scored lines 16 and 17, respectively. Intermediate flaps 18 are positioned between the front wall 14 and the side walls 11 and are substantially square shaped. These flaps 18 are hingedly mounted to the front wall 14 by means of the scored lines 19 and to the side walls 11 by means of the scored lines 20. These scored lines 19 and 20 are continuations of the scored lines 12 and 16, respectively, and are in alignment therewith. A diagonal perforation 21 is provided in the flaps 18 and extends from the intersection of the scored lines 19 and 20 to the outer point of the flaps 18. These intermediate flaps 18 are so scored that when they are folded along the scored lines 19, 20, and the perforation line 21 the flaps 18 will fold into the interior of the box and adjacent the front or side wall 14 or 11, respectively.

Tabs 22 are hingedly mounted upon the scored lines 23 which are continuous extensions of the scored lines 17 and are in alignment therewith. The tabs 22 are free on three sides thereof and are adapted to lie adjacent the inner side of the rear wall when the box is in folded condition.

A permanent cover section 25 comprises an integral extension of the bottom and rear wall

portions 10 and 15, respectively, and is hingedly mounted upon the rear wall 15 by means of the scored line 26, which line is parallel to the scored line 17. This scored line 26 is positioned a distance from the scored line 17 equal to the width of the side walls 11 so that when folded upon the lines 17 and 26, a rear wall 15 is provided of the same height as the side walls 11.

The permanent cover section 25 is provided with side flaps 27 which are hingedly mounted upon the permanent cover section 25 by means of the scored lines 28. These lines 28 are at right angles to the scored line 26 and are in alignment with the scored lines 12 of the bottom section 10 whereby the flaps 27, when folded upon the scored lines 28, will lie adjacent the side walls 11. The side flaps 27 are provided with locking tabs 29 which are hingedly mounted upon the scored lines 30, which lines are parallel to the scored lines 28 whereby the locking tabs 29, when folded, will assume a parallel relation to the permanent cover section 25 and the bottom section 10. The locking tabs 29 are adapted to extend through the slots 13 to lock the box in folded condition.

A movable cover section 35 is an integral extension of the permanent cover section 25 and is hingedly mounted thereto upon the scored line 36. The movable cover section 35 consists of a cover area 37, side flaps 38, tabs 39 and a three part front flap 40. The side flaps 38 are hingedly mounted upon the cover area 37 by means of the scored lines 41 which lines are in alignment with the scored lines 28 and 12, whereby the side flaps 38 will be caused to lie adjacent the side walls 11 when folded upon the scored lines 41. The tabs 39 are hingedly mounted upon the scored lines 42, which lines are at right angles to the scored lines 41 to permit the tabs 39 to assume a right angle relationship with respect to the tabs 38 when folded upon the scored line 42.

The front flap 40 is also hingedly mounted upon the scored line 42. This front flap 40 is, however, provided with two additional scored lines 43 and 44 which are arranged parallel to the scored line 42 thereby dividing the front flap 40 into three parts, 45, 46 and 47. A window 45*a* is positioned in the part 45 of the front flap 40. When this front flap is folded upon the scored line 43. The parts 45 and 46 will be positioned immediately adjacent each other. The part 47 will then be positioned adjacent the inner face of the cover area 37 and may be folded so as to be parallel thereto. A slit 48 is provided in the cover area 37. The part 47 of the front flap 40 is adapted to engage the slit 48 and retain the various members of the movable cover 35 in their respective relations to each other.

In order to fold the box from the blank form, as disclosed in Figure 2, the side walls 11, the front wall 14 and the rear wall 15 are folded upwardly at right angles to the bottom 10. The tabs 22 are folded inwardly from the rear wall 15 so that they may assume a position at right angles to the walls 11 and lie immediately adjacent the rear wall 15 when the side walls 11 have been raised to their vertical position. The intermediate flaps 18 are folded upwardly along the scored lines 19 and 20 and the perforated line 21, thereby allowing the front wall 14 to move upwardly when the side walls 11 are raised vertically, while at the same time providing a hinged joint between the bottom section 10 and the side walls 11 whereby the front wall may be moved downwardly into planar relation with the bottom 10 any time after the box is in folded condition.

After the side, front and rear walls have been folded upwardly at right angles to the bottom 10, the permanent cover section 25 is then folded along the scored line 26 to bring the cover area parallel with the bottom 10 but in spaced relation thereto and adjacent the vertical walls 11. The side flaps 27 are then bent downwardly to enclose the side walls 11 thereby retaining the side walls in a vertical position, and retaining the tabs 22 within the box and adjacent the rear wall 15.

The locking tabs 29 are then bent inwardly into parallel relation with the bottom 10 and are forced into engagement with the slots 13 thereby locking the permanent cover section 25, the side walls 11 and the end wall 15 into permanent relationship.

The movable cover section 35 is then folded into assembled condition. The side flaps 38 are folded upwardly along the scored lines 41 while the tabs 39 are folded upwardly along the scored line 42, whereby the tabs 39 will be positioned at a right angle to the side flap 38, and the side flap 38 will be positioned at a right angle to the cover area 37. The part 45 of the front flap 40 is then bent upwardly adjacent the tabs 39 while the part 46 is bent around the tabs 39 and adjacent their inner faces, whereby the tabs 39 are retained in position between the parts 45 and 46 of the flap 40. The window 45*a*, being in the part 45, will thus be positioned adjacent the tabs 39, cooperation of which parts permit insertion of a placard between the part 45 and tabs 39 which will be exposed through the window 45*a*. The part 47 will assume a position parallel with the inner face of the cover area 37 and the edge thereof may then be brought into engagement with the slit 48 to retain the elements of the movable cover section and their respective folded positions.

It is thus seen that the movable cover section 35 may be hinged upon the scored line 36 and when in closed position, as disclosed in Figure 1, it will be seen that the front wall 14 of the box will be retained behind the folded flap 40 of the cover section, thereby closing the box opening.

The tabs 29 on the permanent cover section 25, having been inserted in the slots 13, will lie immediately adjacent the bottom wall 10 when the box is in folded condition. Since these flaps 29 are folded upon a right angle and are positioned within the slots 13, it will be seen that the permanent cover section 25 will be retained from vertical movement, whereby the walls and permanent cover section are locked together.

To insure locking of the tabs 29 to prevent lateral movement thereof there is shown an arrangement in Figure 7 whereby the tabs 29 are folded upwardly immediately adjacent the side walls 11, and are retained in this position by a lock provided in the side wall 11.

In this modification the side wall 11*a* is provided with a slit 60 similar to the slit 48 in the movable cover section 35. A slot 13*a* is positioned in the side wall 11*a* immediately adjacent the bottom 10*a* through which the tab 29*a* may extend. The tab 29*a* is hingedly secured to the side flap 27*a* in the same manner as heretofore described in regard to the tab 29.

This arrangement may be applied to the box-blank as disclosed in Figure 2 and when the box is to be folded the same procedure of folding

is followed as described with regard to Figure 2. In the arrangement of Figure 7, however, when the tabs **29***a* are inserted through the slots **13***a*, the tabs will then be folded upwardly immediately adjacent the side walls **11***a*. The end of the tab **29***a* will be caused to engage the slit **60** whereby the tab will be retained in the upwardly folded position to prevent lateral movement of the tab **29***a* and the side flap **27***a*, whereby the folded box will be securely locked in folded condition.

It is to be understood that the locking means for the tab **29***a* may be applied for use in combination with one or more of the tabs **29** disclosed in Figure 2. Preferably the locking means would be applied to the tabs positioned closely adjacent the movable cover section **35**, however, it could be applied to all of the tabs if desired.

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

1. In combination in a one piece box having a self-locking enclosed portion, a lid hinged thereto and a hinged front wall to permit access to the enclosed portion, a bottom, side walls, a hinged front wall and a stationary rear wall, a permanent cover section comprising an extension of said rear wall folded on a scored line joining opposite top rear corners of said side walls and including side flaps extending adjacent said side walls and locking tabs extending from said flaps, slots in said side walls adjacent said bottom, slits in said side walls intermediate the top and bottom thereof, said tabs extending through said slots and folded upwardly adjacent said side walls into engagement with said slits in said side walls to secure said tabs in the upwardly folded position to lock said bottom, side walls and end wall in folded relationship with said permanent cover section, and a movable cover section hinged to said permanent cover section to permit free access to the enclosure formed by said permanent cover section and having side flaps and a front flap adapted to extend adjacent said side walls and said front wall when in closing position upon said box.

2. In combination in a one piece self-locking box having a self-locking enclosed portion, a lid hinged thereto and a hinged front wall to permit access to the enclosed portion, a bottom section, side walls, front and rear wall sections, intermediate flaps providing extensions of said side walls when said front wall is hinged forwardly connecting said front wall and said side wall sections and foldable therewith to form integral hinge joints, a hinged tab extending from the end of each of said side walls foldable therewith and engaging the inner face of said rear wall to form box corners, a permanent cover section comprising a cover area extending from said rear wall section including side flaps and locking tabs extending from said side flaps foldable upon suitable scored lines to position said cover area in spaced parallel relation to said bottom with said side flaps enclosing said side walls, slots in said side walls adjacent said bottom, slits in said side walls intermediate the top and bottom thereof, said tabs extending through said slots and folded upwardly adjacent said side walls into engagement with said slits in said side walls to secure said tabs in the upwardly folded position to lock said bottom, sides and end wall to said permanent cover section to provide a permanently folded enclosure, and a movable cover section hinged to said permanent cover section to permit free access to the enclosure formed by said permanent cover section and having interconnected side flaps and a multiple part front flap adapted to extend adjacent said side walls and said front wall when in closing position upon said box, said front flap being folded upon itself to provide a pocket within which a label can be inserted, and a window in said pocket for viewing the label positioned therein.

3. A one piece box blank having a bottom portion, a front portion, a rear wall portion and side wall portions hinged thereto, intermediate flaps hinged to said side wall portions and said front wall portion to interconnect same and having a diagonal score line to permit same to be folded into a box corner, tab means hinged to the end of said side wall portions opposite to said intermediate flaps and adapted to be folded against said rear wall portion, a permanent cover section hinged to said rear wall portion and including side flaps hinged at right angles to said cover hinge and a locking tab extending beyond the marginal limit of each of said flaps, locking slits in said side wall portions to receive said locking tabs, a movable cover section hinged to said permanent cover parallel to said permanent cover hinge and including side flaps hinged at right angles to said movable cover hinge, tabs hinged to said flaps parallel to said movable cover hinge, a three part front flap having parallel scored lines to permit said flap to be folded upon itself and have a part thereof adjacent the top area of said movable cover when in folded condition, and a slit in the top surface of said movable cover forming a tongue to receive the foremost edge of said three-part front flap which interlocks with said tongue to retain said movable cover in assembled relationship.

4. In combination in a one piece self-locking box having a self locking enclosed portion, a lid hinged thereto and a hinged front wall to permit access to the enclosed portion, a bottom section, side wall, front and rear wall sections, intermediate flaps connecting said front wall and said side wall sections and foldable therewith to form integral hinge joints as extensions of said bottom and said side walls when said front wall is hinged forwardly, a hinged tab extending from the end of each of said side walls foldable therewith and engaging the inner face of said rear wall to form box corners, a permanent cover section comprising a cover area extending fom said rear wall section including side flaps and locking tabs extending from said side flaps foldable upon suitable scored lines to position said cover area in spaced parallel relation to said bottom with said side flaps enclosing said side walls, slots in said side walls adjacent the fold line between said side wall and said bottom, said tabs extending through said slots and in engagement with said bottom to lock said bottom, sides and end wall to said permanent cover section when in folded condition, and a movable cover section hinged to said permanent cover section as an extension thereof and having side flaps provided with locking extensions and a multiple part front flap adapted to be folded upon itself to retain said locking extensions therebetween, and a slit in said movable cover section forming a tongue and the front flap received in the slit and interlocking with the tongue to retain said movable cover in assembled relationship.

MARTIN ULLMAN.