United States Patent

[11] 3,608,812

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[45] Patented **Sept. 28, 1971**
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[54] **FLIP-TOP CARTON LOCK**
5 Claims, 9 Drawing Figs.

[52] **U.S. Cl.** ..... **229/37 R,** 229/44 CB, 229/45
[51] **Int. Cl.** **B65d 5/08,** B65d 45/00
[50] **Field of Search** ..... 229/44, 44 CB, 45, 51 RC, 37, 33, 36

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ABSTRACT: This disclosure relates to a lock for a flip-top carton. The lock comprises a flap hingedly connected to a panel of the carton body and tab means associated with the flip-top adapted to cooperate with the flap for releasably locking the flip-top in a closed condition. A slit is provided in the fold line along which the flap is hinged to the body panel whereby bending of the body panel will cause the flap to flex thereby disengaging the tabs and releasing the lock.

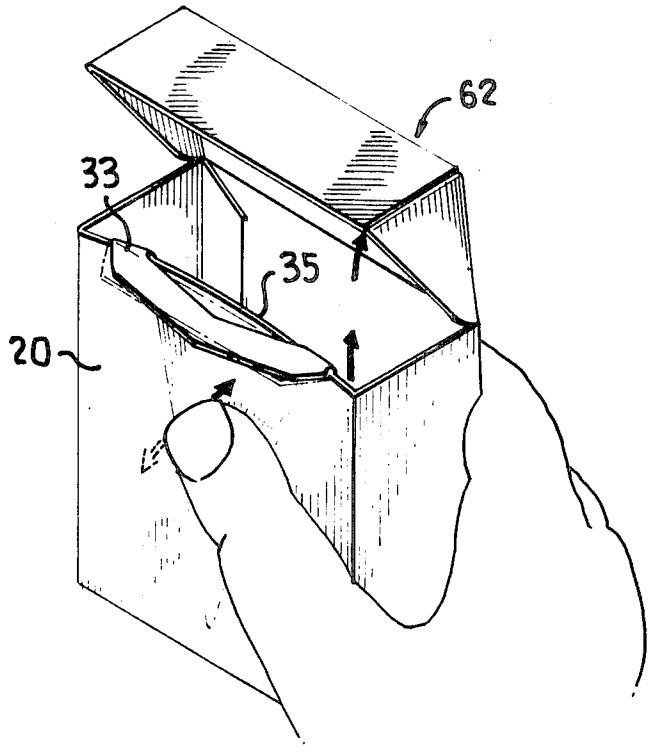

FIG. 1

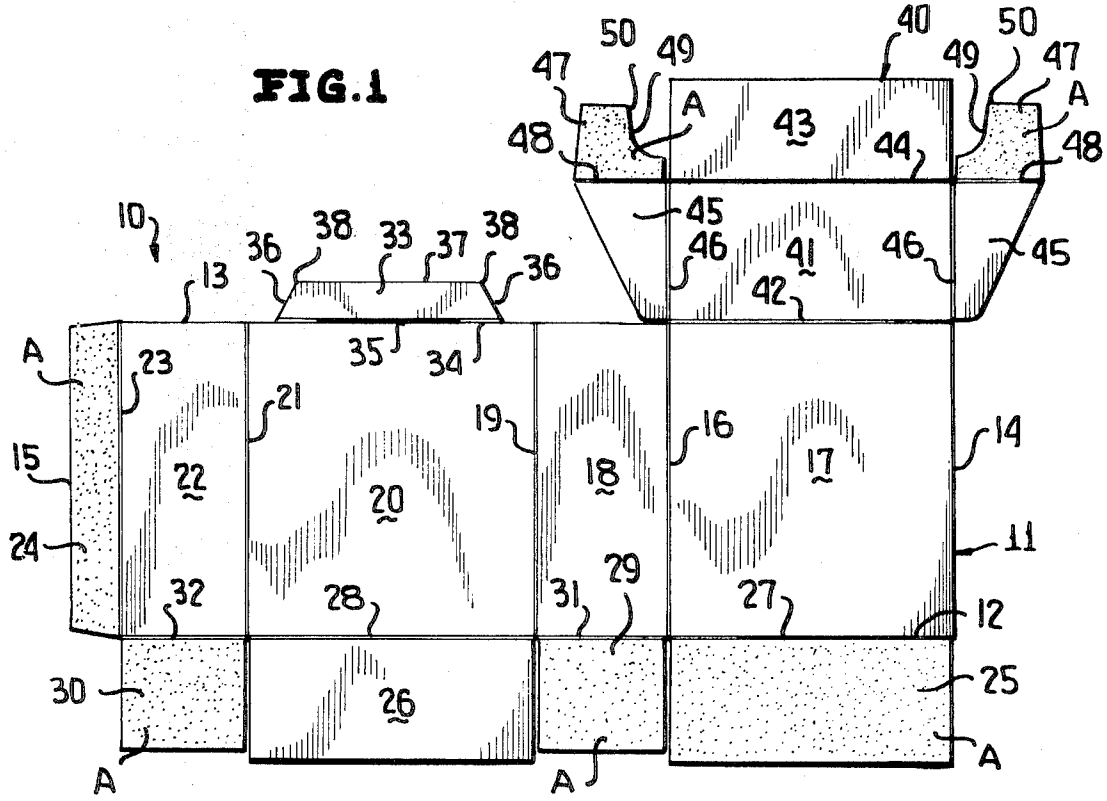

FIG. 2

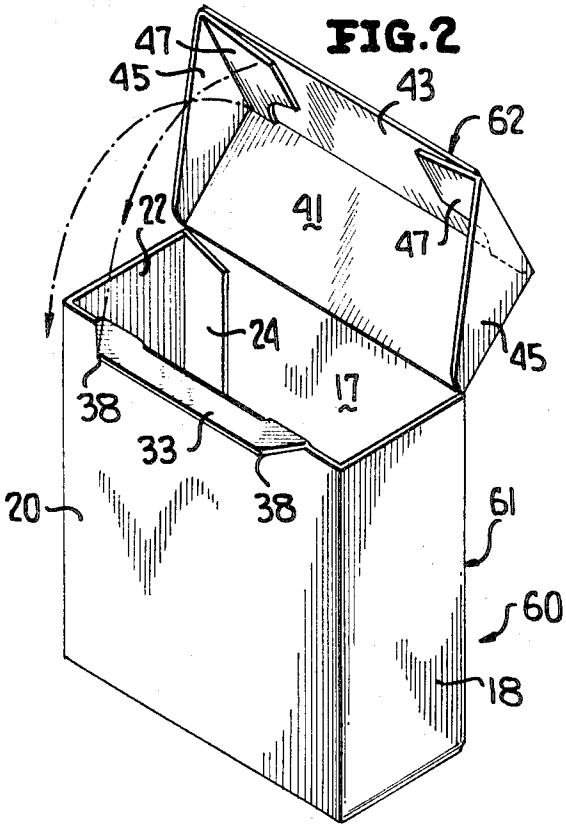

FIG. 3

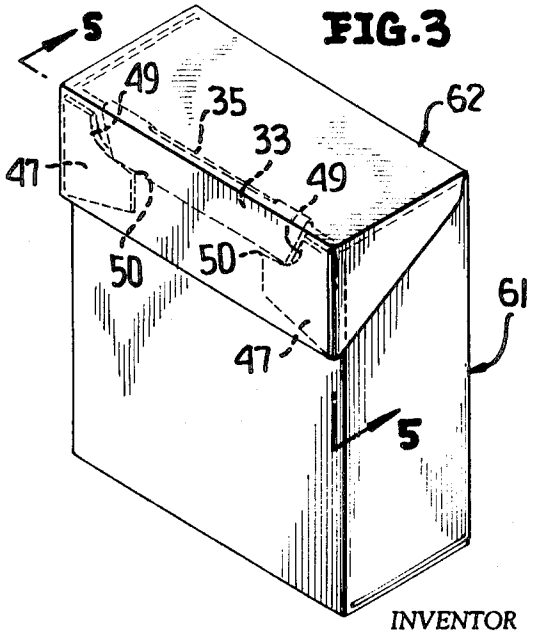

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FIG.4

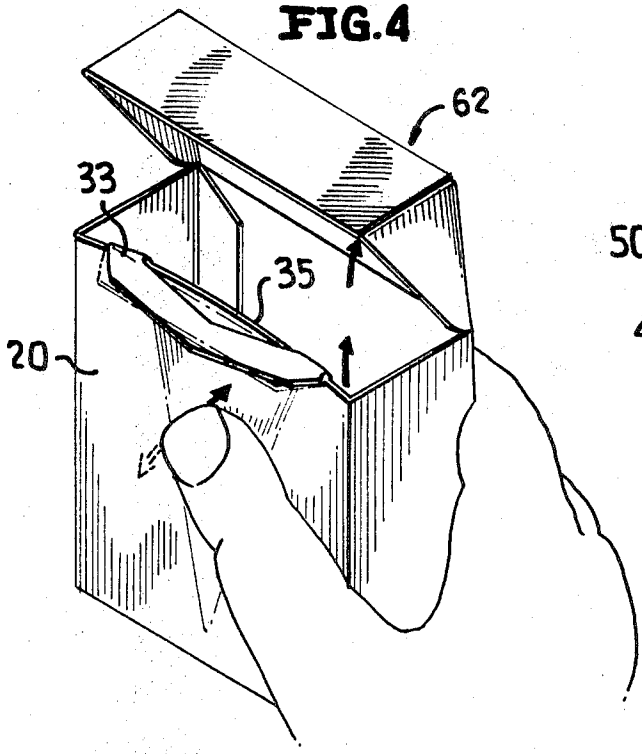


FIG.8

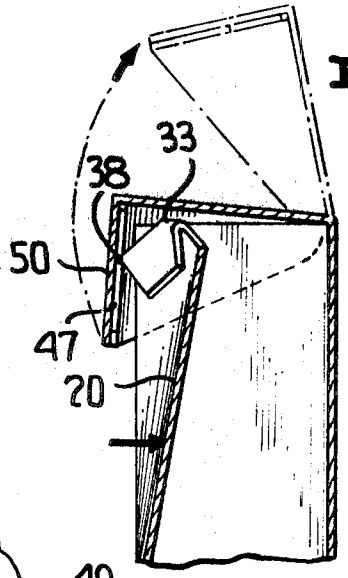


FIG.9

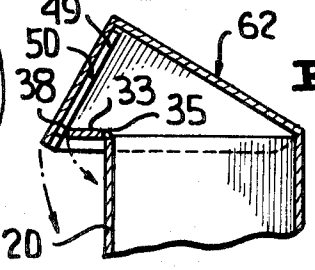


FIG.5

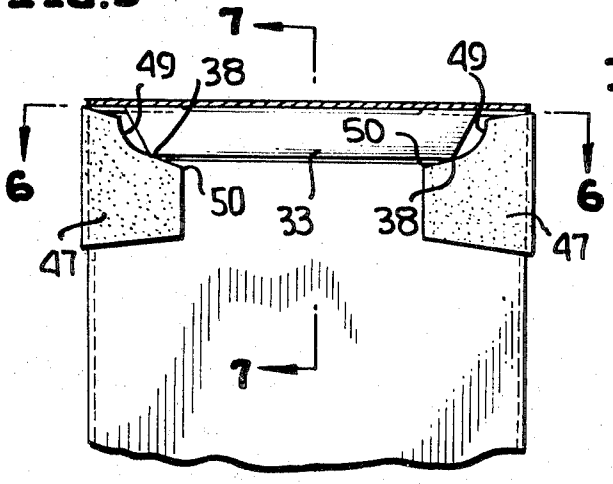


FIG.7

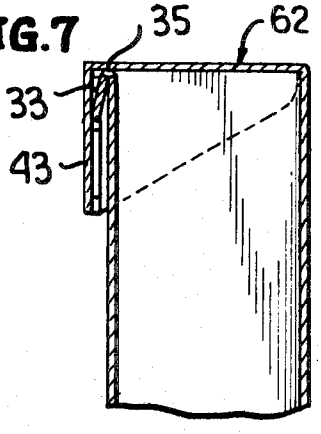
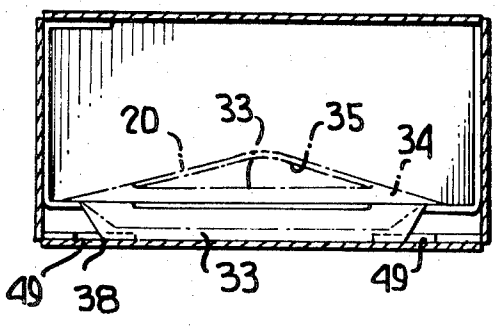


FIG.6



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FLIP-TOP CARTON LOCK

This invention relates to flip-top cartons, and more particularly to a lock for releasably securing a flip-top in a closed condition.

Flip-top cartons of the type to which this invention relates are preferably formed from a single blank of cardboard or other sheet stock and include a body portion and a top hingedly connected thereto which may be readily flipped open to gain access to the contents contained therein. A lock arrangement is generally provided for releasably securing the top to the body of the carton. It is an object of this invention to provide a flip-top carton of the aforementioned type having novel means for releasably locking the flip-top to the body of the carton.

More particularly, it is an object of this invention to provide a flip-top carton having a locking arrangement with novel features of construction which permit the flip-top to pop open upon squeezing of the carton body between the fingers of a user.

Still more particularly, it is an object of this invention to provide a flip-top carton comprising a body having a plurality of panels and a flip-top hingedly connected thereto, a locking flap hingedly connected to one of the panels and locking tabs associated with the flip-top adapted to cooperate with the locking flap for releasably locking the flip-top in closed condition, and a slit defined between the flap and the one panel whereby inward bending of the one panel will cause the locking flap to flex thereby effecting disengagement with the locking tabs to release the flip-top.

Another object of this invention is to provide a blank from which a flip-top carton of the aforementioned type may be constructed, the blank having a front panel, a rear panel, side panels, bottom-forming panels and top-forming panels, a locking flap hingedly connected to one of the panels along a fold line, and a cut formed in a portion of the fold line defining a slit whereby the locking flap when folded out of the plane of the one panel will be readily flexible upon bending of the one panel.

With the above and other objects in view that will hereinafter appear, the nature of the invention will be more clearly understood by reference to the following detailed description, the appended claimed subject matter and the several views illustrated in the accompanying drawings.

In the drawings:

FIG. 1 is a top plan view of a blank from which the carton of this invention may be constructed, and illustrates a novel locking flap hinged to one of the panels of the blank along a partially slit fold line, and locking tabs associated with top-forming panels of the blank having notched corners defining curved surfaces which cooperate with the locking flap upon formation of a carton from the blank to provide means for releasably locking the flip-top in closed condition.

FIG. 2 is a perspective view of the carton of this invention with the flip-top in an opened condition, and illustrates the notched locking tabs adhered to the inner surface of one of the panels of the top and the locking flap hinged to the front panel of the carton along a partially slit fold line.

FIG. 3 is a perspective view of the carton of FIG. 2 with the flip-top in a closed condition, and illustrates the locking flap in locking engagement with the locking tabs.

FIG. 4 is a schematic perspective view of the carton of this invention being held in the hand of a user with the user's thumb pressing the front panel of the carton inward thereby causing the locking flap to flex downward and out of engagement with the locking tabs to permit the flip-top to pop open.

FIG. 5 is a fragmentary sectional view taken along line 5—5 of FIG. 3, and further illustrates the cooperation between the locking flap and the curved surfaces of the locking tabs in the closed condition of the flip-top.

FIG. 6 is a sectional view taken along line 6—6 of FIG. 5, and further illustrates details of the novel locking arrangement of this invention.

FIG. 7 is a fragmentary sectional view taken along line 7—7 of FIG. 5, and illustrates still further details of the cooperating locking flap and locking tabs in the closed condition of the flip-top.

FIG. 8 is a fragmentary vertical sectional view taken through the carton of this invention, and illustrates the front panel of the carton bent inward to the point where the locking flap has flexed downward and is about to become disengaged from the locking tabs, and also illustrates in phantom the opened condition of the flip-top.

FIG. 9 is a fragmentary vertical sectional view taken through the carton of this invention, and illustrates the generally horizontal disposition of the locking flap prior to downward engagement of the flip-top thereover.

Referring now to the drawings in detail, a blank formed in accordance with this invention and constructed from a single sheet of cardboard or other similar sheet stock is illustrated in FIG. 1 and generally referred to by the numeral 10. The blank 10 includes a generally rectangular portion 11 from which a body of a carton constructed from the blank 10 may be formed. The rectangular portion 11 is defined by longitudinal edges 12 and 13 and transverse edges 14 and 15.

A fold line 16 sets off at one end of the rectangular portion 11 in cooperation with the transverse edge 14 and portions of the longitudinal edges 12 and 13 a rear panel 17. A side panel 18 is hinged to the rear panel 17 along the fold line 16 and is further defined by portions of the longitudinal edges 12 and 13 and a fold line 19. A front panel 20 is hinged to the side panel 18 along the fold line 19 and is further defined by portions of the longitudinal edges 12 and 13 and a fold line 21. Another side panel 22 is, in turn, hinged to the front panel 20 along the fold line 21 and is further defined by portions of the longitudinal edges 12 and 13 and a fold line 23. The fold line 23 finally sets off in cooperation with portions of the longitudinal edges 12 and 13 and the transverse edge 15 a glue flap 24.

Inner and outer bottom-forming panels 25 and 26 are hinged to panels 17 and 20, respectively, by means of fold lines 27 and 28 which comprise portions of the longitudinal edge 12. Glue tabs 29 and 30 are similarly hinged to panels 18 and 22, respectively, along fold lines 31 and 32 which comprise further portions of the longitudinal edge 12.

A locking flap 33 having a generally trapezoidal outline is hinged to the panel 20 along a fold line 34 which comprises a portion of the longitudinal edge 13. The middle portion of the fold line 34 is cut to provide a slit 35. The flap 33 includes inclined sides 36 which converge with an edge 37 to define corners 38.

The blank 10 also includes a top-forming portion 40 from which a flip-top may be constructed. The top-forming portion 40 includes a top panel 41 hinged to the rear panel 17 of the rectangular portion 11 along a fold line 42. A front panel 43 of the top-forming portion 40 is, in turn, hinged to the top panel 41 along a fold line 44. Generally trapezoidal side panel portions 45 of the top-forming portion 40 are hinged to the top panel 41 along fold lines 46. Locking tabs 47 are hinged to the side panels 45 along fold lines 48. Corners of the locking tabs 47 are notched to define curved surfaces 49 which terminate in edges 50.

Adhesive A is applied to the flaps 24, 29 and 30, the inner bottom-forming panel 25 and the locking tabs 47 to facilitate construction of a carton from the blank 10 in a manner to be hereinafter described.

In accordance with this invention, a carton 60 illustrated in FIGS. 2–9 may be constructed from the blank 10. The carton 60 includes a body 61 and a flip-top 62. The body 61 may be formed by first folding the bottom-forming panels 25 and 26 and the tabs 29 and 30 downwardly out of the plane of the rectangular portion 11 along the fold lines 27, 28, 31 and 32, respectively. The panels 17, 18, 20 and 22 are then folded along the fold lines 16, 19 and 21, respectively, and the flap 24 then folded downwardly along the fold line 23 and its adhesive-coated surface A secured to the panel 17 adjacent the transverse edge 14. The adhesive-coated surface A of the

inner bottom-forming panel **25** is then secured to the outer bottom-forming panel **26**. The adhesive-coated surfaces A of the tabs **29** and **30** are then secured to the inner surface (unnumbered) of the inner bottom-forming panel **25** to complete the formation of the body **61**.

The locking flap **33** is then folded outwardly along the fold line **34** to assume the generally horizontal position illustrated in FIGS. **2** and **9**. Because of the generally resilient nature of the material of the blank **10** from which the carton **60** is constructed, the flap **33** upon upward or downward deflection will tend to spring back to its normal generally horizontal position.

The flip-top **62** is constructed by folding the panel **43** downwardly relative to the panel **41** along the fold line **44**. The side panels **45** are then folded downwardly along the fold lines **46** and the tabs **47** thereafter folded downwardly along the fold lines **48** and their adhesive-coated surfaces A secured to the inner surface (unnumbered) of the panel **43**. The fold line **42** provides a flexible hinge for the flip-top **62** relative to the body **61**. The panel **41** of the flip-top **62** is initially folded along the line **42** relative to the panel **17** so that the flip-top **62** will assume a normal preset open condition as illustrated in FIGS. **2**, **4** and in phantom in FIG. **8**. As with the flap **33**, the resilient nature of the material of the blank **10** will cause the flip-top **62** to tend to snap back to this open condition whenever it is deflected therefrom.

The closed condition of the flip-top **62** is illustrated in FIGS. **3**, **5** and **7**. In this condition the flip-top **62** is releasably secured to the body **61** of the carton **60** by reason of the engagement of the locking flap **33** with the curved surfaces **49** of the locking tabs **47**. As the flip-top **62** is pivoted downwardly towards its closed position (FIG. **9**), the normally horizontally disposed locking flap **33** will be caused to pivot downwardly along its fold line **34**. The slit **35** in the fold line **34** facilitates an easy folding of the flap **33**. As the front panel **43** of the flip-top **62** slides down over the flap **33** the curved surfaces **49** of the locking tabs **47** will cammingly engage and lock with the corners **38** of the flap **33**. This is most clearly illustrated in FIG. **5**.

When it is desired to open the flip-top **62** the carton **60** may be grasped in the hand of a user and the front panel **20** thereof pressed inward as illustrated in FIG. **4**. Because of the existence of the slit **35** in the fold line **34**, the locking flap **33**, upon inward bending of the panel **20**, will be caused to flex downwardly as illustrated in FIGS. **4** and **8**. This downward flexing of the flap **33** will cause the corners **38** thereof to slide inwardly and downwardly along the curved surfaces **49** of the tabs **47** until they pass the terminal edges **50**. At this point (FIG. **8**), the locking tabs **47** are disengaged from the flap **33** and the flip-top **62** will resiliently snap up to its open position. The locking flap **33** will then assume its normal horizontal position as illustrated in FIGS. **2** and **9**. It should be noted that the flip-top **62** may, of course, be opened by merely grasping it and flipping it open without a direct bending force applied to the panel **20**. On the other hand, the slit **35** permits, upon inward bending of the panel **20** to the position illustrated in FIG. **8** and in phantom in FIG. **6**, the downward flexing of the flap **33** to facilitate the novel flip-top opening technique as hereinabove described.

It should be further noted that the slit **35** facilitates the downward folding of the flap **33** along the fold line **34** and sufficiently reduces the resilient force tending to bias the flap **33** towards its normal horizontal position so that there will be no bulge in the front panel **43** of the flip-top **62** when it is in its closed position as illustrated in FIG. **7**.

From the foregoing, it should be readily apparent that there is provided in accordance with this invention a flip-top carton having novel means for releasably locking the flip-top to the body of the carton, and particularly novel features of construction which permit the carton to be grasped in the hand of a user and the body squeezed between the user's fingers to permit release of the lock and a resilient popping open of the flip-top.

Although a preferred embodiment of the invention has been specifically illustrated and described herein, it is to be understood that minor variations may be made without departing from the spirit of the invention.

I claim:

1. A flip-top carton comprising a body having a plurality of panels and a flip-top hingedly connected thereto, means for releasably locking said flip-top in closed condition, said locking means including a locking flap hingedly connected by spaced aligned fold lines to one of said panels, said locking flap being folded along said fold lines into sandwiched relationship between said one panel and said flip-top in said closed condition and an elongated continuous slit between said locking flap and said one panel and between said fold lines for permitting said locking flap to readily flex transversely of its length as said slit progressively opens between said fold lines upon the application of an inwardly directed force against said one panel to thereby facilitate the release of said locking means.

2. The carton of claim **1** wherein said locking means further includes locking tabs associated with said flip-top adapted to cooperate with said locking flap for releasably locking said flip-top in closed condition.

3. The carton of claim **2** wherein each of said locking tabs includes a curved surface for cammingly engaging said locking flap.

4. The carton of claim **3** wherein said curved surfaces include a terminal edge portion, said locking flap having corners in engagement with said curved surfaces in the locked condition of said flip-top, and wherein inward bending of said one panel in response to said inwardly directed force will cause said locking flap to flex whereby said corners will slide along said curved surfaces until they pass said terminal edge portions thereby releasing said locking means.

5. A flip-top carton comprising a body having a plurality of panels and a flip-top hingedly connected thereto, means for releasably locking said flip-top in closed condition, said locking means including a locking flap hingedly connected by fold line means to one of said panels, said locking flap being folded along said fold line means into sandwiched relationship between said one panel and a panel of said flip-top in said closed condition, said locking flap including a pair of opposite corners, each of said corners in said closed condition normally being in engagement with an associated upwardly facing edge of tabs secured to said flip-top panel thereby defining said locking means, each tab having terminal edges inboard of said upwardly facing edges, and said upwardly facing edges define cam means responsive to inward bending of said one panel and said locking panel for cammingly guiding each corner toward its adjacent terminal edge until passing the same to thereby release said locking means.