Dec. 26, 1944. M. I. WILLIAMSON 2,365,739

CONTAINER WITH COLLAPSIBLE CLOSURE

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Fig. 1.

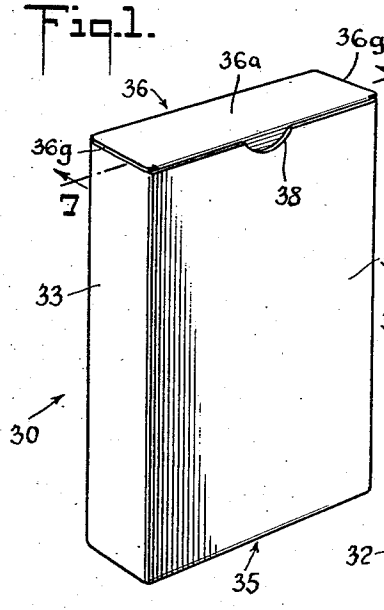



Fig. 2.

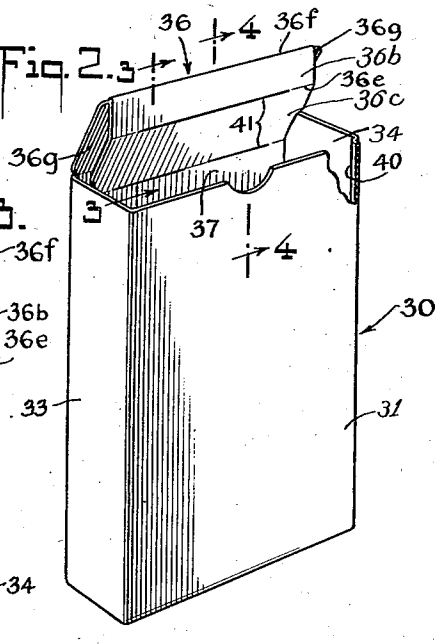



Fig. 3.

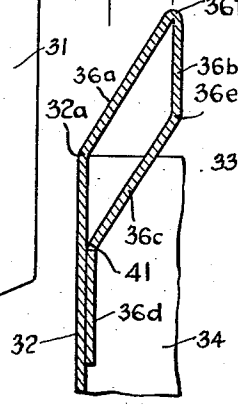



Fig. 4.

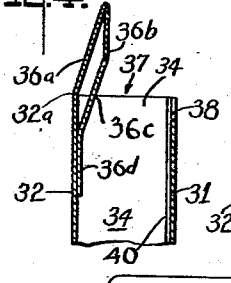



Fig. 5.

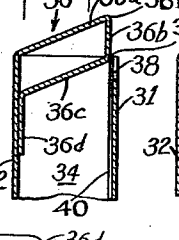



Fig. 6.

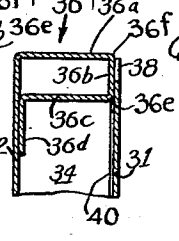



Fig. 7.

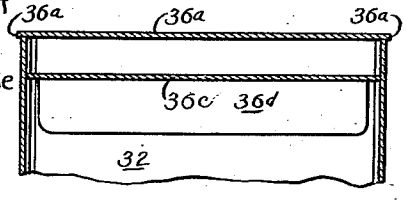



Fig. 8.

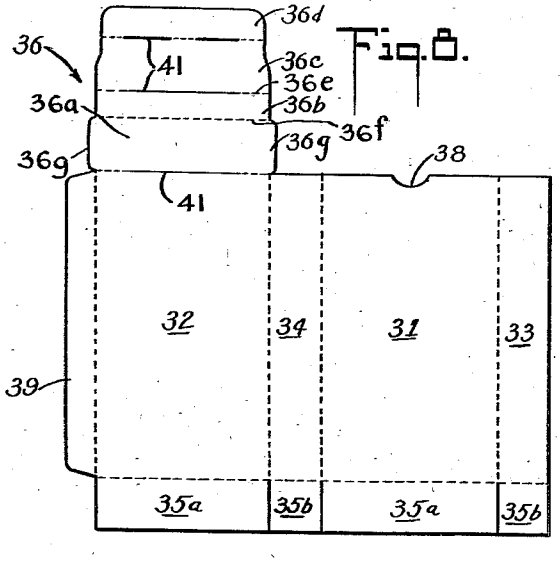
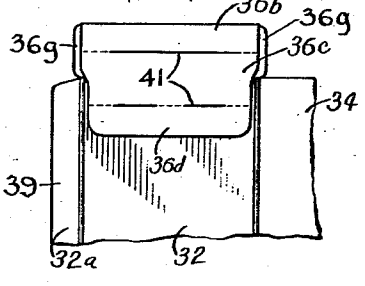



Fig. 9.




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CONTAINER WITH COLLAPSIBLE CLOSURE

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Fig. 10.

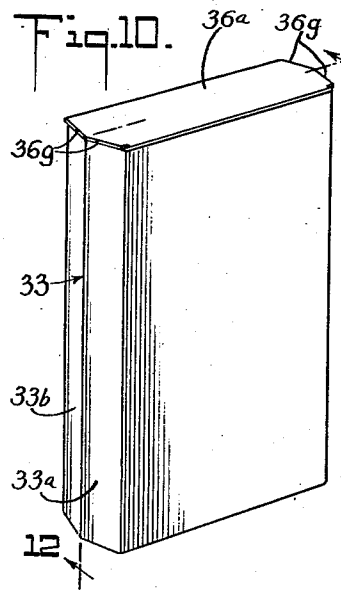



Fig. 11.

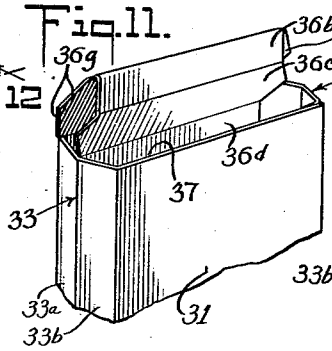



Fig. 12.

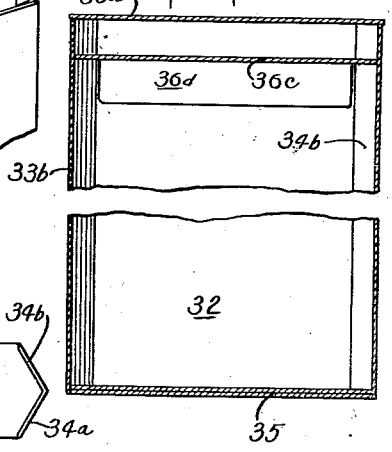



Fig. 13.

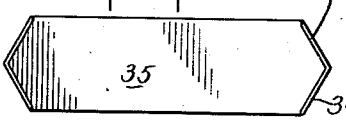



Fig. 16.

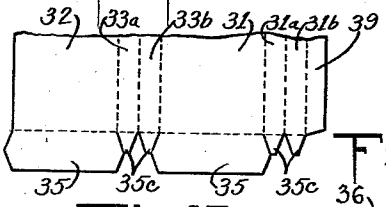



Fig. 14.

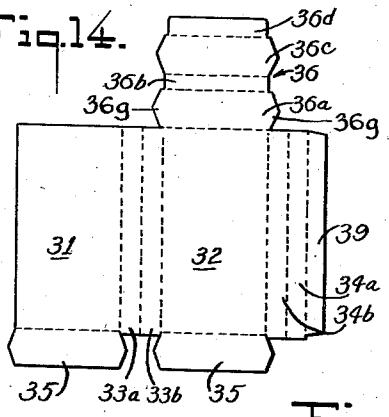



Fig. 21

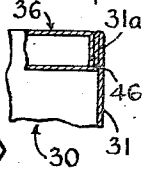



Fig. 17.

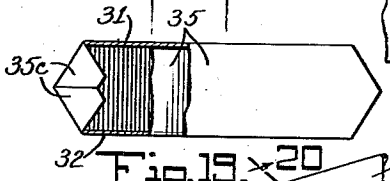



Fig. 18.

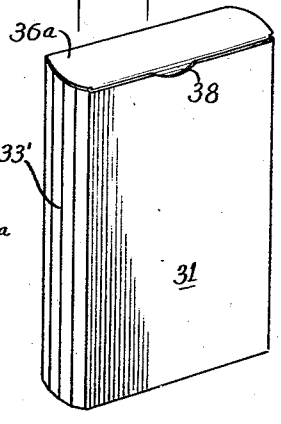



Fig. 15.

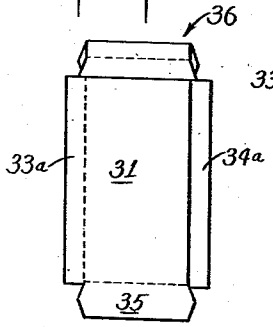



Fig. 19.

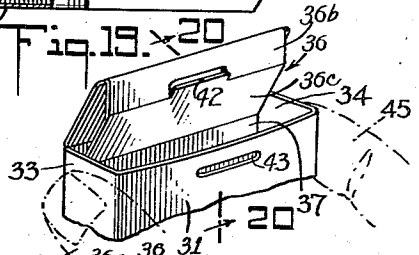
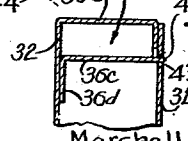



Fig. 20.




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Patented Dec. 26, 1944 2,365,739

# UNITED STATES PATENT OFFICE

2,365,739

## CONTAINER WITH COLLAPSIBLE CLOSURE

Marshall I. Williamson, New York, N. Y., assignor to National Folding Box Company, New Haven, Conn., a corporation of New Jersey

Application September 16, 1942, Serial No. 458,488

11 Claims. (Cl. 229—44)

This invention relates to reclosable containers formed of foldable sheet material such as paperboard, and is particularly concerned with providing a new and improved type of closure for such containers.

In containers from which the contents, such as tobacco and various food, drug, and other products, are to be dispensed from time to time in relatively small portions, it is desirable that the closures thereof have certain special attributes.

A closure structure for this purpose should be such that, when in open position, the contents of the container can be easily and neatly poured out in the desired quantities without interference from any part of the closure. Such nicety of discharge of contents is not afforded by the conventional type of tuck-end carton wherein the closure supporting flaps often interfere annoyingly with pouring discharge of the contents.

The closure should be capable of being easily and speedily opened and reclosed, even in some instances, as with pipe tobacco, by the fingers of the same hand in which the container is held. And the closure should desirably remain attached to the container to prevent its being lost or mislaid.

Also, the entire container should be capable of economical manufacture, on standard automatic machines.

It is an object of the invention to provide a container equipped with a closure having the above recited attributes to a maximum degree.

Outstanding in the attainment of the desired closure characteristics, according to the present invention, is the provision of a plug-like closure structure for the dispensing opening of the container, such closure structure being hinged adjacent the dispensing opening and being so constructed as to automatically collapse into substantially flat formation when swung out from the dispensing opening, and to automatically resume its plug-like formation when swung back into the dispensing opening during the reclosing of the container.

Preferably, such collapsible plug-like closure structure comprises a plurality of panels mutually serially connected, and dimensioned and configurated whereby when in its closing, i. e., plug-like formation, it makes a tight-fit with the defining walls of the dispensing opening of the container. Preferably, the panel serving as the bottom panel of such plug-like closure is dimensioned to project when the closure is collapsed beyond the defining walls of the dispensing opening, thereby reducing the extent or proportion of volume of the container unfilled or unfillable by dispensable contents of the container.

By reason of the friction-fit within the dispensing opening of the container, as afforded by the plug-like nature of this novel closure structure, a sufficiently tight closure is effected to retain the contents of the container and to provide protection thereof from ordinary causes of spoilage or contamination.

Further objects and features of the invention will appear from the following detailed description of the preferred specific embodiments illustrated in the accompanying drawings.

In the drawings:

Fig. 1 represents a view in perspective of a preferred embodiment of the invention set up for use, and having its closure seated in fully closed position;

Fig. 2, a similar perspective view, but showing the closure in an open position;

Fig. 3, a detail sectional view taken on line 3—3 of Fig. 2, and enlarged;

Fig. 4, a detail sectional view taken on line 4—4 of Fig. 2, but drawn to a reduced scale relative to Fig. 3;

Fig. 5, a detail sectional view similar to that of Fig. 4, but showing the closure as it is about to enter the dispensing opening of the container.

Fig. 6, a detail sectional view similar to Figs. 4 and 5, but showing the closure in fully closed position;

Fig. 7, a detail sectional view taken on line 7—7 of Fig. 1;

Fig. 8, a plan view of the inside face of a blank typical of those which may be employed to form the embodiment of Figs. 1 through 7 of integral sheet material.

Fig. 9, a detail plan view of the upper left-hand portion of the blank of Fig. 8, after the terminal panel of the closure portion of the blank has been secured to the inner face of the rear wall panel of the box portion of the blank;

Fig. 10, a view similar to that of Fig. 1, but illustrating another embodiment of the invention, provided with angularly formed side wall panels;

Fig. 11, a perspective view corresponding to the upper portion of Fig. 2, but illustrating the embodiment of Fig. 10;

Fig. 12, a longitudinal sectional view taken on line 12—12 of Fig. 10, a portion intermediate the top and bottom being broken away;

Fig. 13, a bottom plan view of the embodiment of Fig. 10;

Fig. 14, a plan view of the inside face of a blank typical of those which may be employed to form the embodiment of Figs. 10 through 13 of integral sheet material;

Fig. 15, a plan view of the blank of Fig. 14 as glued and folded into collapsed, tubular form ready for shipment to the user;

Fig. 16, a view corresponding to the lower portion of Fig. 14, but illustrating the blank modified with respect to the bottom closure;

Fig. 17, a bottom plan view of the embodiment of Fig. 10 having the bottom formation indicated by the blank of Fig. 16, the bottom panels being partly broken away to reveal otherwise hidden parts;

Fig. 18, a perspective view of another embodiment of the invention provided with side wall panels of multi-angular or substantially curved configuration;

Fig. 19, a perspective view corresponding to that of Fig. 11, but illustrating another embodiment of the invention which conforms generally to the embodiment of Figs. 1 through 7, but includes a tongue-and-slot form of supplemental locking means, it being possible to unlock such locking means by pressing upon the opposite side wall panels of the container proximate the dispensing opening, as illustrated in dotted lines;

Fig. 20, a sectional view corresponding to that of Fig. 6, but being taken on line 20—20 of Fig. 19 and showing the closure locked in fully closed position; and

Fig. 21, a fragmentary view in vertical section corresponding to the right-hand portion of Fig. 20 but illustrating another type of supplemental locking means.

Referring to the embodiment shown in Figs. 1 through 7, the container or box body, designated generally **30**, is shown as of rectangular configuration, and comprises front and rear planels **31**, **32**, and side panels **33**, **34**. The bottom **35** is shown as of conventional formation, glued tight.

Pursuant to the invention the closure or cover, designated generally **36**, comprises a top panel **36***a* which is shown integral with the rear panel **32** of the body and hingedly related thereto. The closure **36** comprises, further, the frontal panel **36***b*, hingedly connected to the top panel **36***a*, also the lower panel **36***c* hingedly connected to the front panel **36***b*, and a fourth or terminal panel **36***c*, hingedly connected to the lower panel **36***c* and secured by adhesive or the like to the inner face of the rear panel **32** of the box body **30**.

The several panels of the closure are preferably dimensioned and configurated to effect a predetermined frictional engagement of the closure with the several inner faces of the box body defining the dispensing opening, thereby providing a tight fitting plug-like closure. The bottom panel **36***c* is preferably equal in length with the top panel **36***a*, considered from hinge line to hinge line, so the thickness of the sheet material forming the terminal or securing panel **36***d* will cause the lower frontal hinge line **36***e* of the closure to wedge against the front panel **31** of the box body tighter than does the upper frontal hinge line **36***f* when the plug-like closure is completely seated within the dispensing opening **37** of the box body, as shown in Fig. 6. It will be observed that the bottom panel **36***c* when the plug-like closure is in collapsed status, extends at its outer portion beyond the outline of the dispensing opening. Such relationship attains a plug-like closure of relatively restricted "thickness" of the closure, which is advantageous in that the extent or proportion of the volume of the plug-like closure with respect to the over-all volume of the container is brought to a minimum and conforms to the legal requirements respecting unfilled or unfillable volume of container content. The frontal panel **36***b* is of such vertical dimension as will provide a suitable thickness or depth of plug formation for the closure. Here it should be kept in mind that such thickness or depth should not be so slight as to cause the lower frontal hinge line **36***e* to strike the top edge of front panel **31** of the box body during the stage of seating the closure, see Fig. 5, nor should it be so great as to prevent the proper seating and maximum friction-fit of the closure. The lateral width of the bottom panel **36***c* is such as will provide a friction-fit against the inner faces of the opposite side wall panels **33** and **34**, respectively, of the box body when the closure is seated within the dispensing opening **37**, but the width of the top panel **36***a* is preferably greater, providing lateral extending shoulders **36***g* which project over the top edges of the respective side walls **33** and **34** when the closure is in closed position and serve as stops for limiting the extent of insertion of the closure within the dispensing opening **37**. Upon full closing of the closure **36**, the top panel **36***a* is brought into substantially flush relationship with the upper edge of the front panel **31**, and the closure and body of the container, combined, present in appearance a regular polyhedron of rectangular formation.

The shoulders **36***g* may serve also as means for grasping the closure to move the same to open position. If desired, a conventional thumb-cut **38** may be provided at the upper edge of the front panel **31** for aiding in the opening of the closure.

Figure 8 illustrates the inside face of a cut and scored integral blank of foldable sheet material, such as paper-board, which may be used to form the embodiment of Figs. 1 through 7. Like parts of the blank and set-up box are designated by like reference characters.

In Fig. 8, the panel **39** is a glue lap, adapted to be adhered to the side wall panel **33**. When this glue lap of the blank has been glued to the side wall panel **33**, and the terminal panel **36***d* of the closure has been glued to the back wall panel **32**, the box or carton is in condition for shipment or storage in collapsed tubular form. When being set up for filling, this partially formed container has its bottom panels **35***a* and **35***b* suitably inter-folded and glued to form the conventional sealed bottom closure indicated.

With respect to the friction-fit of the plug-like closure **36** within the dispensing opening **37** of the box body **30**, it should be noted that the internally formed, vertical score beads **40**, see especially Figs. 2, 4, 5 and 6, are important in providing added frictional engagement.

In order to bring about free and easy closing and opening of the closure **36**, and to minimize its natural tendency to retain or reassume its original collapsed open state, it is often advantageous to partially cut and partially score the lines of hinge between the several component panels of the closure **36**, as indicated at **41**.

The embodiment shown in Figs. 10 through 14 features the side wall panels **33** and **34** as of angular formation, the angularly related parts being indicated **33***a*, **33***b* and **34***a*, **34***b*, respectively. The top panel of the plug-like closure, here indicated **36***a*, has its laterally extending shoulders **36***g* of angular contour, corresponding to the angular formation of the respective side wall panels.

Further, the lateral edges of the lower panel **36c** of the closure are contoured in correspondence to the angular formation of the respective side wall panels of the box body to provide the desired frictional engagement with the inner faces of such side wall panels, and to maintain the angular formation of such side wall panels at their upper ends when the closure is closed. Similarly, the bottom glue panels **35** are provided with correspondingly angular lateral edges for maintaining the angular formation of the side wall panels at their lower ends. Such bottom is closed by applying glue to the inner face of one panel **35**, and clapping it over the other panel **35**. Otherwise, like parts of the embodiment of Figs. 10 through 14, as compared with the embodiment of Figs. 1 through 9 are designated by like reference characters.

A blank for producing the embodiment of Figs. 10 through 13 of integral sheet material is illustrated in Fig. 14.

The blank of Fig. 14, as folded and glued for flat shipping and storage, is shown in Fig. 15. The terminal panel **36d** of the closure is glued to the inner face of the back wall panel **32**, and the glue lap **39** is glued to the inner face of the back wall panel **32**, and the glue lap **39** is glued to the inner face of the front panel **31** at a lateral margin thereof. As thus folded and glued, the container is in collapsed tubular condition ready to be set up for filling.

The embodiment of Figs. 16 and 17 differs from that of Figs. 10 through 15 in the provision of pairs of bottom closure-supporting flaps **35c**. These are formed with due consideration for the angular formation of the side walls of the box or carton body, and are adapted to maintain such angular formation and to support the panels **35** of the bottom closure.

As illustrated in Fig. 18 the container may be formed with multi-angular or substantially curved side walls, indicated **33'**, the top and bottom closures being configurated accordingly, and due precaution being exercised to preserve the important structural and functional features of the invention.

Fig. 19 shows in open position, and Fig. 20 in fully closed position, a container corresponding generally to that of Figs. 1 through 9, but provided with locking means, such as one or more sets of a tongue **42** and cooperating slot **43**, supplementing the frictional engagement of the plug-like closure **36** with the walls defining the dispensing opening **37** of the box body. Such one or more tongues **42** may be formed at the juncture of the frontal panel **36b** with the lower panel **36c**, by cutting the frontal panel **36b** as shown, whereby the tongue **42** projects horizontally into its receiving slot **43** when the cover is pressed down into its closed position.

As indicated in Fig. 19 by the dotted representation of two fingers **44** and **45**, of a hand of the user, the tongue or tongues may be released from locking engagement with the slot or slots **43**, by simultaneously exerting pressure upon the side wall panels **33**, **34** of the box body adjacent the dispensing opening **37**. This pressure causes the front wall panel **31** of the box body to bow outwardly, carrying the defining edges of slot or slots **43** beyond the tongue or tongues **42**.

Supplemental locking of the closure **36** within the dispensing opening of the box body **30** may be accomplished in other ways, for instance as illustrated in Fig. 21, where the front panel **31** is of extended length and has the inward folded portion **31a** at its upper margin providing a catch for the one or more latch tongues or tits **46**, which are formed and extend from the closure **36** in the same manner as the tongue or tongues **42** of the embodiment of Figs. 19 and 20.

Whereas this invention is here illustrated and described with respect to preferred specific forms thereof, it should be understood that various changes may be made in such specific forms and various other forms may be constructed from time to time by those skilled in the art without departing from the spirit and generic purview of the invention as set forth herein and in the claims that here follow.

I claim:

1. In a container, the combination of a body portion having a dispensing opening; closure means hingedly captive to the said body portion adjacent said dispensing opening, said closure means comprising a plurality of panels hingedly connected mutually in series; means hingedly securing one terminal panel of said series to said body portion adjacent the said dispensing opening; and means hingedly securing the opposite terminal panel within the said body portion adjacent the location of securement of said one terminal panel, said closure panels when in closed position forming a plug-like closure means dimensioned and configurated to make a tight fit with the defining walls of said dispensing opening, and collapsible to substantially flat condition when swung out from said dispensing opening, the bottom panel being dimensioned to extend beyond the dispensing opening when the closure means is in collapsed status.

2. In a container, the combination of a body portion having a dispensing opening; closure means hingedly captive to the said body portion adjacent said dispensing opening, said closure means comprising a top, a bottom, and a front panel hingedly connected mutually in series; means hingedly securing the top panel of said series to said body portion adjacent the said dispensing opening; and means hingedly securing the bottom panel within the said body portion adjacent but spaced below the location of securement of said top panel by a distance substantially equal to the length of said front panel, said closure panels when in closed position forming a plug-like closure means dimensioned and configurated to make a tight fit with the defining walls of said dispensing opening, and collapsible to substantially flat condition when swung out from said dispensing opening, the bottom panel being dimensioned to extend beyond the dispensing opening when the closure means is in collapsed status.

3. Structure as recited in claim 2, but having the said bottom panel arranged so that it extends forward slightly farther than does the top panel, whereby its forward edge portion is pressed against the body portion of the container with greater force than is the forward edge portion of the top panel when the closure portion of the container is fully seated within the dispensing opening of the said body portion.

4. Structure as recited in claim 2 wherein tongue means are provided at the front of said closure portion, and cooperating tongue-retaining means are provided at the front of said body portion, whereby said closure portion is secured in place when seated within said dispensing opening.

5. In a container formed of cut and scored

paperboard, the combination of a body portion having a dispensing opening and a closure portion integral with said body portion and hingedly captive thereto at a margin of the said dispensing opening, said closure portion comprising a series of integrally and hingedly related panels including a top panel, a front panel, a bottom panel, and a securing panel, serially related in that order, the said top panel being integrally and hingedly connected to the said body portion at the said margin of the dispensing opening, the bottom panel being dimensioned to extend beyond the dispensing opening when the closure means is in collapsed status, and the said securing panel being secured to the inner face of that wall of said body portion to which the said top panel is connected, interiorly of said body portion and at a location spaced downwardly from the said connection between top panel and body portion by a distance substantially equal to the length of said front panel, the free edge of said securing panel being directed downwardly, whereby said closure is of plug-like formation when seated within the said dispensing opening, closing the same, and is of a flattened formation when swung out from said dispensing opening.

6. Structure as recited in claim 5 wherein the said top panel and the said bottom panel of the closure portion are of equal lengths.

7. Structure as recited in claim 5 wherein tongue means are provided at the front of said closure portion, and cooperating tongue-retaining means are provided at the front of said body portion, whereby said closure portion is secured in place when seated within said dispensing opening.

8. Structure as recited in claim 5 wherein the lateral walls of said body portion are of angular formation, respectively, and wherein the bottom panel of the plug-like closure has its ends angularly configurated to correspond with the said angular formation of the lateral walls of said body portion for maintaining the said angular formation of adjacent portions of said lateral walls when said closure is in closed position.

9. Structure as recited in claim 5 wherein the bottom panel and the front panel are divided by a line of hinge which is partially score and partially cut.

10. Structure as recited in claim 5 wherein the bottom panel and the front panel and the bottom panel and the securing panel are divided by respective lines of hinge which are partially score and partially cut.

11. Structure as recited in claim 5 wherein the line of hinge between the bottom panel and the front panel is score at each side of an intermediate portion, said intermediate portion being a cut into the body of the front panel from said scores, whereby a tongue is provided protruding stiffly outwardly from the front panel at said line of hinge, and wherein latch means is provided by the body portion of the container for locking cooperation with said tongue.

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