United States Patent [19]

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[11] **3,756,497**

[45] **Sept. 4, 1973**

[54] **MAILING TUBE**

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[21] Appl. No.: **207,041**

[52] **U.S. Cl.** **229/22,** 229/45, 229/93

[51] **Int. Cl.** **B65d 5/10,** B65d 3/04

[58] **Field of Search** 229/22, 45, 93, 5.7

[56] **References Cited**

UNITED STATES PATENTS

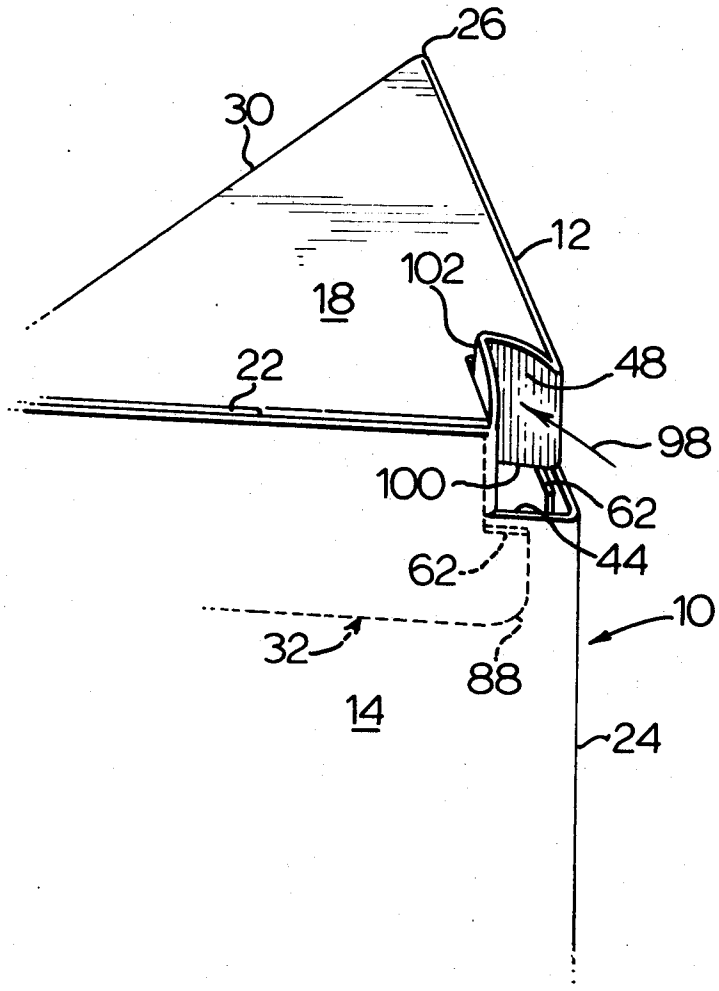
1,889,985	12/1932	Hays	229/22
2,288,739	7/1942	Peters	229/22
2,985,353	5/1961	Force	229/22
3,185,378	5/1965	Rosenburg, Jr.	229/22
3,199,765	8/1965	Locke	229/22
3,482,760	12/1969	Pascus et al.	229/22
3,673,131	1/1972	Gulliver	229/45

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Assistant Examiner—Stephen Marcus
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[57] **ABSTRACT**

A foldable shipping container or mailing tube has a substantially triangular cross-section. At least one of the end panels of the container is hingeably connected to one of the side panels thereof, and is insertable into the open end of the assembled container with a pair of side flaps having indents formed therein which cooperate with an over-center acting locking tab formed in the other two side panels of the container and which locks the end panel into place by cooperative interference with the edges of the indents formed in the side flaps of the end panel.

7 Claims, 7 Drawing Figures



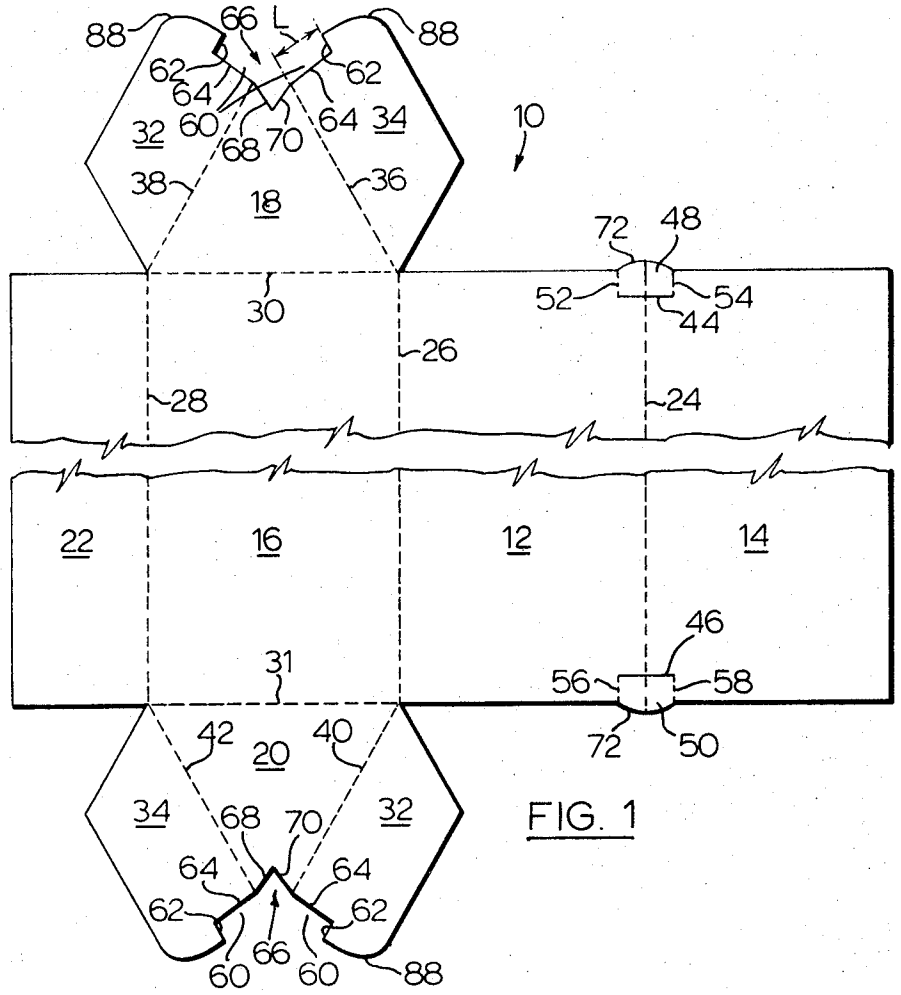


FIG. 1

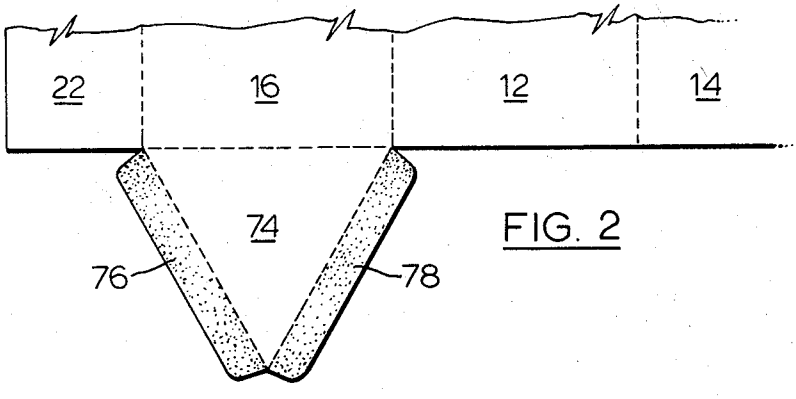


FIG. 2

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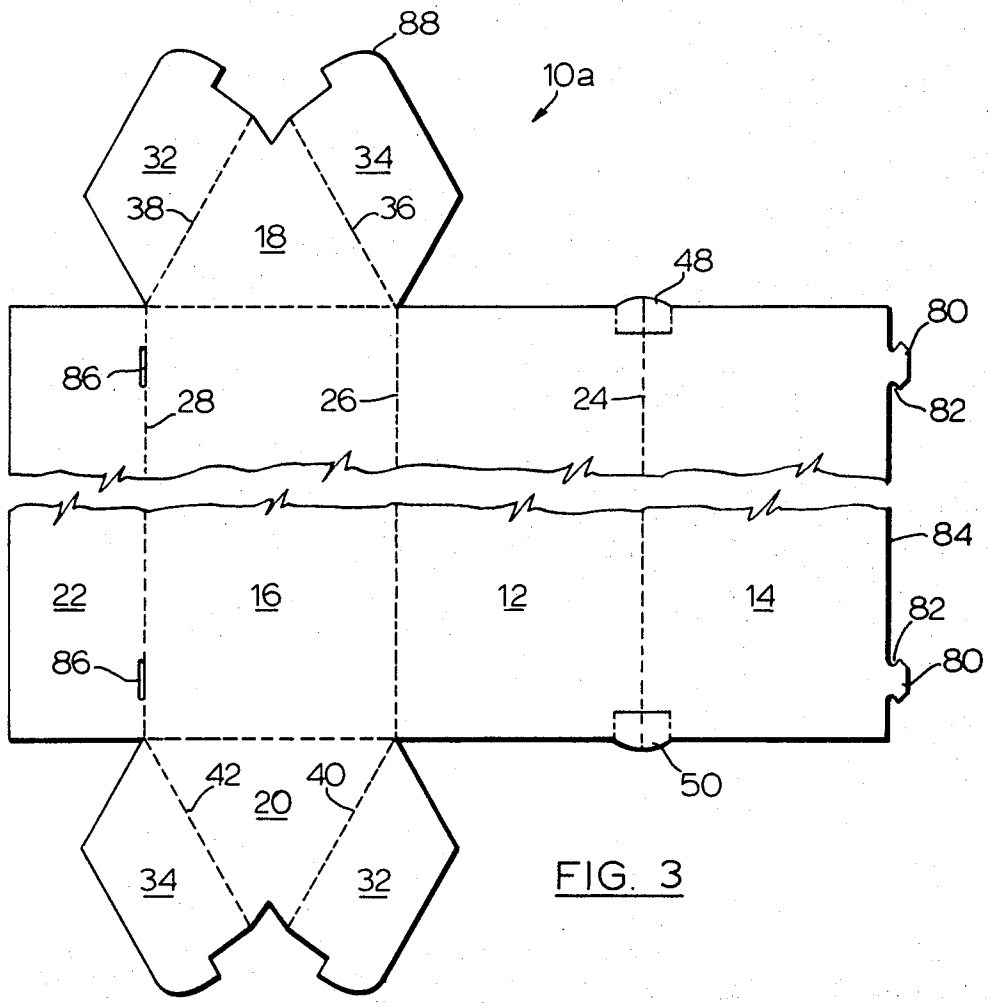


FIG. 3

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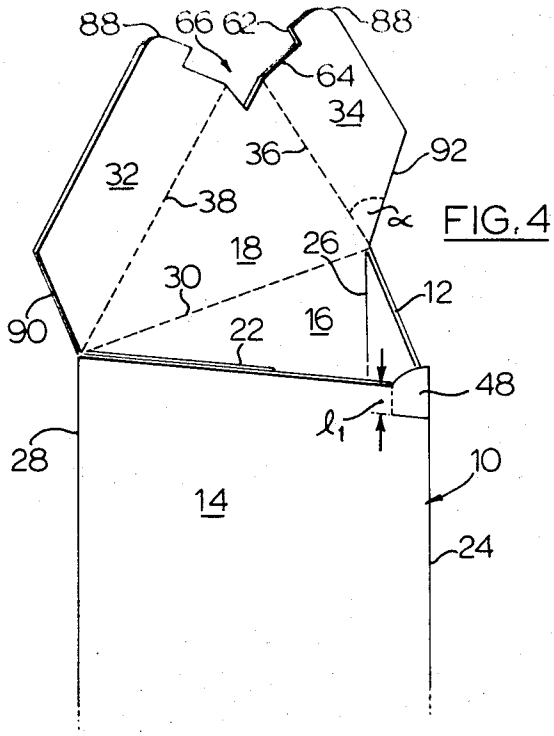


FIG. 4

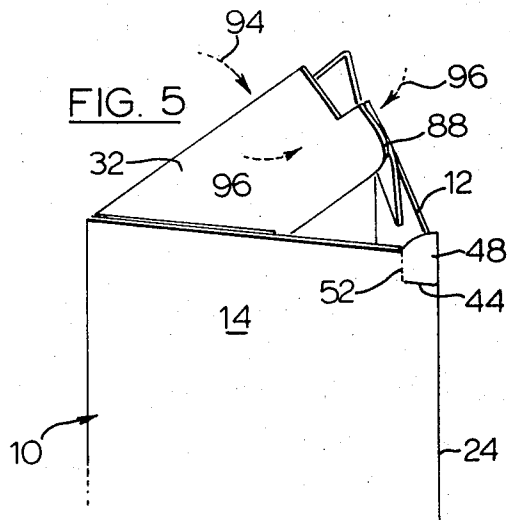


FIG. 5

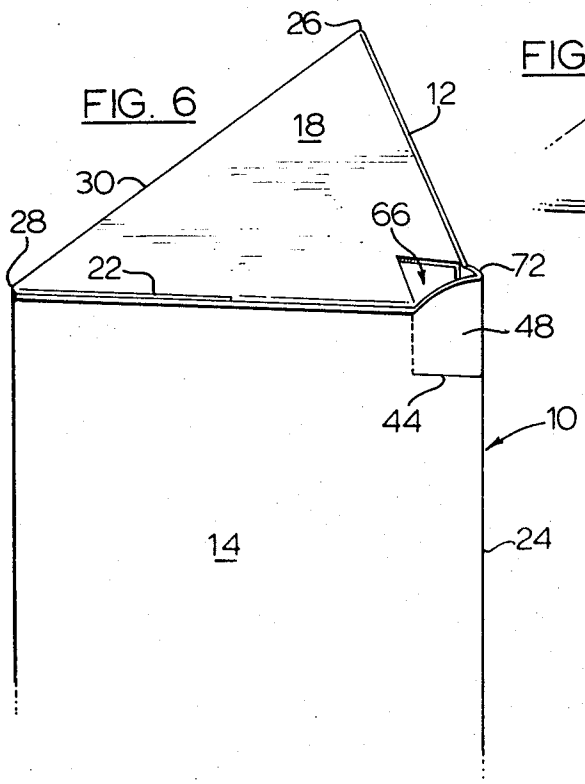


FIG. 6

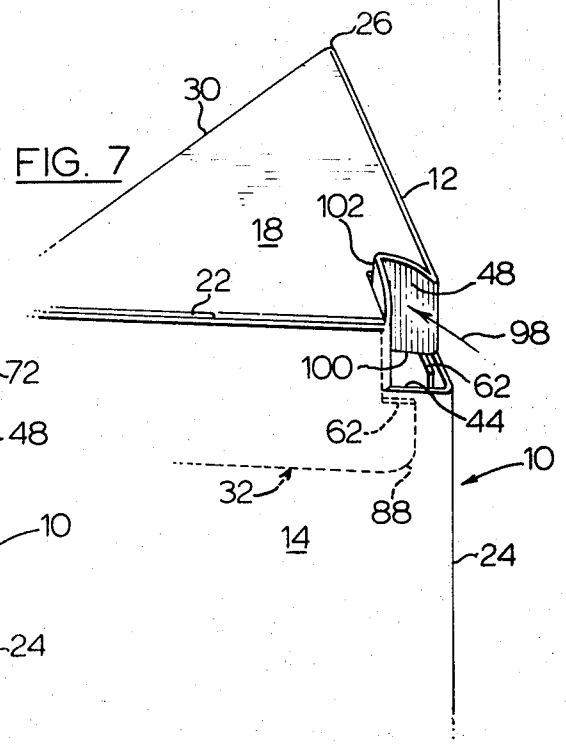


FIG. 7

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MAILING TUBE

FIELD OF THE INVENTION

This invention relates to a foldable shipping container, particular one which, when assembled, has a substantially triangular cross-section. The shipping container is particularly adapted for use as a mailing tube for cylindrical objects, and for storage in mailing of such items as calenders, posters etc. which would normally be rolled into a cylindrical tube for storage and mailing.

BACKGROUND OF THE INVENTION

Triangular shipping and mailing tube structures have been well known: see for example, U.S. Pat. Nos. 3,550,834, issued Dec. 29, 1970 to McCall; 3,482,760, issued Dec. 9, 1969 to Pascus et al. Many other triangular boxes and the blanks therefore are also known. However, there has always been a difficulty in providing a triangular shipping container which is foldable, and which when assembled has a structure whereby the end panels — or at least one of them — can be easily inserted and removed from its closed position so as to allow the insertion or removal of an object from the container.

Triangular shipping containers are especially useful because they permit labelling, stamps, printing, silk screening etc. to be easily placed on the container after it is assembled. Also, more triangular tubes can usually be placed in a given volumn for the storage of cylindrical or other objects than when the storage and shipping containers are also cylindrical. Still further, it has been found that lighter weight mailing tubes can be provided when they are triangular in cross-section, and they are more easily blanked and assembled by hand or by machine than cylindrical mailing tubes. In particular, the provision of a blank which can be assembled to provide the entire shipping container is important; since, with cylindrical shipping containers, the ends must be assembled separately to the cylinders — and usually comprise a metallic insert or cap.

Yet another advantage of triangular shipping or mailing containers, especially for use with posters, calendars etc. which are flat and which may be rolled up for storage and mailing in a container or tube, is that the corners of the triangular tube are still unfilled with the generally cylindrical content, so that removal of the content from the triangular tube can be more easily effected because the finger can be more easily inserted into the free corner for more easy grasping of the objet therein.

SUMMARY OF THE INVENTION

It is a purpose of this invention to provide a foldable shipping container which, when assembled, has a substantially triangular cross-section and which has at least one end panel which can be readily and easily opened and closed so as to provide easy access to the interior of the shipping container. A further object of this invention is to provide a foldable shipping container, and a blank therefore, which can be readily, easily and inexpensively produced, using paper or cardboard of suitable weight and thickness for the purposes intended.

A still further object of this invention is to provide a triangular mailing and storage tube in which not only the end panels can be easily opened and closed, but the entire tube can be easily assembled and dis-assembled.

A BRIEF DESCRIPTION OF THE DRAWINGS

These and other purposes and objects of the invention are more fully discussed hereafter, in association with the accompanying drawings, in which: FIG. 1 is a broken, plan view showing a typical blank for the foldable shipping container of this invention. FIG. 2 is a view similar to FIG. 1 but repeating only one end of the blank with an alternative embodiment. FIG. 3 is yet another view similar to FIG. 1 with yet another alternative embodiment of the foldable shipping container of this invention. FIGS. 4, 5, 6 and 7 show progressive steps in the closing operation of an end panel of a shipping container according to this invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The purposes of this invention are most clearly met by providing a foldable shipping container having at least one end panel which is hingeably attached to one of the side panels of the container. The end panel has a pair of side flaps which have indents formed in them at their outer ends, and the end panel has a notch formed at the apex adjacent the indents. A slit is formed across the apex between the other two side panels of the container, and an over-center locking tab is thereby defined which cooperates with the end panel and the edges of the indent of the side flaps thereof to securely hold and lock the end panel in place when it is assembled into its closed position.

A typical foldable shipping container, or mailing tube, according to this invention is shown at **10** in FIG. **1**, as a blank in the form in which it is stamped out from a suitable blanking machine. Panels **12** and **14** are formed which, in this instance, are substantially equal in size to each other. Also, a panel **16** is formed having end panels **18** and **20**, and a further panel **22** is also shown. The blank may, of course, be die-cut.

Relief lines **24** and **26** are shown between panels **14** and **12**, and **12** and **16** respectively; and further relief lines **28, 30** and **31** are shown between the panel **22** and end panels **18** and **20**, and panel **16**. Each of the end panels **18** and **20** has a pair of side flaps **32** and **34**; and relief lines **36, 38, 40** and **42** are shown between the side flaps **32** and **34** and end flaps **18** and **20**. A pair of slits **44** and **46** is shown, each of the slits being formed in each of panels **12** and **14**. These slits form locking tabs which are discussed in greater detail hereafter, and are indicated at **48** and **50** respectively; having relief lines **52, 54, 56** and **58** between them and the panels **12** and **14**.

An indent **60** is formed in each of the side flaps **32** and **34**, having a depth (L) shown in FIG. **1**, and each of the indents **60** has ends **62** and edges **64**. A notch **66**, having edges **68** and **70**, is formed in each of the end panels **18** and **20** at the apex thereof remote from the relief lines **30** and **32** between the end panels **18** and **20** and the third side panel **16**. A different embodiment is illustrated in FIG. **2**, and is discussed hereafter.

A nosing or projection **72** may be formed in each of the locking tabs **48** and **50**, as shown in FIG. **1**, for a purpose also to be discussed hereafter.

Referring to FIG. **2**, there is shown an end panel **74**, having the same general relationship to panel **16** as the end panel **20**, except that it has side flaps **76** and **78** which are intended to be glued or pasted to the inside of the panels **22** and **14** on the one side and **12** on the

other, so that, when the container having end panel **74** is assembled, the end panel **74** is permanently in a closed position.

FIG. **3** shows an alternative embodiment for a mailing tube **10a** having tabs **80** with relief margins **82** formed at the outer edge **84** of panel **14.** As many tabs **80** may be formed as might be required as discussed in greater detail hereafter; and for each tab **80** a slit **86** is formed, either in panel **22** or panel **16,** or along the relief line **28** between them,as discussed hereafter.

Turning to FIGS. **4, 5, 6** and **7,** it will be shown how an end panel — in this case end panel **18** — is closed using the side flaps **32** and **34,** and the locking tab **48.**

It will, first of all, be noted that side panel **14** overlies the panel **22;** and panel **22** may conveniently be pasted to the underside of panel **14.** Otherwise, the panel **14** may be secured by the use of tabs **80** as shown in the embodiment of FIG. **3;** and it is obvious that the tabs **80** might insert into slits formed along the relief line **28** as indicated, or into slits formed in either panel **22** or **16.** In any event, a foldable shipping container or mailing tube, having a substantially triangular cross-section is shown in FIGS. **4, 5, 6** and **7,** and with an openable end panel **18** to facilitate the insertion and contents from the container **10.**

It will be noticed in FIG. **4** — as well as in FIGS. **1** and **3** — that the outer corner of each of the side flaps **32** and **34** is rounded, as at **88.** To assemble the end panel **18** to its closed position, first the side flaps **32** and **34** are folded along the relief line **38** and **36** respectively to depend downwardly from the end panel **18** — i.e., towards the open end of the container **10.** It is convenient that the inner end of the side flaps **32** and **34,** at **90** and **92** respectively, forms an acute angle with the respective relief line **36** or **38,** so that when each side flap is assembled into the shipping container, it does not interfere at its end **90** or **92** with the inside surface of the side panel **16** of the shipping container **10.** The rounded corners **88** of the side flaps **32** and **34** conveniently assist in the downward motion of the end panel **18** towards its closed position, by the interference of the end corners **88** with the inside of the apex formed between the side panels **12** and **14.** The end panel **18** is moved downwards towards its closed position as indicated by the arrows **94** and **96** in FIG. **5;** until the end panel assumes the position shown in FIG. **6.** At that time, it will be noted that the notch **66** formed in the end panel **18** is opposed to the over-center locking tab **48** which is formed and defined in the side panels **12** and **14** by the slit **44.** The locking tab is then pushed through its locking position, as illustrated in FIG. **7** by pressure applied as at arrow **98;** and the over-centre action of the locking tab permits it to close to the position illustrated in FIG. **7.** It will then be seen that the under edge **100** of the locking tab is in position to interfere with the outer end **62** of the indent **60** formed in each of the side flaps, and thereby to effectively and positively preclude outward movement of either of the side flaps and therefore of the end panel **18.** The end panel is therefore securely locked in place by the action of the locking tab **48.**

As noted, an outward extension may be formed in the locking tab as at **72,** to form an index **102** against which a finger may be applied to release the locking tab from its locking position by pushing it through its over-center action to the position shown in FIG. **6.**

It should be noted that, in order for the locking tab to fully cooperate with the end panel, the distance at which the slit **44** is formed from the end of the panels **12** and **14** is not greater than the depth of the indent **60,** formed in either of the side flaps **32** or **34.** Likewise, the length along each edge of the notch **66** is at least equal to 1/2 the length of the slit **44** — i.e. of the edge of the locking tab **48** which extends into the notch and which cooperates therewith.

Returning now to FIGS. **1, 2** and **3,** it can be seen that a blank for the foldable shipping container or mailing tube of this invention can be formed as shown, where at least one of the end panels **18** and **20** can be opened in the manner shown in FIGS. **4** to **7** and as discussed above. Further, it will be noted that the foldable shipping container can be assembled by pasting the outer surface of panel **22** to the inner surface of panel **14,** or by the cooperation of tabs **80** with slits **86,** or otherwise in the manners well known in the art. The over-center locking tab **48** assures that a respective one of the end panels will be securely held in place when the locking tab is pushed into its locking or engaging position as illustrated in FIG. **7.**

A shipping container or mailing tube according to this invention may conveniently be formed from various flat stock, including heavy paper and cardboard, corrugated cardboard, etc. The material to be used would be chosen in accordance with the requirements for which the container is to be utilized, including impact strength, size of the container, etc.

It has been noted that at least the side panels **12** and **14** should be substantially equal in size — or in any event, that the size of side panel **12** is substantially equal to the side panel formed by the cooperation of panels **14** and **22.** Therefore, the triangle formed by the cross-section of the shipping container, and which is repeated by the triangular end panels with the possible exception of the notches which may be formed therein, is an isosceles triangle. Thus, the closing and opening operation of either of the end panels is more easily effected. In practice, the third side panel may be equal in size to the other two, so that the overall triangular cross-section of the shipping container or mailing tube is substantially that of an equalateral triangle.

There has been described a foldable shipping container or mailing tube which is suitable for storing and shipping or mailing cylindrical objects and objects such as posters or calendars which may be rolled into cylindrical form. The foldable shipping container of the present invention may be manufactured in a suitable paper or cardboard blanking machine, and may be assembled by gluing or pasting the outside surface of one panel member to the inside surface of another panel member, or by the locking of tabs inserted into suitable cooperating slits. In any event, at least one triangular end panel is formed in the shipping container which can be easily opened and closed, and which can be locked in its closed position by the operation of an over-center acting locking tab which is formed in the two side panels of the container remote from the side panel thereof with which the end panel is hingeably connected. It should also be noted that when a container such as that described above is to be used for storing or shipping a particular object for which the container may contain advertising, trademark or other written material, the container may easily be preprinted before it is folded or even before the blank is

formed. The blank may be die-cut, or formed by other such operations as are well known in the art. The container is such that the side may be opened — at least when the container blank is such as that shown in FIG. 3 — completely independently of the ends; and the ends may be opened without regard to the manner in which the sides are assembled.

The embodiments of the invention in which an exclusive property or privilege is claimed are defined as follows:

1. In a foldable shipping container, which, when assembled, has a substantially triangular cross-section, with three substantially rectangular side panels, a first substantially triangular end panel and a second substantially triangular end panel; at least a first and a second of said side panels being substantially equal in size to each other; the improvement comprising:

a. at least one of said end panels being hingeably attached at one edge to an end of the third of said side panels, and having side flaps extending from its other two edges;

b. said side flaps each having an inner end nearest said third side panel, and an outer end;

c. each said outer end of said side flaps having a recess cut at the inner portion of its edge;

d. a notch in the apex of said at least one end panel remote from the hingeable attachment of said end panel to said third side panel; and

e. a slit across the apex of said container formed between said first and second side panels, at the end of said container contiguous said at least one hingeably attached end panel, and at a distance from said end not greater than the depth of the recesses formed in the outer ends of said side flaps; the length along each edge of said notch being at least equal to the length of the part of said slit cut into either of said first and second side panels, respectively; said slit thereby defining the inner edge of an over-centre acting locking tab.

2. The foldable shipping container of claim **1** where the outer corner of each of said side flaps is rounded.

3. The foldable shipping container of claim **2** where an extension of said first and second side panels beyond the end panel, when folded, is formed beyond said slit.

4. The foldable shipping container of claim **3** where both end panels are hingeably attached to the ends of said third side panel, and each has side flaps and a notch.

5. The shipping container of claim **4** where a fourth panel is secured to the edge of said third panel remote from said first and second panels, and underlies said second panel where the container is assembled.

6. The shipping container of claim **5** where at least one tab is formed in the outer edge of said second side panel, and where at least one slit is formed to accommodate said tab when said container is assembled.

7. The shipping container of claim **1** where said third side panel is substantially equal in size to said first and second side panels.

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