

June 22, 1965

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3,190,440

CURVILINEAR WINDOW CONTAINERS AND BLANKS THEREFOR

Filed Sept. 9, 1963

2 Sheets-Sheet 1

FIG. 1

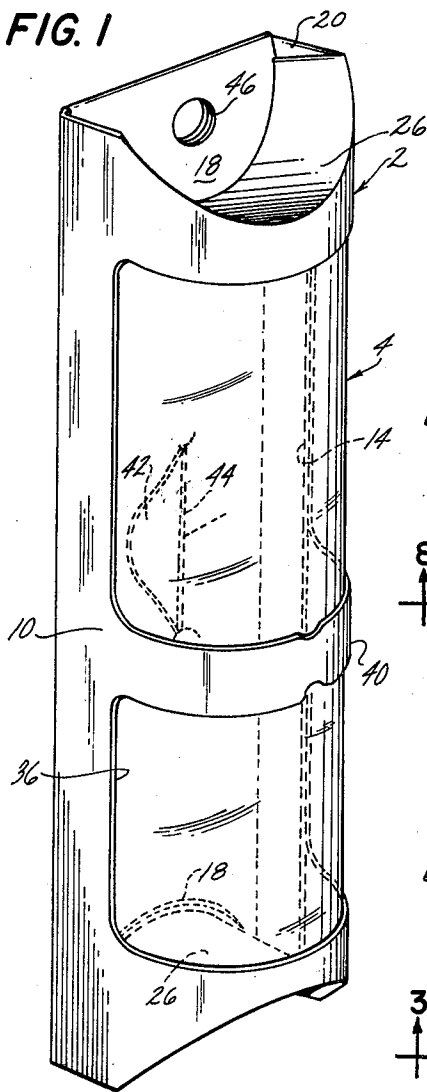


FIG. 6

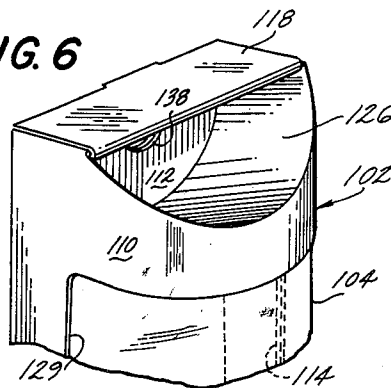


FIG. 7

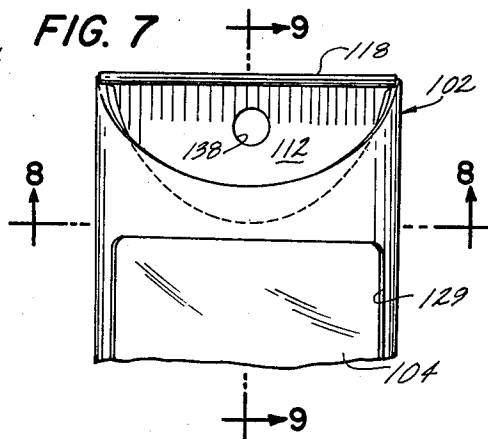


FIG. 2

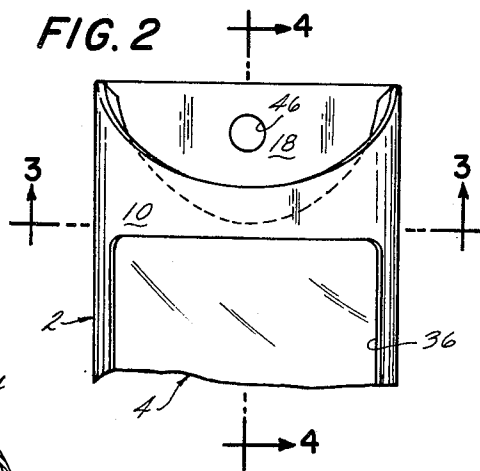
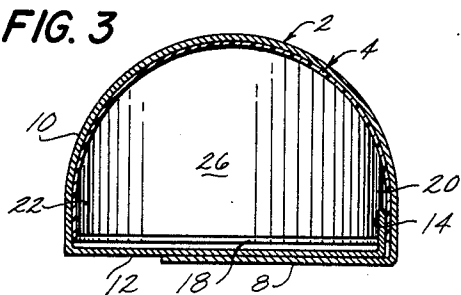


FIG. 3



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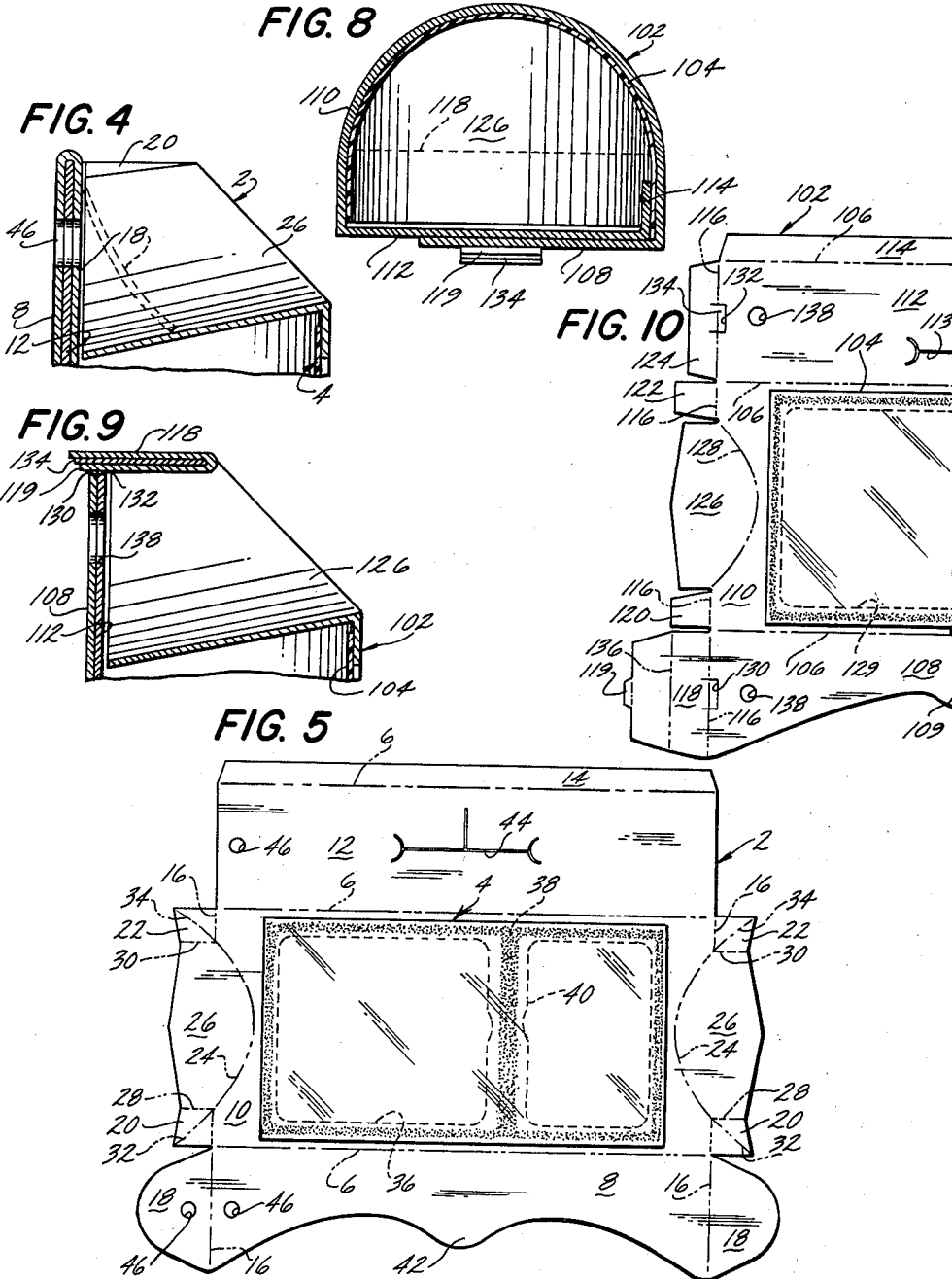
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1

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CURVILINEAR WINDOW CONTAINERS AND BLANKS THEREFOR

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16 Claims. (Cl. 206—45.31)

The present invention relates to window containers, and more particularly to a novel window container having an arcuate window surface.

It is an object of the present invention to provide a highly attractive window container having a relatively large arcuate window surface arching over goods received therein and curvilinear end wall closure panels.

It is also an object to provide such a container which is relatively rigid and durable and which may be fabricated readily and relatively economically from relatively inexpensive materials.

Another object is to provide a single-piece blank for a window container which may be quickly and easily erected into a relatively rigid and durable container having a relatively large curvilinear window surface and curvilinear end wall closure panels.

Still another object is to provide such a blank which is readily and economically fabricated from relatively inexpensive materials and which may be assembled into the erected container without adhesives or other additional securing means.

Other objects and advantages will be apparent from the following detailed specification and attached drawings wherein:

FIGURE 1 is a perspective view of a window container embodying the present invention;

FIGURE 2 is a fragmentary plan view of the upper end portion of the container of FIGURE 1;

FIGURE 3 is a sectional view thereof along the line 3—3 of FIGURE 2;

FIGURE 4 is a sectional view thereof along the line 4—4 of FIGURE 2;

FIGURE 5 is a plan view to a reduced scale of the blank for the container of FIGURE 1;

FIGURE 6 is a fragmentary perspective view of the top end portion of another container embodying the present invention;

FIGURE 7 is a fragmentary plan view of the top end portion of the container of FIGURE 6;

FIGURE 8 is a sectional view thereof along the line 8—8 of FIGURE 7;

FIGURE 9 is a sectional view thereof along the section line 9—9 of FIGURE 7; and

FIGURE 10 is a fragmentary plan view to a reduced scale of the upper portion of a blank for the container of FIGURE 6.

It has now been found that the foregoing and related objects can be readily attained by a window container having a window of synthetic plastic sheet material and a frame of relatively rigid and opaque sheet material with a back wall panel and a cover panel arching thereover to provide a substantially segmental cross section to the container. End wall closure panels are hingedly connected to the ends of the cover panel along inwardly disposed arcuate fold lines and are locked in an inwardly curved configuration by the curve of the cover panel and the rigidity of the material of the frame. A locking panel underlies the back wall panel with locking flaps at the ends thereof and means on the back wall panel engage with said locking flaps to secure the container in erected position. The cover panel has a relatively large window aperture therein which is spaced inwardly from the ends thereof and which is of lesser dimension than the window

2

with marginal portions of the cover panel adjacent the aperture overlying the corresponding marginal portions of the window. The window closely conforms to the curve of the cover panel. The locking flaps and cooperating means on the back wall panel secure the container in erected position against the biasing pressure resulting from the tendency of the arched cover panel and window to return to the original planar position of the blank from which the container was formed.

Although the window might be unsecured to the paperboard frame with attendant problems of control in assembly, it is preferably secured thereto along the overlapping marginal portions of the window and the frame, conveniently by adhesive, heat-sealing, solvent-sealing or other suitable means. Thus, the semi-rigid material of the window cooperates with the relatively rigid material of the frame to produce a strong composite structure which compensates for the loss of strength occasioned by the removal of frame material to provide a large window aperture.

The container may be readily erected from a flat-lying, one-piece blank having a window of synthetic plastic sheet material and an integral frame of relatively rigid and opaque sheet material having weakening or score lines therein defining folds to be made in forming the container. The weakening lines in the frame define a back wall panel, a cover panel hingedly connected to the back wall panel along one side thereof and dimensioned to arch thereover to provide a generally segmental cross section to the container, and a locking panel hingedly connected to the cover wall panel along the other side thereof and adapted to underlie the back panel. At the ends of the locking panel are provided hingedly connected locking flaps. Inwardly disposed arcuate score lines at the ends of the cover panel define end wall closure panels which are adapted to bow inwardly in the erected container into self-locking position.

The cover panel has a relatively large window aperture therein spaced inwardly from the ends thereof and of lesser dimension than the window so that the marginal portions adjacent the aperture overlap corresponding marginal portions of the window, and the overlapping portions of the frame and window are preferably bonded together to provide a rugged composite structure.

Referring now in detail to FIGURES 1-5 of the attached drawings, therein illustrated is a container embodying the present invention having a generally segmental cross section and comprised of a frame of relatively rigid and opaque paperboard sheet material generally designated by the numeral 2 and a window of semi-rigid synthetic plastic sheet material generally designated by the numeral 4.

The structure of the container is best understood by reference to the illustration of the blank in FIGURE 5. The frame 2 is integrally formed and is provided with longitudinally extending rectilinear weakening or score lines 6 defining fold lines and defining a locking panel 8, a cover panel 10, a back wall panel 12, and a longitudinally extending tuck flap 14. Transversely extending rectilinear score lines 16 define locking flaps 18 hingedly connected to the ends of the locking panel 8 and corner dust flaps 20, 22 hingedly connected to the ends of the cover panel 10.

Arcuate score lines 24 disposed inwardly from the ends of the cover panel 10 define end wall closure panels 26 which, in the erected container, are locked in an inwardly curved configuration by the side portions of the curved cover panel 10 and by the rigidity of the material of the frame as seen in FIGURE 1. Score lines 28, 30 cooperate with score lines 16 to define the corner dust flaps 20, 22 which are creased about the tangential extensions

32, 34 of the arcuate score lines 24 to form bellows corners.

The cover panel 10 is provided with a relatively large window aperture 36 spaced inwardly from the ends thereof and of lesser dimension than the window 4. The marginal portions of the cover panel 10 adjacent the aperture 36 overlie corresponding marginal portions of the window 4. An adhesive 38 is interposed between and bonds overlapping portions of the window 4 and the frame 2. In the illustrated embodiment, a strap 40 extends transversely across the window aperture 36 intermediate the ends thereof to enhance the composite action of the frame and window.

The locking panel 8 is provided with a locking tab 42 along its free edge which cooperates with the locking incision slit 44 in the back wall panel 12 and engages therein upon erection of the container to maintain a firm assembly therebetween. The locking panel 8, back wall panel 12 and upper locking flap 18 are provided with circular apertures 46 which are aligned in the erected container as seen in FIGURE 1 to provide an aperture for hanging the container in a display.

In erecting the container, the cover panel 10 is arched over the back wall panel 12 to provide a generally segmental cross section as best shown in FIGURE 3. As the cover panel 10 is arched, the end wall closure panels 26 are bowed inwardly and are locked in that position by the rigidity of the material of the frame. The tuck flap 14 slips between the corner dust flaps 22 and that portion of the cover panel 10 adjacent the locking panel 8 to provide a relatively dust-proof, longitudinal seal for the container.

As shown in FIGURE 4, the end wall closure panels 26 are somewhat overfolded so that the mid-portion of free edge thereof is positioned inwardly of the hinged edge thereof. The free edge of the end wall closure panel 26 is convexly configured, as seen in FIGURES 5 and 10. When folded, the closure panel 26 is retained in its inwardly inclined locked position as most clearly shown in FIGURE 4, the dimension from the edge of the end wall closure to its arcuate fold lines being greater than the rise of the arched cover panel 10 from the back wall panel 12.

The locking panel 8 is folded to underlie the back wall panel 12, and the locking flaps 18 fold about and over the ends of the back wall panel 12. As seen in FIGURE 4, the locking flap 18 resiliently bends, as shown in broken lines, as it is depressed against the end wall closure panel 26 until the free end thereof slips under the free edge of the end wall closure panel 26 which then locks it in overlying relationship with the back wall panel 12 for rapid and convenient erection of the container. In this position, one edge (the right side in FIGURE 3) of the locking flap 18 bears against the tuck flap 14 to prevent relative slippage between the locking panel 8 and the back wall panel 12 caused by the tendency of the arched cover panel 10 and window 4 to flatten out.

Referring now to FIGURES 6-10 of the attached drawings, the container embodiment illustrated therein similarly has a segmental cross section and curvilinear end wall closures and is comprised of a frame of relatively rigid and opaque sheet material generally designated by the numeral 102 and a window 104 of synthetic plastic sheet material. As best seen in the fragmentary illustration of the blank in FIGURE 10, the longitudinal score or weakening lines 106 define locking panel 108 with locking tab 109 at the free outer edge thereof, cover panel 110, back wall panel 112 having a locking incision 113 therein cooperating with the locking tab 109, and tuck flap 114. In this embodiment, transverse score lines 116 define locking flaps 118 having a locking tab 119 at the free edge thereof, corner flaps 120, 122 and end flaps 124, only those of one end being shown in the fragmentary illustration but comparable elements being provided upon the other end. The end wall closure panels 126 are hingedly connected to the end of the cover panel 110 along arcuate score lines 128 disposed inwardly of the frame 102. The frame also has

transverse score lines 136 extending across the locking flaps 118 intermediate the length thereof and a window aperture 129 of lesser dimension than the window 104 so that the marginal portions of the frame about the aperture 129 overlap the margins of the window 104.

A three-sided or U-shaped incision at the intersection of the locking flap 118 and the locking panel 108 forms a locking aperture 130 at the score line 116 when the locking flap 118 is folded about the score line 116 as best seen in FIGURE 9. A similar incision at the intersection of the end flap 124 and the back wall panel 112 defines an aperture 132 and a depending locking tab 134 when the end flap 124 is folded.

In erecting the container, the cover panel 110 is arched over the back wall panel 112 and the locking panel 108 is folded to underlie the back wall panel 112, as seen in FIGURE 8, with the tab 109 engaging in the locking incision 113. Referring again to FIGURE 9, end flap 124 is folded upwardly and tab 134 projects through aperture 130 to prevent lateral slippage between the locking panel 108 and the back wall panel 112 caused by the biasing pressure of the arched cover panel 110 and window 104. The end flaps 124 are folded upwardly, the corner flaps 120, 122 are disposed outwardly thereof, and the locking flaps 118 are folded along the innermost score line along the outer surface of the corner flaps 120, 122 and then about the intermediate score line 136 to extend along the inner surface of the end flaps 124. The tab 134 extends through the aperture 130 and the tab 119 extends through apertures 130, 132 and frictionally bears upon tab 134. The cooperating engagement of the tabs 119, 134 in aperture 130 holds the locking flap 118 in position against inadvertent disengagement and thereby locks the container in erected position.

Circular apertures 138 are conveniently provided in the locking panel 10 and the back wall panel 112 for alignment in the erected container to provide an aperture through which a support may be inserted for hanging the container in a display.

The frame of the container of the present invention may be readily fabricated from paperboard sheet material of about 12 to 50 mils in thickness. Since the paperboard may be dyed or printed readily, wide variations in appearance of the container are possible.

The synthetic plastic sheet material should be semi-rigid to attain maximum strength and rigidity in the container but should be sufficiently flexible to accommodate the stresses and impacts occurring during normal usage. From the standpoint of optimum aesthetic qualities and visibility, the plastic sheeting should be clear and relatively resistant to scratching during normal usage.

Exemplary of the various synthetic plastic sheetings which may be employed are biaxially oriented polystyrene, cellulose acetate, cellulose acetate butyrate, polyvinyl chloride-acetate copolymer, polyethylene and polypropylene. As a specific example of a highly advantageous material, biaxially oriented polystyrene of about 5 to 15 mils in thickness, and preferably of about 5 to 12 mils in thickness, has been particularly desirable because of its clarity, high strength and semi-rigidity coupled with sufficient resiliency and flexibility to resist normal impacts and its relative low cost.

For high-strength composite action and for high-speed assembly, the semi-rigid window is secured to the frame by a suitable adhesive or other means such as heat-sealing or solvent-sealing. However, if desired, despite problems in assembly and loss in composite action, the semi-rigid window may be loosely assembled with the frame or it may be inserted into the partially erected frame in the form of a tray as taught in applicant's copending United States application Serial Number 233,359, filed October 26, 1962, and entitled Container Assembly.

Thus, it can be seen from the specification and drawings that the present invention provides a highly attractive window container having a relatively large curving window surface affording a great degree of visibility for

5

goods received therein with inwardly curving end wall closure panels. The container is durable and may be fabricated from relatively inexpensive materials. The one-piece blank for the container lies flat for convenient storage, yet is easily assembled into the attractive and desirable window container without the need for adhesives or other bonding materials. Thus, there is provided a window container of substantially segmental cross-section which is highly attractive, relatively strong and relatively economical and which is adaptable to a plurality of designs for the effective display of goods.

Having thus described the invention, I claim:

1. A window container having a substantially segmental cross section and inwardly curved end wall closure panels comprising a frame of relatively rigid and opaque sheet material and a window of synthetic plastic sheet material, said frame having a back wall panel, a cover panel arching over said back wall panel providing said container with a substantially segmental cross section, end wall closure panels hingedly connected to the ends of said cover panel along inwardly pointing arcuate fold lines the radial dimension from the center of said arcuate fold to the free end wall closure panels in an inwardly curving configuration, and a locking panel underlying said back wall panel with locking flaps hingedly connected at the ends thereof, said cover panel having a window aperture therein spaced inwardly from the ends thereof and of lesser dimension than said window, the marginal portions of said cover panel adjacent said aperture overlapping corresponding marginal portions of said window and said window conforming to the curve of said cover panel, said back wall panel having means thereon engaged with said locking flaps to secure said container in erected position against the biasing pressure of said arched cover panel and window.

2. The container of claim 1 wherein said window is bonded to said frame by adhesive interposed between overlapping portions of said window and said frame.

3. The container of claim 1 wherein said locking panel lies flat against the outer surface of said back wall panel and including a locking tab upon one of said locking and back wall panels and a cooperating incision in the other of said locking and back wall panels.

4. The container of claim 1 wherein said means of said back wall panel includes a flap on at least one margin of said back wall panel.

5. The container of claim 1 wherein said cover panel has a strap portion extending transversely of said window aperture intermediate the end margins thereof.

6. A window container having a substantially segmental cross section and inwardly curved end wall closure panels comprising a frame integrally formed from relatively rigid and opaque sheet material; a window of semi-rigid synthetic plastic sheet material, said frame having a substantially planar back wall panel with a longitudinally extending tuck flap hingedly connected along the outer side margins thereof, a cover panel arching over said back wall panel providing said container with a substantially segmental cross section, end wall closure panels hingedly connected to the ends of said cover panel along inwardly pointing arcuate fold lines the radial dimension from the center of said arcuate fold to the free edge of each closure panel being greater than the rise of said arched cover panel from said back panel, locking said end wall closure panels in an inwardly curving configuration, and a locking panel underlying said back wall panel with locking flaps hingedly connected at the ends thereof, said cover panel having a window aperture therein spaced inwardly from the margins thereof and of lesser dimension than said window with the marginal portions thereof adjacent said aperture overlapping corresponding marginal portions of said window, said window resiliently conforming to the curve of said cover panel, said locking flaps overlying the ends of said back wall panel with an edge portion thereof bearing against said tuck flap to pre-

6

vent relative slippage between said locking panel and said back wall panel caused by the biasing pressure of the arched cover panel and window, said locking flaps being dimensioned to extend under the free edge of said end wall closure panels and being held thereby in overlying relationship; and means bonding overlapping portions of said window and said frame.

7. A window container having a substantially segmental cross section and inwardly curved end wall closure panels comprising a window of semi-rigid synthetic plastic sheet material; an integrally formed frame of relatively rigid and opaque sheet material, said frame having a substantially planar back wall panel with end flaps hingedly connected to the ends thereof, a cover panel arching over said back wall panel providing said container with a substantially segmental cross section, end wall closure panels hingedly connected to the ends of said cover panel along inwardly pointing arcuate fold lines the radial dimension from the center of said arcuate fold to the free edge of each closure panel being greater than the rise of said arched cover panel from said back panel, locking said end wall closure panels in an inwardly curving configuration, corner flaps hingedly connected to the ends of said cover panel adjacent said end wall closure panels, and a locking panel underlying said back wall panel and having locking flaps hingedly connected at the ends thereof, said back wall panel having incisions adjacent the ends thereof and said locking panel having locking apertures adjacent the ends thereof aligned with said incisions in said back wall panel, said locking flaps each having a locking tab on the outer edge thereof and being folded over said end flaps and cover flaps, said locking tabs being engaged within said incisions and said locking apertures to prevent relative slippage between said locking panel and said back wall panel caused by the biasing pressure of the arched cover panel and window, said cover panel having a window aperture therein spaced inwardly from the margins thereof and of lesser dimension than said window with the marginal portions thereof adjacent said window aperture overlapping corresponding marginal portions of said window, said window resiliently conforming to the curve of said cover panel; and means bonding overlapping portions of said window and said frame.

8. The container of claim 7 wherein said incisions adjacent the ends of said back wall panel are generally U-shaped incisions pointing inwardly and defining tabs depending from the hinged edge of said end flaps, said depending tabs being engaged within said locking apertures adjacent the ends of said locking panel to prevent relative slippage between said locking panel and said back wall panel.

9. A blank for a window container having a substantially segmental cross section and inwardly curved end wall closure panels comprising a window of synthetic plastic sheet material; an integrally formed frame of relatively rigid and opaque sheet material having weakening lines therein defining folds to be made in forming the container and defining a back wall panel, a cover panel hingedly connected along one side to said back wall panel and dimensioned to arch over said back wall panel to provide a substantially segmental cross section to the container, end wall closure panels hingedly connected to the ends of said cover panel along inwardly disposed arcuate weakening lines each having a radial dimension from its free edge to the center of the arcuate weakening line which is greater than the maximum rise of said cover panel when arched over said back wall panel, and a locking panel hingedly connected to said cover panel along the other side thereof and adapted to underlie said back wall panel in the erected container, said locking panel having locking flaps at the ends thereof and said back wall panel having means thereon for engagement with said locking flaps in the erected position of said container to hold said container in erected position, said cover panel having a

window aperture therein spaced inwardly from the ends thereof and of lesser dimension than said window with marginal portions of the panel adjacent said aperture overlapping corresponding marginal portions of said window; and means bonding said overlapping portions of said window and frame.

10. The blank of claim 9 wherein the relatively rigid sheet material of said frame is paperboard sheet material of about 12 to 50 mils in thickness and said window material is semi-rigid synthetic plastic sheet material of about 5 to 15 mils in thickness.

11. The blank of claim 9 wherein said window is bonded to said frame by adhesive interposed between overlapping portions of said window and said frame.

12. The blank of claim 9 including a locking tab upon one of said locking and back wall panels and a cooperating incision in the other of said locking and back wall panels providing a lock therebetween.

13. The blank of claim 9 wherein said means of said back wall panel includes a flap on at least one margin of said back wall panel.

14. A substantially planar blank for a window container having a substantially segmental cross section and inwardly curved end wall closure panels comprising a window of semi-rigid synthetic plastic sheet material; an integrally formed frame of relatively rigid and opaque sheet material having weakening lines therein defining folds to be made in forming the container and defining a generally rectangular back wall panel with a longitudinally extending tuck flap hingedly connected along the outer side margin thereof, a cover panel hingedly connected along one side to the other side margin of said back wall panel and dimensioned to arch over said back wall panel providing a substantially segmental cross section to the container, end wall closure panels hingedly connected to the ends of said cover panel along inwardly disposed arcuate weakening lines each having a radial dimension from its free edge to the center of the arcuate weakening line which is greater than the maximum rise of said cover panel when arched over said back wall panel, and a locking panel hingedly connected along the other side of said cover panel and adapted to underlie said back wall panel in the erected container, said locking panel having locking flaps hingedly connected at the ends thereof adapted to overlie the ends of said back wall panel and dimensioned to extend under the free edge of said end wall closure panels to be held thereby in overlying relationship in the erected container and to bear against said tuck flap for preventing relative slippage between said back wall panel and said locking panel for holding said container in erected position, said cover panel having a window aperture therein spaced inwardly from the margins thereof and of lesser dimension than said window with the marginal portions of said panel adjacent said aperture overlapping corresponding marginal portions of said window; and means bonding overlapping portions of said window and said frame.

15. A substantially planar blank for a window container having a substantially segmental cross section and inwardly curved end wall closure panels comprising a window of semi-rigid synthetic plastic sheet material; an integrally formed frame of relatively rigid and opaque sheet material having weakening lines therein defining folds to be made in forming the container and defining a generally rectangular back wall panel with end flaps hingedly connected to the ends thereof, a cover panel hingedly connected along one side to one side of said back wall panel and dimensioned to arch over said back wall panel providing a substantially segmental cross section to the container, end wall closure panels hingedly connected to the ends of said cover panel along inwardly disposed arcuate weakening lines each having a radial dimension from its free edge to the center of the arcuate weakening line which is greater than the maximum rise of said cover panel when arched over said back wall panel, corner flaps hingedly connected to the ends of said cover panel on opposite sides of said end wall closure panels, and a locking panel hingedly connected along the other side of said cover panel and adapted to underlie said back wall panel in the erected container and having locking flaps hingedly connected at the ends thereof, said back wall panel having incisions adjacent the ends thereof and said locking panels having locking apertures adjacent the ends thereof and adapted to be aligned with said incisions in said back wall panel in the erected container, said locking flaps each having a locking tab on the outer edge thereof and being adapted to fold over said end flaps and corner flaps with said locking tabs engaged within said incisions and locking apertures in the erected container, said cover panel having a window aperture therein spaced inwardly from the margins thereof and of lesser dimension than said window with marginal portions of said cover panel adjacent said window aperture overlapping corresponding marginal portions of said window; and means bonding overlapping portions of said window and said frame.

16. The blank of claim 15 wherein said incisions adjacent the ends of said back wall panel are generally U-shaped incisions pointing inwardly and defining tabs adapted to depend from the hinged edge of said end flaps for engagement within said locking apertures adjacent the ends of said locking panel in the erected container.

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