July 25, 1967 R. H. GUERNSEY 3,332,600

COLLAPSIBLE PAPERBOARD BOX

Filed Sept. 2, 1965

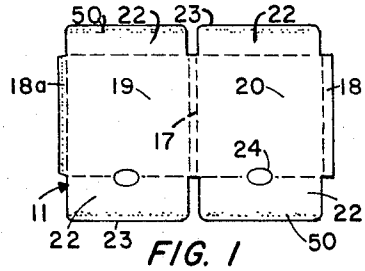


FIG. 1

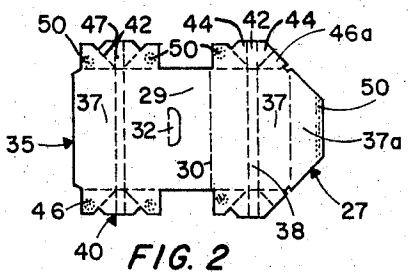


FIG. 2

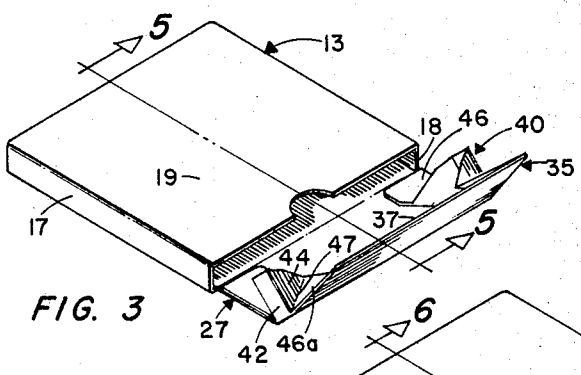


FIG. 3

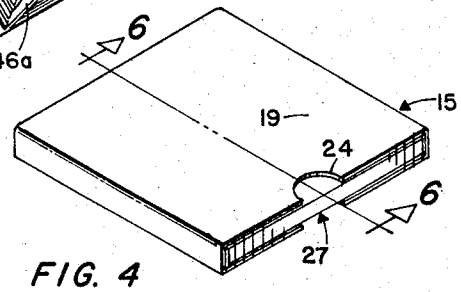


FIG. 4

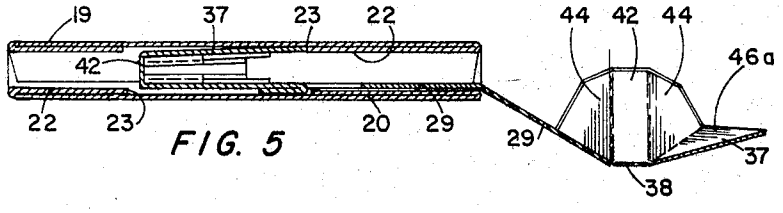


FIG. 5

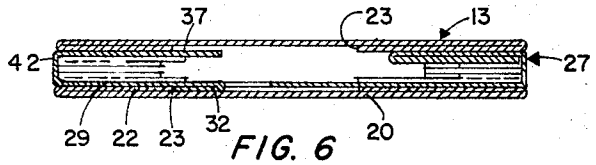


FIG. 6

INVENTOR.
Richard H. Guernsey

BY

ATTORNEY

United States Patent Office 3,332,600 Patented July 25, 1967

3,332,600

COLLAPSIBLE PAPERBOARD BOX

Richard H. Guernsey, Park Forest, Ill., assignor to Creative Packaging Incorporated

Filed Sept. 2, 1965, Ser. No. 484,615
6 Claims. (Cl. 229—20)

ABSTRACT OF THE DISCLOSURE

A paperboard box comprising a tray and a sleeve, each being collapsible and capable of being formed from a single blank. The tray is limited in its movement within the sleeve in both directions by a pair of limit stop edges on the inner surfaces of the sleeve. The limit stop edges are adapted for individual abutment with a pair of respective edges on the tray which are spaced to provide the desired maximum travel of the tray within the sleeve in opposite directions.

This invention relates to a collapsible paperboard box and in particular to a box of the packaging type having a tray with limited sliding motion. In the design and construction of paperboard boxes it is particularly desirable to produce a box which may be shipped in a flat form to the ultimate user. At the same time such a box must be easily erected. If boxes were shipped to purchasers in their erected form, shipping costs would be substantial. In addition, the boxes, being empty, might be more likely to be damaged enroute to the purchaser. There are a variety of paperboard constructions; and, through experience, the most preferred form is one which utilizes a minimum of paperboard sections. Thus, in addition to meeting the criteria of being produced in a collapsible form for shipment, the box should not contain a large number of elements that would complicate erection as well as increase production costs.

Many goods are sold in boxes which are not necessarily consumed within a short period. One example is in the tape recording industry where reels containing tape are packaged in boxes and may be used over a number of years. In order to safeguard the tape and reel the box containing it should be rigid and durable. When the article is frequently removed from the box it is apparent that a simple means must be developed for easy access.

The box of this invention meets all of the above criteria and is particularly appealing to the purchaser of the boxed article as well as the supplier who packages the articles. In general, the novel construction of this box comprises a sleeve and a tray formed from moderately heavy duty paperboard. Both the tray and sleeve may be shipped to the article supplier in a collapsed form. Furthermore, both the tray and sleeve are formed from one-piece paperboard blanks. The tray is adapted for free sliding movement within the sleeve but is able to exit from the sleeve at only one end. Furthermore, the tray can only be pushed into the sleeve to a point where it becomes aligned with the sleeve. In short, the box enables the user of the article to pull the tray containing the article partially out of the sleeve. Consequently, there is no possibility of losing the sleeve since it is not easily separated from the tray. Furthermore, the likelihood of accidentally dropping the article is reduced.

It is therefore one object of this invention to provide a new and improved collapsible box.

Another object of this invention is to provide a new and improved box including a tray adapted for limited movement within a sleeve.

Another object of this invention is to provide a novel

box embodying a tray which may be collapsed to a flat form subsequent to its final erection.

Other objects and advantages of this invention will be apparent from reading the following description in connection with the drawing in which:

FIG. 1 is an illustration of the blank used for forming the box sleeve;

FIG. 2 is an illustration of the blank used for forming the box tray;

FIG. 3 is a perspective view of the assembled box in its open position with the tray extended;

FIG. 4 is a perspective view of the box in its closed position;

FIG. 5 is a view taken in cross section along lines 5—5 of FIG. 3; and

FIG. 6 is a view in cross section taken along lines 6—6 of FIG. 4.

Referring to FIG. 1, sleeve **11** may be formed from the illustrated blank which is formed of semirigid paperboard adaptable to sharp creases after being scored by a conventional die. This blank may be formed into sleeve **13** which forms one part of box **15**. A pair of edge walls **17** and **18** and **18***a* are adjacent a pair of top and bottom sections **19** and **20**. The top and bottom sections may be substantially double walled by the provision of panels **22** which serve as the inner layer of the walls. These panels do not extend along the full length of the sleeve. In effect, a transverse portion of each of the inner layers may be said to have been removed, resulting in limit stop edges **23**. Oval cutouts **24** are also provided in the blank for easy access to a tray **27** formed from the blank in FIG. 2.

Tray **27** includes a bottom panel **29** having a transverse crease line **30**. A limiter cutout flap **32** may also be formed in bottom panel **29**. Flanking bottom panel **29** at opposite ends are a pair of transverse retaining sections **35**. In general, these two retaining sections may be substantially similar.

Thus, each retaining section **35** has a hinged access panel **37** and a top end wall **38**. In addition, each retaining section has a pair of collapsible protective side elements **40**. Each of these side elements includes a side wall **42** and a pair of side wall sections **44**. Each of the side wall sections **44** is integrally hinged to a support panel **46**. To facilitate the hinging effect of these elements crease line **47** may be partially cut. At one end of the tray blank **27** a panel **37***a* may be provided which produces a double walled access panel **37** in order to increase rigidity.

The two above-described blanks **11** and **27** require a minimum of gluing for assembly. Thus, in regard to blank **11** glue strips **50** may be placed on all four panels **22** and panel **18***a*. In regard to tray blank **27** glue spots **50** may be placed on six of the support panels **46** as well as on panel **37***a*. No glue is required for the two support panels **46***a*. For assembly of the blanks the panels are folded along the illustrated crease lines and held together by the glued portions.

In assembling the tray the collapsible protective side elements **40** will be erected in such a manner that support panels **46** are glued flush to their respective access panels **37**. The side wall sections **44** in conjunction with their respective side walls **42** will provide protective means for containing the article within the box as well as maintaining them in a substantially dust proof condition. In addition, the side elements **40**, and in particular side walls **42**, serve to provide rigidity for the box once the tray is within the sleeve.

In order to insert the tray in the sleeve the limiter cutout flap **32** is doubled back onto bottom panel **29** in a stressed condition. The tray is then inserted in the sleeve

until the box is in the form illustrated in FIGS. 4 and 6. It will be noted that the edge of the limiter cut-out flap **32** is in abutment with one of the limit stop edges **23** on the inner surface of the sleeve. This prevents the tray from being pushed beyond its fully closed position in the sleeve.

When the box is in its open position as illustrated in FIGS. 3 and 5, the tray will be partially extending from the sleeve. Further extension of the tray is prevented through the coaction of the edge of the tray's panel **37** with a second limit stop edge **23** on the inner surface of the sleeve. Crease line **30** on the trays bottom panel **29** permits easy access to the article within the box. As the extended retaining section **35** of the tray is deflected downwardly it approaches a straight plane since the protective side elements tend to collapse. This further facilitates access to the article.

It is apparent that the dimensions of the limit stop edges **23** and the limiter cutout flap **32** may be placed in predetermined positions enabling the sleeve to travel the desired distance. Likewise, the longitudinal length of the collapsible protective side elements will be dimensioned in accordance with the article to be packaged. In the illustrated embodiment the box has been designed for containing a circular article such as a tape reel. Thus, the protective side elements **40** must not extend too far or they will interfere with removal of the reel.

For shipping purposes, assembled sleeve **13** may be collapsed into one plane since its edge walls **17** and **18** are pivotally hinged to top and bottom sections **19** and **20**. Likewise, the assembled tray **27** is collapsed into one plane by outwardly extending the two transverse retaining sections **35**. The collapsible protective side elements **40** will be depressed whereby side wall **42** will be in contact with top end wall **38** and side wall sections **44** with bottom panel **29** and access panel **37**. Thus, the two box components are capable of being shipped in stacks of flat but assembled forms at a cost substantially less than if they were shipped in erected forms.

While only one embodiment of this invention has been illustrated and described, it will be apparent to those with skill in the art that modifications can be made without departing from the spirit of this invention and the scope of the appended claims.

I claim:

1. A two-piece paperboard container comprising: a double-open-ended sleeve having two opposing edge walls integrally connected to double walled top and bottom

sections, each of said sections having a transverse portion of the inner wall layer removed to provide a respective limit stop edge, a tray adapted for limited travel within said sleeve having a bottom panel integrally hinged to two transverse retaining sections, each of said retaining sections comprising a hinged access panel with a pair of collapsible protective side elements in folding connection on said tray bottom and access panel, a limiter cutout flap positioned in said tray bottom adapted for abutment with a respective said limit stop edge to limit the travel of said tray within said sleeve in one direction, and an edge of an access panel adapted for abutment with the other said limit stop edge to limit the travel of said tray within said sleeve in the opposite direction.

2. The container of claim **1** in which each of said retaining sections comprises a top end wall hinged to said access panel.

3. The container of claim **2** in which each of said protective side elements comprises a side wall hinged to said top end wall.

4. The container of claim **3** in which said side wall is in folding connection with said tray bottom and access panel by a pair of integral wall sections whereby said protective side elements may be collapsed flush with said tray bottom, top end wall and top panel.

5. The container of claim **4** in which said tray bottom has a transverse crease extension of said sleeve when said tray is in its maximum extended position.

6. The container of claim **5** in which said limit stop edges and cut-out flap are at predetermined positions limiting exit of said tray from said sleeve to a single direction.

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JOSEPH R. LECLAIR, *Primary Examiner.*

DAVIS T. MOORHEAD, *Examiner.*