May 26, 1970 C. B. PIERCE 3,514,032

TOP OPENING CARTON

Filed May 8, 1968

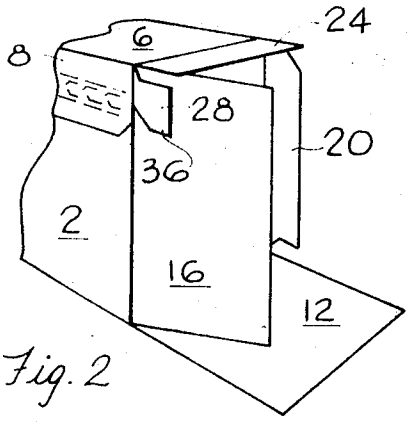


Fig. 2

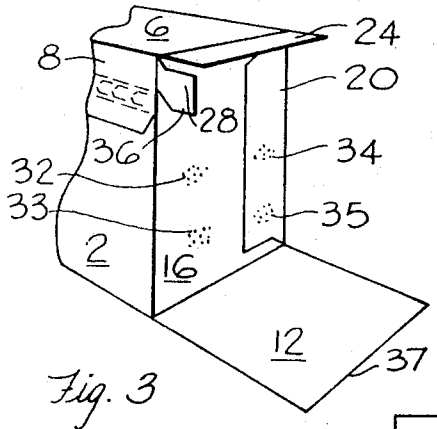


Fig. 3

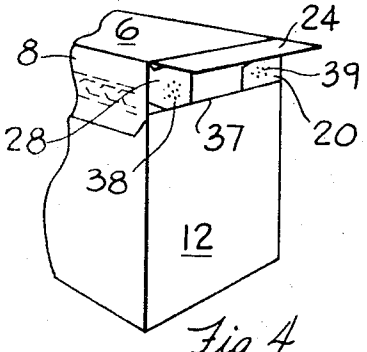


Fig. 4

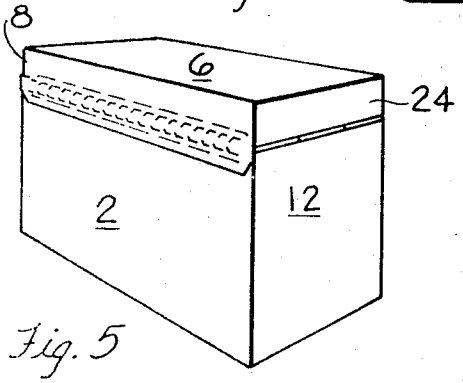


Fig. 5

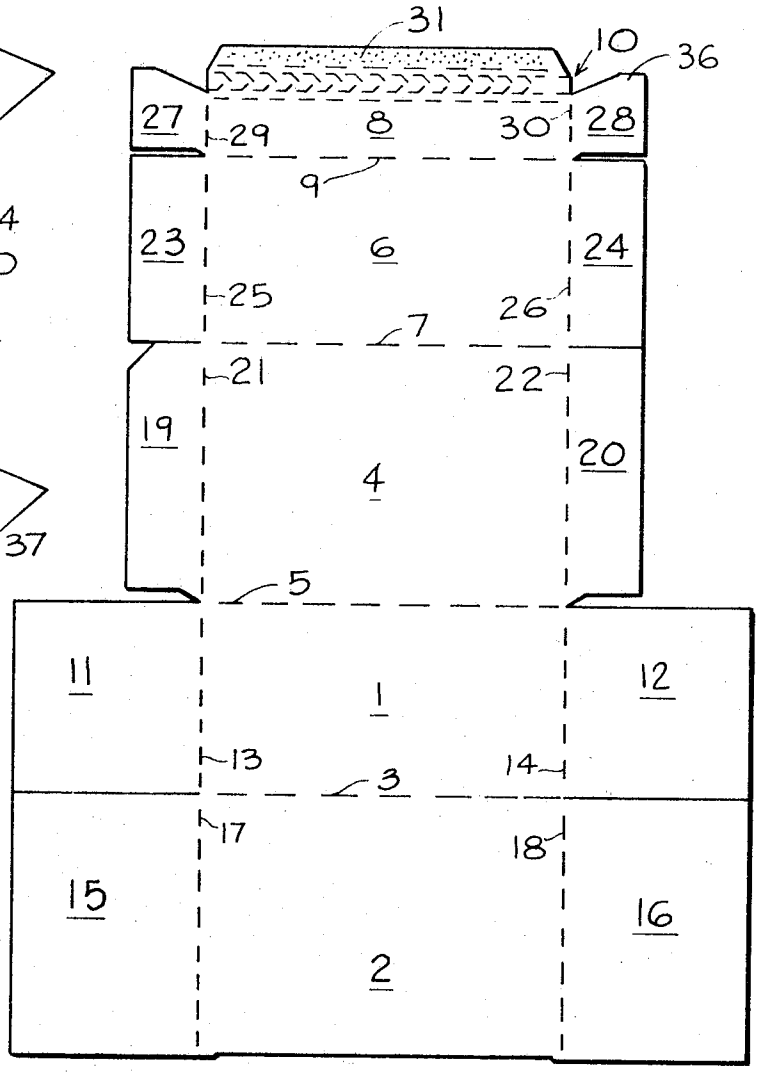


Fig. 1

INVENTOR

CLARKE B. PIERCE

BY: Walter M. Rodgers

ATTORNEY

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TOP OPENING CARTON

Clarke B. Pierce, Milpitas, Calif., assignor to The Mead Corporation

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ABSTRACT OF THE DISCLOSURE

A folding box of the so-called trunk style having bottom, front, rear and lid panels is provided at each end with a bottom end panel foldably joined to an end edge of the bottom panel, a lid end panel foldably joined to the adjacent end of the lid panel, a front end panel foldably joined to the associated end of the front panel, a rear end panel foldably joined to the associated end of the rear end panel and normally disposed in overlapped face contacting relation with the adjacent one of said front end panels, a lid front panel foldably joined to the front edge of the lid panel, an end flap foldably joined to each end of the lid front panel and folded into flat face contacting relation with the associated front end panel, each end flap being configured along its lower edge so as to protrude below the bottom edge of the associated lid end panel and so as to extend underneath the upper edge of the associated bottom end panel, the lid and bottom end panels being disposed in the same plane and with their adjacent edges in close proximity to each other. A method of sealing the ends of the carton is employed wherein all end panels and flaps are closed initially and wherein certain panels are then opened and glued closed while the carton is moved continuously.

Carton sealing machnies of the type disclosed, for example, in U.S. patent application Ser. No. 601,301 filed Dec. 13, 1966 are arranged to close the ends of a folding box by applying glue and then pressure to a pair of end panels in a predetermined sequence. During the application of glue for sealing one end panel, for example, it is necessary that the panel or panels to which an application of glue is to be made by securely held in a desired position so that the desired application of glue may be made. Furthermore, in folding boxes it is generally desirable particularly in trunk style cartons to provide a structure in which there are no outwardly extending protrusions and in which the exterior panels are disposed in the same plane so that no abutment edges are presented which might hang up against adjacent cartons or other objects.

According to this invention, the end panels associated with the lid of a trunk style carton are disposed in the same plane as the outer end panels of the body portion of the carton and sequential gluing of the end panels is accommodated by constructing an end flap so that the lower edge thereof protrudes downwardly sufficiently to underlie at least partially the upper edge of the outer end panel of the body portion of the carton. This downwardly protruding flap underlies and bridges the adjacent edges of a pair of outer coplanar end panels so that an improved sealing method is made possible in which the coplanar panels are opened, glued and sealed sequentially while the flap is held closed continuously first by one coplanar panel and then by the other.

For a better understanding of the invention, reference may be had to the following detailed description taken in conjunction with the accompanying drawings in which FIG. 1 is a plan view of a blank constructed according to this invention; FIG. 2 is a perspective view of one end of a carton formed during the process of its formation

from the blank shown in FIG. 1; FIG. 3 is a view similar to FIG. 2 and which shows a subsequent stage during the formation of the carton; FIG. 4 is a view similar to FIGS. 2 and 3 and depicts the end structure of a carton during a stage of folding and gluing subsequent to that depicted in FIG. 3; and in which FIG. 5 is a perspective view of a completely formed and set up carton constructed according to this invention.

In the drawings, the numeral **1** designates a bottom panel of a carton such as an ice cream carton. The numeral **2** designates the front panel of the carton which is foldably joined to the bottom panel thereof along fold line **3**. A rear panel **4** is foldably joined to bottom panel **1** along fold line **5** and lid panel **6** is foldably joined to the top edge of rear panel **4** along fold line **7**. A lid front panel **8** is foldably joined to the front edge of lid panel **6** along fold line **9** and a tear strip generally designated by the numeral **10** is formed in the lid front panel **8** in a manner well known in the art.

The ends of the carton are identical and comprise bottom end panels **11** and **12** which are foldably joined to bottom panel **1** along fold lines **13** and **14** respectively. Front end panels **15** and **16** are foldably joined to front panel **2** along fold lines **17** and **18** respectively while rear end panels **19** and **20** are foldably joined to rear panel **4** along fold lines **21** and **22** respectively.

The lid of the carton comprises lid end panels **23** and **24** which are foldably joined to lid panel **6** along fold lines **25** and **26** respectively and end flaps **27** and **28** which are foldably joined along fold lines **29** and **30** respectively to the end edges of lid front panel **8**.

In order to form the carton, a tubular structure is first formed by making an application of glue to lid front panel **8** as indicated by stippling at **31**. Thereafter front panel **2** is folded upwardly and forwardly along the fold line **3** to occupy a position of flat face contacting relation with the bottom panel **1**. Following this folding operation, lid panel **6** is folded up and forwardly along fold line **7** so that the stippled areas **31** of lid front panel **8** come into contact with the upper edge of front wall **2**. Following this folding and gluing operation, the carton is formed into a tubular structure such as is generally indicated in FIG. 2.

Ordinarily one end of the carton is closed but not glued and the carton is arranged to rest on the closed end while the other end remains open. Thereafter the contents such as ice cream may be loaded into the carton through the upper open end. The upper end of the carton is then closed and carton and contents proceed to the end sealing operation during which both ends are sealed.

In order to close one end of the carton, front end panel **16** is first folded into the closed position astride the end of the carton and rear end panel **20** is thereafter folded into overlapped face contacting relation with front end panel **16** as is best shown in FIG. 3. Following the overlapping of front and rear end panels **16** and **20** as shown in FIG. 3, the end flap **28** is folded into flat face contacting relation with the front end panel **16** following which folding operation lid end panel **24** and bottom end panel **12** are folded into flat face contacting relation with the panels **16**, **20** and **28** so that the carton then appears as depicted in FIG. 5. Of course the procedure for closing the other end is identical.

While it is not particularly significant which coplanar p nel **12** or **24** is folded outwardly before the other panel in order to accommodate gluing, it ordinarily is preferable to fold the bottom end panel **12** outwardly while the lid end panel **24** is held in flat face contacting relation with the remaining panels. During this operation, an application of glue is made to the outside surface of front end panel **16** as indicated by the dotted and stippled areas

designated by the numerals **32** and **33** and a similar application of glue is made to the outside surface of rear end panel **20** as indicated by the dotted and stippled areas **34** and **35**. Thereafter panel **12** is pressed into firm engagement with the panels **16** and **20** and is held in that position by the glue. When closed, panel **12** holds flap **28** in the correct position for a subsequent gluing and sealing operation. Instead of applying glue to panels **16** and **20**, it could as well be applied to the inside surface of panel **12** as is obvious.

Since the end flap **28** cannot be conveniently glued to the front end panel **16** due to interference with later opening of the carton, the end flap **28** must be held in its position of face contacting relationship with the front end panel **16** by other means. Thus according to a feature of this invention, the lower edge **36** of end flap **28** is arranged so as to protrude downwardly sufficiently to underlie the upper edge **37** of bottom end panel **12**. Thus after end panel **12** is folded upwardly into the position shown in FIG. 4 end flap **28** is held in the proper position by the upper edge **37** of bottom end panel **12**. Thus with the parts in the position depicted in FIG. 4 an application of glue is made to the outside surface of end flap **28** as indicated by the dotted and stippled area **38** and a similar spot of glue is applied to the upper part of rear end panel **20** as indicated at **39**. Instead of applying glue to the outside surfaces of flap **28** and of rear end panel **20**, an application of glue could be made to the inside surface of coplanar lid end panel **24** as is obvious and so as to form a bond between panel **24** and flap **28** and panel **20**. Thereafter the lid end panel **24** is folded downwardly to occupy the position depicted in FIG. 5 and the carton is complete.

From FIG. 5 it is apparent that the exposed end structure of the carton comprising coplanar lid end panel **24** and bottom end panel **12** forms a flush arrangement which is both attractive in appearance and which due to the flush coplanar relationship is not likely to result in outwardly protruding edges which might hang up and interfere with adjacent objects.

Furthermore, the fact that downwardly protruding part **36** is provided for the end tab **28** results in the application of uniform pressure along the entire top edge **37** of bottom end panel **12** during the sealing operation so that a more precise sturdy and uniform structure results. For this reason it is not necessary to provide embossed areas on panel **16** in the areas of glue spots **32** and **33** so as to compensate for the overlapping relationship between front end panel **16** and rear end panel **20**.

Although shown resting on its bottom panel in FIGS. 2–5, the carton ordinarily is disposed to rest on one end during sealing. Thus it is desirable though not necessary to utilize the effect of gravity in gluing the various panels and flaps and to this end glue is ordinarily applied at the upper end of the carton on the outside surfaces of

the panels **16** and **20** and the flap **28** and at the lower end of the carton on the inside surfaces of coplanar panels **12** and **24**.

While a particular embodiment of the invention has been shown and described, the invention is not limited thereto and it is intended in the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the invention.

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

1. A carton comprising a bottom panel, front and rear panels foldably joined to the front and rear edges respectively of said bottom panel, a lid panel foldably joined to the edge of said rear panel remote from said bottom panel, a lid front panel foldably joined to the edge of said lid panel remote from said rear panel and secured to said front panel along an edge of said lid front panel remote from said lid panel, an end flap foldably joined to each end of said lid front panel, a bottom end panel foldably joined to each end of said bottom panel, a lid end panel foldably joined to each end of said lid panel, a front end panel foldably joined to each end of said front panel, a rear end panel foldably joined to each end of said rear panel and normally disposed in overlapped face contacting relation with the adjacent one of said front end panels, each end flap being folded into flat face contacting relation with the associated one of said front end panels and being configured and arranged to protrude below the lower edge of the associated one of said lid end panels, means securing each of said lid end panels to the associated end flap, each bottom end panel being folded into flat face contacting relation to the associated front and rear end panels, and the upper edge of each bottom end panel being disposed immediately below and in the same plane as the lower edge of the associated lid end panel, and means securing each of said bottom end panels to the associated front and rear end panels.

2. A carton according to claim **1** wherein said lid end panels are secured to said end flaps by a permanent glue bond and to said rear end panels by a severable glue bond.

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DAVIS T. MOORHEAD, Primary Examiner

U.S. Cl. X.R.

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