United States Patent [19]

Goebel

[11] **3,713,576**

[45] **Jan. 30, 1973**

[54] CYLINDRICAL CARTON

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[22] Filed: **Dec. 28, 1970**

[21] Appl. No.: **101,665**

[52] **U.S. Cl.** **229/21,** 229/8, 229/38

[51] **Int. Cl.** **B65d 3/04**

[58] **Field of Search** .....229/21, 38, 93, 87.2, 8, 41 C, 229/37 R, 5.5

[56] **References Cited**

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[57] **ABSTRACT**

A cylindrical carton is made from a folded sheet of flexibly stiff carton material. It comprises a body having opposite side and end margins. The body is flexed into cylindrical form with the opposite side margins overlapped and secured. At least one end margin is scored and folded into a plurality of triangular end sections which may be reversely folded inwardly of the cylinder to abut the sections against each other in mutually braced relation, thereby forming a self-sustaining end closure for the carton.

3 Claims, 7 Drawing Figures

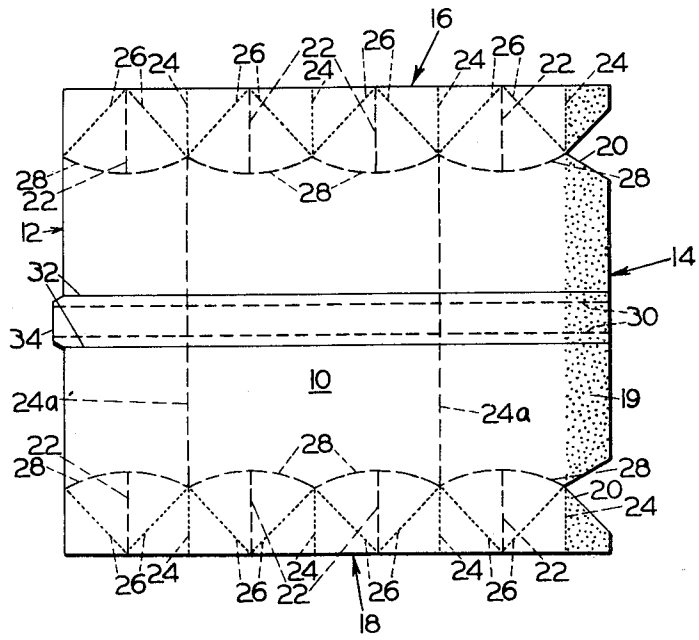


FIG. 1

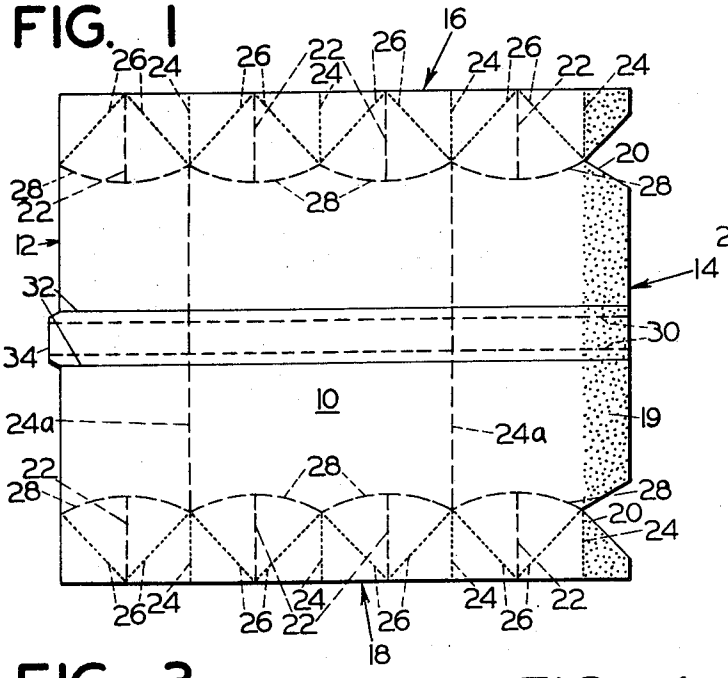


FIG. 2

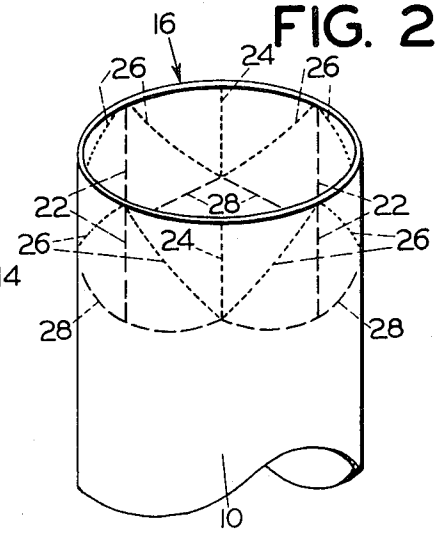


FIG. 3

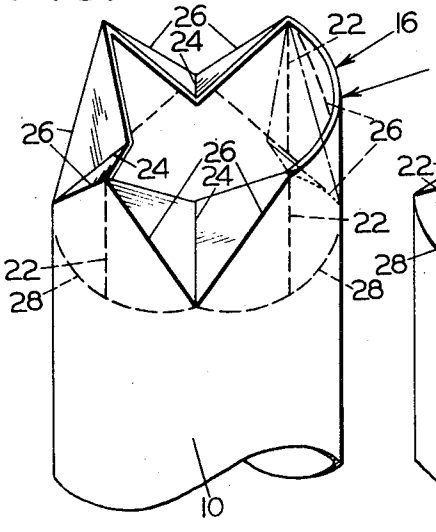


FIG. 4

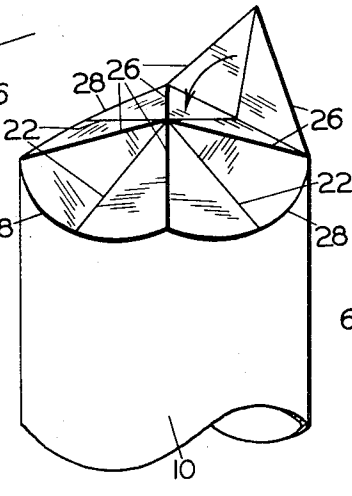
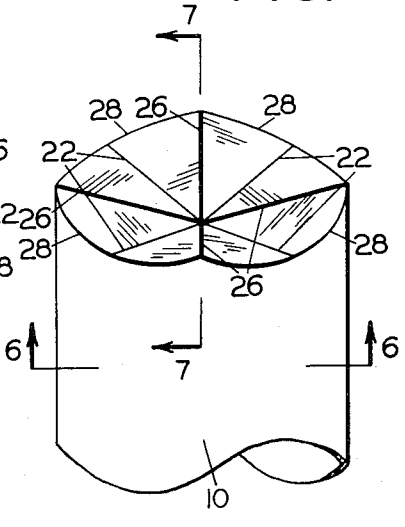


FIG. 5



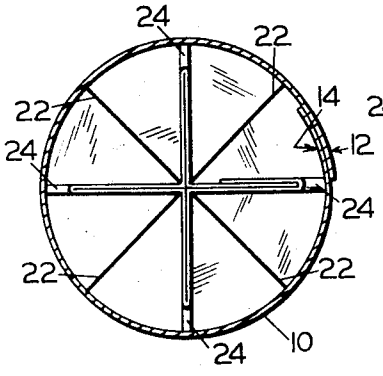


FIG. 6

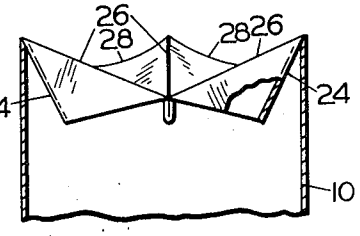


FIG. 7

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CYLINDRICAL CARTON

This invention relates to paper board cartons of cylindrical contour which readily may be converted from a flat storage condition to a cylindrical use condition.

Although paperboard containers of various sizes, shapes and contours heretofore have been designed and made commercially available, there still exists the need for a uniformly cylindrical paperboard container which may be used to merchandise and protect a consumer product having a circular edge which must be maintained blemish free about its entire circumference. This is the case, for example, when merchandising such products as hats, wigs, and various types of clothing including non-wrinkle men's trousers.

It is the object of the present invention to provide a cylindrical carton which meets the foregoing need and which in addition is easily and economically manufactured; storable in a flat, stacked condition; easily assembled to a cylindrical use condition; sufficiently strong to protect the merchandise which it contains; uniformly cylindrical; easily opened and re-usable, if re-use is desired; or, if permanently sealed, easily entered by means which does not weaken the skin tension of the cylinder.

The manner in which the foregoing and other objects of the invention are accomplished will be apparent from the accompanying specification and claims considered together with the drawings wherein:

FIG. 1 is a plan view of the cut and scored blank employed in the manufacture of the herein described cylindrical carton;

FIGS. 2, 3 and 4 are fragmentary perspective views illustrating the steps involved in folding the carton;

FIG. 5 is a fragmentary perspective view similar to FIGS. 2, 3 and 4, but illustrating the carton in its folded condition; and

FIGS. 6 and 7 are sectional views taken, respectively, along lines 6—6 and 7—7 of FIG. 5.

In its broad aspect, the presently described cylindrical carton comprises a folded sheet of flexibly stiff carton material having a body with two opposite side margins and two opposite end margins. The body is flexed into cylindrical form with the opposite side margins adjacent each other. Securing means such as adhesively united overlapped panels secure the side margins together in carton-forming relation.

At least one end margin is scored and folded into a plurality of triangular end sections interconnected by a plurality of reversely folded connecting sections. The apices of the triangular end sections meet at substantially the longitudinal axis of the cylindrical body. The end sections are reversely folded inwardly along their bases to abut them against each other in mutually braced relation, thereby forming a self-sustaining end closure for the carton. If desired, the end section may be permanently sealed in its folded condition by application of a suitable adhesive.

Considering the foregoing in greater detail and with particular reference to the drawings:

This presently described cylindrical carton comprises a body **10** originally comprising a die cut or otherwise shaped, substantially rectangular, flat sheet of flexibly stiff carton material such as paperboard.

The sheet has a first side margin **12**, an opposite side margin **14**, a first end margin **16** and an opposite end margin **18**.

One of the side margins, for example, side margin **14**, is intended to overlap the opposite side margin **12** and to be secured thereto by application of adhesive **19**. Any suitable drying, thermoplastic, thermosetting, or pressure sensitive type of adhesive may be employed. Side margin **14** also is formed with a pair of notches **20** dimensioned and positioned as required to accommodate the folding end closing function of the carton.

The end margins **16**, **18** of the carton body are provided with a cooperating network of creased and/or perforated scores which makes possible folding the margins inwardly to create the desired end closures. The network of scores on one end may be substantially identical with that on the other.

The net result of the network of scores is to divide each end margin into a plurality of scored sections in number predetermined to permit flexing the body portion of the carton into a cylindrical contour and maintaining this contour during use of the carton. In the illustrated form of the invention, four such sections are created, although a greater number may be present if desirable or necessary, as determined by such factors as the carton size, the properties of the paperboard sheet employed, etc.

Thus, as shown particularly in FIG. **1**, each end margin of body **10** has a plurality of spaced, longitudinally extending crease scores **22**. In the folded position of the carton wherein the body assumes a cylindrical configuration, these scores will be substantially equal in length to the radius of the cylinder.

The end margin also is provided with a plurality of spaced, longitudinally extending perforated scores **24**. These are somewhat shorter in length than scores **22** to which they are substantially parallel.

Two of scores **24**, which lie diametrically opposite each other in the assembled carton, have central extensions **24a** which connect with the corresponding scores on the opposite end margin and form two continuous score lines along the entire length of the sheet. These make possible folding the body to a flat, intermediate transportation and storage position pending its ultimate assembly and use.

Each end margin further is provided with a plurality of diagonal, perforated scores **26**. These lie diagonally between longitudinal scores **22**, **24** which they interconnect. The angle of notch **20** matches the angle of these diagonal scores to permit folding along the scores.

Each end margin further is formed with a plurality of concavely transverse crease scores **28**. These lie on a line roughly determined by the radius of the assembled carton, i.e., the length of scores **22**. They make possible folding the margin into reversely bent, mutually braced segments which maintain the carton in its cylindrical shape.

Means also are provided for opening the carton after it has been assembled, sealed and used.

The means employed for this purpose comprise a first pair of substantially continuous cut scores **30**, and a second pair of substantially continuous cut scores **32**. These lie substantially parallel to each other, transversely of the sheet from which the carton is made, and an-

nularly of the cylindrical carton after assembly. They are on opposite sides of the sheet.

They do not penetrate the sheet completely and are offset from each other so that the fibrous character of the paperboard sheet is not weakened sufficiently to interfere with the skin tension of the carton surface. A pull tab **34** is provided at one end. Pulling on the tab tears the sheet along the offset scorings, thus opening the carton.

The manner of assembly of the carton, its construction, and its mode of functioning in the assembled condition are illustrated sequentially in FIGS. **2** to **7** inclusive.

First, the cut and scored flat sheet is folded along long scores **24**, **24a**. This places glue coated margin **14** in lapped relation to margin **12**. Upon setting of the glue, a flat, cylinder-forming blank is formed which may be shipped and stored in its flat condition.

When useof the carton is contemplated, longitudinal scores **24** first are folded inwardly, followed by longitudinal scores **22**, folded in the same direction, FIGS. **2** and **3**.

The inward folding is continued along transverse scores **28**. Preliminary to the folding, or contemporaneously, the body portion is flexed into substantially cylindrical form.

Folding the margins along the score lines in this manner divides each end margin into substantially triangular sections of two classes. The triangular sections of the first class comprise those defined by diagonal scores **26** and transverse scores **28**. These form the end closing surfaces.

Triangular sections of the second class are defined by the end edges of the sheet and diagonal scores **26**. These form connecting sections which connect the end closing sections.

The dimensions and relationships of the triangular sections are such that upon first creating them by folding along the score lines a convex end closure such as is illustrated in FIG. **4** is created. However, upon pushing inwardly on the end closure sections, they are moved past a dead center position, into the concave or dished position illustrated in FIG. **5**. They may be fixed in this position by the application of adhesive, if desired.

In their concave position, the triangular end closure sections are wedged together, bracing each other in a self-sustaining condition in which the apices are precisely on the longitudinal axis of the cylinder. A constant radius of the carton surface from the longitudinal axis is thus maintained by the outward pressure exerted by the end wall segments working against the fixed diameter of the carton circumference. This creates a skin tension which establishes itself as a circular form and which is maintained by the bracing action of the end wall sections against each other and against the carton surface. It also insures that there will be no flat spots in the carton surface, which in turn could damage merchandise packaged therein.

When it is desired to open the carton, tab **34** is pulled. Thereupon the carton separates along annular score lines **30**, **32**. Provision thus is made for opening the carton easily, but with means which does not weaken the skin tension nor destroy the cylindrical symmetry of the carton during its use.

Having thus described my invention in preferred embodiments, I claim:

1. A cylindrical carton made from a folded sheet of flexibly stiff carton material, the carton comprising:

a. a body having two opposite end margins and two opposite side margins,

b. the body being flexed into cylindrical form with the opposite side margins adjacent each other,

c. securing means securing the side margins together in carton-forming relation,

d. at least one end margin being scored and folded into a plurality of triangular end closing sections interconnected by a plurality of triangular connecting sections, the end closing and connecting sections being defined by a plurality of long and short longitudinal score lines interconnected by diagonal score lines to define the sides of triangles, the inner ends of the longitudinal score lines being interconnected by transverse score lines defining the bases of the triangular end closing sections, the long longitudinal score lines being substantially equal in length to the radius of the cylindrical carton,

e. the end closing sections being reversely folded inwardly along their bases, after inward folding of the connecting sections, to abut the end closing sections against other in mutually braced relation, thereby forming an end closure for the carton,

f. the apices of the triangular end closing sections meeting at substantially the longitudinal axis of the cylindrical body.

2. The carton of claim **1** wherein both end margins are scored and folded to form a cylindrical carton closed at both ends.

3. The carton of claim **1** wherein the body is provided with two diametrically opposite, substantially parallel scores extending longitudinally of the body in alignment with the short longitudinal score lines for permitting folding of the body into a flat storage and transportation condition, preliminary to folding of the end margins.

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