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Moore

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[54] **CARTON WITH EASY OPENING FEATURE AND BLANK THEREFOR**

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[73] Assignee: **Fibreboard Corporation,** San Francisco, Calif.

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[52] **U.S. Cl.** ..... **229/51 AS,** 229/51 TS

[51] **Int. Cl.** **B65d 17/20,** B65d 5/74

[58] **Field of Search** ..... 229/51 TS, 51 AS, 37 R

[56] **References Cited**

UNITED STATES PATENTS

3,399,820	9/1968	Foster et al.	229/37 R
3,539,093	11/1970	Massengill	229/51 TS
3,761,012	9/1973	Rosenburg, Jr.	229/51 TS

FOREIGN PATENTS OR APPLICATIONS

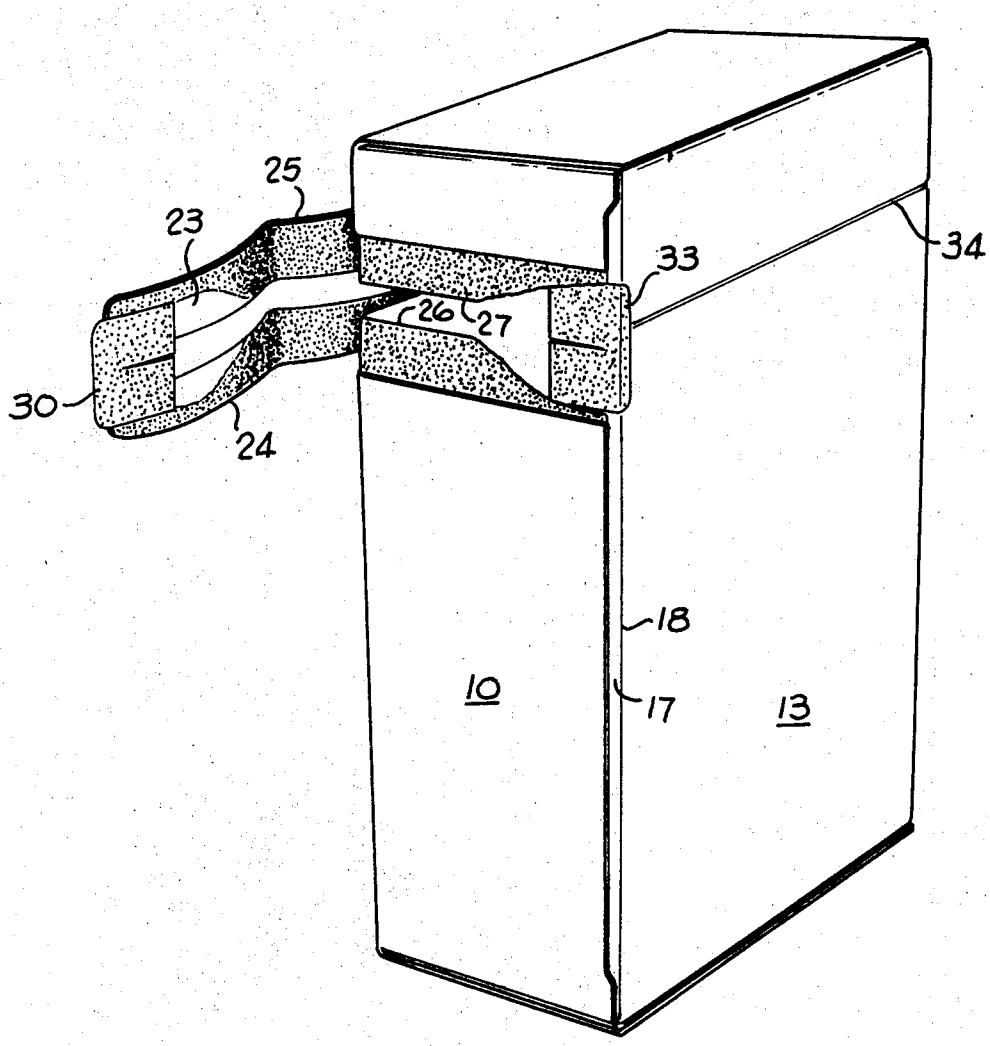
649,764	12/1962	Italy	229/51 AS
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[57] **ABSTRACT**

A carton, formed from a blank of paperboard or the like coated with a barrier film, is provided with a tear strip opening feature which includes a tab formed in the manufacturer's flap of the carton to facilitate opening thereof.

6 Claims, 4 Drawing Figures



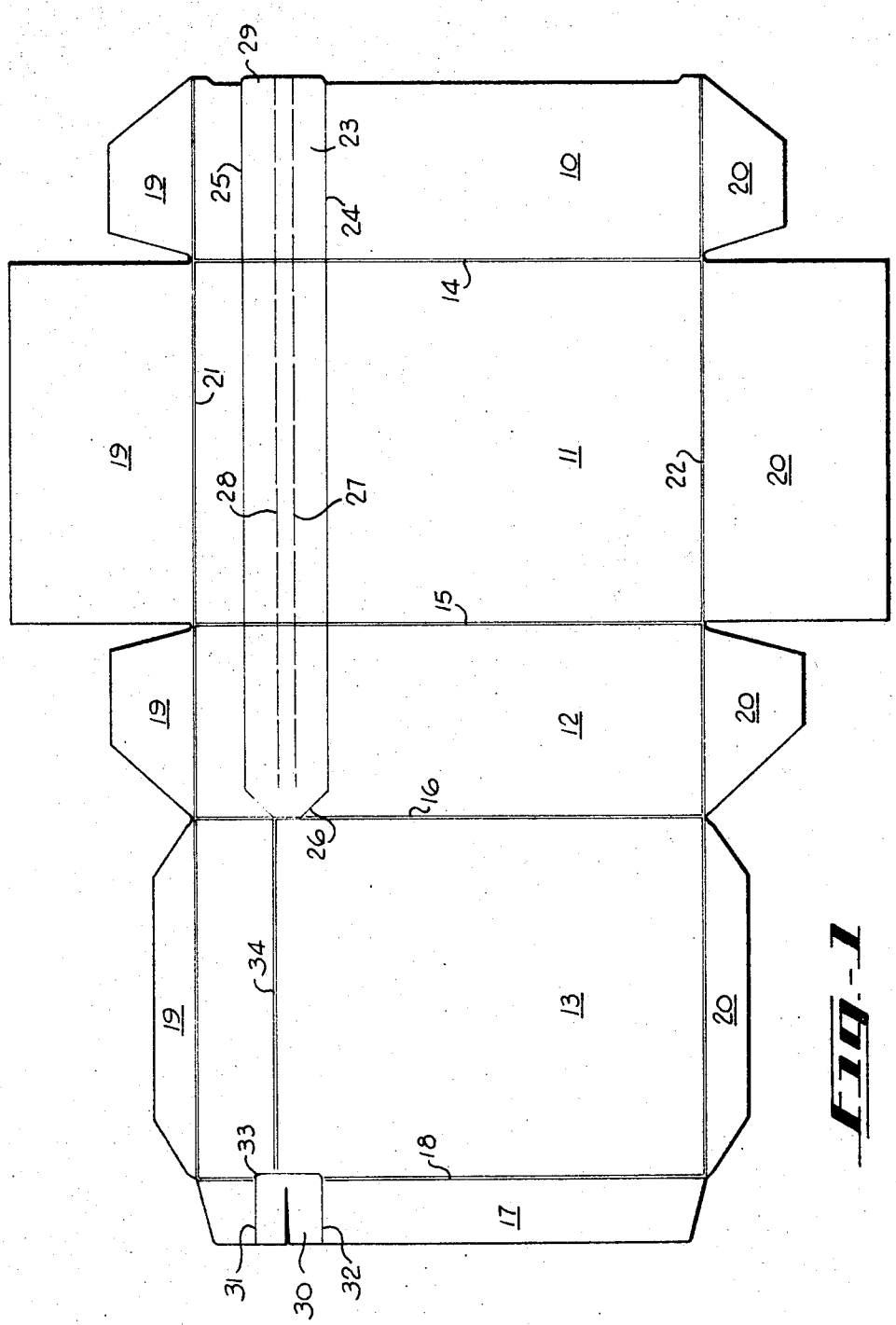

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Fig. 1

Fig. - 3

Fig. - 2

Fig. - 4

CARTON WITH EASY OPENING FEATURE AND BLANK THEREFOR

BACKGROUND OF THE INVENTION

A relatively recent development in the packaging art has been the formation of cartons from blanks coated on at least one surface with a heat sealable barrier film such as polyethylene or the like. Cartons formed from such blanks have two substantial advantages over conventional blanks. First, the heat sealing properties of the barrier film permit the carton closures to be sealed without the use of additional adhesives and second, the barrier properties eliminate the need for carton overwraps or product bags within the carton which were previously required for products which must be protected from air, moisture, vapor and the like. Unfortunately, such cartons also have one unfavorable feature; these barrier films are tough and very difficult to tear causing problems in opening the cartons. The most difficult problem is to provide means to initiate opening of a tear feature.

PRIOR ART

Tear strip openers for cartons have been known and used for many years. A conventional tear strip is shown in U.S. Pat. No. 2,218,509. This strip is formed by lines of perforations extending through the carton material and a cut line to initiate tear. Obviously, such a tear strip would destroy the barrier properties of a barrier film and permit air and moisture to reach the product in the carton. An effort to solve the problems associated with opening such a carton is disclosed in U.S. Pat. No. 3,399,820, assigned to the assignee of this invention. This patent discloses a tear strip opening means formed of limited depth cuts on the interior surface of the carton and similar cuts in the exterior surface of the carton, the latter cuts spaced from the former to preserve barrier properties. A tab, shown at **15*d*** in FIGS. **1** and **2** of the drawings of this patent, is formed on the end of the tear strip to be grasped and pulled to initiate tear. To function properly, this tab must be free; that is, not sealed to underlying manufacturer's flap **11.** While this is an excellent idea, an unforseen problem occurred during commercial production of these cartons. When the carton blanks were folded and sealed into tubular form by applying heat to the contact surfaces of panel **15** and manufacturer's flap **11** it was found that in most instances the tab **15*d*** was also sealed to the manufacturer's joint. Since the bond formed by these heat sealable coatings is very strong, it was extremely difficult to start the tear strip and open the carton.

SUMMARY OF THE INVENTION

An object of this invention is to overcome the above, briefly described problems involved in opening a carton formed from a blank coated with a heat sealable barrier film by providing tear strip opening means which do not destroy the barrier properties of the film but which can be opened easily, and particularly to provide means whereby the tearing of such a tear strip may be easily started.

In the preferred embodiment the carton comprises a first side panel, a front panel, a second side panel, a back panel and a manufacturer's flap integrally joined to an edge of the back panel and sealed to the first side panel to form a tubular carton body. Top and bottom closure flaps are suitably connected to these panels. The carton is coated with a barrier film of polyethylene or the like on both interior and exterior surfaces. A tear strip extends across three of the panels, commencing at the juncture of the manufacturer's flap and the first side panel. The tear strip is formed by limited depth cuts in the interior and exterior surfaces of the carton suitably spaced to preserve the barrier properties of the carton. Limited depth cuts are also formed in the exterior surface of the carton blank in the area under the tear strip so that, when the flat folded carton is squared up into tubular form, a slight tearing occurs and a tab in the manufacturer's flap is created which protrudes slightly from the carton body. This tab may then be grasped to initiate tearing of the tear strip without the necessity of tearing through the tough barrier film.

BRIEF DESCRIPTION OF THE DRAWINGS

Other objects of this invention will become apparent from the following description and accompanying drawings wherein

FIG. **1** is a plan view of the outer surface of a paperboard blank adapted to be erected into a carton embodying the invention;

FIG. **2** is a perspective view of a carton formed from the FIG. **1** blank;

FIG. **3** is a view similar to FIG. **2** in which the tear strip has been partially removed; and

FIG. **4** is an enlarged cross sectional view taken along line **4—4** of FIG. **2** looking in the direction of the arrows.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

In the preferred embodiment, the blank shown in FIG. **1** is coated on both interior and exterior surfaces by a barrier film of polyethylene. The blank comprises first side panel **10,** front panel **11,** second side panel **12** and back panel **13** hingedly connected together along scorelines **14, 15** and **16.** A manufacturer's flap **17** is hingedly connected to back panel **13** along scoreline **18.** A plurality of top closure flaps **19** and bottom closure flaps **20** are hingedly connected to the respective carton panels along scorelines **21** and **22** and are adapted to form top and bottom closures for the carton.

A tear strip **23** extends from the free edge of first side panel **10** across said first side panel, front panel **11** and second side panel **12,** ending at scoreline **16.** The tear strip comprises two spaced, limited depth parallel cut lines **24, 25,** in the outer surface of the blank extending through the barrier film but not through the paperboard. At the ends of these cut lines adjacent scoreline **16,** they are joined by an angled cut line **26,** also extending through the barrier film but not through the paperboard. The tear strip **23** further comprises parallel, limited depth cut lines **27, 28** on the inner surface of the blank also extending through the interior barrier film but not through the paperboard. These cut lines **27, 28** are spaced inwardly from, but parallel to, cut lines **23, 24.** This spacing preserves a major portion of the barrier properties of the film on the carton surfaces, in that air or moisture entering a cut line must pass through the paperboard for a substantial distance to enter the sealed carton. It should be understood that a single cut line on the interior surface of the carton will serve the same purpose as the two cut lines **27, 28** al-

though two such lines are preferred. A starting end **29,** of the tear strip is formed adjacent the edge of first side panel **10.**

Further, a tab **30,** is formed in manufacturer's flap **17** in the area underlying the end of tear strip **23** in the formed carton. The function of this tab will be described hereinafter in conjunction with a description of the opening of the sealed carton. The tab comprises two parallel, limited depth cut lines **31, 32** extending transversely of the manufacturer's flap and located, in the final sealed carton, so that they will lie closely adjacent to, but slightly inwardly of tear strip cut lines **24, 25.** These cut lines **31, 32,** extend across manufacturer's flap **17** from its free edge through scoreline **18,** and also extend through the barrier film but not through the paperboard. A third cut line **33,** joins the ends of cut lines **31** and **32.** Preferably, this cut line **33** lies slightly across scoreline **18** from manufacturer's flap **18;** that is, within the area of back panel **13.** This cut line **33** also extends through the barrier film but not through the paperboard.

In addition, scoreline **34** is formed across back panel **13** corresponding to the centerline of tear strip **23.**

To form the carton, back panel **13** and manufacturer's flap **17** are folded along scoreline **16** to lie against the inside surface of second side panel **12** and front panel **11.** Then first side panel **10** is folded inwardly so that its edge area overlies manufacturer's flap **17.** Heat is then applied in this area sealing the exterior of manufacturer's flap **17** to the interior of first end panel **10** by means of the heat sealable barrier film to form a flat folded tubular carton.

The flat folded carton may then be erected by first folding along scorelines **15** and **18** to form an open tube, folding bottom flaps **20** along scoreline **22** and heat sealing to form a bottom closure, inserting the contents and then folding top flaps **19** along scoreline **21** and heat sealing to form a top closure. This results in the completed carton shown in FIG. **2.**

An interesting phenomenon occurs when the carton is opened into tubular form by folding along scorelines **15** and **18.** As scoreline **18** is folded through a 90° arc, the natural stiffness of the exterior barrier film layer combined with the relative susceptibility of the underlying paperboard to tearing action causes a slight tear to be created in the area underlying the edge of tab **30.** This results in the lifting of the end of tab **30** slightly away from the body of the carton as shown in FIG. **2,** providing a space for insertion of a fingernail or the like to initiate removal of the tear strip. The tearing effect described and the formation of tab **30** is shown more clearly in FIG. **4** Folding of panel **13** and manufacturer's flap **17** perpendicular position causes the area adjacent cut line **33** to tear along arc **35.** The end of tab **30** remains attached to tear strip **23** as shown and protrudes outwardly from the carton body.

FIG. **3** shows the carton with the tear strip partially removed. To thus open the carton, a fingernail or the like is inserted under tab **30** in the space formed at cut line **33.** A slight force exerted outwardly on tab **30** will cause the fibers of the paperboard body to split apart across manufacturer's flap **17** in the area between cut lines **31** and **32** and between the layers of barrier film. When this area is split apart the remainder of the tear strip will pull apart, again only requiring separation of the paperboard fibers in the areas between exterior cut lines **24, 25** and interior cut lines **27, 28.** It should be noted that tab **30** remains sealed to tear strip **23** and the entire tear strip and tab may be removed without the necessity of tearing across the tough barrier film. This may be accomplished despite the fact that the arrangement of limited depth cut lines preserves the barrier properties of the carton until it is opened. After removal of the tear strip **23,** the top of the carton may be folded back along scoreline **34** to remove the contents.

This type of opening feature is particularly suitable to cartons coated with tough barrier films of material which is difficult to tear. Examples of such films are polypropylene and polyvinylidene chloride in addition to the aforementioned polyethylene. This opening feature might also be applicable to a non-barrier carton in which the glue used in sealing the manufacturer's flap to the adjacent panel is very strong and difficult to separate.

It should be understood that the limited depth cut lines hereinbefore referred to should extend through the barrier film where such films are used and may extend up to about half way through the paperboard forming the carton.

What is claimed is:

1. A paperboard carton comprising a first side panel, a front panel, a second side panel and a back panel hingedly connected along parallel scorelines, a manufacturer's flap hinged along a scoreline to said back panel and sealed to said first side panel to form a tubular carton body, end closure flaps hinged to said panels and adapted to form end closures for said carton,

a tear strip formed across at least three of said panels, said tear strip having an end at which tear is initiated, said end lying at an edge of said first side panel and sealed to said manufacturer's flap therewith, and

limited depth transverse cuts formed in the area of said manufacturer's flap which underlies said end of said tear strip, said transverse cuts extending across said manufacturer's flap and beyond the scorelines joining said manufacturer's flap to said back panel, and a longitudinal limited depth cut in said back panel joining the ends of said transverse cuts,

said cuts forming tab means which protrude from the carton body when the carton is in erected condition, so that said tab means may be grasped and pulled to initiate removal of said tear strip.

2. The carton of claim **1** wherein at least the exterior surface of said carton is coated with a heat sealable barrier film.

3. The carton of claim **2** wherein said heat sealable barrier film is polyethylene.

4. The carton of claim **2** wherein said tear strip further comprises two parallel, limited depth cut lines in the outer surface of said carton, said cut lines extending through the barrier film but not through the paperboard and at least one limited depth cut line in the interior surface of said carton, parallel to and lying between said aformentioned cut lines.

5. A paperboard carton blank comprising a first side panel, a front panel, a second side panel, a back panel and a manufacturer's flap hingedly connected along scorelines, said manufacturer's flap having a free edge, and said first side panel having a free edge, and end closure flaps hinged along scorelines to the said panels,

said manufacturer's flap adapted to be sealed to said first side panel to form a tubular carton body,

a tear strip extending across said side panels and said front panel and having an end at the edge of said first side panel adapted to be sealed to said manufacturer's flap,

said tear strip comprising two parallel, limited depth cut lines in the exterior surface of said blank and at least one limited depth cut line in the interior surface thereof, parallel to and lying between said first mentioned cut lines,

and tab means formed in the area of said manufacturer's flap underlying and sealed to said end of said tear strip, said tab means adapted to protrude from the carton body when said blank is sealed into tubular form and erected,

said tab means comprising transverse, limited depth cuts extending from the free edge of said manufacturer's flap across said flap and across the scoreline joining said flap to said back panel, and a longitudinal, limited depth cut in said back panel joining the ends of said first mentioned cuts.

6. The blank of claim **5** wherein at least the exterior surface of the blank is coated with a heat sealable barrier film, and said cut lines in said exterior surface and said cuts extend through said barrier film but not through said paperboard.

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