

Sept. 15, 1964

T. W. FOSTER ETAL

3,148,824

SEVERANCE LINE CONSTRUCTION FOR CARTONS

Filed Feb. 4, 1963

Fig. 1

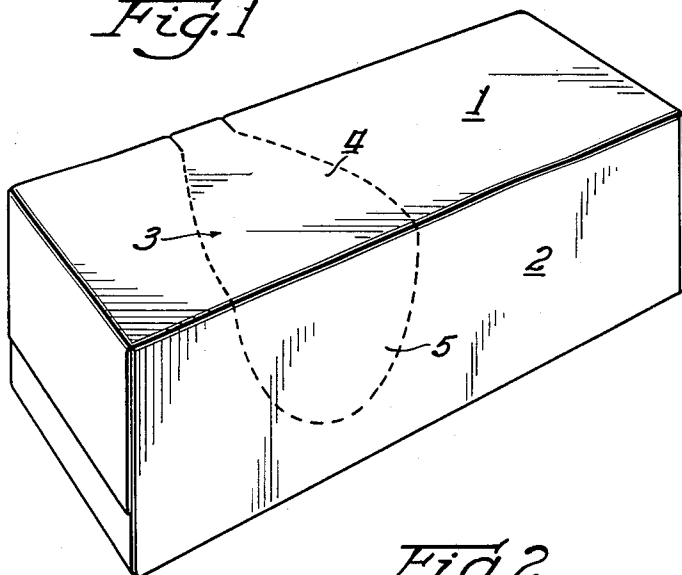


Fig. 2

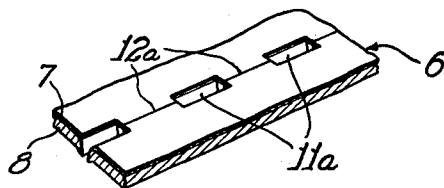


Fig. 3

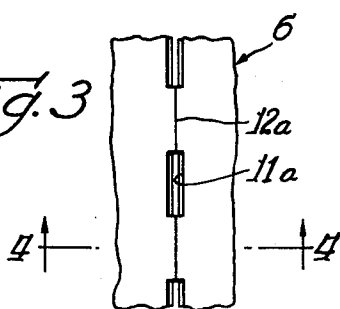


Fig. 4

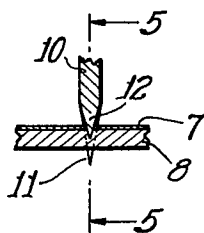
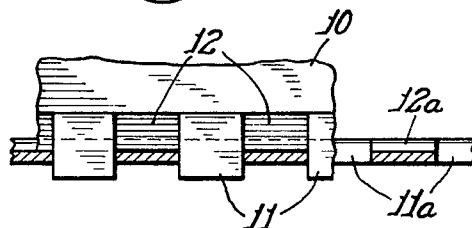


Fig. 5



Inventors:
Thomas W. Foster and
Charles W. Venturoni
By Richard W. Carpenter *att.*

1

3,148,824

SEVERANCE LINE CONSTRUCTION FOR CARTONS

Thomas W. Foster, Chicago, and Charles W. Venturoni,
Glen Ellyn, Ill., assignors to Container Corporation of
America, Chicago, Ill., a corporation of Delaware
Filed Feb. 4, 1963, Ser. No. 255,962
1 Claim. (Cl. 229—51)

The present invention relates to fabricated paperboard products, such as foldable cartons, and particularly relates to cartons and similar articles, formed of paperboard, having a weakened severance line or a severable tear-out area in one or more panels or walls.

An object of the invention is to form a neat appearing and efficient form of weakened line in a wall or other panel which will remain intact up to the time of use and will permit the user of the paperboard item to tear the paperboard along a severance line, or tear out a severable area in a single panel, or in one or more adjoining panels, without a tendency of the edge portions shredding or peeling along the severed edges.

A further object of the invention is to form in a paperboard panel a weakened severance line which is of particular advantage in a paperboard carton or other paperboard product in which the line of severance is formed along a curve, as for example, when it is desired to tear out a rounded contour section from a wall panel.

Additional and more specific objects and advantages of the invention will become apparent as the description proceeds.

In the drawings—

FIGURE 1 is a perspective view of an erected folding carton formed with severance lines for removal of an oval dispensing opening;

FIGURE 2 is an enlarged, fragmentary perspective view of a section of paperboard having the improved severance line formed therein;

FIGURE 3 is a plan view of an enlarged fragment of paperboard similar to FIGURE 2;

FIGURE 4 is a fragmentary sectional view taken along line 4—4 of FIGURE 3, and indicating the construction of cutting edge on a cutting tool designed to produce the severance line of the present invention; and

FIGURE 5 is a fragmentary vertical section taken along line 5—5 of FIGURE 4.

According to known methods for cutting paperboard to produce a weakened severance line, a cutting tool is employed which has an interrupted cutting edge enabling it to form a series of short, aligned, spaced cuts passing through the board. While this creates a weakened line of tear satisfactory for affording easy access to the interior of a carton, or for the removal of an area or strip of paperboard in other types of constructions, it is not satisfactory in certain situations. As an example, if the paperboard, formed with such a weakened line, has a relatively strong and tough outer surface and tearing along such line is commenced, the fibres, transverse to the line of cuts and in the spaces therebetween, tend to cling together sufficiently to cause small strips or shreds to form and produce peeling of the surface portions of the board in the parts that are intended to remain after removal of the part to be discarded. This peeling occurs most frequently when the portion to be removed from a panel has a curved contour and in which the path of the curve extends toward the extended axis of the portion of the panel to be removed. This tendency to peel is quite undesirable in folding cartons to be used in the dispensing of household consumer items where it is intended that the package will remain accessible for a period of time while the contents are being used. In uses in which emphasis is placed on the attractiveness of the package, any

2

shredding or peeling of the panel around the dispensing opening detracts from the appearance of the package and tends to create resistance to the product in the minds of the users.

According to the present invention, a series of short, primary cuts is formed to define the line of severance, such cuts extending completely through the paperboard and additional short, spaced cuts are formed intermediate the primary cuts and on the exterior surface of the board, such secondary cuts passing only part way through the paperboard.

Referring to the drawings, an erected carton is shown in which the top wall 1 and an adjoining wall 2 are formed with a tear-out area indicated as a whole at 3 and comprising sections 4 and 5 in the respective wall sections 1 and 2.

The paperboard from which the carton is made is shown in detail in FIGURE 2. The board is indicated as a whole at 6 and comprises a facing portion 7 and a main body portion 8. In usual practice the facing portion 7, which constitutes the outside of the sheet of board, is formed as a relatively dense, tough covering or liner for the weaker filler or body portion 8. This liner portion, in practice, may be formed as an integral part of the sheet on a multi-cylinder paperboard machine. In a sheet having a thickness of .012 to .020 inch, the liner portion may have a thickness of approximately .003 inch. The liner portion 7 may comprise bleached sulphate pulp or the equivalent, and the filler portion 8 may comprise a type of pulp formed of mixed papers and commercially termed "chip stock."

The liner portion 7, being dense and tough, provides a good printing surface and has good resistance to abrasion and tearing.

The carton is cut and creased in flat blank condition on a cutting and scoring press. In order to form a satisfactory severance line a cutting tool, the edge portion of which is indicated at 10, may be employed. The cutting elements comprise a series of equi-length blade sections 11, 11 between which are shallower blade sections 12, 12. The cutting tool is controlled so that the cutting edges of sections 11, 11 will pass completely through the paperboard sheet to form primary cuts 11a, 11a, as indicated in FIGURE 4, and the cutting edges of the shallower sections 12, 12 will pass completely through the liner portion 7 of the sheet and may penetrate to a depth of approximately half way through the composite sheet, thus forming secondary cuts 12a, 12a.

By so cutting the liner portion of the sheet the fibres of this portion which extend transversely of the severance line will be cut and thus the tendency of the liner to shred and peel into the panel portions outside the area to be removed will be overcome. This is of particular advantage in assuring a clean tear along curved lines, such as those illustrated in the panel 2 in FIGURE 1. In this panel the section to be removed is oval and the direction of the tear, as it progresses, is inward toward the longitudinal axis of the tear-out portion 3. As the tear-out portion is being severed along the curved lines in panel 2 there still remains some uncut fibres between the adjacent ends of the primary cuts 11a, 11a, but such uncut fibres are below the bottoms of the secondary cuts. Except for the secondary cuts the progressive upward pull along the edges of panel section 5 would tend to lift small portions of the fibres between the ends of the primary cuts and start the peeling of one or more strips of the surface of the sheet in a direction approximately at right angles to the bottom edge of panel 2. This tendency would be increased where the grain of the board is disposed transversely to the lengths of panels 1 and 2. By making the secondary cuts penetrate sufficiently to pass entirely through the liner, the stronger fibres are cut be-

tween the ends of the primary cuts 11a, 11a to prevent peeling, but, at the same time, a sufficient thickness of board remains intact between the primary cuts to assure that the removable panel will remain in place until lifting force is applied to remove it.

By so preparing paperboard cartons to provide for an easy tear-out section and overcoming the tendency of peeling or shredding of the surface of the panels adjoining, but outside the tear-out area, the cartons, when so constructed, are rendered more desirable for household use. This is especially true in situations in which the carton is to be used as a dispensing container for extended periods. In such case it is important that the carton remain in a neat and attractive condition.

The present invention is not limited for use on cartons but is applicable to other types of paperboard products in which it is desired to provide tear lines for easy severance of panel sections. Accordingly, it is to be understood that limitations on the invention are intended only as specifically set forth in the appended claim.

What is claimed is:

A paperboard panel constructed with a thin integrally formed, tough facing bleached sulphate or equivalent liner, such panel having a severance line therein comprising a series of elongated, spaced, aligned, primary cuts passing entirely through the board and by a series of elongated, secondary cuts narrower than the primary cuts, aligned symmetrically therewith, and located alternately therebetween, such secondary cuts extending only partially through the paperboard but entirely through said facing liner.

References Cited in the file of this patent

UNITED STATES PATENTS

2,189,431	Moore	Feb. 6, 1940
2,769,588	Beck	Nov. 6, 1956
3,021,002	Guyer	Feb. 13, 1962
3,045,891	Alvarez	July 24, 1962