Dec. 27, 1938. F. J. HOARLE 2,141,752

TRANSPARENT CONTAINER

Filed Feb. 16, 1935

Fig. 1.

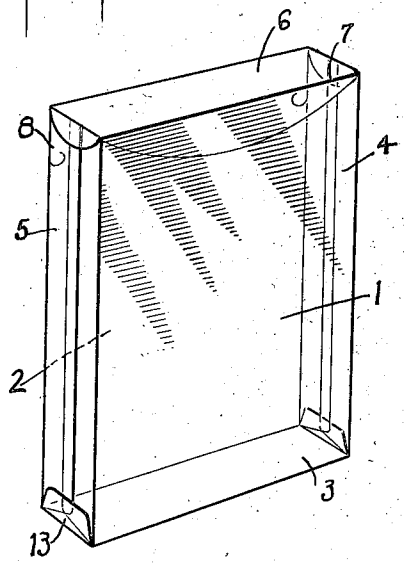


Fig. 2.

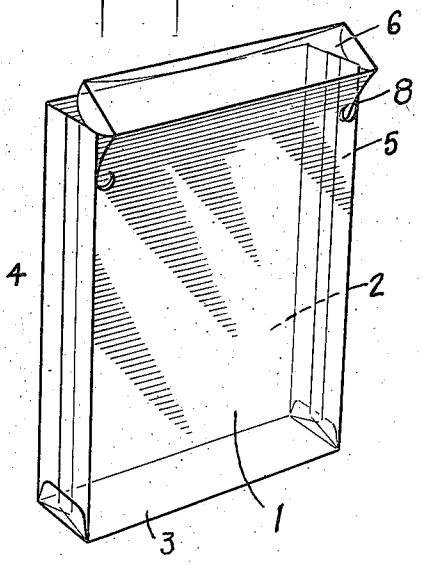


Fig. 3.

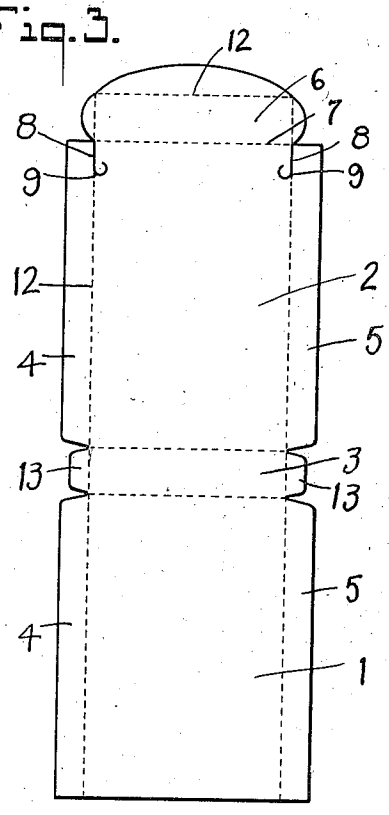


Fig. 4.

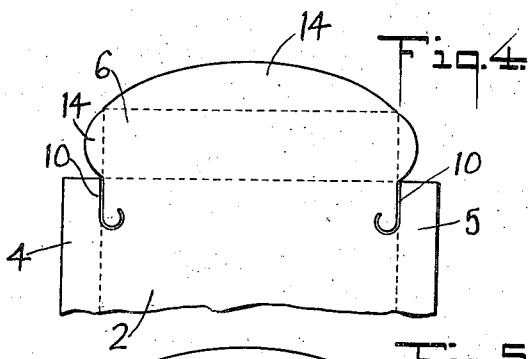
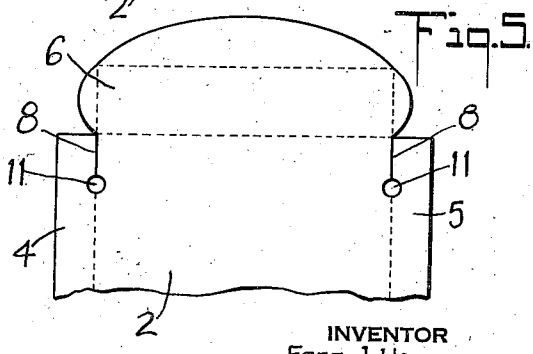


Fig. 5.



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TRANSPARENT CONTAINER

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Application February 16, 1935, Serial No. 6,766

4 Claims. (Cl. 229—44)

This invention relates to cartons or containers formed of artificial sheet material, for instance, those formed of derivatives of cellulose and more particularly to such containers or cartons formed in a manner that they may be easily and continually opened and closed without tearing or splitting at the point or line of bending.

An object of the invention is the economic and expeditious production of containers and cartons of artificial sheet or film material that do not tear or split upon opening and closing of same. Other objects of the invention will appear from the following description and drawing.

In the drawing, wherein like reference numerals refer to the same or similar elements in the various figures:

Fig. 1 is a front perspective view of a closed container.

Fig. 2 is a rear perspective view of the container shown in Fig. 1 with the closing member in open position.

Fig. 3 is a plan view of the blank used in forming the container shown in Figs. 1 and 2.

Fig. 4 is a plan view of a part of a blank having a modified form of protection against tearing especially adaptable to relatively heavy stock.

Fig. 5 is a plan view of a part of a blank having a modified form of protection against tearing.

It is a known property of artificial sheet materials of the transparent variety that the same are durable until a tear is started, after which the tear may be extended with the greatest of ease. It is also known that where there is a sharp reentrant angle, the apex of said angle acts as a starting point from which the material will readily and easily tear or split. In forming cartons of this material, which cartons are designed for continued use or reuse and which are not to be destroyed upon opening, it has been found very difficult to design a package which would not tear, this being due to the fact that reentrant angles were always necessary. By employing this invention the cartons or containers are made such that there are no sharp reentrant angles at or near a point or line where the material will normally be flexed and/or bent through a substantially small arc. Thus, by employing this invention, packages, cartons or containers may be formed that have exceptionally long life and may be opened and closed indefinitely without developing tears.

In accordance with my invention, I form containers of sheet material and especially those materials which are transparent by forming the container such that it has a bottom, two side walls and two end walls and a closure member or cover formed integral with one of said walls so cut and shaped that the opening and closing of the closure member or cover does not flex the material sharply at a point or on a line connected with a sharp reentrant angle. In the making of the carton or container, the side wall integral with the cover member is made such that it is not integral with the joining end or side walls adjacent thereto for a space next to where the closure joins the side wall, thus forming a slit. Preferably this slit terminates in a circular opening or slit in the wall, the shape of said opening or slit being such as to prevent tearing from starting at that point as it is along the slit and its termination point that the material will be flexed as the cover is opened and closed.

This invention is applicable to the making of packages, cartons, containers and the like of any suitable shape such as square, rectangular, etc. These packages may be designed for the insertion of inner packages or to contain the articles without further wrapping. For instance, cartons may be made for the purpose of holding a package of cigarettes, a deck of playing cards, a box of candy and other like articles.

Although cartons, containers and packages may be made, according to this invention, of any suitable sheet material, it is of special applicability to the forming of packages from transparent materials such as sheets, films, foils, etc. made of or containing derivatives of cellulose and/or regenerated or reconstituted cellulose. Thus, the sheet material may contain the inorganic esters of cellulose or the organic esters and ethers of cellulose. An outstanding example of the inorganic esters of cellulose is cellulose nitrate. Examples of organic esters of cellulose are cellulose acetate, cellulose formate, cellulose propionate and cellulose butyrate, while examples of cellulose ethers are methyl cellulose, ethyl cellulose and benzyl cellulose.

The containers, cartons or packages may be formed of any thickness of material. The invention, however, is of major importance when employing material of sufficient thickness that it is not destroyed upon opening of the package but is used over and over again. For instance, this invention is of major importance when employing cellulose acetate material ranging in thickness from .005 to .02 or more inches in thickness. The size, shape and use to which the package is intended or designed to be used will govern, to a great extent, the thickness of

the material employed. For relatively small size packages such as a container adapted to receive a package of playing cards, a package of cigarettes or the like, sheet material say from .005 to .01 of an inch may be employed successfully.

The sheet material may contain besides a cellulosic base material effect materials which may enhance its value for the purpose for which it is intended. For instance, effect materials which aid in the flexibility, color, non-combustibility, life and feel may be incorporated with the cellulosic base material in any suitable manner. Thus, plasticizers, lubricants, filling materials, pigments, fire retardants, dyes and lakes may be incorporated with the sheet material.

As an aid in visualizing the invention, reference is made to the accompanying drawing.

In the drawing there is shown a container adapted to receive a deck of playing cards or similar package, which container is made of a transparent material. The container consists of a front wall 1 and a back wall 2, a bottom 3, end walls 4 and 5 and a closure member 6. These walls are suitably held together to form a desired shape package by overlapping the edges of the various walls and glueing or welding the same together in any suitable manner. For instance, the edges may be welded together, when employing sheets containing organic derivatives of cellulose, by applying thereto a dilute solution of a volatile solvent therefor contacting the thus wetted portions together and allowing the same to dry. Adhesives, glues and pastes may be used, if desired, in place of the solvent material or in conjunction therewith. Where the closure or cover member adjoins the back wall as at the line 7 the back wall is cut or separated from the end walls to form a slit 8. This slit preferably at its end furthermost from the closure or cover member, circles or arcs into the back wall and turns in a direction at least parallel to the slit as shown at 9 on the drawing. The length of the slit 8 may vary within fairly large limits, depending upon the stock employed and the use to which the container is intended to be used.

In forming containers of relatively heavy material, for instance, material above .01 inch in thickness the slit may be widened to form a cut-out portion as shown at 10 in the drawing. This may be performed by a double bladed member when stamping out the blank. By this modification sufficient clearance is made such that when the carton is opened or closed the edges of the rear wall as it is flexed outward will not be caught or held by the adjacent end walls. Although this modification is preferable in heavy material, it is not necessary and that type of slit shown in Figure 3 may be successfully employed.

In a further modification of this invention, the complementary slits 8 may be terminated in a cut-out portion 11 which may or may not lie in both the back side wall and the end wall. These complementary cut-out portions 11 are preferably circular in shape such that there is no angle present to act as a starting point from which a tear would start. The complementary cut-out portion 11 may be employed with a very short slit 8 or the cut-out portion 11 may be so positioned that it touches or crosses the line 7 in which case there would obviously be no slit 8. Whether a slit 8 is employed at all or its length when employed will depend upon the radius of curvature through which the material or stock employed will bend without tearing or as with some material become discolored due to surface cracks being developed.

The construction described above not only shapes the carton such that there is no sharp angle from which a tear would start but also provides for a greater area of material which is susceptible to being flexed when the closure or cover member is open, thus eliminating any sharp bend of the material. It will be seen from the drawing, especially Figure 2, that upon opening the closure or cover member 6 the back wall flexes through a large radius of curvature from the bottom of the complementary cut-out portions on back wall 2 and including part of the closure member 6, and does not bend on any one line as on line 7.

In forming the blank, the face of the material may be perforated, scarred or mitered on the line where the material is to be bent such as on lines 7, 12 and other lines where the material is to be bent in forming the container. The scarring of the blank may be dispensed with and the blank may be merely molded into shape at the lines 7 and 12 by means of heat and pressure. Suitable tab members 13 may be provided as an aid in holding the various walls and the bottom of the container together. There may also be provided tabs 14 on the closure member to aid in holding the closure member in a closed position and adapted to act as finger pieces in opening and closing said closure member.

Although the box shown on the drawing has been described particularly in reference to a carton for containing a deck of playing cards, it is applicable to any shape or size of box. Obviously, any suitable size or shape of tab or lapping members may be employed for the type of box being constructed. Although the box is shown as being made from a single member or sheet of material the same may obviously be formed of two or more sheets of material welded together either prior to or during the formation of the container.

It is to be understood that the foregoing detailed description and drawing are given by way of illustration and that many variations may be made therein without departing from the spirit of my invention.

Having described my invention, what I desire to secure by Letters Patent is:

1. In a container having two side walls and two end walls, a closure member integral with one of said side walls and adapted to flex across the width of the said side wall, said side wall being formed with a cut along each of its lines of juncture with the end walls so as to render a substantial portion of the area of the said side wall capable of flexing on operation of the closure member, the end of each of said cuts making an edge which curves away from the corresponding line of juncture and towards said closure member in order to prevent the flexing of the closure member tearing the container.

2. In a container having two side walls and two end walls of transparent material, a closure member integral with one of said side walls and adapted to flex across the width of the said side wall, said side wall being formed with a cut along each of its lines of juncture with the end walls so as to render a substantial portion of the area of the said side wall capable of flexing on operation of the closure member, the end of each of said cuts making an edge which curves away from the corresponding line of juncture and towards said closure member in order to prevent

the flexing of the closure member tearing the container.

3. In a container having two side walls and two end walls of transparent cellulose acetate material, a closure member integral with one of said side walls and adapted to flex across the width of the said side wall, said side wall being formed with a cut along each of its lines of juncture with the end walls so as to render a substantial portion of the area of the said side wall capable of flexing on operation of the closure member, the end of each of said cuts making an edge which curves away from the corresponding line of juncture and towards said closure member in order to prevent the flexing of the closure member tearing the container.

4. In a container having two side walls and two end walls, a closure member integral with one of said side walls and adapted to flex along a line extending across the width of the said side wall, said side wall having complementary cut-out portions along the lines of juncture of the wall with the end walls, said cut-out portions extending inwardly into the said side wall at points in the vicinity of the line of flexure of the closure member and curving towards said closure member across the line of flexure so as to assist in the flexing of the closure member and to prevent tearing of the container across the line of flexure.

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