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FOLDABLE PAPER BLANK AND METHOD OF MAKING THE SAME

Original Filed April 17, 1926

Fig. 1.

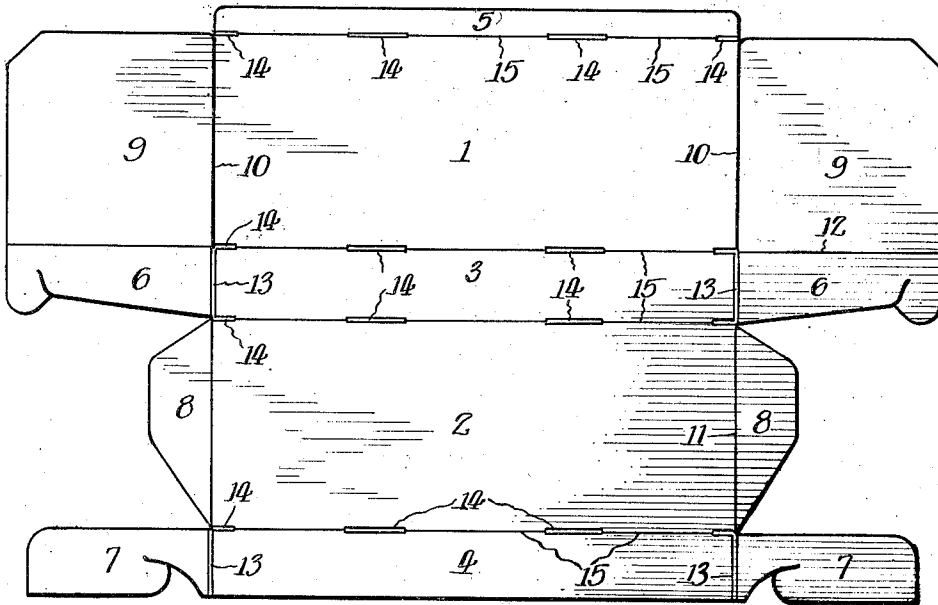


Fig. 2.

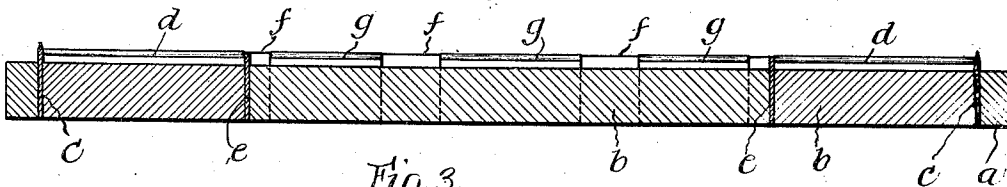


Fig. 3.

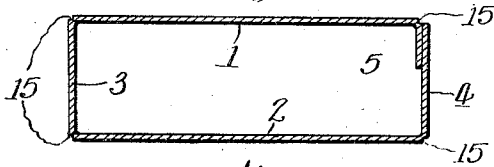
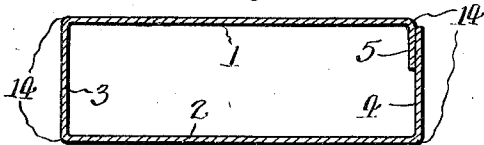


Fig. 4.



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UNITED STATES PATENT OFFICE

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FOLDABLE PAPER BLANK AND METHOD OF MAKING THE SAME

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The invention relates to foldable paper board blanks for cartons and the like and to methods of manufacturing such blanks, and seeks to provide an improved blank and an improved method of forming the same such that the fold lines will bend readily and thus permit the easy and quick setting-up of the cartons and which fold lines, are at the same time quite strong. A further object of the invention is to provide an improved method of forming fold lines in the carton blanks which will obviate the danger of cutting entirely through the stock.

Heretofore it has been usual to form the folding lines of paper carton and like blanks either by creasing the stock throughout the lengths of the lines, or by providing cuts extending along the entire lengths of the lines and part way through the stock. It is difficult to provide creases of any considerable length which will permit the easy and quick setting-up of the blanks by hand or by machinery, and, while straight cuts obviate this difficulty, they materially weaken the finished product. Moreover, there is considerable difficulty in properly adjusting the cutting knives employed to avoid cutting entirely through the stock.

In accordance with the present invention, the foldable lines of the blank, or such as are of considerable length and which should be both strong and permit easy bending, are formed in part by creasing and in part by cutting the stock along the folding lines and, in the preferred embodiment of the invention, such cuts extend only part way through the thickness of the stock. To form each fold line, the cutting and scoring die is provided with a series of alternately arranged creasing rules and cutting knives arranged in line and which preferably have their working edges substantially in the same plane so that the blunt working edges of the creasing rules will limit the extent to which the sharp edges of the knives can penetrate the stock.

In the accompanying drawing:

Fig. 1 is a plan view of a carton blank formed in accordance with the present invention.

Fig. 2 is a cross section of a cutting and

creasing die for forming the blank shown in Fig. 1.

Figs. 3 and 4 are cross sections through different portions of the carton blank of Fig. 1 after it is set up.

The present invention is adapted for use in connection with blanks of many different forms. The carton blank shown in Fig. 1 is cut from stock and is provided with longitudinal and transverse folding lines to form top and bottom panels 1 and 2, side panels 3 and 4, a narrow flap 5 along the edge of the top panel 1, folding end flaps 6, 7 and 8, at the ends of the side and bottom panels respectively, and flaps 9 connected to the upper edges of the end flaps 6.

The carton blank is cut from paper board stock by a suitable die or form made up of creasing rules and cutting rules or knives. The rules and knives are assembled as usual in a suitable frame or chase *a* and are held therein in proper position by spacing blocks *b*. The blank is cut from the stock and its marginal edges formed by knives or cutting rules such as indicated at *c* in Fig. 2, which are, of course, arranged in the chase to conform with the outline of the blank and are of sufficient height to cut entirely through the stock when the latter is pressed against the form. Similar knives are also employed in forming the particular blank shown, for cutting through the stock along the lines 10 between the top panel 1 and the flaps 9.

The corner folding lines 11 between the end flaps 8 and the bottom wall 2, and the folding lines 12 between the flaps 6 and 9, are not required to be particularly strong and in order to permit the ready folding of the parts connected by these folding lines, they are formed by knives such as indicated at *d* in Fig. 2. These knives are of less height than the knives *c* and hence, only cut part way through the stock. The folding lines 13 between the end flaps 6 and 7 and the side walls 3 and 4 are quite short in the form shown, and are preferably formed by creasing rules such as indicated at *e* in Fig. 2, and having unsharpened working edges of a width equal to the thickness of the rules.

The long corner folding lines at the edges

of the top and bottom walls 1 and 2 of the improved carton blank, are formed in part by creases 14 and in part by straight cuts 15 in line with the creases and preferably extending only part way through the stock. Preferably, as shown, each of these fold lines has short creases at its ends and at spaced intervals throughout its length, with the cuts extending between and in alignment with the creases. Each of these longitudinal folding lines is made by providing the cutting and creasing form with a series of alternately arranged creasing rules *f* and cutting knives *g* as indicated in Fig. 2, these knives and rules being arranged in alignment with their upper working edges in substantially the same plane or with the sharp edges of the knives projecting very slightly above the flat, blunt edges of the creasing rules. Preferably, the blunt creasing rules *e* and *f* are of the same height and the scoring knives *d* and *g*, which are intended to cut partly through the stock, are of the same height.

The blanks are formed by pressing the stock in the usual manner against the knives and rules of the form. With the preferred arrangement shown, the creasing rules *f* will limit the extent to which the scoring knives *g* can penetrate the stock, and, for this reason, the press, platen, or the like, employed for forcing the stock against the knives and rules can be readily adjusted to prevent the scoring knives from cutting entirely through the stock. However, with some blanks and particularly if the fold lines are formed of a series of quite short, alternate cuts and creases, careful adjustment to avoid penetration of the stock by the scoring knives, will not be necessary. The parts of the improved blank can be readily and quickly bent to set up the carton or the like and at the same time a product of strong construction is provided.

From the foregoing it is apparent that the fold line between adjacent, relatively foldable panels, is a line along which the stock of the blank is weakened for folding purposes without cutting away any portions of the blank, and that such fold line comprises alternate relatively weak and strong sections disposed in longitudinal alignment along a straight fold line, and along which line the blank may be folded with ease and dispatch and which will also present a satisfactory degree of strength. It is also noted that the adjacent edges of the relatively foldable panels of the blank meet throughout the lengths thereof along the fold line and thereby greatly facilitates the rapid, accurate folding of the blank.

Obviously the form of the improved blank may be widely varied and the details set forth changed without departure from the scope of the invention as defined in the appended claims.

I claim as my invention:

1. A foldable paper blank having a fold line along the length of which the stock of the blank is weakened for folding purposes, certain weakened sections of the stock along the fold line being relatively strong with respect to and alternating with other weakened sections of the stock along the fold line.

2. A foldable paper blank having a fold line along the length of which the stock of the blank is weakened for folding purposes, certain weakened sections of the stock along the fold line being relatively strong with respect to and alternating with other weakened sections of the stock along the fold line, the fold line beginning and ending with a relatively strong section.

3. A foldable paper blank having a fold line along the length of which the stock of the blank is weakened for folding purposes, certain weakened sections of the stock along the fold line being relatively strong with respect to and alternating with other weakened sections of the stock along the fold line, relatively strong stock sections of the fold line being creased longitudinally thereof, and the relatively weak stock sections of the fold line being cut part way through the stock longitudinally of the fold line.

4. A foldable paper blank having a fold line along the length of which the stock of the blank is weakened for folding purposes, certain weakened sections of the stock along the fold line being relatively strong with respect to and alternating with other weakened sections of the stock along the fold line, relatively strong stock sections of the fold line being creased longitudinally thereof, and the relatively weak stock sections of the fold line being cut part way through the stock longitudinally of the fold line, the fold line beginning and ending with a relatively strong creased section.

5. The herein described method of producing a fold line in a blank of paper stock adapted to be folded to form, which consists in weakening certain sections of the stock longitudinally along the line of fold to produce relatively weak sections of stock, and weakening certain other sections of the stock along the line of fold to produce relatively strong weakened sections of stock alternating with the relatively weak sections of stock.

6. The herein described method of producing a fold line in a blank of paper stock adapted to be folded to form, which consists in weakening the stock longitudinally along the line of fold from end to end of the line of fold, and weakening certain sections of the stock along the line of fold more than other weakened sections of the stock to form relatively weak stock sections alternating with relatively strong stock sections.

7. The herein described method of producing a weakened fold line in a blank or paper-

stock adapted to be folded to form, which consists in creasing certain sections of the stock longitudinally along the fold line, and cutting certain other sections of the stock longitudinally along the fold line and partially through the thickness of the stock and in alternation with the creased sections.

8. A folding paper board blank having one or more folding lines each of which is formed of spaced sections along which the stock of the blank is creased and intermediate sections along which the stock of the blank is only partially cut, substantially as described.

9. A folding paper board carton body comprising top, bottom and side walls, having straight adjacent edges meeting throughout the lengths thereof and connected along folding lines each having sections at its ends and at spaced intervals between its ends and along which the paper board stock is creased and sections along which the paper board stock is partially cut extending between the creased sections, substantially as described.

10. A paper board blank comprising at least two relatively foldable panels meeting throughout the lengths of their adjacent edges at a straight fold line along the entire length of which the stock of the blank is weakened by relatively strong, creased sections at and intermediate the ends of the fold line and by relatively weak, cut sections extending between and in alignment with the longitudinal axes of the creased sections, substantially as described.

11. A foldable paper board blank having one or more fold lines, each of which comprises spaced sections along which the stock of the blank is creased and intermediate sections formed by cuts extending part way through the stock of the blank, substantially as described.

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