Aug. 9, 1949. C. O. BALL 2,478,359

PAPER CONTAINER

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Fig. 1.

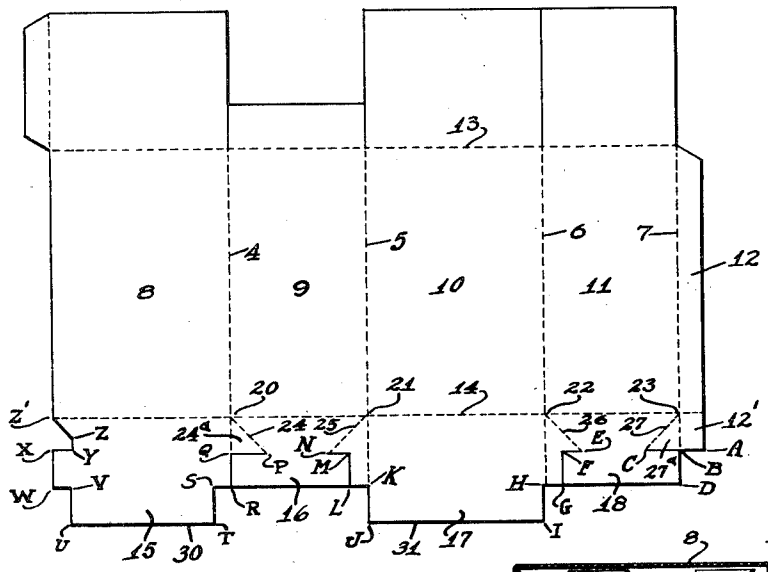


Fig. 2.

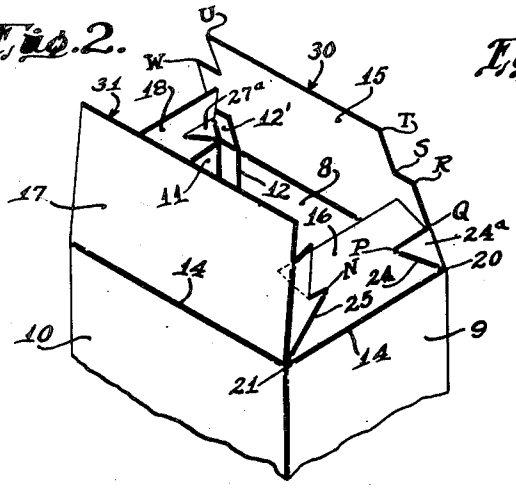
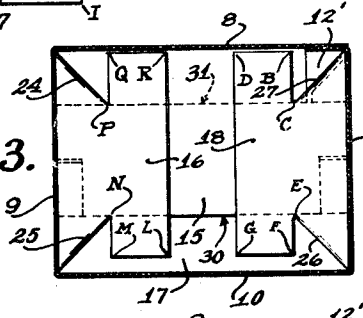


Fig. 3.



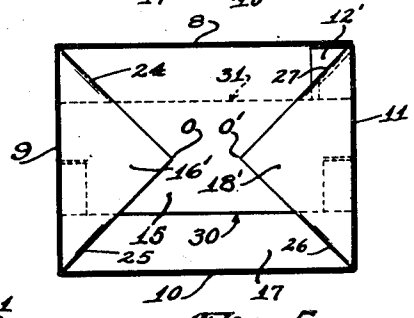


Fig. 5.

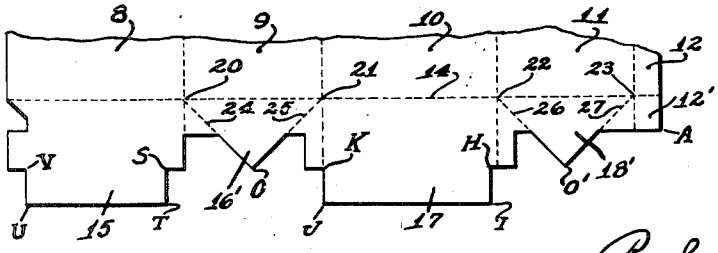


Fig. 4.

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PAPER CONTAINER

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4 Claims. (Cl. 229—38)

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My invention relates to articles made of paper or other sheet material, such articles including a rectangular tubular body with a closed end therefor, all formed in a single piece of sheet material. The invention is particularly adapted for use in the manufacture of containers for liquids and may also be embodied in other articles.

An object of the invention is to provide a novel form of blank cut from sheet material and provided with score lines or fold lines along which the blank is folded to form the body and a closed end of the article, the end-forming portion of the blank being designed to provide efficient use of the sheet stock from which the blanks are cut, so that waste material due to the cutting of the blanks is reduced to a minimum.

A further object of the invention is to provide a construction of the character indicated in which the thickness or number of layers of the stock in the formed article is reduced to a minimum. The invention provides such a construction which comprises not more than three layers of the stock at any point.

A further object of the invention is to provide a paper container having a rectangular body and a closed bottom consisting of a single integral folded blank of sheet material so designed and constructed that joints at the corners are avoided and a structure provided which is not vulnerable to leakage.

A still further object of the invention is to provide a novel container of the character indicated in which there are no joints in the bottom corners and no cut edges extending to any of the bottom corners.

Other objects of the invention will appear hereinafter.

Referring to the accompanying drawings:

Fig. 1 is a plan view of a blank of sheet material cut and scored for folding to form a rectangulaar body and closed bottom.

Fig. 2 is a perspective view, on a larger scale, of the inverted container with the bottom end-forming portion of the blank partly folded.

Fig. 3 is a cross-sectional view of the completed container, giving a view of the inner bottom surface.

Fig. 4 is a fragmentary plan view of a modified form of blank.

Fig. 5 is a sectional plan view of a container formed from the blank shown in Fig. 4.

Referring particularly to Fig. 1, the blank consists of a single piece of sheet material such as paper or cardboard, provided with fold lines along which the blank is folded for shaping the

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article. The fold lines may be in the form of scores, creases, or weakened lines and are indicated on Fig. 1 by broken lines. The fold lines include parallel lines 4, 5, 6, and 7, along which the blank is folded to form the rectangular body of a container having sides or panels 8, 9, 10, and 11, the fold lines being extended downward through the bottom-forming portion of the blank. The fold lines may be spaced to form narrow sides 9 and 11, and comparatively wide sides 8 and 10, but may be equally spaced if desired to provide a square body. A body seam flap 12 is adapted to be folded along the line 7 and lie against the inner surface of the side 8 when the blank is folded. The flap is adhered to the side 8 by any approved adhesive material for forming a tight body seam. The upper and lower margins of the container are defined by fold lines 13 and 14 respectively. The top of the container is formed by flaps folded along the score line 13. Said flaps comprise extensions of the sides of the container.

The portion of the blank below the margin line 14 includes foldable bottom-forming sections 15, 16, 17, and 18 which are extensions respectively of the sides or panels 8, 9, 10, and 11, and serve, when the blank is folded, to form the bottom of the container. These bottom-forming sections are herein referred to as flaps although not separated by lines of cleavage. The several superposd layers of material comprised in the folded bottom are secured together by an adhesive to form a liquid-tight bottom for the container.

The outline of the bottom-forming portion of the blank comprises lines connecting the points A, B, D, H, I, J, K, S, T, U, V, W, X, Y, Z, Z'. The bottom-forming portion of the blank is also formed with slits extending between the points B and C, E and F, F and G, L and M, M and N, P and Q, Q and R. The bottom score line 14 is perpendicular to and crosses the lines 4, 5, 6, and 7 at the points 20, 21, 22, and 23 respectively. Diagonal score lines 24, 25, 26 and 27 extend downwardly from the points 20, 21, 22 and 23 respectively. The score lines 24 and 25 in the extension 16 are downwardly convergent with the lower ends terminating at the points P and N. The score lines 26 and 27 in the section 18 also are downwardly convergent, terminating at the points E and C.

After the blank has been folded to form the rectangular body, the end sections are folded inwardly so that the sections 16 and 18 form the innermost layer of the folded bottom. The section 15 folds inwardly to overlie the folded

sections 16 and 18 and thereby form an intermediate ply or layer of the folded bottom. The section 17 overlaps the section 15, and thus forms the outermost layer of the folded bottom and comprises a major portion of the exterior bottom surface of the article. The section 15 is of such width that its edge 30 meets the inner ends of the fold lines 25 and 26 (Fig. 3) when the blank is folded. The edge 31 of the section 17 likewise meets the fold lines 24 and 27 at the points P and C.

The body seam strip 12 in the blank is extended downwardly below the score line 14 to provide a section 12' which folds into position to overlie the triangular section 27a of the section 18 as said section 27a folds back along the score line 27. The notch formed by cutting the section 15 along the lines XY, YZ, and ZZ' is shaped and positioned to overlie the infolded section 12' of the side seam, thus avoiding the building up of more than three thicknesses or layers of the material at the area of the superposed folded sections 12' and 27a.

As shown in Fig. 1 the lower portion of the section 15, namely, that portion between the lines UV and ST, is made shorter than the width of the side 8. The distance between the lines ST and JK is substantially equal in length to the line JI. Also the distance between the line HI and the vertical extension of the outer edge of the section 12 is preferably equal to the length of the line JI. One purpose of these proportions is to facilitate the nesting of the bottom ends of the blanks which may be fitted together with the sections 15, 16, 17, and 18 of one blank opposite the sections 18, 17, 16 and 15, respectively, of the adjoining blank. The narrowing or shortening of the lower portion of the section 15 also facilitates the operation of folding the bottom sections into position. The line HI as shown in Fig. 1 is offset a short distance to the left of the corner line 6 which also facilitates the said nesting of the blanks.

As the bottom sections are folded inwardly to form the bottom of the container, the triangular corner piece 24a of the section 16 folds back into superposed relation to the body of said section, so that the outer side of the triangle extends along the marginal line 14. The corresponding triangular portion of the section 16 at the opposite end thereof in like manner is folded back to lie against the main portion of the section 16. This latter folded triangular section includes a rectangular extension bounded by the lines ML, LK, and K21 with the edge K21 extending along the line 14. The extension 18 which is scored and slit in substantially the same pattern as the extension 16, also folds in like manner.

In the modified construction shown in Figs. 4 and 5, the section 16' includes a triangular portion having its sides upwardly divergent from the point O, said sides being in line with and forming extensions of the diagonal score lines 24 and 25. The extension 18' is of similar construction comprising a triangular portion having its lower angle at the point O'. This construction omits the lateral rectangular extensions or wings comprised in the sections 16 and 18 of Fig. 1. These wings include, for example, the wing or extension bounded by the lines PQ, QR, and RL (Fig. 1).

Modifications may be resorted to within the spirit and scope of my invention.

I claim:

1. A blank of sheet material adapted to be folded to form a container having a rectangular body and a closed end integral therewith, said blank having parallel score lines defining panels which form the sides of the container, said panels including comparatively narrow panels alternating with comparatively wide panels, said blank being formed with a score line perpendicular to and intersecting said parallel lines and separating the panels from the bottom-forming portion of the blank, said bottom-forming portion comprising foldable sections consisting of extensions of said panels and separated by said parallel lines, the said extensions of said narrow panels each having downwardly convergent score lines extending from the upper corners of the extension and terminating at points intermediate the upper and lower edges of the extension, the latter being slit to form rectangular wings comprised in the lower portion of the said extension extending outwardly beneath said diagonal score lines, said extensions of the wider panels being extended downward to a greater distance than said extensions of the narrow panels and shortened horizontally and the spacing therebetween correspondingly increased to an extent to permit the bottom-forming portion of the blank to be nested with another of the same shape.

2. A blank of sheet material adapted to be folded to form a container having a rectangular body and a closed end integral therewith, said blank having parallel score lines defining panels which form the sides of the container, said panels including comparatively narrow panels alternating with comparatively wide panels, said blank being formed with a score line perpendicular to and intersecting said parallel lines and separating the panels from the bottom-forming portion of the blank, said bottom-forming portion comprising foldable sections consisting of extensions of said panels and separated by said parallel lines, the said extensions of said narrow panels each having downwardly convergent score lines extending from the upper corners of the extension and terminating at points intermediate the upper and lower edges of the extension, said extensions of the wider panels being extended downward to a greater distance than said extensions of the narrow panels and shortened horizontally and the spacing therebetween correspondingly increased to an extent to permit the bottom-forming portion of the blank to be nested with another of the same shape.

3. A blank of sheet material adapted to be folded to form a container having a rectangular body and a closed end integral therewith, said blank having vertical score lines defining panels which form the sides of the container, said panels including comparatively narrow panels alternating with comparatively wide panels, said blank being formed with a horizontal score line intersecting the said vertical lines and forming a dividing line between the panels and the bottom-forming portion of the blank, said bottom-forming portion comprising flaps in line with and individual to the said panels and foldably united to the panels along said horizontal line, the narrow flaps each having downwardly convergent score lines extending from the upper corners of the flap and terminating at points intermediate to the top and bottom of the flap, said flaps of the wider panels being extended downward to a greater distance than the flaps of the narrow panels, thereby providing an empty space between said extensions of the wider pan-

els, one said extension being cut back at the end thereof adjoining said space to such an extent that the length of said space horizontally is substantially equal to and at least as great as the horizontal length of the other said extension, whereby the bottom portion of the blank may be nested with another of the same shape.

4. A container having a rectangular body and a closed end, said container consisting of the blank of sheet material defined in claim 3, folded to form the container, and adhesive material adhering the superposed portions of the folded blank.

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