Feb. 20, 1968 C. A. STOPPER 3,369,729

COLLAPSIBLE CONTAINER

Filed Dec. 27, 1965

FIG. 1

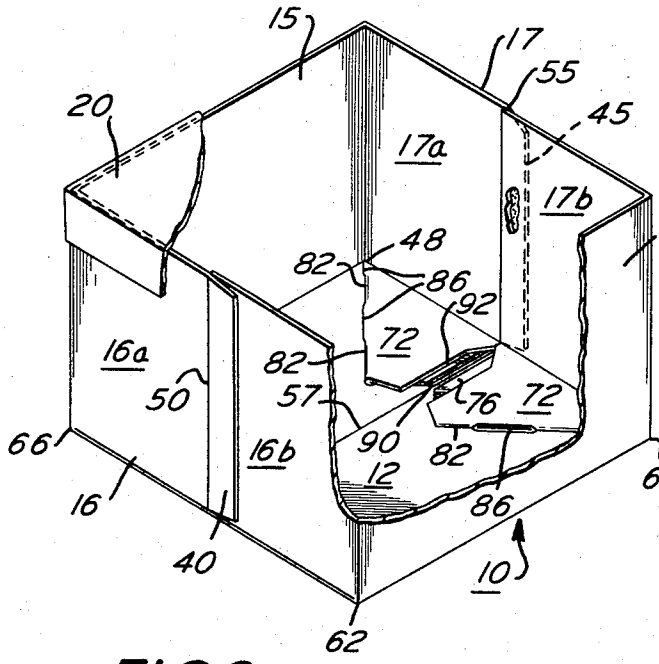


FIG. 2

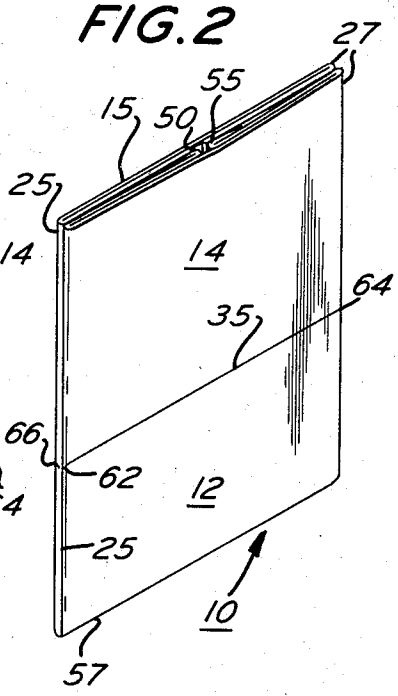


FIG. 3

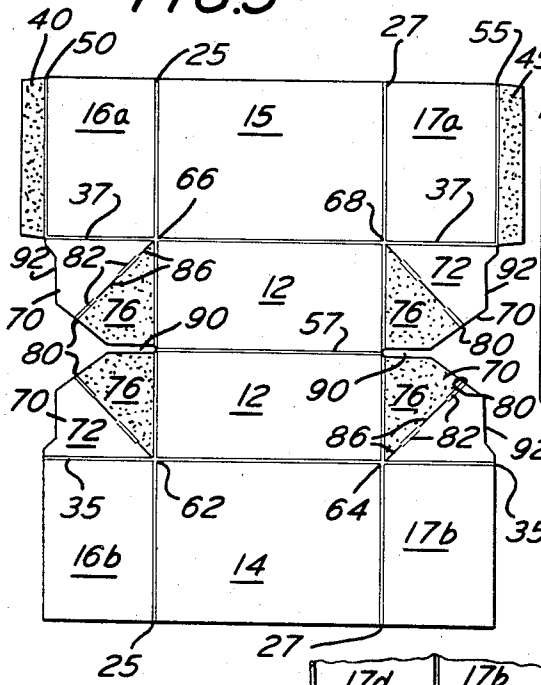


FIG. 4

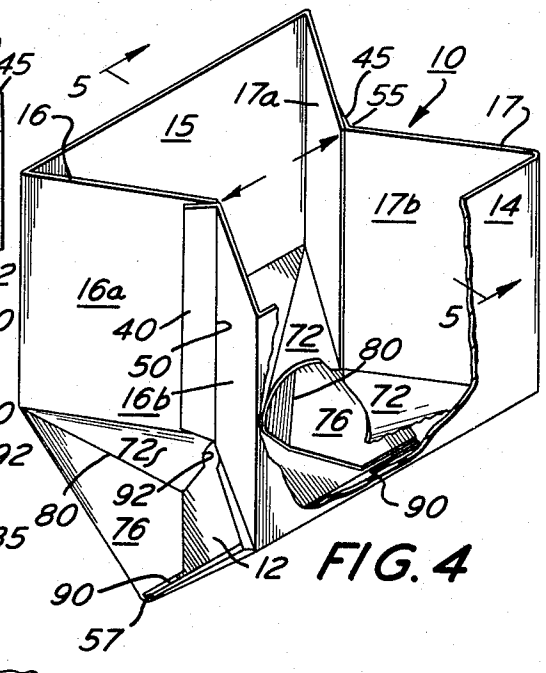
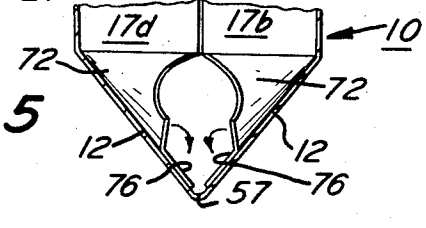


FIG. 5



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COLLAPSIBLE CONTAINER

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ABSTRACT OF THE DISCLOSURE

A collapsible container formed from a single blank which may be collapsed into a flat and compact rectangle and easily and readily assembled, said blank having intersecting fold lines thereacross to define rectangular bottom, side, and end walls forming said container with corners thereof at intersections of said fold lines, said blank including a hinge portion at each of said corners, each hinge portion being an integral continuation of said bottom and end walls extending across said fold lines, said hinge portions each having a section fastened flat against said bottom, said bottom and end walls having central crease lines thereacross along which said end walls can be folded inward and said bottom can be folded outward to collapse said container to a flat and compact rectangle.

This invention pertains generally to collapsible containers, and with more particularity, to a container constructed from a single blank of cardboard or other pliable material, which may be collapsed into a flat and compact rectangle to facilitate storage and shipment thereof.

The packaging industry is highly competitive, therefore any savings of container material and/or of shipping and storage space yields an appreciable economic advantage. Furthermore, it is also desirable that such containers be easily and readily dispensed and assembled after shipment and storage thereof. Naturally, the containers must be of a sturdy and suitable construction for their intended purpose.

Therefore it is a principal object of this invention to provide an improved collapsible container formed from a single blank, and which may be collapsed into a flat and compact rectangle.

An object of this invention is to provide a container that may be economically manufactured by utilizing a novel blank of minimal wastage.

Another object is to provide a collapsible container that can be collapsed into a flat and compact rectangle for shipping and storage in a minimal space and yet quickly set up for use in a simple convenient manner.

A further object of this invention is to provide a collapsible container blank which is simple and uncomplicated to be readily adapted for container manufacturing in conjunction with high speed automatic machinery.

It is also an object to provide a sturdy collapsible container which has stiffener portions reinforcing the end walls and bottom, thereby adapting the container for rough usage.

Yet another object of this invention is the provision of a collapsible container of the class described in which the parts are so arranged for manufacture, shipment and storage in a collapsed or knocked down disposition and finally put in disposition for use by simply opening thereof by the consumer without any special mechanical operations or additional attention, and the same parts of the container, in either open or collapsed dispositions, tending to retain the container at each respective disposition.

For the purpose of illustrating the invention, there is shown in the drawings a form which is presently preferred; it being understood, however, that this invention

is not limited to the precise arrangements and instrumentalities here shown.

Other objects and a fuller understanding of the invention may be had by referring to the following description and claims, taken in conjunction with the accompanying drawing in which:

FIGURE 1 represents an isometric view of the invented container in an open, set-up disposition.

FIGURE 2 illustrates the container of FIGURE 1 in a collapsed or knocked-down disposition.

FIGURE 3 is a plan view of an unformed blank utilized to construct the invented container.

FIGURE 4 is an isometric view, partially in section, showing the invented container and its various parts in a semi-collapsed disposition.

FIGURE 5 is a cross-sectional view taken along line 5—5 of FIGURE 4.

Referring to the figures of the drawing in detail, wherein like numerals indicate like elements, there is shown in FIGURE 1 a representation of the collapsible container of the present invention designated generally at **10**. As illustrated, the container **10** is a box formed by a rectangular bottom **12**, rectangular side walls **14**, **15** and rectangular end walls **16**, **17**. If desired, the container **10** may be provided with a cover **20**, a corner portion thereof being disclosed in FIGURE 1.

The container **10** of the present invention is formed out of a single integral blank of a cardboard or similar pliable material, which blank has the configuration shown in FIGURE 3 of the drawing. The blank there shown is proportioned to form a square container for use as a hat box, or the like, however, it being readily apparent to those skilled in the art, of course, that other proportions for the novel blank are available which may be chosen to form a more elongated container for use, say as a shoe box.

The blank is scored, as illustrated, completely thereacross, by the parallel pairs of intersecting fold lines **25**, **27** and **35**, **37** to define the bottom **12**, side walls **14**, **15** and end walls **16**, **17**. Notice that the end walls **16**, **17** of the container **10** are provided on the blank by half-portions **16***a*, **16***b* and **17***a*, **17***b*, respectively, at opposite ends of the side walls **14** and **15**, as shown.

Joining tabs **40**, **45** are utilized to join the half-portions **16***a* to **16***b* and **17***a* to **17***b*, respectively, thereby completing the end walls **16**, **17** upon assembly of the container **10**. In the blank embodiment illustrated, a joining tab **40**, **45** extends outward, as shown, from one of the half-portions of each of the end walls **16**, **17** for attachment to a remaining half-portion of each, respectively, that is tabs **40**, **45** extend from half-portions **16***a*, **17***a* for attachment to half-portions **16***b*, **17***b*. It is understood, naturally, that the joining tabs **40**, **45** may extend from either half-portion for joining to the remaining half-portion of each end wall **16**, **17**, the reversal from that illustrated being a mere equivalent. An adhesive may be applied at one surface of the tabs **40**, **45**, as indicated on the drawing by the shading. As an alternative, the adhesive may be applied on the surfaces of the remaining half-portions **16***b*, **17***b*, either instead of, or in addition to that on the tabs **40**, **45** for a joining together thereof. Furthermore, the blank may be cut without any extending tabs **40**, **45** in order to completely eliminate wastage of material at the blank ends. In this instance, the half-portions may be joined by separate individual joining tabs, such as by an adhesive tape or the like. Thus it is demonstrated that other equivalent alternates may be resorted to for joining of the half-portions in the assembly of the container **10**, and that all such alternates are understood to be within the scope of this invention.

The joining tabs **40**, **45**, although extending from the half-portions **16***a*, **17***a*, respectively, are defined therefrom by the scored lines which delineate the central crease lines

50, 55 of end walls 16, 17. As shown, the crease lines 50, 55 extend vertically across the end walls, dividing them into equal portions which may be folded inward to collapse the container 10. Another central crease line 57 is scored across the blank, at the middle thereof, in parallel relation to the pair of fold lines 35, 37 to divide the bottom 12, as indicated, for an outward folding thereof into two equal parts.

It is to be noted, that the intersections of the fold lines 25, 27, 35, 37 define points of the corners 62, 64, 66 and 68 of the container 10. The blank configuration of the invention includes a hinge portion 70 at each of said corners. Each hinge portion 70 is an integral continuation of both the bottom 12 and a respective one of the end wall half-portions, the hinge portions 70 being separately defined therefrom by respective ones of the intersecting fold lines 25, 27, 35, 37 at each corner 62, 64, 66, 68, as shown in FIGURE 3. Each hinge portion 70 is divided by a diagonal hinge line 80 into a mobile section 72 (unshaded) and a stationary section 76 (shaded). Each hinge line 80 extends from its respective corner 62, 64, 66, 68, diagonally across the hinge portions 70 as shown. To facilitate folding and unfolding along the hinge lines 80, they have slit portions 82 at the corners and midway therealong; with the remaining portions of the hinge lines therebetween and at the outermost ends being scored portions 86. The individual hinge portions 70 are separated from one another by slots 90 between adjoining ones of the stationary sections 76. As illustrated, the slots 90 extend longitudinally outward from opposite ends of the crease line 57 and in alignment therewith. Indentations 92 in each mobile section 72 provide a space between adjoining of the mobile sections upon assembly of the container 10 with the half-portions joined to complete the end walls 16 and 17, as may be best visualized by reference to FIGURE 4. Additionally, the corner material of each hinge portion 70 has been removed, forming a V-shaped notch between the slots 90 and the indentations 92 of the illustrated blank configuration. It is to be understood that the invented container may be formed out of a modified blank, having a different configuration, that is, without portions removed, such as the notches, slots and indentations afore-described. However, it has been found that such removed portions greatly facilitate the assembly and the setting-up and collapsing of the container 10, as will become readily apparent from a further reading of the description.

As indicated by the shading of FIGURE 3, the inside surface of each of the stationary sections 76 may be coated with an adhesive for attachment thereof on the bottom 12. Again an equivalent means may be utilized to fasten the stationary portions 76 on the bottom 12, for example, the adhesive coating may be placed instead on surfaces of the bottom 12, or fasteners such as staples may be satisfactory.

Assembly of the container 10 by formation of the blank configuration of FIGURE 3 requires only minimal and single steps which are readily adaptable to high speed automatic machinery. The joining tabs 40, 45 are folded down flat along the central crease lines 50, 55 to positions back flat against the half-portions 16*a*, 17*a*, respectively. All portions of the blank configuration lying outside of the parallel pair of fold lines 25, 27 are folded back inward therealong to a flat position overlying the blank portions between the fold lines 25, 27. That is, the half-portions 16*a*, 17*a*, 16*b*, 17*b* flatly overlay the side walls 14, 15, respectively, and the hinge portions 70 overlay flat against the bottom 12. Thus, the mobile sections 72 and stationary sections 76, of each hinge portion 70, are in an adjacent relationship flat against the bottom 12. Application against the bottom 12 of the adhesive surfaces (which may be pressure sensitive), on stationary sections 76, serves to securely fasten the stationary sections in place against the bottom 12. Of course, alternate fasteners such as staples may be employed in place of the adhesive. It must be pointed out that the mobile sections 72 remain free from the bottom and may be folded along the hinge lines 80 for movement to another position when the container 12 is opened and set-up. Since the previously folded joining tabs 40, 45 are flat over the respective half-portions 16*a*, 17*a*, with the adhesive surfaces thereof being uppermost, all that remains in the assembly of container 12 is a folding together of the blank along the central crease line 57. The slots 90 provide space between adjacent of the hinge portions and thereby allow the folding of the blank along crease line 57 to be absolutely flat. The adhesive surfaces of the half-portions 16*b*, 17*b* complete the end walls 16 and 17 of the container 12 in its collapsed disposition. The resulting configuration, which is an assembled but yet unformed container 12, resembles a flat and compact rectangle, as seen in FIGURE 2, ready for immediate packaging in stacks of pluralities of such rectangles. It is to be noted that an infinite number of different proportioned containers 12, that is elongated instead of square, may be created by a simple modification to the blank configuration shown. For those purposes it being only necessary to choose greater spacing between the parallel pair of fold lines 25, 27.

Final formation and dispensing of the containers 12 is accomplished by the consumer thereof, who may be a retail merchant or the like, it only being necessary to open the collapsed container 12 by spreading the side walls 14 and 15. This will cause an outward unfolding of the end walls 16 and 17 along central crease lines 50 and 55, and a simultaneous inward unfolding of the bottom 12 along central crease line 57. The mobile sections 72 of hinge portions 70 will fold along the diagonal hinge lines 80 and snap outward into a flat overlying position above the stationary sections 76, thereby forming the rectangular contianer 12 of FIGURE 1. The space between adjacent mobile sections 72 is provided by their opposed indentations 92, and thus each hinge section is separate for independent action to facilitate formation of the container 12. As may be seen by reference to FIGURES 4 and 5, the mobile sections 72 flex somewhat while being folded between the collapsed and set-up dispositions of the contanier 12. However, the mobile sections 72 resume a flat and unflexed condition whenever the container 12 is either fully collapsed or fully set-up. For this reason, the flexure of the mobile sections 72 causes them to snap into position with a firm tendency retaining the container 12 at either of its ultimate dispositions aforementioned. In addition, the hinge portions 70 form a stiffening reinforcement for bottom 12, while the joining tabs 40, 45 likewise form a stiffening reinforcement for the end walls 16, 17. The container 12 may be depended on then to be stable and sturdy. A stack of the collapsed containers 12 may be conveniently placed for dispensing in a manner similar to that for dispensing of the common paper bag. Thus, individual collapsed containers 12 may be fed, to a packaging clerk, or the like, for opening and formation thereof.

The present invention may be embodied in other specific forms without departing fromt he spirit or essential attributes thereof and, accordingly, reference should be made to the appended claims, rather than to the foregoing specification as indicating the scope of the invention.

What is claimed is:

1. A collapsible container comprising a single integral blank having intersecting fold lines thereacross to define rectangular bottom, side, and end walls forming said container with corners thereof at intersections of said fold lines, said blank including a hinge portion at each of said corners, each hinge portion being an integral continuation of said bottom and end walls extending across said fold lines, said hinge portions each having a section fastened flat against said bottom, said bottom and end walls having central crease lines thereacross along which said end walls can be folded inward and said bottom can be folded outward to collapse said container to a flat and compact rectangle.

2. A collapsible container in accordance with claim 1 wherein said hinge portions are each divided into stationary and mobile sections by diagonal hinge lines extending from each of said corners outward across said hinge portions, said stationary sections being folded back and fastened flat against said bottom, and said mobile sections being folded back along said hinge lines and fold lines separating them from said end walls to a flat overlying position against said stationary sections in an open disposition of said container and said mobile sections being unfolded against said bottom adjacent to said stationary sections in a closed disposition of said container, said hinge portions thereby stabilizing said container at said open and closed dispositions, respectively.

3. A collapsible container in accordance with claim 2 wherein said end walls include half-portions extending from opposite ends of each of said side walls and being separated therefrom by said fold lines, said half-portions being fastened together in pairs along said central crease lines thereacross to define said end walls upon assembly of said container.

4. A collapsible container in accordance with claim 3 wherein one half-portion of each of said pairs carries a respective one of said crease lines and includes a joining tab extending therebeyond, said tab having an adhesive surface for fastening to a remaining half-portion of each of said pairs, said tab of each of said pairs and said hinge portions stiffening and reinforcing said end walls and bottom, respectively.

5. A collapsible container in accordance with claim 2 wherein said hinge portions are separate from each other.

6. A collapsible container in accordance with claim 5 wherein pairs of said hinge portions are separated by slots extending from opposite ends of the crease line across said bottom, said slots being aligned with said crease line and having a sufficient width for accommodation of said crease line between said pairs of hinge portions upon collapse of said container for storage thereof in a flattened and compacted configuration.

7. A collapsible container in accordance with claim 2 wherein said diagonal hinge lines are slit for a portion of their lengths and scored for the remaining portion of said lengths, thereby facilitating folding back and unfolding of said hinge portions along said diagonal hinge lines.

8. A collapsible container in accordance with claim 7 wherein said diagonal hinge lines are slit midway therealong and at said corners of said container with scored portions therebetween and at the outermost ends of said hinge lines.

9. A blank configuration for formation into a collapsible container, comprising, a rectangular sheet of pliable material divided by parallel pairs of intersecting fold lines into a bottom, side walls, end wall half-portions at opposite ends of said side walls, and hinge portions at intersections of said fold lines, each hinge portion being an integral continuation, extending across said fold lines, of said bottom and one of said half-portions, said hinge portions each divided into stationary and mobile sections by diagonal hinge lines extending from each of said intersections outwardly across said hinge portions, said configuration having joining tabs extending from half-portions on opposite ends of said side walls, said tabs defined by crease lines scored in said half-portions, and said blank configuration including a central crease line scored across said bottom.

10. A blank configuration in accordance with claim 9 wherein adjacent stationary sections of said hinge portions are separated by slots extending outward from ends of said central crease line and being in alignment therewith.

11. A blank configuration in accordance with claim 10 wherein said mobile sections of said hinge portions include indentations and a diagonal cut between said slots and indentations of each of said hinge portions forming an inwardly directed central notch at opposite ends of said configuration.

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