Aug. 6, 1957 D. H. BLATT 2,801,784

SHIPPING CONTAINER

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Fig. 1

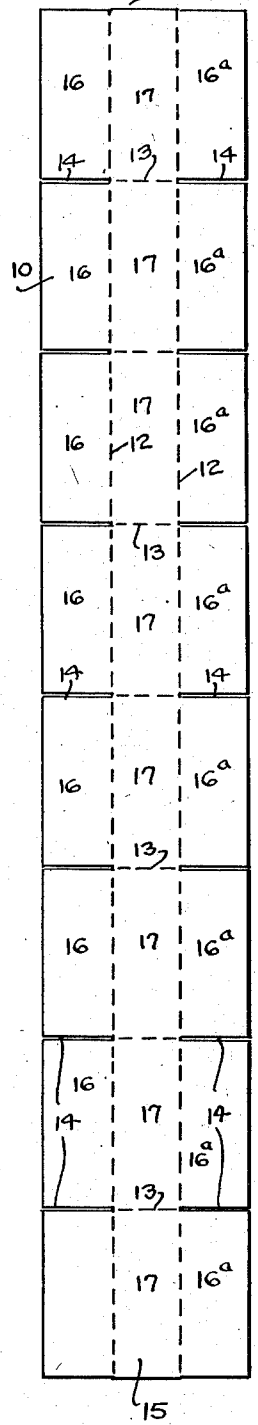


Fig. 3

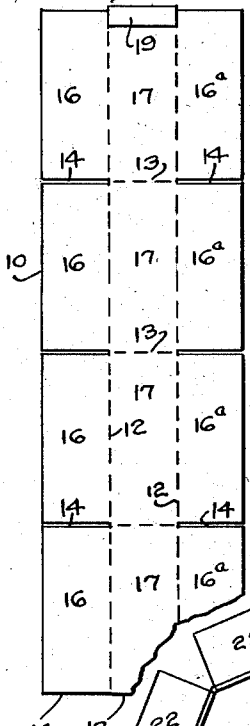


Fig. 4

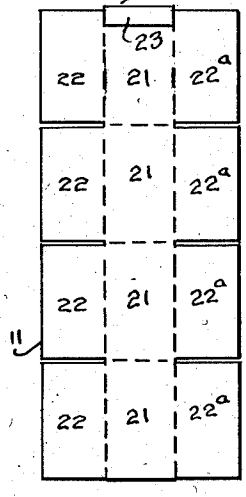


Fig. 2

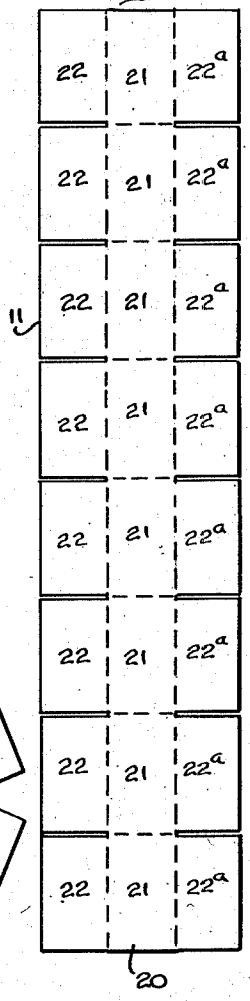


Fig. 6

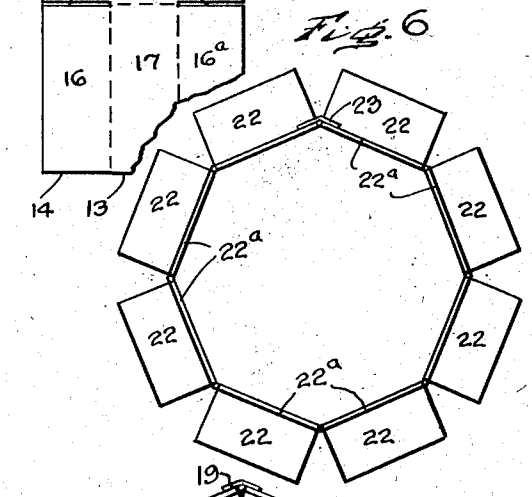
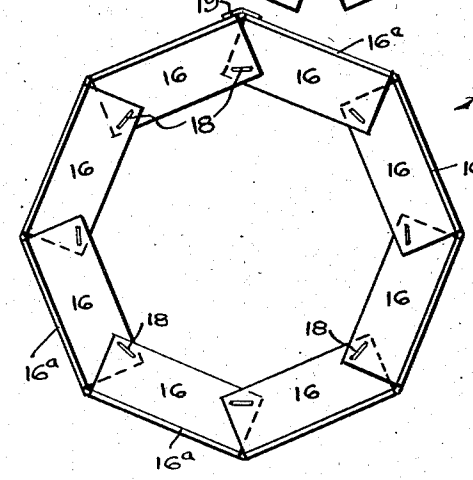


Fig. 5



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Fig. 7

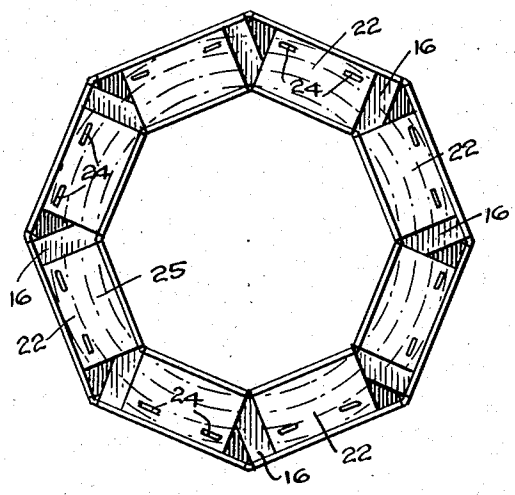


Fig. 9

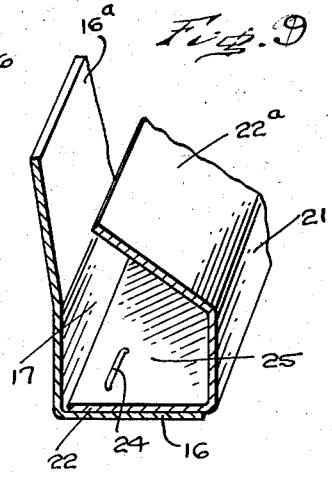


Fig. 8

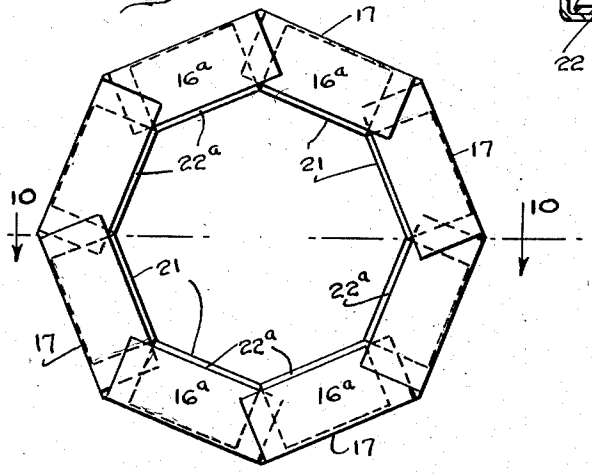
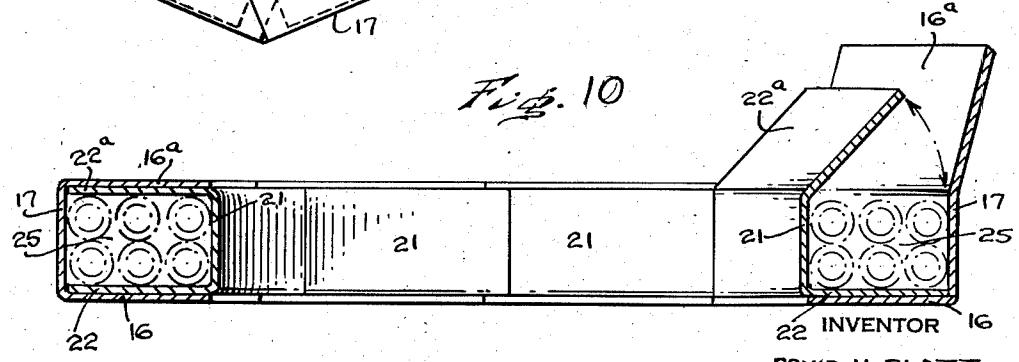


Fig. 10



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2,801,784

SHIPPING CONTAINER

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Application April 2, 1956, Serial No. 575,525

4 Claims. (Cl. 229—23)

This invention relates generally to shipping containers formed of corrugated board and the like and more particularly to a novel construction of a toroidal shaped container.

It has long been recognized by shippers of articles of circular form, such as coiled pipe, tubing, cable, wire, tire casings and other such annular shaped articles, that when the same are packed in containers of square shape, such containers entail considerable waste of valuable floor space, particularly in transportation vehicles, in relation to the shape of the article encased in the container. Obviously, if the outer shape of the container may be made to conform generally to the external shape of its contained article, the number of such article-filled shipping containers of a given size which may be stored within a given area of floor space may be considerably increased. Such "high density" stacking of the encased articles not only during shipment thereof, but also when the same are stored, results in substantial savings to both the shipper and the consignee of the goods.

Having in mind the foregoing, it is among the principal objects of the present invention to provide an exceedingly simple and inexpensive construction of toroidal shaped shipping container which is ideally adapted for the reception of articles of generally annular shape, such as coiled hose, wire, cable and the like.

More specifically, it is an object of the invention to form such a toroidal shaped container of a pair of flat blanks of suitable sheet material, such as corrugated paper board, which are respectively cut, scored and shaped into generally annular form and which are then assembled in nested relation to provide the container with an annular article-receiving chamber or well having endless concentric side enclosing walls, a permanently closed bottom wall and a readily openable top wall.

A further object of the invention is to provide a construction of toroidal shaped hollow container suitable for the shipment and storage of relatively heavy articles which by the nature and form of its construction is not only provided with a reinforced bottom wall and with overlapping top closure flaps to adequately close the top of the container after the annular shaped article is placed therein, but is also strengthened throughout.

Still another and important object and advantage of the present invention resides in the fact that the toroidal shape of the container in itself is such as to insure against any lateral shifting of the article packed therein, there being thus eliminated completely the necessity of employing in the container any auxiliary packing or filler members of any kind.

Other objects of the invention and advantages inherent in and resulting from the use of the container constructed in accordance therewith will be apparent more fully hereinafter, it being understood that the present invention consists substantially in the combination, construction, location and general arrangement of parts, all as described in detail in the following specification, as shown in the accompanying drawings and as finally pointed out in the appended claims.

In the accompanying drawings which are illustrative of a container constructed in accordance with and embodying the principles of the present invention,

Figure 1 is a plan view of the blank cut and scored to form the outer member of the toroidal container;

Figure 2 is a plan view of the blank similarly cut and scored to form the inner member of the container;

Figures 3 and 4 respectively show the blanks of Figures 1 and 2 folded upon themselves with their free ends secured preliminary to their being shaped into the form of endless annular members;

Figure 5 is a plan view of the outer member expanded to annular shape and showing the bottom flaps thereof in overlapped, secured together relation;

Figure 6 is a plan view of the inner member expanded to annular shape, showing the bottom flaps thereof extended in position to overlie the bottom flaps of the outer member;

Figure 7 is a plan view showing the bottom flaps of the inner and outer members secured together to form the completed container, with its top flaps open;

Figure 8 is a plan view of the completed container showing its top closure flaps in closed position;

Figure 9 is a perspective view, partly in section, of a portion of the container; and

Figure 10 is a transverse sectional view of the container as taken on the line **10—10** of Figure 8.

Referring now more particularly to the drawings, it will be observed that the container of the present invention is essentially constructed of two rectangular blanks **10** and **11** formed of suitable sheet material, such as corrugated fiber board, the blank **10** constituting the outer shell of the container and the blank **11** constituting the inner shell thereof.

The blank **10**, which is scored longitudinally along the spaced parallel lines **12—12** and transversely along the uniformly spaced lines **13**, is also slit at opposite sides thereof, as at **14—14**, to provide a central panel **15** having along each opposite side thereof a plurality of relatively foldable flaps **16** and **16a**. The blank thus scored and slitted may be bent along the transverse fold lines **13** into the shape of a polygonal shell having a wall portion formed of contiguous sections of the central panel all of the same size and shape. In the particular construction illustrated, the panel **15** is transversely scored to provide eight identical contiguous sections **17** which are relatively bendable about the transverse fold lines **13** to form an octagonal shell.

The flaps **16** along one side of the panel **15** are foldable inwardly toward the center of the preliminarily formed shell and at right angles to the angularly related wall sections **17** to provide the shell with an inwardly extending flange (see Figure 5) which is made up of the several flaps **16** disposed with their corner portions overlapping one another. Upon permanently securing together the overlapping corner portions of the adjoining flaps **16**, as by wire staples **18** or otherwise, the outer shell formed of the blank **10** assumes a more or less rigid polygonal shape, in which formed structure the flaps **16a** respectively extend coplanar with the angularly related wall sections **17**.

In order to complete the external shell structure as shown in Figure 5, the opposite ends of the central panel **15** thereof are joined together in abutting relation, as by an adhesively secured tape **19** or otherwise. Preferably, this tape **19** is applied before expanding the blank

into polygonal shell form, as by folding the blank about its central transverse score line and then taping together its free ends, as shown in Figure 3, to provide a relatively compact, flat structure convenient for handling and for storage.

The blank **11**, of which is formed the internal shell structure of the container, is also longitudinally scored, and transversely scored and slitted to provide a central panel **20** having a plurality of contiguous sections **21** adapted to be angularly related to form a wall of polygonal shape and a plurality of relatively foldable flaps **22** and **22a** extending from opposite sides of the wall-forming central panel **20**. As in the case of the blank **10**, the contiguous sections **21** of the panel **11** are all of identical size and shape to provide a polygonally shaped shell of which the wall sections are all angularly related to the same degree. However, the blank **11** is appreciably shorter than the blank **10** so that the shell formed thereof is diametrically smaller than that formed of the blank **10**. Preferably, the number of foldable wall-forming sections **21** in the blank **11** equals that of the corresponding sections in the blank **10**, so that upon nesting the shell formed of the blank **11** within the shell formed of the blank **10** their corresponding angularly related sections may be disposed in spaced, parallel relation to provide a container having an annular article-receiving chamber or well.

In order to insure maintenance of the inner and outer shells of the container in their desired concentric relation, the flaps **22** of the blank **11**, when the latter is expanded into shell form, are turned outwardly as shown in Figure 6 so that they respectively extend at right angles to the angularly related wall-forming sections **21** and so are adapted to overlie the corresponding flaps **16** which form the bottom unturned flange of the outer shell. As in the case of the structure formed of the blank **10**, the opposite ends of the central panel **20** of the blank **11** are suitably hingedly joined, as by a flexible adhesively secured tape **23**. The blank **11**, like the blank **10**, may be doubled upon itself, as shown in Figure 4, to form a compact, substantially flat unit which is adapted to be readily expanded into generally annular shape to form the inner shell of the assembled container.

For effecting a permanent assembly of the nested inner and outer shell structures, the outwardly turned flaps **22** of the expanded inner shell are permanently secured in superposed flatwise relation to the corresponding inwardly turned flaps **16** of the expanded outer shell, as by wire staples **24** or otherwise. The resulting structure is a toroidal shaped container (see Figures 7, 8 and 10) of substantial strength and rigidity having an annular well **25** which is ideally adapted to receive circular articles, such as coiled hose, cable and the like. The annular well **25** is thus provided with a double thickness bottom wall formed of the permanently secured overlapping flaps **16** and **22**, with spaced, concentric side walls formed respectively of the angularly related contiguous sections **17** of the blank **10** and the corresponding sections of the blank **11** and with overlapping top closure flaps formed respectively of the flaps **16a** and **22a** of the blanks.

These top closure flaps normally extend coplanar with the wall-forming sections to which they are joined during assembly of the inner and outer shells to make up the complete container and until after the container is loaded, whereupon first one set of the closure flaps (e. g. those designated **22a**) and then the second set thereof (e. g. those designated **16a**) are folded across the open top of the well to close the same, the two sets of top closure flaps being thus disposed in substantially the same relation as are those forming the bottom of the well. However, in order to facilitate opening of the container, the top closure flaps in their overlapped relation may be held closed by adhesive tape or any other suitable means (not shown) which lends itself readily to easy opening of the top closure flaps.

It will be understood, of course, that the blanks **10** and **11** may be transversely scored and slitted at uniformly spaced intervals to provide each of them with any desired equal number of contiguous wall-forming sections, which number for each blank may range from three (to provide a hollow container of triangular shape in horizontal cross-section) to more than the eight shown in the drawings (to provide a hollow container of generally cylindrical form in horizontal cross-section). Obviously, the hollow container is always of polygonal shape in horizontal cross-section because of the angularly related flat side wall sections thereof, but the greater the number of such sections employed in constructing the walls of the nested shell structures the more closely will the completed container approach a truly cylindrical shape.

It will be apparent also that the effective transverse width of the annular article-receiving well **25** of the container may be varied as desired by simply varying the transverse width of the opposite side flaps of the blanks **10** and **11**, while the depth of the well may be varied by changing, as desired, the transverse width of the central wall-forming panels of the blanks. Thus, if a narrow, deep well is desired, the opposite flaps of the blanks **10** and **11** would be of reduced width while the central transversely scored panels thereof would be of substantially increased width. Conversely, if it is desired that the toroidal container be provided with a wide, shallow well, the side flaps of the blanks **10** and **11** would be relatively wide as compared with the width of the transversely scored central panels thereof. Although unnecessary in all instances, it is preferred that the overlapping flaps forming the stapled bottom of the toroidal container and those constituting the top closure elements are of such relative transverse dimension that they all extend across the bottom and the top of the container well for the full width thereof, thereby insuring substantially complete transverse overlapping of the overlaying pairs of the flaps.

It will be apparent that the present invention is subject to various changes and modifications which may be made from time to time without departing from the general principles or real spirit thereof, and accordingly, it is intended to claim the invention boardly, as well as specifically, as indicated by the appended claims.

What is claimed as new and useful is:

1. A shipping container of generally toroidal form comprising a pair of blanks of sheet material cut, scored and folded to provide a pair of hollow shell members each of the same polygonal shape in horizontal cross section but of different diametric dimension, said members being nested one within the other to provide an annular article-receiving well therebetween, said blank being each characterized in that it includes a plurality of angularly related contiguous wall-forming sections, each of said sections having flaps extending laterally from opposite edges thereof and adapted to be folded at right angles to the plane of their associated section, the flaps extending laterally from the bottom edges of said wall-forming sections constituting the bottom closure flaps of the annular well of the container and those extending laterally from the top edges of the wall-forming sections constituting the top closure flaps for said well of the container.

2. In a shipping container as defined in claim 1 wherein the bottom closure flaps associated with one of said shell members are substantially disposed in a common plane extending normal to the axis of the container with the end portions of adjoining pairs of said flaps in overlapping relation.

3. In a shipping container as defined in claim 1 wherein the bottom closure flaps associated with one of said shell members are substantially disposed in a common plane extending normal to the axis of the container with the end portions of adjoining pairs of said flaps in overlapping relation, and wherein said overlapping end portions of said flaps are permanently secured together.

4. In a shipping container as defined in claim 1 wherein the bottom closure flaps associated with one of said

shell members are substantially disposed in a common plane normal to the axis of the container with the end portions of adjoining pairs of said flaps secured together in overlapped relation and wherein the corresponding flaps associated with the other of said shell members respectively overlap and are secured to the flaps of said first mentioned shell member.

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