

- [54] COLLAPSIBLE CAN
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[58] Field of Search 220/1 R, 6; 215/1 C;
150/5; 229/41 R, 41 B, 41 C

[56] **References Cited**

UNITED STATES PATENTS			
2,139,143	12/1938	Wiswell.....	220/6
2,899,110	8/1959	Parker.....	215/1 C
3,353,700	11/1967	Kalina.....	220/1 R
3,721,371	3/1973	Dolveck	220/85 B

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[57] **ABSTRACT**

A container structure having a continuous, cylindrical

wall made from aluminum or other substantially thin metallic or plastic material capable of collapsing inwardly along the longitudinal axis of the container when pressure or force is applied to opposite ends of the container inwardly towards its center. The container includes a plurality of figures integrally formed in the wall such that the plurality comprise at least one first set of figures having a first edge which are disposed in successive relation to one another so as to be substantially equal to the circular circumference of the container. The plurality of figures further comprise at least one second set arranged in angular relation to said first set wherein said second set has a second edge arranged in successive relation to one another and equal substantially to the elliptical circumference of the container. The majority of the wall area is covered with adjacently and contiguously arranged figures oriented in the plurality of first and second sets such that the average person is capable of exerting an amount of force on the ends of the container sufficient to collapse it due to the folding of the wall primarily along each of the first edges of each of the figures in each of the plurality of first sets.

7 Claims, 5 Drawing Figures

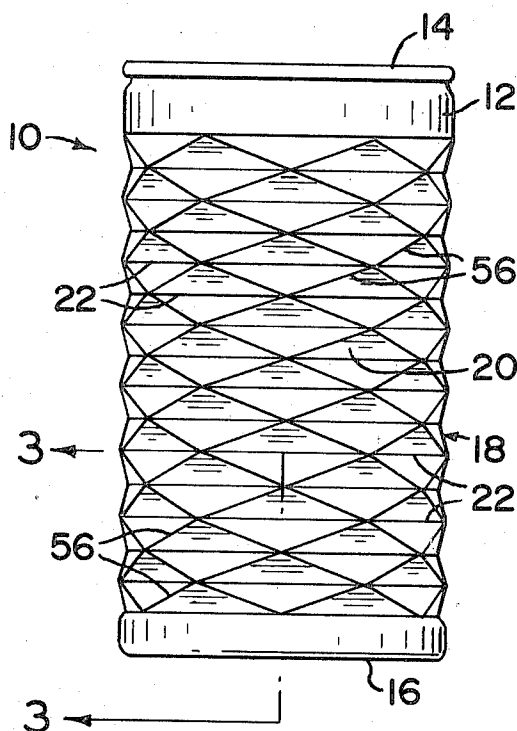


FIG. 1

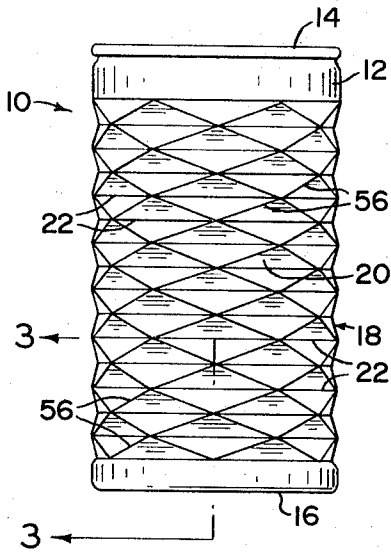


FIG. 3

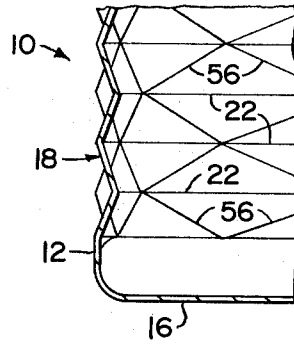


FIG. 2

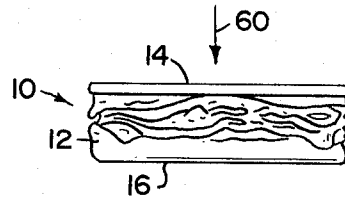


FIG. 4

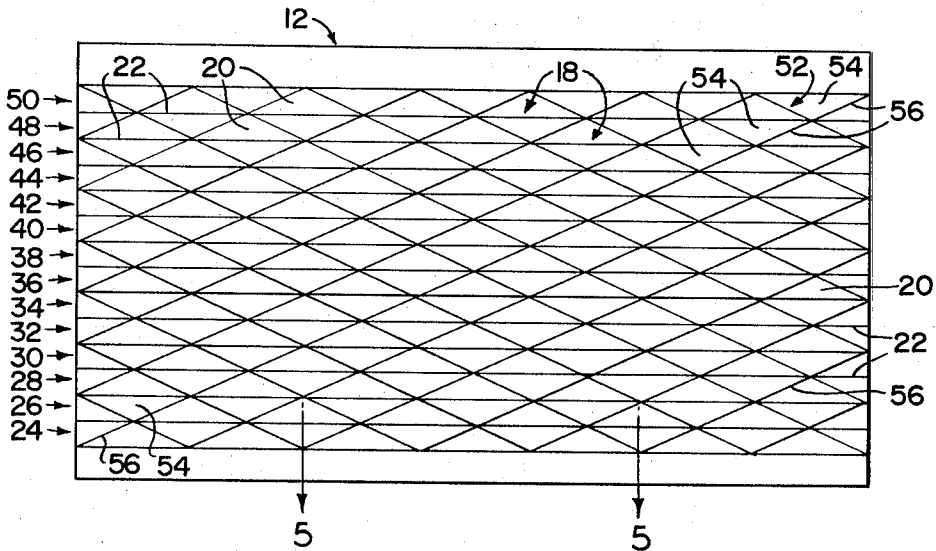
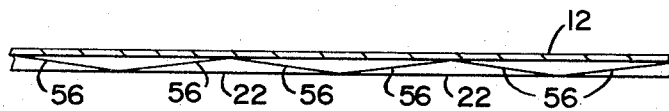


FIG. 5

COLLAPSIBLE CAN

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to a collapsible container which may be in the form of a liquid containing, non-pressurized can made of aluminum or other material wherein the container has a continuous wall with a plurality of figures having a predetermined configuration formed integrally therein. The disposition and configuration of the figures relative to one another allows collapse of the container when pressure or force is applied thereto in the required fashion.

2. Description of the Prior Art

Containers for liquids in the form of metallic, cylindrical or tubular cans have been known in the prior art for many years. Generally, the most common type of container utilized has a continuous, tubular or cylindrical wall which may be formed from a flat sheet of substantially rectangular material having its opposite extremities joined to each other along a seam extending substantially parallel to the longitudinal axis of the container. In more recent years, containers made from aluminum are formed by being extruded into a continuous walled container being seamless because of the extruded method of construction. Generally, in more recent years, this type of a container has become most popular for use as a container in the sale of beer, soft drinks, etc.

A modification of these type of containers comprises the container wall itself being structured specifically to allow it to collapse. Collapsing containers existing in the prior art and commercially available are normally structured specifically to aid in the dispensing of the contents of the container in an efficient regulatable manner so as to avoid waste and/or control the rate of dispensing. However, one of the problems associated with the conventional dispensing container is that normally metallic collapsible containers are made sufficiently rigid so as to avoid collapsing except under extreme pressure. This extreme pressure is normally placed on the container by a mechanically operated tool which serves to gradually deform or collapse the container as the contents are being dispensed.

Due to the wide popularity that metallic cans of this type have enjoyed, their disposal has recently become a problem. In order to recycle such cans it is first necessary to substantially flatten or crush them into a much smaller dimension than that which they assume in their normal configuration. The facility normally available for reducing conventional refuge to a flat or crushed state does not efficiently accomplish this purpose.

With the recent emphasis on ecology, the efficient and proper disposal of all refuge, including cans of this type, has been given emphasis. When a container is made from aluminum, it does not corrode or otherwise dissolve or disappear naturally because of the environment in which it is left. Instead, such a container remains a blight on its surroundings and is specifically the type of litter which ecology enthusiasts are trying to eliminate.

Accordingly, there is a need in the container production industry for a container capable of being collapsed into a size which is a small fraction of its original size thereby more readily lending itself to adequate and efficient disposal. Even more important, such collapsible container should be capable of being pressed into its

reduced size by a minimal amount of force. Such force of compression should be of the magnitude capable of being delivered by the average person without the aid of mechanical tools or the like. However, the desirable can or container should be structured to be capable of allowing such containers or crates of such containers to be stacked on top of one another without fear of the container itself collapsing.

The U.S. Pat. to Wiswell, U.S. Pat. No. 2,139,143 discloses a collapsing container and collapsing device therefor. The Wishwell container is primarily designed to be collapsed for the purpose of dispensing the contents of the container. In accomplishing this, the cylindrical wall of the container comprises a system of pre-arranged creases, ridges or scoring formed therein such that a tool providing pressure inwardly on both or opposite ends thereof may forcibly collapse the container thereby expelling its contents. While the structure herein disclosed is sufficient for accomplishing its intended purpose, it does not meet the current needs of the industry as discussed above. Accordingly, there is a need in the industry for a container capable of being collapsed merely by exerting pressure from the user without the aid of any mechanical device is primarily intended to reduce the size of the container for disposal purposes.

SUMMARY OF THE INVENTION

This invention relates to a collapsible container of the type having a cylindrical or tubular wall. The wall itself may be continuous as the type produced with modern day extrusion machines or may be originally produced from a flat, substantially rectangular sheet having its ends joined together by a seam extending substantially parallel to the longitudinal axis of the container.

The major portion of the wall comprises a plurality of specifically dimensioned and configured figures arranged in angular, multi-planed relation to one another. The plurality of figures may be arranged in at least one first set of figures having a first edge. The first set is disposed such that the first edge are arranged in end to end, continuous relation to one another and define the circular circumference of the container. Each of these first edges is equally dimensioned relative to the other and accordingly, the number of figures defining the first set dictates the dimensions of each figure since, in all embodiments of the present invention the total dimension of the combined length of all first edges of the first set substantially equals the circular circumference of the container.

The plurality of figures are further arranged to comprise at least one second set of figures wherein each figure in the second set includes a second edge. The second edge of each figure is also arranged successively relative to one another and disposed so as to define an elliptical circumference of the container arranged at an angular relation to the longitudinal axis thereof.

In one embodiment of the present invention, a plurality of first sets of figures are arranged in a substantially stacked array or immediately adjacent in contiguous relation to one another along a major portion of the longitudinal axis of the container. Accordingly, each figure of each first set is arranged in contiguous relation to correspondingly positioned figures in the next adjacent first sets on either side thereof. Similarly, the plurality of figures are arranged into a plurality of second

sets whereby each figure in one of said second sets is arranged in contiguous relation to at least one correspondingly positioned figure in the next adjacent second set.

In order to accomplish the specific arrangement of figures to provide collapsing of the container with a predetermined force, a triangular configuration of each figure may be utilized. However, it should be noted that each figure, as defined, is not limited to specifically a triangular configuration. An important feature of the present invention is that the arrangement of figures are such as to provide at least one set having a first edge thereon specifically dimensioned and disposed relative to one another to define substantially the circular circumference of the container and also to have a second set of figures arranged thereon wherein each of the figures have a second edge which are so dimensioned and disposed relative to one another as to define the elliptical circumference of the container. Any given figure in the wall of the container may be common to both a first set of figures and a second set of figures as defined above. When so arranged, pressure exerted on the opposite ends or extremities of the can inwardly along the longitudinal axis thereof and towards the center thereof results in collapsing of the container due to folding of the container wall primarily along each of the first edges of each of the first set of figures.

It is further important to note that the plurality of figures may be formed on the wall of the container such that each of the figures may be considered to be in either a first set of figures, or a second set of figures as these first and second sets are defined above.

The invention accordingly comprises a product possessing the features, properties and relation of structural components which will be exemplified in the product hereinafter described and the scope of the invention will be indicated in the claims.

BRIEF DESCRIPTION OF THE DRAWINGS

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description taken in connection with the accompanying drawing in which:

FIG. 1 is a side plan view of the container and wall structure having the plurality of figures formed therein.

FIG. 2 is a side plan view showing the container of the present invention in collapsed form wherein collapsing is caused by pressure of force being exerted on the container in the direction shown.

FIG. 3 is a sectional view showing the interior and planar relation of the figures formed in the wall of the container.

FIG. 4 is a detailed view of the wall of the container in non-rolled form before the container is shaped into its cylindrical configuration.

FIG. 5 is a sectional view taken along lines 5-5 of FIG. 4.

Similar reference characters refer to similar parts throughout the several views of the drawing.

DETAILED DESCRIPTION

This invention relates to a container for storing liquid wherein the container is of the type commonly known as a metallic can having a cylindrical sidewall interconnecting to bases. The sidewall may be extruded and thereby formed from one piece of a metallic material such as aluminum. Alternately, the wall may be rolled

into shape and joined at its opposite extremities by a longitudinal stem extending parallel to the longitudinal axis of the container.

As shown in FIG. 1, the container, generally indicated as 10, has a cylindrical or tubular shaped sidewall 12 interconnected between an upper and lower base 14 and 16 which comprise the opposite extremities or ends of the container 10. As shown in both FIGS. 1 and 4, the major portion of the wall 12 is covered by a plurality of contiguously located figures 18, which in the particular embodiment shown, are defined by a four sided, triangular shape.

The plurality of figures comprise a plurality of sets of figures indicated generally as 20 (FIGS. 1 and 4) disposed in offset, substantially stacked array. Each set defines a substantially circular configuration about the container. Each figure in each set includes a first edge 22 which is successively arranged in end to end relation with the first edge of each of the other figures in the same set. The figures of each set are so disposed that the sum or total of the first edges 22 in each of the figures 20 is equal to the circular circumference of the container 10. Furthermore, each first edge of the figures in each set are disposed, when formed into the completed container 10, to define a plane which is substantially perpendicular to the longitudinal axis of the container. In the embodiment shown, the plurality of first sets are generally indicated successively as 26, 30, 34, 38, 42, 46, and 50. Again, note that each of the first edges in each set is arranged in substantially parallel relation to the correspondingly positioned first edges in the next adjacent set of figures.

The plurality of figures formed on wall 12 also comprises a plurality of second edge 56 which are also arranged in successive end to end a substantially co-linear relation wherein each figure 54 of a second set is disposed such that the total of the second edges 56 is substantially equal to the elliptical circumference of the container when in the formed configuration as shown in FIG. 1. The term co-linear as used herein is not necessarily intended to define a straight line but may include a substantially curved line configuration.

The plurality of figures are also disposed such that a plurality of second edges, for example 51 are formed in substantially parallel relation to the next adjacent plurality of second edges 53. Accordingly, referring to FIG. 2, when force is applied to both or opposite ends of the container 10 along the longitudinal axis, inwardly towards its center as indicated by direction arrow 60, the container collapses along the longitudinal axis. The collapsing is accomplished by the wall 12 folding primarily along the first edges 22 of each set and all second edges 56 of each set. Furthermore, the structure of the wall is such because of the relative arrangement of the first and second edges that the amount of forces applied to collapse a container can be easily applied by the average user of the container without the aid of any mechanical device or tool.

Collapse of the container, when filled for use, and shipped or stored, is prevented since the container will be filled with liquid, almost to its top base 14 thereby giving the container added strength when filled due to the incompressibility of liquids.

It will thus be seen that the objects made apparent from the preceding description are efficiently attained and, since certain changes may be made in the above product without departing from the scope of the inven-

tion, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all the generic and specific features of the invention herein described and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

Now that the invention has been described, what is claimed is:

1. A container structure of the type capable of collapsing along its longitudinal axis, said container comprising: a wall including a plurality of multi-edged figures arranged in predetermined aligned relation to one another, each of said figures comprising a first edge and a plurality of second edges, said first and second edges of each figure disposed relative to one another so as to define a substantially diamond shaped configuration, said plurality of figures comprising a plurality of sets of figures, each set comprising a predetermined number of said diamond shaped figures disposed in successive, end to end relation to one another thereby defining a substantially circular configuration, said plurality of sets arranged in substantially stacked, offset relation to the next adjacent set such that figures of adjacent sets disposed in offset relation to one another are also contiguous to one another along a common second edge of said contiguously positioned figures; said first edge of each figure in each set disposed to define a plane substantially perpendicular to the longitudinal axis of said container structure and the totality of each set equal to the circular circumference of the container, said second edge of each figure and each set disposed in sub-

stantially co-linear relation to the correspondingly positioned second edge of adjacently positioned sets such that the totality of correspondingly positioned second edges are equal to the elliptical circumference of said container, whereby pressure applied inwardly along the longitudinal axis of said container wall will cause folding of said wall along the first and second edges of each figure and thereby collapse said container.

2. The container structure as in claim 1 wherein said first edge and said second edge of each figure are disposed in angular relation of from 10° to 15° relative to one another.

3. A container structure as in claim 1 wherein each of said first edges of each set of figures and each of said second correspondingly positioned second edges of said adjacently positioned sets of figures are substantially equal to the circular circumference and the elliptical circumference of said container respectively.

4. A container structure as in claim 1 wherein each of said figures comprises two triangles arranged in non-coplanar relation to one another and having a common base defined by said first edge of said diamond shaped figure.

5. A container structure as in claim 1 wherein each of said first edges of said first set of figures are substantially equally dimensioned to each other and said first set comprising seven such figures.

6. A container structure as in claim 1 wherein the wall surface of said container is continuous and is formed of aluminum material.

7. A container structure as in claim 1 wherein the wall surface is continuous and formed of plastic material.

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