Jan. 23, 1940. H. CAREW 2,187,769

CONTAINER AND BLANK THEREFOR

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Fig. 1

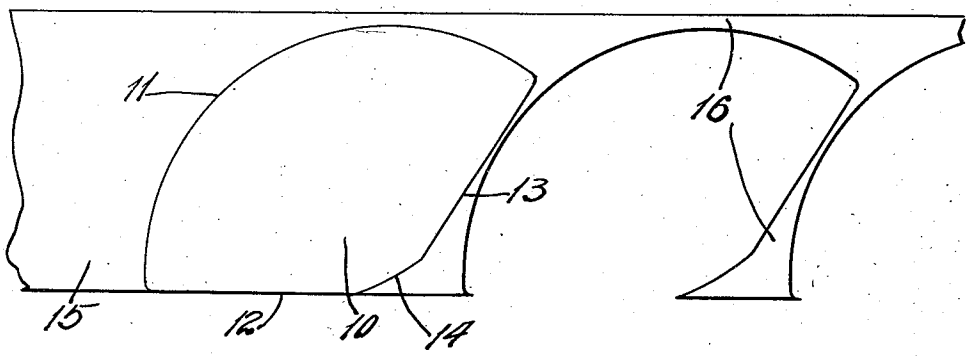


Fig. 2

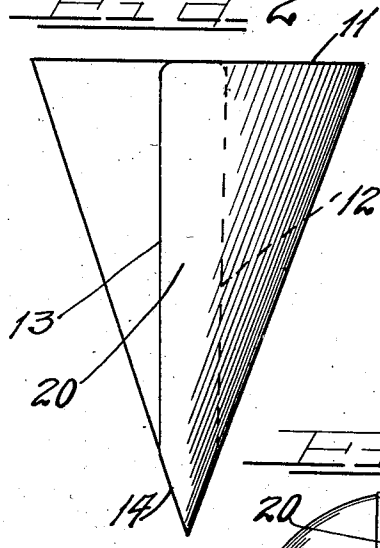


Fig. 3

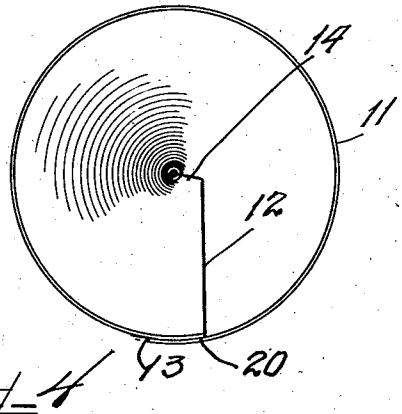
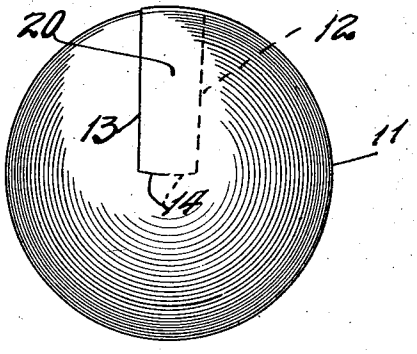


Fig. 4



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Fig. 5

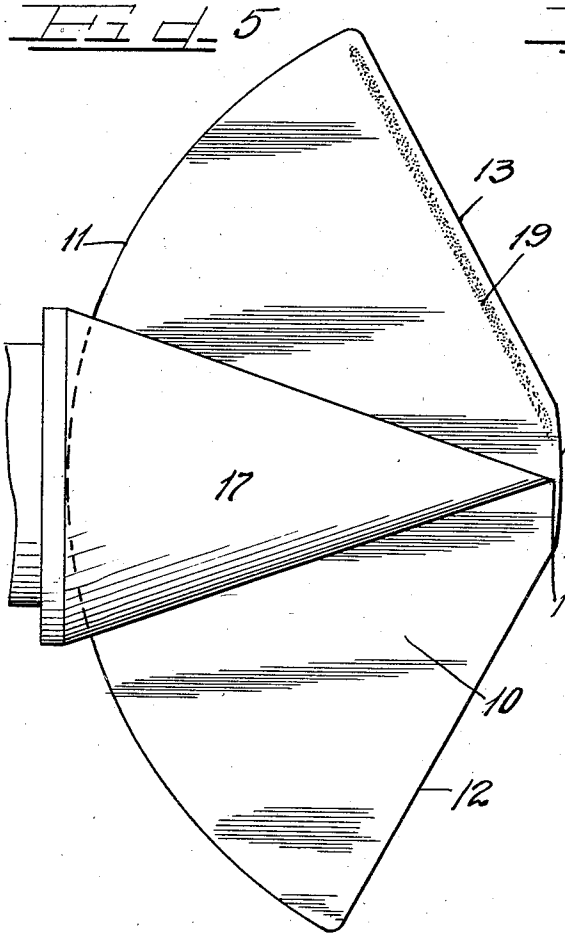


Fig. 6

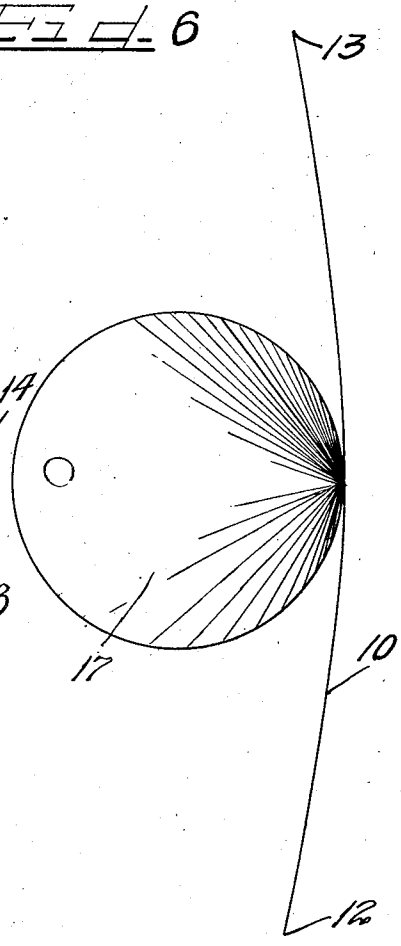
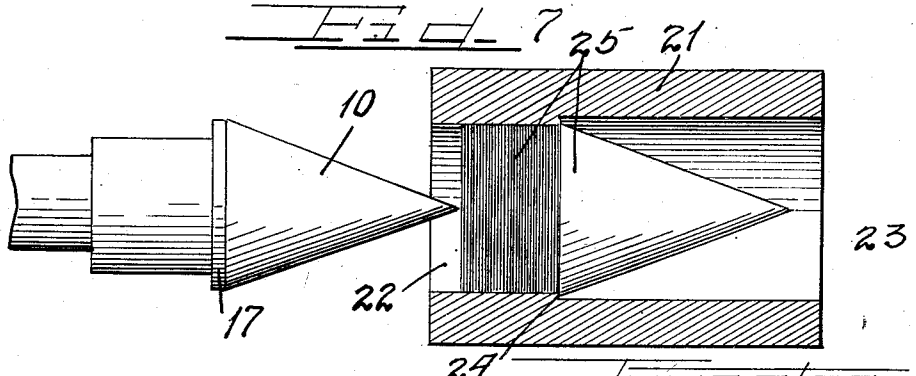


Fig. 7



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Patented Jan. 23, 1940 2,187,769

UNITED STATES PATENT OFFICE

2,187,769

CONTAINER AND BLANK THEREFOR

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Application September 9, 1937, Serial No. 162,968

14 Claims. (Cl. 229—1.5)

This invention relates to improvements in a container, and more particularly to a container of the type of a drinking cup, ice cream cup or the like, preferably made from paper, fiber or some similar material sufficiently economical to warrant the disposition of the container after a single usage, although the invention may have other uses and purposes as will be apparent to one skilled in the art.

In the manufacture of paper containers, such as drinking cups and the like, the cost of the paper stock used is one of the major items of expense, and in this particular field economy in production is most desirable, if not essential. It is also desirable to provide a container blank of such a character that successive blanks may readily be severed from a substantially continuous sheet or strip of stock.

With the foregoing in mind, it is an important object of the present invention to provide a blank for making a container, which blank comprises an exceedingly small amount of stock.

Another object of the invention is the provision of a container blank which may be cut from a continuous strip of stock in such a manner that the blank, together with the wastage contingent with the cutting thereof, reaches a desirable minimum.

A further object of the invention is the provision of a container blank having a substantially straight edge, which blank may be severed from a continuous strip of stock with such straight edge coinciding with an edge of the stock strip, the blank being complete in nature when severed from the stock strip and not requiring any further trimming or cutting operations.

Another feature of the invention resides in the provision of a container blank which lends itself to a simple and economical method of forming the resultant container.

It is also an object of this invention to provide a blank for forming a container of substantially true conical shape, the blank having a pair of substantially straight edges joining a pair of arcuate edges, the arcuate edges being of equal radii.

A still further feature of the invention is the provision of a quadrangular blank for forming a container of substantially true conical shape, the blank having an arcuate leading edge and being wound into conical shape about a point substantially opposite the center of said leading edge but spaced inwardly therefrom.

Another object of the invention is the provision of a container of substantially true conical shape, made from a single blank of material, with marginal portions of the blank overlapped to form a seam which is of substantially the same width throughout its length.

A further object of the invention is the provision of a blank for making a container of substantially true conical form, the blank being of such shape and character that the completion of the formation of the apexial region and the tight sealing of this region in the resultant container may be effected by forcibly nesting the container being formed in a stack of previously formed and nested containers of similar character.

While it is known that a blank for the formation of a container of substantially true conical shape must be provided with an arcuate edge for defining the mouth of the container, it is an important object of the present invention to provide a blank having an arcuate leading edge opposite to the edge defining the mouth of the container, which leading edge is substantially bisected in the formation of the container, and two halves of this edge are brought up and disposed in the body part of the container, which construction lends itself to an economical method of forming the container.

Still a further feature of the invention is the provision of a blank for forming a container of substantially true conical shape, which blank is substantially symmetrical in shape, i. e., having coinciding halves if folded along an axis of the blank.

While some of the more salient features, characteristics and advantages of the present invention have been above pointed out, others will become apparent from the following disclosures, taken in conjunction with the accompanying drawings, in which:

Figure 1 is a fragmentary plan view illustrating how the blank embodying principles of the present invention lends itself to being cut from a continuous strip of stock;

Figure 2 is a side elevational view of the finished container;

Figure 3 is a top plan view of the finished container;

Figure 4 is a bottom plan view of the finished container;

Figure 5 is a fragmentary plan view illustrating a step in the forming of the blank into the container and showing certain salient points in connection with the blank and container;

Figure 6 is an elevational view taken from the right of Figure 5; and

Figure 7 is a fragmentary view, partly in section and partly in elevation, illustrating how the particular blank lends itself to a simple method of forming the container.

As shown on the drawings:

In the illustrated embodiment of the present invention, there is seen a blank 10 which is a substantially flat sheet of stock, which may be paper of the character used in making paper drinking cups, the so-called dry wax paper being a satisfactory example. In the illustrated instance, as seen clearly in Figures 1 and 5, the blank 10 is of such a shape as to include a relatively long arcuate edge 11 to define the mouth of the resultant container, a pair of substantially straight side edges 12 and 13, and another shorter arcuate edge 14 which is the leading edge of the blank during the formation of the cup or container.

The arcuate or mouth edge 11 substantially terminates in the side edges 12 and 13 which are preferably non-radial with respect to the mouth edge 11 and which converge in a direction away from the edge 11, but do not meet. These side edges are joined at their nearer ends by the arcuate edge 14, so that the complete blank is quadrangular in shape and comprises a pair of opposed substantially straight side edges and a pair of opposed arcuate edges. Preferably, the arcuate edges 11 and 14 are of equal radii, and in the illustrated instance the center of curvature of the edge 11 is substantially at the midpoint of the edge 14, and the center of curvature of the edge 14 is substantially at the midpoint of the edge 11. Thus, the center of curvature of the mouth defining arcuate edge 11 is within the area defined by the major bounding edges of the blank, and would so be even, for example, if one of these bounding edges was notched around said center so the center would, in fact, be off the paper proper. It is apparent, therefore, that the complete blank is substantially symmetrical in that if the blank were folded on the median line from the edge 11 to the edge 14, both halves of the blank would coincide with each other.

It might be noted that in the event it is desirable to form the blank into a conical container with the use of a rotating mandrel embodying a gripper for grasping an edge portion of the blank, after which the blank is wound or wrapped around the mandrel, one of the edges 12 or 13 may be made slightly concave to facilitate the winding action, all in an obvious manner and without departing from the spirit of the invention.

The blank 10 lends itself to being cut from a continuous strip of stock, such as the strip 15 seen in Figure 1, and blanks may be successively severed from the strip, as indicated in this figure. It will be noted that one of the side edges of the blank, in this instance the edge 12, coincides with the side edge of the stock strip, to eliminate wastage of material. Of course, as the blanks are successively cut from the strip 15, there will be some wastage of stock which is indicated at 16 in the right-hand portion of Figure 1, but it will be noted that the stock strip 15 is relatively narrow and that the blank itself together with its proportional amount of the wastage 16 results in the use of an exceedingly small amount of stock for each container.

While the method of forming the blank into container-shape is described and claimed in my co-pending application, Method of making a paper cup, filed August 12, 1938, Serial No. 224,480, certain steps of the method are presented herein for the purpose of clarity, to indicate how the blank, by its own shape, lends itself to an economical method of forming.

With reference to Figures 5 and 6, it will be seen that the blank 10 may be wound or wrapped around a conical mandrel 17 which is preferably non-rotative. The winding of the blank is centered around a point 18, in this instance the apex of the mandrel. It will be noted that this point 18 is substantially opposite the midpoint of the arcuate edge 14, but is spaced from this point so as to lie inside the blank proper. While the location of the point 18 may vary to some extent, it has been found that a tighter seal can be made at the apex of the cup if the point 18 is spaced inwardly from the edge 14, rather than coinciding with this edge.

The edges 12 and 13 are brought around the mandrel 17 so that the marginal portions adjacent these edges overlap to form a seam. It will be noted that the blank carries a suitable adhesive 19 for retaining the margins overlapped. In actual commercial practice, the adhesive 19 would probably be on the opposite side of the blank from the illustration in Figure 5, so that the adhesive would be on the outside of the inner margin of the seam. However, for the purpose of clarity in illustration, the adhesive is illustrated as being on the inside of the outer margin of the seam.

With the illustrated showing, the edge 12 would first be brought around the mandrel, and then the edge 13, to provide the overlapped marginal seam 20 illustrated in Figures 2, 3 and 4. Of course, suitable pressing means may be utilized to press the overlapped margins together and thus insure a bonding by the adhesive.

It will be noted that in thus forming the blank around the point 18, the arcuate edge 14 is substantially bisected, and the two half portions of this edge are brought up onto the body of the blank in overlapped relationship as a continuation of the seam 20, illustrated in Figures 2, 3 and 4, thus providing a tightly sealed apex for the cup or container amply sufficient to prevent leakage of liquid contents.

It will further be noted that the seam 20 is of substantially the same width throughout its length, with the exception of the margins adjacent the halves of the arcuate edge 14, and that the halves of the arcuate edge 14, as nearly as possible consistent with this edge being arcuate, coincide in the finished container with an element of the cone, as seen best in Figure 2, so that the container is not only highly efficient in use but very pleasing in appearance.

At the time of the formation of the seam 20, the apexial region of the cup, especially in the vicinity of the half portions of the arcuate edge 14, is not tightly sealed, and this is accomplished by forcibly nesting the container in a plurality of completely formed and nested containers held under pressure against expanding to full size at the open ends.

In Figure 7, there is illustrated diagrammatically a chute or receiver 21 having a bore 22 at one end and a larger bore 23 at the other end, a shoulder 24 resulting from the differently sized bores. A plurality of completely finished containers 25 are shown in nested relationship in the receiver, and these containers have been forcibly pressed from left to right in the smaller bore 22 which is of such a size as to prevent complete

expansion of the mouth edge of the container. The container being formed, shown on the mandrel 17, is forced into nested relationship with the containers 25 in a manner sufficiently positive and under sufficient pressure to insure a tight seal of the apexial region of the container. As successive containers are forced into the smaller bore 22, containers are successively pushed into the larger bore 23, wherein after the mouth end passes the shoulder 24 the containers may expand to their full size and thus become loosened from the following containers.

From the foregoing, it is apparent that I have provided a novel container of substantially true conical shape, and a single novel blank for forming the container, the blank requiring the use of a very limited amount of stock and lending itself to the easy and efficient cutting of the blank as well as a simple and rapid method of forming the container, whereby the container may be manufactured expeditiously and very economically. It will be noted also that the container is not only pleasing in appearance, but highly efficient in operation and may be utilized for holding liquids, solids or frozen confections.

I am aware that many changes may be made and numerous details of construction may be varied through a wide range without departing from the principles of the present invention, and I, therefore, do not purpose limiting the patent granted hereon otherwise than is necessitated by the prior art.

I claim as my invention:

1. A paper cup of substantially true conical shape comprising a single blank of material having a pair of curved edges of equal radii, with the apex of the cone adjacent the center of one of said curved edges, and the other edge defining the mouth of the cup.

2. A blank for forming a vessel having substantially a true conical shape, said blank comprising a lower edge consisting of a single arc, and an upper edge consisting of a single convex arc to define the mouth of the container having the same radius of curvature as the lower edge and with the center of said radius of curvature on the said lower edge.

3. A vessel of substantially true conical shape formed from a blank having a pair of arcuate edges with the center of curvature of one of said arcuate edges on an intermediate point of the other arcuate edge, said blank being wound around a point in proximity to one of said arcuate edges with the other arcuate edge forming the mouth of the vessel.

4. A container of substantially true conical shape formed from a blank having opposed edges each comprising an arc and both arcs being of equal radii, and straight side edges between said arcuate edges, said blank being wound around a point near the center of one of said arcuate edges but lying within the body of the blank spaced from said edge.

5. A container of substantially true conical shape formed from a symmetrical blank having opposed edges each comprising an arc and both arcs being of equal radii, one of said arcuate edges defining the mouth of the container and having its center of curvature on an intermediate point of the other arcuate edge, the radius of said mouth defining edge being substantially equal to the longest top to bottom dimension of the blank, and straight side edges between said arcuate edges, said blank being wound around a point substantially on the median line of the blank but spaced inwardly from one of said arcuate edges to define the apex of the container.

6. A blank for forming a container of substantially true conical shape, said blank having a pair of straight edges, and a pair of arcuate edges of equal radii with the center of curvature of each arcuate edge on the opposite arcuate edge.

7. A blank for forming a container of substantially true conical shape, said blank having an arcuate edge for defining the mouth of the container terminating in a pair of inwardly converging non-meeting side edges, and an arcuate edge joining the other ends of said side edges, both arcuate edges having equal radii.

8. A container of substantially true conical shape formed from a single blank of material having an arcuate edge to define the mouth of the container, a pair of converging non-meeting side edges, and another arcuate edge joining said side edges, said blank being wound to cause an overlap of the margins adjacent said side edges of substantially even width from top to bottom of the finished container.

9. A blank for making a container of substantially true conical shape, said blank having a pair of side edges one of which is substantially straight and coincides with the side edge of a strip of stock from which successive blanks are severed, an arcuate edge connecting said side edges and defining the mouth of the finished container, and another edge joining the opposite ends of said side edges which is substantially bisected in forming the apex of the container, one portion of the last said edge appearing on the outside of the finished cup and the other portion on the inside.

10. A container of substantially true conical shape formed from a single blank of material having an arcuate edge to define the mouth of the container, a pair of converging non-meeting side edges, and another arcuate edge joining said side edges, said blank being wound to cause an overlap of the margins adjacent said side edges of substantially even width from top to bottom of the finished container, the last said and shorter arcuate edge being substantially evenly divided by said overlap in the apex region of the container with each part of said edge substantially paralleling an element of the cone.

11. A container of substantially true conical shape formed from a blank having a pair of opposed arcuate edges with the center of curvature of one of said edges on an intermediate point of the other of said edges.

12. A conical paper container formed from a blank having more than three sides one of which is arcuate to define the mouth of the container with the radius of said side being equal to the longest longitudinal dimension of the blank before forming the container and approximately equal to an element of the finished container.

13. A paper blank for forming a conical container, said blank having more than three bounding edges one of which is arcuate to define the mouth of the container, the apex of the container occurring at a point in close proximity to another bounding edge substantially opposed to said arcuate edge, and the center of curvature of said arcuate edge being substantially on an intermediate point of said other bounding edge.

14. A conical paper container having a side seam comprising overlapped marginal portions

adhesively held together and formed from a single blank having a pair of arcuate edges of equal radii and a straight edge connecting said arcuate edges, said straight edge being a part of a side bounding edge of the stock strip from which the blank is severed and the margin adjacent said straight edge forming one portion of said side seam, and one of said arcuate edges defining the mouth of the container, with the center of curvature of the mouth defining edge located within the area defined by the major bounding edges of the blank.

HERMAN CAREW.