Sept. 17, 1935. B. B. LEE 2,014,477

PAPER CONTAINER

Filed April 12, 1933

Fig. 1

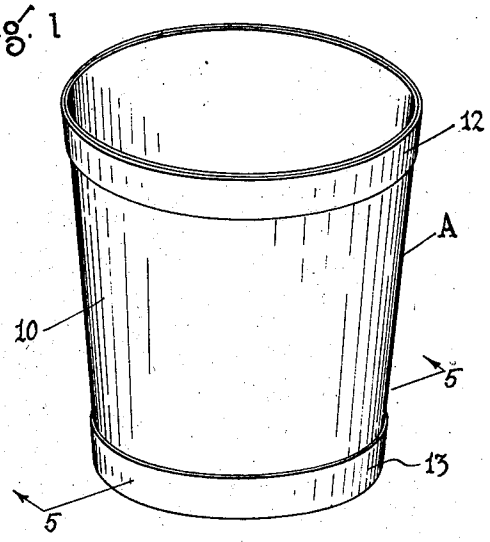
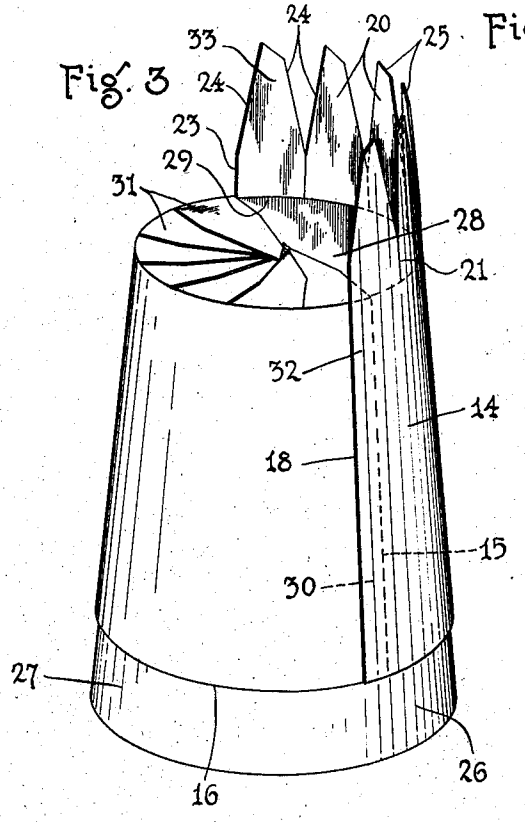


Fig. 3



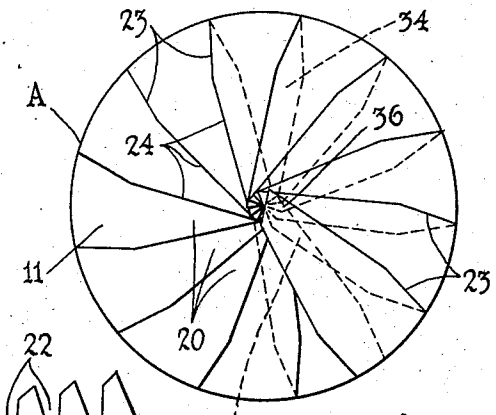


Fig. 4

Fig. 2

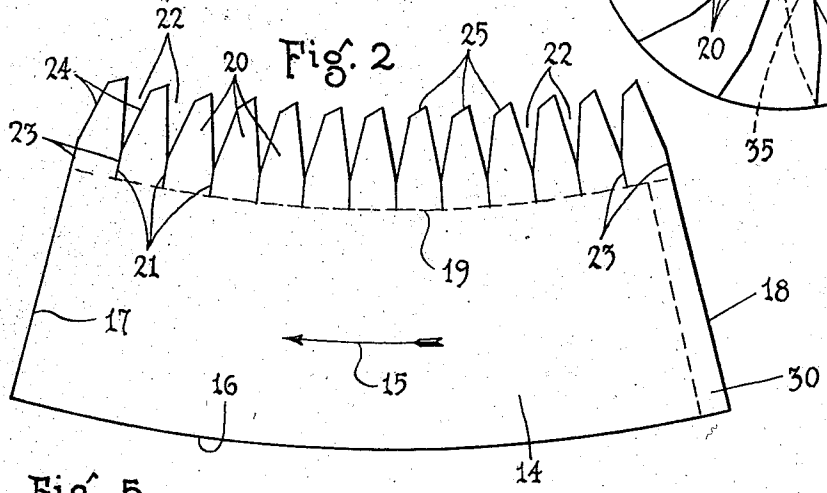
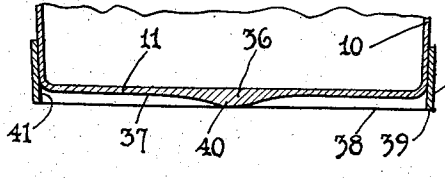


Fig. 5



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PAPER CONTAINER

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Application April 12, 1933, Serial No. 665,722

3 Claims. (Cl. 229—21)

My invention relates to paper containers and particularly to containers adapted to be used for shipping commodities such as butter and the like.

An object of the invention resides in providing a paper container which may be used as a butter tub.

A still further object of the invention resides in providing a laminated container.

Another object of the invention resides in constructing the container from sheets of paper glued together to form a composite structure of desired strength and rigidity.

A still further object of the invention resides in constructing the bottom of the tub integral with the sides thereof.

A feature of the invention resides in constructing the container from a number of blanks each having a segmental shaped body portion and tongues issuing outwardly therefrom, said tongues being adapted to be turned into lapping relation and glued together to form a bottom for the container.

An object of the invention resides in constructing the bottom with a thickening at the center thereof constituting a protuberance issuing beyond the bottom proper for reinforcing and stiffening the bottom of the tub and for forming a support for the bottom inwardly of the periphery thereof.

Another object of the invention resides in providing a hoop encircling the tub near the bottom for further supporting the tub at the peripheral edge of the bottom thereof.

A still further object of the invention resides in forming said protuberance by causing a greater overlapping of the tongues of the bottom at the center of the bottom than at the marginal portions thereof.

An object of the invention resides in constructing said tongues with converging edges, the convergence of said edges increasing toward the ends of the tongues.

A feature of the invention resides in cutting the ends of the tongues off obliquely with respect to the center lines of the tongues.

Another object of the invention resides in constructing the container from a blank formed with two concentric arcuate edges and two radial edges, said blanks having tongues at the concave arcuate edges thereof, each of said tongues having radial edges throughout portions thereof and non-radial edges at other portions thereof extending in oblique relation with respect to the radial edges.

An object of the invention resides in a method of constructing containers utilizing sheets of paper cut into blanks of desired form and a glue for securing the sheets together having water as a solvent, said method consisting in moistening the blanks and thereafter applying the glue to the blanks while the blanks are moistened and in subsequently securing the blanks to one another to form the composite container structure.

Another object of the invention resides in providing a method of forming paper receptacles in which the blanks are assembled upon a mandrel having a circumferential wall and a radial wall and in which the body portion of the blank is first applied to the circumferential wall of the mandrel and the tongues formed on the blank thereafter applied to the radial wall of the mandrel.

A still further object of the invention resides in providing a method of forming paper receptacles in which other blanks are successively applied to the first blank, the body portion thereof being first attached to the previously mounted blank and the tongues thereof being subsequently attached to the tongues of the previously mounted blank and to one another.

Other objects of the invention reside in the novel combination and arrangement of parts and in the details of construction hereinafter illustrated and/or described.

In the drawing:

Fig. 1 is a perspective view of a butter tub illustrating an embodiment of my invention.

Fig. 2 is a developed view of one of the blanks from which the body of the tub is constructed.

Fig. 3 is a perspective view showing the method of constructing the tub.

Fig. 4 is a bottom view of the tub after all of the blanks have been applied.

Fig. 5 is an elevational sectional view taken on line 5—5 of Fig. 1.

In the shipment of butter and similar commodities considerable expense is encountered in the use of the ordinary wooden tubs now customarily employed for this purpose. Such tubs are readily broken in shipment and are fairly heavy thereby occasioning considerable cost in the shipment of commodities therein. With my invention a simple and practical tub is provided which is extremely light in weight and which has great rigidity and strength and in which commodities such as butter and the like may be repeatedly shipped without appreciable injury to the tub.

In Fig. 1, I have shown a butter tub which is indicated in its entirety at A and which is constructed in accordance with my invention. This tub comprises a body portion 10 which is constructed in the shape of a truncated cone having a bottom 11 formed integral therewith. The said tub further includes hoops 12 and 13 at the upper and lower portions thereof which are secured to said body portion and which stiffen and reinforce the same.

The tub A is constructed from a number of blanks each identical in construction. One of these blanks is shown in Fig. 2 and is indicated in its entirety by the reference numeral 14. This blank is constructed from a sheet of paper in which the grain runs in the direction of the arrow 15 shown in Fig. 2. The blank 14 is formed with an outer arcuate edge 16 and with two radial edges 17 and 18. The edge 16 is of a length somewhat greater than the circumference of the finished tub A at the open end thereof. Along an arcuate line 19 near the other end of the blank 14 and concentric with the edge 16 is formed a number of tongues 20. These tongues are constructed by severing the sheet from which the blank is constructed along radial lines 21 and by further cutting away portions of the sheet designated at 22. This forms the tongues with radial edges 23 extending throughout a portion of the length thereof and with edges 24 which converge toward one another more abruptly than the edges 23, said edges extending throughout the remaining portion of the tongues. The extreme ends of the tongues are cut off obliquely at 25. Each tongue is of the same length and of exactly the same construction.

In constructing the tub a mandrel or form 26 is employed which is shown in Fig. 3. This mandrel has a circumferential surface 27 shaped in the form of a frustum of a cone and a radial surface 28 extending at right-angles to the axis of the mandrel and at the end of the mandrel having the smaller diameter. The mandrel 26 may have a rounded corner 29 between the circumferential surface 27 thereof and the radial surface 28.

In the formation of the tubs, as many blanks are utilized as found necessary to give the desired strength to the finished tub or receptacle. One of the blanks 14 is first moistened and thereafter glue applied to a band 30 thereof along the marginal portion of the blank adjacent the radial edge 18 thereof and upon the outer surface thereof. Glue is also applied to the blank on the same side thereof upon all of the tongues 20. The blank while so moistened and coated with glue is placed upon the mandrel 26 with the line 19 coinciding with the corner 29 of the mandrel. The coated band 30 is next forced into engagement with the marginal portion of the blank 14 adjacent the radial edge 17 thereof and caused to adhere thereto. Thereafter the tongues 20 are successively folded over the corner 29 of the mandrel and upon the radial surface 28 thereof. A number of tongues so applied are indicated at 31 in Fig. 3. This is continued until all of the tongues have been secured to one another and form a part of the bottom of the tub. The blank 14 when so applied forms one of the laminæ of the tub. While said lamina is still moist, the second blank is prepared in the same manner excepting that it is coated with adhesive or glue throughout one entire surface thereof. This blank is then applied to the previously attached blank by first securing the body portion of the blank to the body portion of the previously applied blank. The tongues 20 of this second blank are next applied one at a time to the tongues of the previously mounted blank and this continued until all of the tongues are properly applied. This procedure is continued until as many blanks have been applied as are necessary to give the tub the desired thickness, strength and rigidity.

In certain instances it may be found desirable to apply the glue to both sides of the blank. In such case the blank first applied is coated on one side only and the procedure is the same as previously described. Each subsequent blank is thereafter coated on both sides and applied as described. For convenience the blanks may be coated on one surface before being mounted on the mandrel and on the other surface after having been mounted on the mandrel.

In the arrangement of the successive blanks constituting the laminæ of the receptacle, the joints at the radial edges 17 and 18 of the blank and indicated at 32 are staggered so as to distribute the same uniformly about the tub throughout the circumferential extent thereof. At the same time the tongues of the succeeding laminæ are staggered with respect to the tongues of the underlying laminæ so as to break joints and produce a more substantial and rigid construction.

The moisture added to the paper and that of the glue may be removed by drying in the atmosphere or, if desired, heat may be applied as by running the tubs after removal from the mandrel through an oven. The tubs may also be dried by heating the mandrel.

By running the grain of the paper in the direction shown by the arrow, the tub becomes so constructed as to most effectively resist bursting pressure which is occasioned through the packing of the commodity contained within the same and to the handling of the same. Since the joints along the elements of the tub are staggered the strength of the tub is equally as great at any cross section thereof. At the same time no appreciable thickening is noted at the body of the tub due to the joining of the material used in forming the various laminæ of the tub.

As will be noted in Fig. 4 the ends of the tongues designated by reference character 33 Fig. 3, overlap one another to a greater extent than the adjoining portions of the tongues. These portions are formed with a substantially uniform overlapping indicated at 34. The length of the tongues is such that the oblique edges 25 of the tongues of the outer laminæ are all tangent to the axis of the tub. Due to the fact that the inner laminæ are of lesser radial and circumferential dimensions than the other laminæ, the ends of said laminæ completely overlap one another. In this manner the bottom of the tub is completely sealed through the overlapping of the first laminæ applied, the subsequent laminæ merely reaching one another. By reason of the greater overlapping of the tongues at the central portion of the tub which is represented by the triangular section designated at 35, a protuberance 36 is formed on the bottom of the tub at the center thereof which projects outwardly beyond the outer surface 37 of said bottom. This protuberance serves to support the bottom of the tub at its center when the tub rests upon a flat surface.

In supporting the tub at the peripheral edge of the bottom thereof, the hoop 13 is employed. This hoop, like hoop 12, may be constructed of

paper formed from arcuate strips glued together to form a composite structure. Said hoops 12 and 13 may be applied to the tub immediately after the body and bottom thereof are constructed. If desired, however, said hoops may be formed and dried and subsequently applied to the body of the tub after the same has become dry. In either event said hoops 12, 13 are preferably constructed of the same material as the tub proper and are glued thereto with the grain of the paper running in the direction of the circumference of said hoops. In this manner the hoops never become loosened and remain firmly attached to the tub at all times. In applying hoop 13 to the lowermost portion of the tub, said hoop is allowed to project outwardly beyond the tub as indicated at 38 a distance equal to the distance that the protuberance 36 projects beyond the lower surface 37 of the tub. When the tub is set upon a flat surface the lower edge 39 of hoop 13 engages such surface and likewise the center 40 of the protuberance 36. This causes the tub to be supported both at its marginal edge and at the center, thereby preventing the bottom from being unduly stressed or unsupported when the contents are placed within the tub. Due to the lower portion 41 of the hoop 13 projecting below the bottom 11 of the tub the lowermost portion of the tub can be more readily grasped by the fingers and the tub more readily handled.

In addition to the hoop 13 I employ the hoop 12 previously referred to which encircles the tub at the upper open end of the same. This hoop may likewise be constructed of paper of the same material as the body of the tub and similar to the hoop 13, is glued to the tub. The hoop 12 serves to reinforce the rim of the tub and to prevent breakage or injury to the body of the tub at the open end thereof.

In the construction of receptacles or containers in accordance with my invention, I have found that various grades of paper may be advantageously utilized. A paper constructed from a spruce pulp is quite suitable. Craft paper and papers having about the same strength as craft paper may also be used. For gluing the sheets or laminæ of paper together, a casein glue is preferable, though any type or form of adhesive such as water glass, animal glue or any other adhesive may be employed. In addition to paper any material such as wood laminæ or fabrics may be utilized separately or together with paper and glued together to form the tub. The number of laminæ used in the tub depends entirely upon the strength, stiffness and rigidity necessary to cause the tub to properly function when filled with the commodity for which it is intended. For butter tubs four to eight thicknesses of paper of approximately four to seven thousandths of an inch will be found sufficient.

In conjunction with my improved tub any type of closure may be employed. The closure may be also constructed of paper by utilizing laminations of paper in much the same way as the body of the tub. Such closure may be also constructed from flat sheets of paper by pressing the same in suitable molds and heating and drying after the paper has been formed. Such construction not constituting any particular of this invention, has not been illustrated. Any desired type of fastening device may also be used with my improved tub, one form of such construction being disclosed in an application for patent being filed herewith.

My invention is highly advantageous in that an extremely practical and useful article is provided. The tub may be constructed at an exceedingly low cost. The tub may be used repeatedly so that the cost of containers per pound of commodities shipped is very low. The tub is easily handled and is extremely strong and rigid in construction. By means of the central protuberance on the bottom and the outwardly extending hoop the tub is fully supported and but small stress is applied to the bottom. The tub is extremely light, thereby reducing transportation charges in the shipment of commodities in the same. The tub is practically unbreakable and when mistreated, is merely dented or deformed without breaking the tub or exposing the contents of the same.

Changes in the specific form of my invention, as herein disclosed, may be made within the scope of what is claimed without departing from the spirit of my invention.

Having described my invention, what I claim as new and desire to protect by Letters Patent is:

1. A tub comprising a body portion formed of a number of laminæ arranged in overlapping relation and secured together, said laminæ having tongues issuing from the ends thereof, the adjoining tongues being adapted to be turned into overlapping arrangement upon themselves and secured together to form a bottom for the tub, said tongues being constructed with converging edges, the degree of convergence thereof within the bottom increasing toward the ends of the tongues.

2. A tub comprising a body portion and a bottom integral therewith, said bottom being formed with an integral protuberance in the vicinity of its center extending outwardly beyond said bottom, and a hoop at the periphery of said bottom, extending beyond the bottom the same distance as said protuberance, said hoop and said protuberance supporting said tub on the surface on which it may be placed.

3. A tub constructed from a blank formed with two concentric arcuate edges and two radial edges, said blank having a number of tongues issuing from the concave arcuate edge, said tongues having radial edges extending from said arcuate edge for a portion of the length of the tongues, and having converging edges extending angularly from said first-named edges and symmetrical with respect to the center lines of said tongues, said tongues being further constructed with oblique end edges, said blank being folded to bring all of the edges of the tongues within the confines of the bottom of the tub to provide a bottom of minimum thickness near its periphery of uniform thickness throughout an annular zone intermediate its center and periphery and of a maximum thickness at its center to produce a central protuberance thereon.

BESS B. LEE.